



Global Facility for Disaster Reduction and Recovery

Disaster Risk Management Programs for Priority Countries



THE WORLD BANK



GFDRR

Global Facility for Disaster Reduction and Recovery



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Disaster Risk Management Programs for Priority Countries

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CONTENTS

FOREWORD / v

2009 Priority Countries

AFRICA

Burkina Faso / **2**

Ethiopia / **17**

Ghana / **32**

Malawi / **47**

Mali / **70**

Mozambique / **97**

Senegal / **108**

Togo / **138**

EAST ASIA AND PACIFIC

Indonesia / **154**

Marshall Islands / **164**

Papua New Guinea / **177**

Solomon Islands / **188**

Vietnam / **198**

EUROPE AND CENTRAL ASIA

Kyrgyz Republic / **216**

LATIN AMERICA & CARIBBEAN

Haiti / **228**

Panama / **242**

MIDDLE EAST & NORTH AFRICA

Djibouti / **256**

Republic of Yemen / **264**

SOUTH ASIA

Nepal / **278**

Donor Earmarked Countries

EAST ASIA AND PACIFIC

Cambodia / **288**

Lao PDR / **297**

Philippines / **305**

Vanuatu / **316**

LATIN AMERICA & CARIBBEAN

Colombia / **332**

Costa Rica / **342**

Ecuador / **354**

Guatemala / **364**

SOUTH ASIA

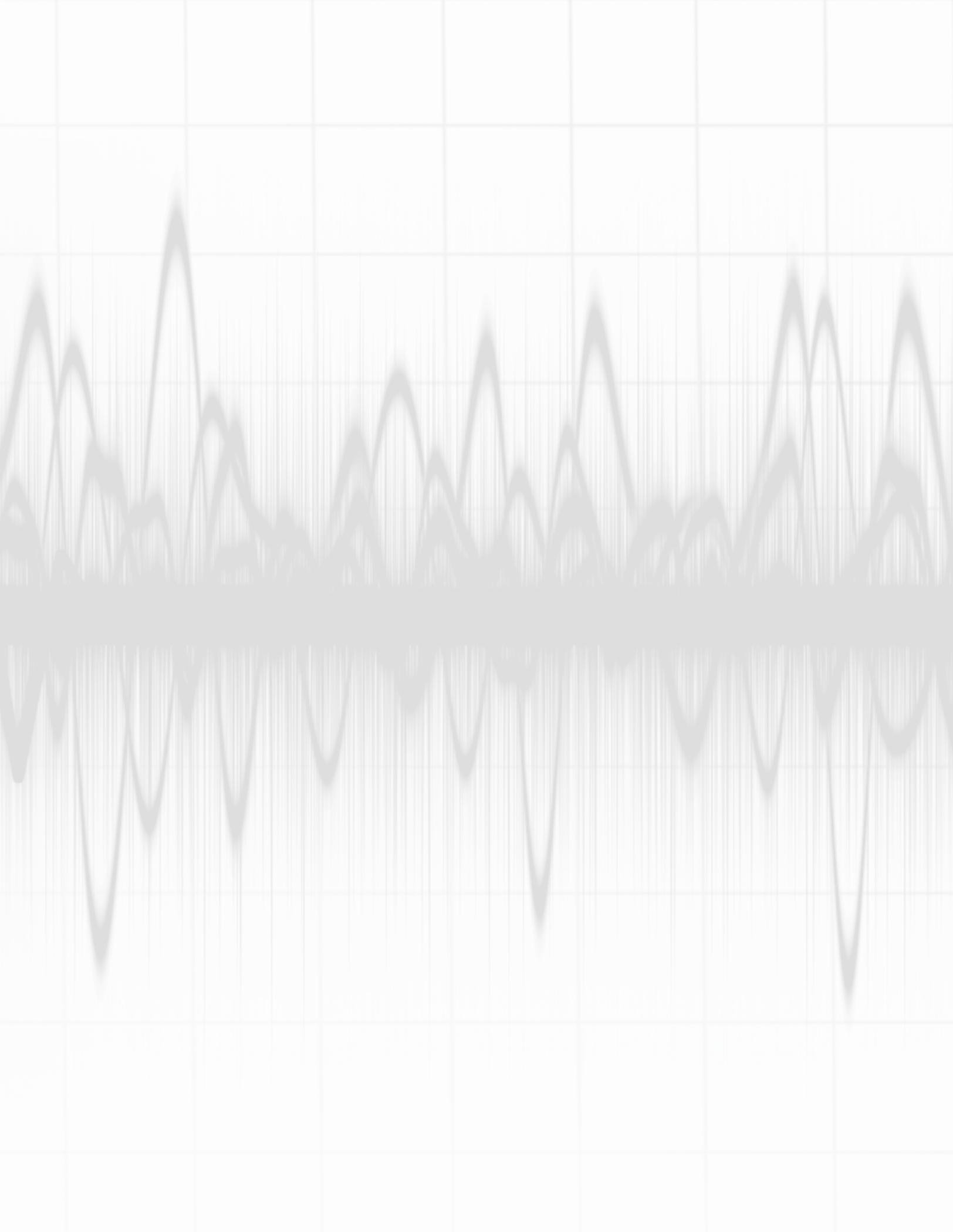
Bangladesh / **376**

Pakistan / **386**

Sri Lanka / **399**

Prospective Country

Fiji / **412**



FOREWORD

This is the 2nd edition of the Disaster Risk Management Program for Priority Countries, originally published by GFDRR in 2009. It now includes the country programs missing in the first edition (Burkina Faso, Malawi, Mali, Senegal, and Philippines¹) as well as an update of the DRM Country Program for Haiti (to take into account the impact of the January 2010 earthquake), Panama, Guatemala, Ecuador, Colombia, Costa Rica

As indicated in the previous edition, the presented programs are indicative; as the detailed planning and implementation phases have started, further dialogue with the Governments and other partners has refined the agendas and prioritized interventions.

13 country programs have already received an initial allocation totaling \$22.86M, representing 25.25% of the total \$90.522M planned for these country programs. Ethiopia (\$1.75M), Malawi (\$1M), Mali (\$1.4M), Mozambique (\$1.46M), Nepal (\$1.8M), Senegal (\$1.4M), Solomon Islands (\$2M), Togo (\$1.75M), Indonesia (\$2M), Vietnam (\$2M), Djibouti (\$1M), Haiti (\$4.8M) and Panama (\$500k).

In each priority country, GFDRR has hired DRM Specialists to facilitate a more effective implementation of the respective country programs as well as a greater DRR harmonization at the country level among all the key partners, including better integration of the DRR and climate adaptation as part of the overall national development agendas.

GFDRR is in the process of implementing its Results Agenda, which remains one of its top priorities. The GFDRR Results Model provides an innovative way forward and a methodology for quantifying DRM Mainstreaming Progress and Impacts across all priority countries, which will further strengthen the strategic positioning of our efforts. Preliminary operationalization of the GFDRR Results Framework has resulted in unearthing key findings, which in turn completes the virtuous cycle of mainstreaming a results-based thinking in everything that GFDRR does.

The ability to view GFDRR impact on country performance helps GFDRR strategically focus on its portfolio of countries. The ability to measure our impact in a country and to be able to look at the performance of that country simultaneously would help us in strategically positioning our efforts to be able to extract the most return on investment with respect to developmental impact.

At its 5th meeting in Copenhagen in November 2008, the GFDRR Consultative Group asked the Secretariat to focus on a select group of priority countries to achieve increased impact.

In GFDRR's Track II, Mainstreaming Disaster Risk Reduction in Development, this led to a prioritization of operations in 20 core countries, including **Burkina Faso, Djibouti, Ethiopia, Ghana, Haiti, Indonesia, Kyrgyz Republic, Madagascar, Malawi, Mali, Marshall Islands, Mozambique, Nepal, Panama, Papua New Guinea, Senegal, Solomon Islands, Togo, Vietnam, and Republic of Yemen.**

1 The formulation of the DRM program for Madagascar was put on hold because of the political situation but should resume soon.

The countries were selected due to their high vulnerability to natural hazards and low economic resilience to cope with disaster impacts including anticipated climate change and variability. Two thirds of the countries are least developed countries and twelve are highly indebted poor countries. Nine are from Africa and several others are Small Island States at high risk.

These 20 core countries will receive 80 percent of available funds while 20 percent will be made available for flexible, innovative, high impact grants, such as those that catalyze increased investment programs and integration of disaster risk reduction and climate change adaptation in development in any disaster prone country.

GFDRR will also systemize and deepen its engagement in eleven single donor trust fund countries, including **Bangladesh, Cambodia, Colombia, Costa Rica, Ecuador, Guatemala, Lao PDR, Pakistan, Sri Lanka, Philippines,** and **Vanuatu**, using funding made available by the concerned donors.

To develop a strategic and integrated vision, GFDRR is preparing comprehensive programs for disaster risk management and climate change adaptation for the next three to five years in each of the priority and donor earmarked countries.

The Development Process of Programs

A multi-stakeholder planning process lays the foundation for the comprehensive national programs for disaster risk reduction and climate change adaptation. The process ensures the facilitation of ownership by governments for their risk reduction agenda and the initiation of larger strategic partnerships and disaster risk reduction platforms.

In each priority country, the following steps are undertaken to develop the country programs:

1. Investigation of a) the underlying risk factors and b) the progress in the five priority areas of the Hyogo Framework for Action;
2. stocktaking of ongoing risk reduction and climate change adaptation programs by key stakeholders, including UN agencies, multilateral and bilateral donors, and other partners;
3. identification of key gaps at national, sector, and local levels;
4. solicitation of proposals from different government and non-government entities and concerned donor agencies;
5. analysis of the solicited proposals and consensus building in a consultative process involving a range of stakeholders, including relevant government ministries, UN organizations, multilateral and bilateral donors, IN GOs and civil society actors;
6. development of strategic comprehensive programs of support based on the gathered information.

Criteria used for the selection of the proposed activities include the relevance in addressing underlying risk factors, the leveraging potential of future disaster risk management interventions, and meeting the challenge of increased risk reduction activity synchronization and synergy building across various donors and thereby improving the quality and effectiveness of donor aid in the DRM arena.

Achieving Outcomes

A set of priorities has emerged which will drive the GFDRR supported risk reduction agenda for the next three to five years.

Knowledge, advisory, and capacity building on all levels. Many countries are undergoing a substantial shift in DRM structures, roles and responsibilities away from classical disaster response functions to multi-sectoral and ministerial development agendas around risk reduction and climate change. It will require a strong investment in national capacities

for Governments to lead and implement the comprehensive risk reduction agendas and to coordinate between ministries. Local authorities at district level will also require technical support to put new strategies into practice.

Intensified support for sectoral mainstreaming. The programs identify the Governments' demand for technical and managerial support to develop sector specific risk reduction strategies and priority program investments. The most urgent investments are linked to the hydro-meteorological sector in flood protection and mitigation of storm damages due to increased severity of changing weather patterns.

Coordination of disaster risk management and climate change adaption agendas. Disaster risk reduction and climate change adaptation should largely be managed as one integrated agenda. Both agendas have a few differences but many overlaps. Many of the country programs aim to integrate the two agendas and strengthen the coordination between climate change adaptation and disaster risk reduction institutions. The resulting climate risk management approach treats existing and future climate-related risks as one continuum, generates social and economic benefits in the short term, while also reducing vulnerability to long-term changes in climate.

Comprehensive risk assessments. Many countries have made progress in sector specific hazard assessments but there is practically no targeted country within the GFDRR framework that has developed a comprehensive hazard risk assessment system where data is easily collected, analyzed and shared with various stakeholders either within the government or with external constituencies. Generally, the scope of monitoring systems will have to be expanded in most countries while investments in advanced technology are required.

Better risk financing models to alleviate macro and micro economic loss of assets due to disasters. The area of risk financing is emerging as a macro-economic issue of great importance, most notably as all countries face significant loss in GDP by a wide range of natural hazards. Most GFDRR core countries therefore strive to develop innovative finance instruments including Disaster Management Funds for response and recovery activity as well as Catastrophe Insurance risk financing models to cover losses to state and private sector assets. Pooling risks at a macroeconomic level as well as finding micro-insurance schemes for individuals at a community setting prove how complex and diverse the needs are for innovative finance instruments.

Improved engagement of civil society and community actors in building resilience on local levels to ensure a bottom up process to mainstreaming risk reduction priorities. The country programs address the need for an increased decentralization of DRM management responsibilities to local authorities on provincial, district and communal level. Mainstreaming and leveraging of DRM programs at national level will be complemented through strengthening human resources, appropriate tools and empowerment of institutions at the point of service delivery.

Strategic partnerships with other development actors including regional Banks, bilateral donors, the UN system, INGOS and civil society. The GFDRR funding requests are built on a thorough in-country assessment process with relevant government ministries, the UN system, the Red Cross and Red Crescent movement, IN GOs, local civil society actors, and other partners. All country assessments have clearly concluded that one single organization cannot tackle the rising demands of integrating a comprehensive risk reduction and climate change adaption agenda alone. However, the coordination mechanisms are often still weak and a large number of donors with specific technical agendas are not part of a broader risk reduction platform. GFDRR will strengthen existing and initiate new partnerships for its work as a technical engine for DRM excellence and a catalyst for leveraging investments into mainstreaming risk reduction and climate change in a larger development agenda. The new round of program proposals is built on a promising commitment by many in-country partners to a joint DRM agenda that is executed by a wide range of partners, including the Governments, UN, civil society, bilateral donors, and other partners.

Table: GFDRR Priority and Donor Earmarked Countries

#	Country	Region	LDC (Least Developed Country)	Income group	Lending Category	HIPC (Heavily Indebted Poor Country)	SIDS (Small Islands Developing State)	LLDC (Landlocked Developing Country)
2009 Priority Countries								
1	Burkina Faso	AFR	Yes	Low	IDA	Yes		Yes
2	Ethiopia	AFR	Yes	Low	IDA	Yes		Yes
3	Ghana	AFR		Low	IDA	Yes		
4	Madagascar	AFR	Yes	Low	IDA	Yes		
5	Malawi	AFR	Yes	Low	IDA	Yes		Yes
6	Mali	AFR	Yes	Low	IDA	Yes		Yes
7	Mozambique	AFR	Yes	Low	IDA	Yes		
8	Senegal	AFR	Yes	Low	IDA	Yes		
9	Togo	AFR	Yes	Low	IDA	Yes		
10	Indonesia	EAP		Lower middle	IBRD			
11	Marshall Islands	EAP		Lower middle	IBRD		Yes	
12	Papua New Guinea	EAP		Low	Blend		Yes	
13	Solomon Islands	EAP	Yes	Low	IDA		Yes	
14	Vietnam	EAP		Low	IDA			
15	Kyrgyz Republic	ECA		Low	IDA	Yes		Yes
16	Haiti	LAC	Yes	Low	IDA	Yes	Yes	
17	Panama	LAC		Upper middle	IBRD			
18	Djibouti	MNA	Yes	Lower middle	IDA			
19	Yemen, Rep.	MNA	Yes	Low	IDA			
20	Nepal	SAR	Yes	Low	IDA	Yes		Yes
Donor Earmarked Countries								
1	Cambodia	EAP	Yes	Low	IDA			
2	Lao PDR	EAP	Yes	Low	IDA			Yes
3	Timor-Leste	EAP	Yes	Lower middle	IDA		Yes	
4	Vanuatu	EAP	Yes	Lower middle	IDA		Yes	
5	Colombia	LAC		Lower middle	IBRD			
6	Costa Rica	LAC		Upper middle	IBRD			
7	Ecuador	LAC		Lower middle	IBRD			
8	Guatemala	LAC		Lower middle	IBRD			
9	Bangladesh	SAR	Yes	Low	IDA			
10	Pakistan	SAR		Low	Blend			
11	Sri Lanka	SAR		Lower middle	IDA			
<p>Income Group: All economies are divided based on 2007 gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are: low income, \$935 or less; lower middle income, \$936–3,705; upper middle income, \$3,706–11,455; and high income, \$11,456 or more.</p> <p>Lending category: IDA countries are those that had a per capita income in 2007 of less than \$1,095 and lack the financial ability to borrow from IBRD.</p>								



DISASTER RISK MANAGEMENT

Africa

Burkina Faso / Ethiopia / Ghana / Malawi / Mali / Mozambique / Senegal / Togo

BURKINA FASO

Burkina Faso is one of the priority countries of the World Bank's Disaster Risk Management (DRM) team for 2009/11. This country note on Disaster Risk Management and Adaptation to Climate Change (DRM/ACC) is a baseline document for priority investments in those areas, and for the support the World Bank will provide to Burkina Faso through funds allocated under the "Global Facility for Disaster Reduction and Recovery" (GFDRR).

Based on analysis of the impact of climate variability and change on various development sectors in Burkina Faso, and on national strategies and interventions formulated by Government and its partners, and taking into account the five (5) priorities¹ of the Hyogo Action Framework (CAH) and objectives set in Burkina Faso's National Adaptation Program of Action (NAPA), this document identifies major problems, suggests key priority actions to be undertaken in the area of Disaster Risk Management and addresses adverse impacts of climate change.

The document provides an outline of current weather conditions in Burkina Faso, long and medium term trends and establishes linkages with major disaster risks. It analyzes the institutional framework, related policies and investments, problems, challenges, and identifies priorities, as well as recommendations for supporting GFDRR.

This country document was drafted after a participatory process carried out in close consultation with the National Council for Emergency Relief and Rehabilitation (CONASUR), which is Burkina Faso's risk prevention and humanitarian action co-ordination institution. Key government and non-government stakeholders were also involved.

1. DISASTER RISK PROFILE

Current climate and expected change

Burkina Faso is a flat landlocked country with an area of 274,200 sq km. **Located between 10 and 15 degrees northern latitude**, the country is found in the Niger River Loop, despite a close link to the Gulf of Guinea through Volta River. Burkina Faso is bordered by six countries from the sub-region (see map).

Due to its geographical position, Burkina Faso is characterized by a dry tropical climate which alternates between a short rainy season and a long dry season. Burkina Faso's climate is prone to strong seasonal and annual variation due to its location in the hinterland and within the confines of the Sahara. The country has three climatic zones: the Sahelian zone in the north receiving less than 600mm average annual rainfall; the north-sudanian zone in the center receiving an average annual rainfall between 600 and 900mm; and the south-sudanian zone in the south with an average annual rainfall in excess of 900mm.



¹ Ensure that disaster risk reduction is a national and local priority with a strong institutional implementation base, (2) Identify, assess and monitor disaster risks and enhance the early warning system, (3) Use knowledge, innovations and education to build a safe and resilient society at all levels, (4) Reduce underlying risk factors, and (5) Enhance disaster preparedness for efficient response at all levels.

Climate change may affect the Sahelian region of Africa through severe variations in rainfall, water shortage and low agricultural yield. This should amplify drought risks and evaporation, and reduce agricultural productivity (a 10% drop in rainfall is expected by 2050; GIEC, 1997). In addition, climate change will probably result in higher temperatures (a 1.4-1.6°C rise is expected by 2050; GIEC, 1997), potentially increasing the risk for forest fires or bushfires.

The simulations made by theoretical models and adapted to current conditions in Burkina Faso do not always show the same evolution values for parameters. Values adopted by Government under the National Adaptation Program of Action (NAPA)² were instrumental in assessing vulnerability and adaptation capacities to climate variability and change. These simulations indicate that Burkina Faso shall experience:

- a 0.8°C rise in average temperature by 2025 and a 1.7°C rise by 2050;
- a relatively low drop in rainfall of -3,4% by 2025 and -7,3% by 2050. The decrease in rainfall would be coupled
- with a very strong seasonal and inter-annual variability of climatic factors.

Whatever model is used, it is evident that climate variability and change is real in Burkina Faso, with strong impacts on key economic sectors such as agriculture, water resources, animal husbandry and forestry (NAPA, 2007 – table 1).

TABLE1. CLIMATE CHANGE AND VARIABILITY EVIDENCE AND THEIR IMPACTS ON MAIS SECTORS
(adapted from SP/CONEDD, 2006)

Evidence of Climate Change and Variability (CCV)	EXCESS RAINFALL Floods and erosion; Crop destruction; Drowning of livestock; Surface water pollution	VARIATION AND DROP IN RAINFALL Drop in the water table level; Recurrent droughts; Unfavorable isohyets migration; drought events in the course of the season; sudden drop in rainfall; Shift of the rainy season	RISE IN TEMPERATURE Aggravated evaporation of waterways; Accelerated soil lateritization; Increased water needs for crops	INCREASED WIND SPEED Violence; Frequency of (desert) wind storms; Soil erosion
Impacts of CCV on Water sector	Existing structures may be destroyed by heavy flooding. Siltation of lakes and waterways	Draining of wells and drainage wells; Low filling of lakes; Insufficient water for various uses; Water stress aggravation	Draining of surface water bodies; Increased water needs; Aggravated evaporation	Increased evaporation of water bodies; Siltation of lakes; Water pollution
Impacts of CCV on Agriculture	Low productivity, runoff and water erosion; Rice production in flooded areas; Soil drainage; Loss of crops	Disruption of the agricultural calendar; Reduction in agricultural output; Risk of extinction of species less resilient to climate change; Water deficit for crops; Food insecurity	Degradation of the agronomic condition of soils; Extension of farming areas to make up for the low yields; Extinction of certain species; Outbreak of crop pests (locusts, caterpillars); Drop in market gardening output	Destruction of fruit trees; De-blossoming of crops; Low production; Lodging of crops not conducive to crop production
Impacts of CCV on livestock	Drowning of livestock in water; Prevalence of moisture-related diseases	Fodder resource deficiencies; Loss of livestock; Water scarcity for livestock; Drop in productivity	Poorer fodder quality; Quick drainage of watering points	Poor water accessibility and fodder deficiencies

² MAGICC/SCENGEN: Models for climatic variable projections

Types of disasters

Burkina Faso is a Sahelian country faced with several weather constraints.

In Burkina Faso, droughts and floods are the most serious constraints. Between 1991 and 2009, the country has experienced eleven (11)³ major floods which have affected 383,203 people and claimed 93 lives, three (3) major droughts which have affected 96,290 people, an invasion of locusts and many episodes of epidemic diseases.

Frequent flooding is the major disaster facing authorities each year. Over the past twenty years, especially in 1988, 1992, 1994 and 1999, some zones were severely affected. For example, loss of agricultural production due to flooding of agricultural fields was estimated at 1.803 billion FCFA in 1992 and at CFAF 63,937,680,000 in 1994. Also, the cost of rehabilitating damaged dams in 1994 was estimated at CFAF 192,776,576 (Integrated Water Resource Management Project, 2000). Great weather and hydrological variability is demonstrated for example by the 1994 floods which affected over 650,000 people and were immediately followed by a drought in 1995, which in turn affected about 75,500 people and destroyed initial maize production in the Haut Plateau and northern districts.

The severe floods of September 2009 affected more than 150,000 people⁴ in Ouagadougou. Long-term impacts on the regional economy are not well-known yet, but damages alone exceed US\$ 130 million (PDNA, 2009).

Over the past thirty years, Burkina Faso (the north and center most especially) has witnessed several food disasters resulting from successive drought periods. Major crises were recorded in 1972/73 and 1983/84, and minor crises in 1990/91, 1995/96 and 1997/98 (PNOCSUR, June 1999).

Burkina Faso was also affected by crop pests (grasshoppers, aphids, cantharides, caterpillars, seed-eaters, migratory locusts, diseases) in 1986, 1988, 1989, 1990, 1991, 1992, 1994 and 2004. The most affected provinces were Yatenga, Soum, Séno, Bam, Yagha, Sourou, Passoré, Sanmatenga, Houet, Gourma and Kouritenga. These pests resulted in serious crop losses, tree destruction and low yields. **Locust invasions** from reproduction areas in neighboring countries such as Mauritania, Niger, Chad and Mali have been particularly disastrous. The most recent and most serious invasion in 2004 affected the entire country, with a peak in the northern regions.

Meningitis outbreaks are recurrent in Burkina. The most serious one which occurred in 1996/97 affected 42,000 people and claimed 4,000 lives. Recent outbreaks were as follows: 2006, 19,134 victims, 674 deaths; 2007, 26,878 victims, 1,923 deaths; 2008 (up to week 21), 9,609 victims, 942 deaths.

Cholera outbreaks also pose a cyclical threat during the rainy season.

Vulnerability and disaster exposure

With its geographical position, its tropical climate with drought periods and heavy rainfall, the flooding of the major rivers (Niger, Comoé and Volta), Burkina Faso is characterized by a strong structural vulnerability. This vulnerability is further accentuated by current weather features as well as development choices.

Burkina Faso's economy is essentially based on the primary sector (agriculture, livestock farming, silviculture and fisheries) which accounted for about 40 percent of GDP in 2003. Unfavorable soil climate conditions (low quality of minerals in the soil and insufficient rainfall) and continued soil degradation (due to wind and water-induced erosion) result in poor agricultural output, and Burkina Faso is the lowest performing agricultural country in Africa.

³ EM-DAT

⁴ EM-DAT: The OFDA/CRED International Disaster Database, www.emdat.be - Université catholique de Louvain - Brussels - Belgium"

Burkina Faso's population has doubled over the past 25 years. In 2006⁵, the population was estimated at 13.7 million inhabitants, with a 2.3 percent annual growth rate. This strong population growth puts pressure on natural resources and induces (i) an extensive agriculture, (ii) increased deforestation, (iii) depletion of the vegetation through overgrazing, (iv) resettlement of the population in flood-prone areas, which poses an additional dilemma to the land use planners.

Widespread poverty of Burkina Faso's populations increases their vulnerability to climate change impacts. Burkina Faso is one of the poorest countries in the world, with a GDP per capita of 345 US\$ and a human development index of 0.302, compared to an African average of 0.480. In 2004, Burkina Faso was ranked 175th out of 177 countries (UNDP, 2004). Findings from three priority surveys conducted by Government in 1994, 1998 and 2003 indicate increasing incidence of poverty (revised CSLP, 2004).

Expected climate variability and change will exacerbate these constraints and negatively impact the economy of rural populations, especially the poorest people (more than 80 percent of the country's population live directly on agriculture).

With the frequency and severity of natural disasters, Burkina Faso Government has devised strategies, plans/programs and bills to build capacities at all levels and avert and manage disaster risks, as well as climate change impacts.

The government has established perennial institutions such as CONEDD⁶ and CONASUR to address these issues. The government has also signed and ratified various international conventions and agreements (in particular the three Rio Conventions implemented through projects), as well as the Hyogo Action Framework.

Government initiative has gone through an in-depth analysis in accordance with Hyogo Action Framework priorities to identify strengths and weaknesses and recommend actions to be undertaken by GFDRR in support of such initiative.

2. ACTIVITIES UNDER HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Strengthening institutional and political coordination at all levels

In the face of climate-related crises, Burkina Faso Government has developed numerous policy instruments, planning and action programs that often overlap and with limited the implementation is very limited. This is further aggravated by the lack of any common vision for all interventions or actions.

Burkina Faso devised the National Adaptation Program of Action (NAPA), the Strategic Framework for the Fight against Poverty (CSLP), the Rural Development Strategy (SDR), the National Action Plan for Desertification Control (PAN/LCD), the National Biodiversity Strategy and Action Plan, the Action Plan for Integrated Water Resource Management (PAGIRE), as well as other instruments aimed at regulating energy, cereal and food security policies.

Legislative and regulatory instruments were also formulated, including the bill on Agrarian and Land Reforms (RAF), the Environment Code, the Forestry Code, the Orientation Law on Pastoralism, the Orientation Instruments on Decentralization, the Orientation Instruments on Water Management and the decree to establish CONASUR. These legislative instruments are quite often incomplete and some too old, without any implementing instruments; hence the need to raise awareness and enforce their implementation. Most international conventions have been signed or ratified, but their implementation remains low.

⁵ Preliminary 2006 GPHC data, April 2007

⁶ CONEDD: National Council on Environment and Sustainable Development, CONASUR: National Council for Emergency Relief and Rehabilitation

At the institutional level, Disaster Risk Reduction (RRC) activities are placed under the coordination of the National Council for Emergency Relief and Rehabilitation (CONASUR)⁷ which is attached to the Ministry of Social Action and National Solidarity. CONASUR has a Permanent Secretariat, regional (CORESUR), provincial (COPRSUR), district (CODESUR) and village (CODEVI) committees.

Though NGOs like the Burkina Faso Red Cross and Catholic Relief Services (CRS) may be endowed with excellent technical capacities, their working relations with CONASUR are not good. Some key CONASUR institutions have very limited technical capacities both in terms of skilled human resources and technical and operational resources. Senior officials of technical departments in ministries, local authority and civil society organization officials, opinion leaders may be called to action in case of disaster, and yet most of them have never been trained in crisis prevention, management and recovery.

To address climate change impacts, the government has established the National Council on Environment and Sustainable Development (SP/CONEDD) in charge of promoting environment and sustainable development policies and regulation. Its mission is to ease effective mainstreaming of key environmental management principles into national and sectoral development policies to promote sustainable development. SP/CONEDD is made up of the Focal Point on Climate Change as well as the Designated National Authority (AND) for the Clean Development Mechanism (MDP).

Though they have the same technical structure, **SP/CONEDD and SP/CONASUR** address climate change adaptation and mitigation, and disaster risk reduction and management separately. There is a lack of communication because there is no functional relationship between the two entities.

Implementation of an integrated programmatic RRC and ACC approach is the most efficient way of building population and ecosystem resilience to climate impacts and improving disaster prevention. This is recommended by the Hyogo Action Framework (for resilient States and Communities 2005-2015), the Bali Action Plan (2007), the Stockholm Action Plan (2007), the World Bank Strategic Framework on Development and Climate Change (CSBMCC), and the Climate Change Strategy for Sub-Saharan Africa (2010).

Also, **institutional and technical capacity building** of the stakeholders through support to the drafting of orientation instruments on disaster prevention and management, technical training of officials of CONASUR institutions, focal points and technical partners involved in the process are as many priority actions likely to improve the national mechanism for disaster risk reduction and management.

HFA Priority # 2: Strengthening the formulation and publication of information on climate risks

In Burkina Faso, assessment of hydro-meteorological risks and disaster prevention is carried out only selectively and solely through projects.

Assessment of the country's vulnerability to climate change (CC) was carried out during NAPA formulation in 2006. This assessment enabled to prioritize risks and to highlight the most relevant threats, thereby allowing for a more realistic planning in the formulation of contingency plans. Meanwhile, no such follow-up has been undertaken since then.

⁷ Members are: the Minister of Foreign Affairs; the Minister in charge of Agriculture, Hydraulics and Fishery Resources; the Minister in charge of Health; the Minister in charge of Defense; the Minister in charge of Security; the Minister in charge of Finance; the Minister in charge of Communication; the Minister in charge of Housing; the Minister in charge of Transport; the Minister in charge of Animal Resources; the Minister in charge of Disenclavement; the Minister in charge of Secondary and High Education and Scientific Research; the Minister in charge of the Environment; the Minister in charge of Basic Education; the Minister in charge of Women's Promotion; the Minister in charge of Youth Affairs or his representative; Region Governors; the Regional Council Chair; the President of the Burkina Faso Red Cross; the Permanent Secretary of Non-Governmental Organizations; the Ministry of Social Action and National Solidarity.

Assessment of adaptive capacities to climate change in the city of Ouagadougou carried out by the Science Application and Popularization Institute (IVAC) paved the way for: (i) issuance and production of information on the impacts of extreme climatic events and climate change within an urban and peri-urban context of Ouagadougou with emphasis on water supply and sanitation and on human health (malaria and waterborne diseases); (ii) production of particular toolkits and strengthening of existing information systems to raise awareness of the populations and decision-makers to extreme climate events; (iii) mainstreaming of climate-related risks into programs and projects to develop the city of Ouagadougou. Though interesting, this study remains selective and has no follow-up envisaged for ensuring sustainability of findings.

As concerns major hydro-meteorological hazards (floods and droughts), issuing of information and warnings is carried out by relevant technical structures.

- **The Department of Meteorology assesses and continually monitors climatic factors** such as precipitation and temperatures and provides forecasts relating to the beginning and end of the rainy season, and also droughts and floods. It ensures regular transmission of data and warnings through radio and televised bulletins and broadcasts (daily or decadal). However, the **scarcity of reporting stations** adversely impacts the quality and accuracy of forecasts, hence the need to improve the coverage of radars and reporting stations.
- **The Directorate General for Water Resources (DGRE) assesses and monitors the level of major rivers and waterways through reporting stations whose coverage is incomplete.** Though this monitoring is permanent, it does not provide useful real time data along the rivers. Weekly information bulletins on the hydrological situation are issued and forwarded to the Council of Ministers. A multifunctional data collection framework would be of great use.
- **Sub-regional projects such as the Niger Hycos with the Niger Basin Authority (ABN on the Niger) Volta Hycos with the Volta Basin Authority (ABV on the Volta)** carries out modeling on the behavior of the main rivers and waterways, and maps are drawn up. However, spatial analysis of the vulnerability of exposed elements (populations and infrastructures), combined with analysis of potential socioeconomic impacts would allow for an assessment and a complete cartography of flood risks.
- **The Directorate General of Plant Protection (DGPV)** permanently assesses and monitors locust invasion risks. With modern equipment and advanced transmission techniques coupled with field surveillance by agents as well as the people's contribution through locust monitoring brigades, the Locust Control Project (PLUCA) ensures real time and permanent surveillance of the locust threat.

Other information systems also contribute to the dissemination of information on climate variability and disaster risks, including: the National Environmental Information System (SNIE), the National Water Information System (SNIEAU), the National Agricultural Forecasts and Statistics System as well as the Early Warning System (EWS) geared towards food security promotion. Despite the various information systems, no link has been established between them to account for disaster risk reduction and management.

Research centers also play an important role in data production and transfer using programs at national and regional levels. The main centers are the following:

- The West African Seasonal Forecast (PRESAO) initiated in 1998 by various institutions such as the African Center of Meteorological Applications to Development (ACMAD), AGRHYMET and the Niger Basin Authority (ABN). This initiative aims to build national capacities in the area of weather forecasts in the sub-region.
- The AGRHYMET Regional Center of CILSS which has activities on climate change notably the "Support to Adaptive Capacities to Climate Change in the Sahel" program. This program aims at building the capacities of both AGRHYMET Center staff and local authorities in Sahelian countries. Pilot projects on adaptation to climate change in the agricultural and livestock sectors are also implemented.

- The CIFOR Regional Office in Ouagadougou which is currently conducting two research projects in the region on climate change impacts. TroFCCA (Tropical Forests and Climate Change Adaptation Program) seeks to promote understanding of tropical ecosystem adaptation to climate change. The “Semi-Arid Water Balance” Project which aims to predict the impact of climate change on the water level in semi-arid environments, especially in Western Africa, through research on the role of forests in regulating the water cycle.
- The University of Ouagadougou (Department of Geography and Department of Sociology) which carries out research on climate change in relation to human adaptation, Integrated Water Resources Management (IWRM) and migration. The Science Applications and Popularization Institute has built curricula, and intends to set up a research station to collect climate change data in West Africa and assess climate change impacts on ecosystems and mankind.
- The Development Research Institute (IRD) in Burkina Faso plays a key role in the AMMA project. IRD coordinates the Priority Solidarity Fund (FSP) Interdisciplinary and participatory Research on West African Ecosystems, Climate and Society (RIPIECSA). FSP RIPIECSA supports interdisciplinary research on climate change impact on the environment and society, with a view to building relations between West African scientific societies working in the area of climate change.

Yet, findings from these studies/programs are poorly capitalized in national planning. Thus, national strategies or programs and plans to implement environmental conventions do not take into account potential climate change impacts or disaster risk management and reduction.

In summary, in terms of early warning system, Burkina Faso has a good experience with regard to assessing, detecting, monitoring and predicting risks related to droughts and food insecurity. In addition, there is no harmonized mechanism uniting all of the available information on climate change and disaster risk.

Efforts carried out in the area of early warning system would need to be strengthened to monitor climate factors and rapidly developing hazards such as floods. Coordination of existing information and early warning systems, in particular in order to monitor message content and format, as well as transmission, coverage and effective use by recipients, needs to be permanently ensured (monitoring system) through an adequate mechanism.

HFA Priority # 3: Capacity and knowledge building

There are no programs devoted to capacity building in the area of DRR and CC, trainings are not systematically carried out but are done using projects though without any coordination.

Since 2003, civil protection training is organized annually by the DGPC. Open to everybody, such training is carried out with assistance from the International Civil Protection Organization (ICPO).

The Burkina Faso Red Cross is also very active in the area of training volunteers. Each year, training modules on first aid and basic first aid are sent to national and provincial teams of volunteers. The Red Cross also organizes awareness raising to guide stakeholders involved in GRC on their role and responsibilities.

A series of common or specific trainings meant for CONASUR senior officials, focal points and technical partners **in the area of disaster risk reduction and management is provided for under the capacity building project to be implemented by CONASUR.** Such trainings will allow for the diffusion of knowledge in the area of R/GRC, and also raise awareness to the stakeholders' roles as enshrined in legal and statutory instruments.

Advocacy campaigns targeting decision-makers and sensitization and information drives for Burkina's high-level staff and local communities are regularly organized by CONASUR.

As part of NAPA implementation, two (2) projects being designed will contribute in building knowledge of the adverse impacts of climate change, and in enhancing civil society contribution to the implementation of the national CC program. These projects will also lead to the translation of NAPA documents into the three main national languages (Mooré, Dioula, and Fulfuldé).

Research equally contributes to capacity building and awareness raising on climate risks in Burkina Faso.

Generally, a research unit or structure is attached to the technical ministry to support implementation of its mandate and work plan. Research is also carried out on actions geared towards disaster risk reduction through the National Scientific Research Center (CNRS), where research on optimal and quality animal productivity (improvement of pastoral zones with veterinary posts and boreholes, delineation of grazing areas and creation of pathways for livestock, intensifying current pest control) resulted in conditions conducive to improved livestock production.

Despite the various actions and initiatives by the authorities to drill the population on climate change impacts, awareness to DRR is far from satisfactory. This is partly due to poor resources; it is also due to communication tools used by climate change and disaster management adaptation and mitigation agencies in order to inform and educate the stakeholders on potential hazards and on means to mitigate their impacts.

While knowledge about the risks associated with drought (food insecurity and malnutrition) are relatively well understood, awareness about long-term reduction of flood risk is only partially addressed.

There is need to ensure capacity building for authorities of the Directorate General of Town Planning and Land Ownership Works (DGUTF) on land use planning and better site planning to avoid flood plains are occupied by vulnerable, both in urban, peri-urban and rural areas. Territorial development plans, zoning regulations and urban development planning instruments should also be implemented.

Large scale and systematic awareness-raising of the population and council authorities on improving and developing drainage systems and adequate sanitation is necessary, particularly in urban areas, as in Ouagadougou, where short but heavy rains may quickly lead to floods (September 2009).

In several parts of the country, the population already lives in flood-prone areas made up of river and waterway beds and basins. To protect and mitigate looming disaster impacts, steps to sensitize the population on the risks they run and urge them to leave threatened areas for more secure areas should be taken.

HFA Priority # 4: Financing climate resilience

The financing mechanism for disaster risk management and climate resilience is not yet sufficiently developed and adapted.

Operations specifically aimed or directed towards reducing the risk factors underlying the natural disasters are financed, particularly in the areas of environment and natural resources management, sustainable management of land and water resources management planning, energy and food security.

PNOCSUR funding is ensured through the Cereal Development Fund (FODEC). The mechanism's financial instrument which is administered and managed by the Joint Management Committee (CPG) brings together representatives of the State and donors. It is made up of two funds:

- The Food Security Actions Fund (FASA) accredited to intervene within the framework of the constitution/ reconstitution and maintenance of the National Security Stock, management of the financial stock whose volume should make it possible to purchase 25,000 tons of cereals, and the financing of food distribution operations in disaster-stricken zones;
- The Incentive Activities and Cereal Sector Promotion Fund (FIAP) designed to promote the initiatives of stakeholders of the cereal sector, this fund sets aside credit lines and guarantee funds in local financial institutions meant for private businessmen in the area of production, processing, storage and marketing.

NAPA implementation is mainly supported by GEF, Japanese and Danish cooperation. Among the twelve (12) priorities identified, two (2) are under implementation and one (1) is being prepared. The first project, which is sponsored by GEF/LCDF (US\$ 2.9 million) with UNDP as executing agency, is focused on implementation of the best agro-sylvo-pastoral adaptation practices. The second project is funded by Danish cooperation and executed by WWF (US\$ 870,000); its activities focus on capacity building of civil society organizations in the area of climate variability and change. The project under preparation is funded by Japanese cooperation (US\$ 3 million) and targets mainstreaming of climate-related aspects to regional and local development action plans and will also step up meteorological services and CONASUR through purchase of equipment.

The “National Capacity Building on Prevention, Preparedness and Response” Project being formulated will support community adaptive activities to climate variability and change by sponsoring micro-projects and innovative initiatives taken by village communities or divisions to showcase behavioral change, practices or adaptive technologies to climate variability and change in accordance with priority actions defined in the National Adaptation Program of Action to Climate Change (NAPA).

These interventions are mainly supported by external resources and therefore there is no sustainability of actions taken. Besides, the weakness of national structures to raise funds other than GEF funding is one of the key obstacles to disaster risk management.

Burkina Faso has been confirmed as pilot country for the forest investment program (FIP). In fact, with the framework for Reducing Emissions from Deforestation and Forest (REDD), the Strategic Investment Fund for Climate (FISC) was established to provide financial resources and test new development strategies or widen the scope of activities based on a particular specific climate issue or sectoral measures as part of targeted programs. The Forest Investment Program (FIP) was thus set in motion to devise policies and measures, and markedly provide funding to control deforestation and forest degradation and promote sustainable forest management to reduce GHG emissions and protect forest carbon stocks.

Important challenges need to be taken up in the area of funding.

To optimize response, a suitable, flexible and easily used financial mechanism granting funds to address various multi-sectoral needs is necessary. Strengthening of PNOCSUR financing system and its adaptation to a multi-sectoral and broad-based environment for the fight against climate variability and change effects could contribute in improving the RRC national funding mechanism. For a country such as Burkina Faso, which is continuously faced with permanent climate variability and natural risks, a good disaster funding strategy and mechanism is essential to sustainable development. Inclusion of the RRC into NAPA will enable additional financial resources to be tapped.

HFA Priority # 5: Strengthening the preparedness to respond to climate variability and change

Burkina Faso Government and development partners have formulated and implemented short and long term programs geared towards preventing and managing successive food crisis; the prevention and management of food crisis are ensured by three distinct structures:

- The Food Security Information Coordination Committee (CO) is in charge of coordinating collection, processing and dissemination of data on Burkina's agricultural and food situation. It is more specifically in charge of managing the Early Warning System (EWS) which makes it possible to apprehend the food situation in risk-prone areas.
- The National Stock Security Management Company (SONAGESS) manages the national buffer stock whose conventional volume is 35,000 tons. SONAGESS also ensures receipt and conservation of food aid granted to the State, as well as management of the Market Information System (SIAI).
- The National Council for Emergency Relief and Rehabilitation (CONASUR) is responsible for coordinating disaster response at national, regional, provincial, divisional and village levels.

Within this framework, the National Emergency Aid Organization and Coordination Plan (PNOCSUR) was established to lend support to CONASUR **but it remains solely focused on promoting food security.**

Burkina Faso developed a multi-risk contingency plan in 2009. This contingency plan is the main tool for disaster preparedness and response management in Burkina Faso. This national plan has the following objectives: i) clarify relations/responsibilities between the various technical State services and humanitarian partners; ii) facilitate coordination of actions and provide consistency of sectoral plans ; iii) identify and mitigate the most obvious risks; iv) propose a joint general planning framework on emergency risks; v) mainstream prevention, preparedness and response to emergencies into national development plans and programs; vi) reduce intervention delays and the number of deaths.

It covers three (3) stages of disaster management:

- The pre-disaster phase consists in organizing rapid operational and intervention structures. This induces minimum preparedness of both tools and intervention equipment to come to the aid of victims. Hence the importance of early information, which will make it possible to obtain good forecasts for efficient intervention. The training of stakeholders is very important in the course of this phase.
- The disaster phase or emergency situation or crisis situation in which the disaster has to be identified, victims saved, damage assessed, authorities informed, assistance organized and first aid transported to the premises.
- The post-disaster phase or post-crisis or post-disaster situation which corresponds to the rehabilitation/reconstruction/rebuilding phase and which seeks to restore normal living conditions, and improve such conditions if need be.

The contingency plan was put to test in 2009 through the use of a "life-size" simulation exercise, which was reviewed in 2010. The working out of Relief Organization Plan assistance organization plans (ORSEC) and the pre-positioning of goods and equipment in regions would contribute to the effective implementation of the plan. This implementation is currently curtailed by the low skilled human capacity and sustainable financial sources.

The Directorate General of Civil Protection (DGPC) and the Red Cross are the main stakeholders in the area of emergency relief and first aid. **Relief organization plans (ORSEC) should be appended to the multi-risk contingency plan,** but funding remains the major limiting factor of this project. ORSEC plans are the operational part of the contingency plan in a given zone and deserve to be strengthened.

The Catholic Relief Services (CRS) NGO uses a global DRR integration approach in its sectoral development programs. Concerning food crisis prevention and mitigation, its intervention is done through school canteens, humanitarian assistance and emergency aid in the country's most vulnerable zones. CRS also plays a key role in the resettlement project of September 2009 flood victims. However, these operations still hinge on external funding provided by USAID.

Despite these achievements, important needs should be addressed, especially in relation to rebuilding after floods. In fact, the rebuilding practice is a rather new experience for most authorities at council, central and regional levels. Knowledge, guides and reference models (concrete examples and experiences) on rebuilding are some of the needs expressed by these authorities. Rebuilding needs assessment is generally done at a much later phase, after emergency needs assessment and the availability of reports is delayed.

The loss and damage assessment report on September 1, 2009 floods (PDNA, 2009) has become a baseline document for the country's mid-term reconstruction. It would be advisable to reinforce the damage and post-emergency needs assessment system as well as the mid-term and longer term rebuilding responses. It will notably include strengthening the mechanism for needs planning and response implementation assessment as well as building knowledge for implementing these mechanisms.

The implementation of action 2009 plan prepared by the government to cope with the effects of the global financial crisis and flooding will be a springboard to better secure the affected public including schools and hospitals.

3. INTEGRATION OF DISASTER RISK MANGEMENT IN DEVELOPMENT STRATEGIES

The disaster risks reduction and strengthening resilience to climate variability and change are objectives stated in environmental and natural resources management policies and plans; Natural resource protection is in Burkina Faso's constitution. The Ministry of the Environment and Livelihoods formulated and implemented sustainable environmental management policies and programs.

Since the United Nations Conference on the Environment and Development held in Rio de Janeiro in 1992, the fight against climate change impacts is a priority of Burkina Faso Government. The country's priority is rather centered on forecasts, variations and potential impact management given the country's great vulnerability. In July 2007, Burkina Faso Government formulated and adopted the National Social Action Policy, which takes into account the issue of disaster risk reduction (part 2; program 7). This policy is now the baseline for all interventions in the area of disaster prevention and management in the country.

Social development policies and plans have been developed to reduce the vulnerability of high-risk populations. These programs, policies and funds are put to use in sectoral ministries, namely: Health, Agriculture, Environment, Infrastructure, Animal Husbandry, Basic Education, Social Action, Housing, Economy and Transport (Meteorology).

Since 2007, CONASUR receives technical support from SNU for identifying activities under the mainstreaming of Disaster Risk Reduction (DRR) into the Burkina Faso's education system. This initiative which involves the Ministry of Basic Education and Literacy through its Department of Allocation of Specific Means to Schools (DAMSE) should be pursued with the organization of brainstorming workshops with all stakeholders involved in educational activities or disaster risk reduction, including pupils and communities.

Sectoral economic and production policies and plans are set up for ACC and DRR and implemented as part of the reforestation and forest management program; community investment and agricultural fertility; natural resource management and land ownership security; rural transport and electrification.

Though adaptation to climate variability and change and disaster risk reduction is taken into account in sectoral programs, it should be noted that **the Strategic Framework for Poverty Alleviation (CSLP) does not specifically address the issue**. Mainstreaming climate resilience and disaster risk reduction in planning and implementation of the CSLP priority sectors is not clearly specified. This mainly explains the selective nature of interventions funded by the State budget with support from technical and financial partners. Considering that the vulnerability to climate risks can undermine the development process and destroy years of effort, at times regressing people to lower poverty levels it is recommended to include climate variability and change adaptation and disaster prevention and management in the PRSP as a crosscutting issue in itself.

The exposure of the economy of Burkina Faso to exogenous shocks such as those from climate risks is highlighted in the (2009-2012) Country Assistance Strategy⁸ of the World Bank (CAS). World Bank interventions contribute to adaptation to climate variability and change and disaster risk reduction, especially through activities in the “Rural Development and Environment” as well as “Energy and Transport” sectors. Priority actions undertaken within this framework are the following: promotion of sustainable land management techniques; reduction of agricultural pressure on natural resources; and promotion of the use of alternative energy sources to firewood.

Environmental and disaster risk management issues are a priority intervention provided for by the (2008-2012) United Nations Development Assistance Framework (UNDAF). The country document program (DPP) of the United Nations Development Programme (UNDP) supports five UNDAF effects. Among these five effects features notably the “improvement of food security for the most vulnerable groups and natural resource management”. In order to contribute to the improvement of food security and natural resource management, objectives pursued by the Country Action Plan Program (CAPP) are as follows: (i) promotion of small-scale agricultural production; (ii) promotion of the crisis prevention and management mechanism due to climate hazards; (iii) diversification and increase of rural household income especially for women and youths and (iv) sustainable natural resource management with increased participation of women in decision-making.

Despite the apparent priority granted to disaster risk reduction, its systematic integration as an adaptive tool to climate change in the planning and implementation of CLSP priority sectors should be clearly made known. Its better anchoring in the CSLP document and more information on the country's vision for its effective implementation are also required to pave the way for their real integration, in a broad-based manner, in the CSLP sectoral priority policies and programs and give partners the opportunity to include it considering the importance it deserves in their cooperation strategies and programs with Burkina Faso.

4. KEY DONOR ENGAGEMENTS

Burkina Faso's technical and financial partners often intervene in DRR/ACC through wider programs aimed at improving natural resource and land management. Integration of the environmental component in the European Union's policy in Burkina Faso found expression essentially in two sub-regional sectoral programs in the area of water and sanitation, education and health. However, inclusion of the environment at large remains insufficient, notably in rural development and transport.

⁸ Country Assistance Strategy for FY10

Concerning multilateral organizations, UNDP, WWF, FAO, CILSS, UNITAR and the World Bank intervene at various levels in the area climate variability and change. However, UNDP has developed many more activities as compared to other organizations and which mainly consist in supporting CONEDD in the conduct of activities linked to the operationalization of UNFCCC in Burkina Faso.

At the bilateral level, Danish, Japanese and Swedish cooperation are the major partners on environmental and climate risk management issues. Approximately fifteen projects involving close to twenty partners and worth about US\$ 350 million are currently implemented in the area of rural development, environmental protection and energy in Burkina Faso.

Table 2. Projects underway

Projects underway and Organizations	Partners	Tentative Budget, Years	Areas of Action according to CAH
Strengthening the efficiency of the contribution of the civil society to climate change adaptation issues.	DANIDA, WWF	CFAF 400,251,200	1, 3, 4, 5
Adaptation to climate change to improve on food security in Burkina Faso.	DANIDA, UNDP	US\$ 870,000	1, 2, 3, 4, 5
National capacity building for prevention, preparedness and response to food crisis and disasters in Burkina Faso.	PNUD	US\$ 1,795,000	2, 3, 5, 4
Renovation of the Bam lake	IFR/ARR	(2007-2015), US\$ 0.44 million	1, 3, 5
Renovation of hydro agriculture in Bonvalé	BOAD	(2007-2015), US\$ 1 million	3, 5
Agricultural Development Support Program of Burkina Faso (PADAB II)		(2006-2011)	3, 5
Education Sector Support Program (PADSE)		(2006-2010)	3, 4
National Food Security Program	FAO, Spain, Venezuela	(2006-2015), Funds committed: US\$ 4.42 million	2, 3
PABSO	KFW	(2006-2013), US\$ 14 million	
Small-Scale Irrigation and Water Management Project (PIGEPE)	IADF, OPEP, Beneficiary Governments	(2008-2014), US\$ 19.1 million	3, 4
Small-Scale Irrigation and Water Management Project (PIGEPE)	IADF	(2008-2015), US\$ 22 million	3, 4, 5
Action Plan for Integrated Water Resources Management (PAGIRE)	DANIDA, ASDI, FRENCH COOPERATION, EU, ADB, GEF	(2004-2015), US\$ 19 million	3, 4, 5
Area-Based Investment Program for Agricultural Fertility (PICOFA)	IADF, ADB, BOAD, Beneficiary Governments	(2004-2011), US\$ 26,9 million	3, 4, 5
SAAGA OPERATION	STATE	(1999-2015), US\$ 31 million	1, 2

(Cont.)

Projects underway and Organizations	Partners	Tentative Budget, Years	Areas of Action according to CAH
Sustainable Rural Development Program (PDRD)	IADF, BOAD, GEF, OPEP, Beneficiary Government,	(2005-2014), US\$ 38.3 million	3, 4, 5
Support Program to the Agro-Sylvo-Pastoral Sectors (PAFASP)	IDA / STAE	(2006-2012), US\$ 103 million	3, 4, 5
Integrated Development Program of the SAMENDENI Valley	DIB, SDF, FKDEA, FADD, BOAD, OPEP, BADEA, FRDC	(2006-2011), US\$ 144 million	3, 4, 5
CC DARE Program	UNDP, UNEP		

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

An in-depth analysis of the disaster risk management and climate change adaptation in Burkina Faso enabled us to distinguish four (4) priority areas of interventions which could be supported within the framework of GFDRR (see table below); they are:

- Strengthening CONASUR, improving its relations with other institutions;
- Establishing a functional early warning system;
- Strengthening the response capacity of CONASUR institutions;
- Implementing climate change adaptation actions at village level.

Table No 3. List of defined priority key areas

Actions proposed for GFDRR funding	Potential partners	Tentative total action and years covered (in US\$)	Potential products and remarks	Priority actions of the concerned Hyogo Action Framework (CAH)
Strengthening CONASUR	GFDRR, UNDP, Government of Burkina Faso	490,000	Diagnostic analysis of the organizational and institutional capacities of CONASUR, Support to capacity building	1, 2, 4
Devising an early warning system	GFDRR, Government of Burkina Faso	2,000,000	Diagnostic analysis of the organizational, technical and material capacities of du CONASUR, support to capacity building	2, 4
Capacity building for response institutions	GFDRR, Government of Burkina Faso	550,000	Diagnostic study of the state of the equipment, devising a support plan, support by funding equipment acquisition	3, 5
Investments: Development micro-projects	GFDRR, Government of Burkina Faso	2,000,000	Investment in sustainable development projects	1, 2, 3, 4, 5

Each key area includes several actions covering various aspects of the Hyogo Action Framework. A total number of ten (10) tentative actions proposed for GFDRR funding are listed in the following table, in decreasing order of priority. For each action proposed, the tentative budget, priority actions of the concerned Hyogo Action Framework and an outline of expected products and possible comments are presented in the table below. Actions were classified taking into consideration the following five (5) criteria:

- 1- The non realization of the action implies a negative impact on DRR/ACC interventions underway
- 2- The implementation of action improves the quality of current and future interventions.
- 3- The quality of other proposed actions in the DRM Country Note depend on the application of this action.
- 4- The implementation of the action will have positive impact on the people.
- 5- The Implementation of the action will have a positive impact on the economy at national and decentralized levels.

Table No 4: List of priority actions proposed for GFDRR support

Position	Proposed priority Actions	Budget (thousands of US\$)	Hyogo Action Framework	Expected products and remarks
1	Support to the development of the national RRC strategy and improvement of the coordination and communication capacities of CONASUR	240	1, 3	This action is co-funded by UNDP
2	Early warning system – phase 1 (design and acquisition of equipment)	700	2	The early warning system is devised, the technical specificities are defined, and some equipment have been bought.
3	Support for the implementation of the contingency plan	200	4	Support to the pre-positioning of equipment in vulnerable zones
4	Capacity building of material and technical institutions of CONASUR	1,100	2	Key CONASUR institutions acquire equipment indispensable for their activities.
5	EWS – phase 2 (Finalization and analytical studies)	200	2	Analytical studies on disasters are conducted and their results are available through the information system in place.
6	Capacity building of CONASUR coordination et de communication	100	1, 3	Functional links are established between CONASUR institutions
7	Elaboration of ORSEC plans	150	4	Support of DGPC for the elaboration of ORSEC plans in some regions
8	Capacity building of response equipment	200	2, 3	Institutions such as DGPC, the Red Cross and SP/CONASUR have adequate equipment for their intervention in case of emergency.
9	Investments : micro-projects adaptive to climate change	2,000	5	Micro - projects adaptive to climate change are implemented at community level.
10	Support to research on climate crisis	150	3	DRR/ACC research programs are implemented.
	Total	5,040		

ETHIOPIA



The preparation of the Ethiopia Disaster Risk Management (DRM) Plan comes at a very opportune moment because of: a) the recent (and ongoing) Business Process Re-engineering (BPR) throughout the government, which has considerably transformed structures and staffing at several ministries, including the Ministry of Agriculture and Rural Development; b) the development of a new National Policy on Disaster Risk Management, which is expected to be submitted to Parliament by July 2009 and potentially ratified in 2010; and c) a new mandate and approach for Disaster Management and Food Security Sector (DMFSS) to shift from a focus on ex-post emergency response and relief work to the much broader ex-ante disaster risk reduction. DMFSS is also a lead agency for issues related to climate change.

To prepare the Country DRM Note, consultations were undertaken with members of the World Bank's Ethiopia Country team and the DMFSS, and meetings were held with Ministry of Health, Ministry of Water Resources, National Meteorological Agency, Environmental Protection Authority, European Commission, WFP, UN-OCHA, UNDP, UN-ECA, UNICEF, FAO, DFID, USAID, FEWS-NET, DMFSS Livelihood Integration Unit, SC-UK, IFPRI, Oxfam-US, CARE, Relief Society of Tigray, and the Ethiopian Red Cross.

The matrix of priority areas and actions for DRM and estimated budget allocations were discussed and cleared at a debriefing meeting held at DMFSS on May 15, 2009 with wide participation of stakeholders from Government, donors, and NGOs. There is strong support and ownership and endorsement by DMFSS for the matrix of priority areas and actions.

1. DISASTER RISK PROFILE

A wide range of natural hazards are present in Ethiopia, including drought, floods, landslides, human and animal diseases, pests, earthquakes, and urban and forest fires. Recurrent drought and floods in particular have the most severe impacts on people's lives in Ethiopia (refer to Figures 1 and 2). The country's vulnerability to natural disasters is due to a number of inter-linked factors. These include dependence on rain-fed agriculture, under-development of water resources, land degradation, low economic development, and weak institutions. Furthermore, with a population of 80 million people, Ethiopia is the second most populous country in Sub-Saharan Africa, and has a relatively rapid annual population growth rate of 3.2%. With a GDP of US\$200 per capita, Ethiopia is also one of the world's poorest countries.

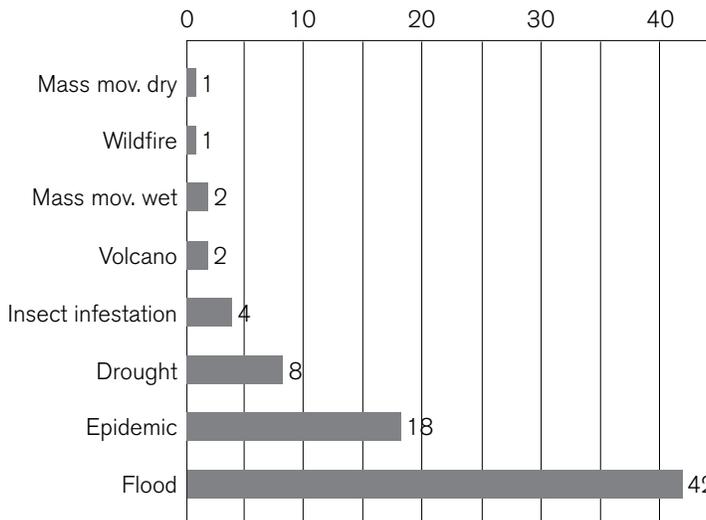
Drought is the most significant and recurrent climate-related hazard affecting the country. Ethiopia has mainly dry sub-humid, semi-arid and arid regions, all of which are prone to desertification and drought. Ethiopia has a long history of recurring drought; however, since the 1970s, the magnitude, frequency, and impacts of droughts have become more severe. Moreover, due to climate change and human-induced factors, the areas affected by drought and desertification are expanding in Ethiopia.

Flash floods and seasonal river floods are becoming increasingly common due to deforestation, land degradation, increasing climate variability, and settlement patterns. During the past two decades, major floods in

Top 10 Disasters in Ethiopia, 1999-2009

Hazard	People Affected	Date
Drought	12,600,000	2003
Drought	4,500,000	2008
Drought	2,600,000	2005
Flood	361,600	Oct 2006
Flood	239,586	July 2007
Flood	235,418	Apr 2005
Flood	110,000	Apr 2003
Flood	79,000	Oct 1999
Flood	45,000	Oct 1999
Flood	38,000	Aug 2006

Natural Disaster Occurrence Reported, 1980-2008



Source: EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium.

1988, 1993, 1994, 1995, 1996 and 2006 have caused significant loss of life and property. Large-scale flooding is limited to the lowland areas of the country; however, intense rainfall in the Highlands causes flooding of settlements in a number of river basins, particularly the Awash River Basin in the Rift Valley. Annual flooding in urban areas, especially in Addis Ababa, causes property damage along streams descending from the nearby hills. Flash floods are common in most parts of the country, especially when rains occur following prolonged dry spells.

Ethiopia’s climate is highly variable, and is projected to become more variable due to climate change, with the potential for increased frequency of extreme weather events including floods and droughts. Rural areas are very vulnerable to climate variability. The most vulnerable sectors to climate variability are agriculture, water, health, and energy.¹ Smallholders dependent on rain-fed crop production and pastoralists in drought-prone areas are the most vulnerable rural livelihood systems. Approximately 85% of the population lives in rural areas and depends on the local natural resource base to meet their basic welfare needs. The relatively under-developed, semiarid, and arid regions of Afar and Somali have been historically vulnerable to unfavorable climatic conditions, which are being exacerbated by climate change. The Amhara and Oromia regions are characterized both by areas of good agricultural production in the highlands and midlands and by recurrent droughts. The Tigray region, vulnerable to recurrent drought, is also vulnerable to climate change.²

Recurrent droughts, conflict, rising food prices and isolation of affected populations have resulted in persistent and high levels of food insecurity, and recurrent emergency situations. In 2008, more than six million Ethiopians required emergency food assistance due to drought and rising food prices. In recent years the value of emergency food and non-food aid has reached over US\$350 million on average per year. Although once self-sufficient in food and a net exporter of food grains, since the 1980s, Ethiopia has been a net importer of grain due to a decline in crop production caused by land degradation, soil erosion, and a decline in farm sizes, and rapid population growth and increasing demand for grains as livestock feed. Food aid has tended to be managed through emergency mechanisms that hand out food to needy households, rather than being provided as part of development programs that build and/or

1 Most of Ethiopia's electricity is from hydro-electric power.
 2 'Measuring Ethiopian Farmers' Vulnerability to Climate Change Across Regional States' Temesgen Deressa, Rashid M. Hassan, Claudia Ringler. IFPRI Discussion Paper 00806, October 2008.

protect assets (human, natural or physical). Thus, although there have been massive flows of food aid into Ethiopia since the 1980s, its contribution to sustained economic development has been insignificant.

The vulnerability to climate-related hazards and food insecurity is closely linked to land degradation. About 85% of the land surface in Ethiopia is considered susceptible to moderate or severe soil degradation and erosion. In the Highlands, shrinking farm sizes and soil degradation and erosion are reducing the sustainability of agricultural production and causing downstream pollution (including siltation of dams), thereby making it difficult for rural populations to meet their basic needs. The annual costs of land degradation are estimated to be at least 2-3% of agricultural GDP.³ To put this in perspective, that means that land productivity would need to increase by more than 20% immediately to reverse the damage of the past 10 years. In addition, land productivity is declining as average per household landholdings are declining due to population pressure and limited uncultivated land.

Despite the widespread problems related to droughts, there are some Highland areas that are relatively high rainfall areas, and, from a national perspective, Ethiopia is relatively well endowed with water resources. However these water resources are unevenly distributed both spatially and temporally. Between 80-90% of the country's surface water resources are found within four major river basins – Abay (Blue Nile), Tekeze, Baro Akobo and Omo and Omo Gibe. These are located in the west and southwest of the country with no more than 30-40% of the total population. In the east and central river basins, where 60 percent of the population resides, there are only 10-20% of the country's surface water resources. The Ethiopian Highlands contain the headwaters of a number of major rivers that flow across its borders and which are vital sources of water for neighboring and downstream countries, especially the Sudan, Egypt and Somalia.⁴ Historically there has been a problem for Ethiopia to exercise its riparian water rights and to access rivers whose source is in Ethiopia.

2. ACTIVITIES UNDER HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Policy, Institutional Capacity and Consensus Building

KEY DRM INSTITUTIONS AND NATIONAL DRM POLICY

Ethiopia's institutional framework for disaster risk management has undergone numerous changes in mandate, structure, and scope over the past 30 years. Following the devastating 1973/4 famines in Northern Ethiopia, the Relief and Rehabilitation Commission (RRC) was established. During its 20-year existence, RRC focused on disaster response and the distribution of relief supplies. The ratification of the National Policy on Disaster Prevention and Preparedness Management (NPDPM) in 1993 led to a shift in thinking based on the perceived need to more closely link the relief and development agendas.⁵ With this in mind, the government restructured RRC to establish the Disaster Prevention and Preparedness Commission (DPPC), and gave it a mandate to focus on the links between relief and development.⁶

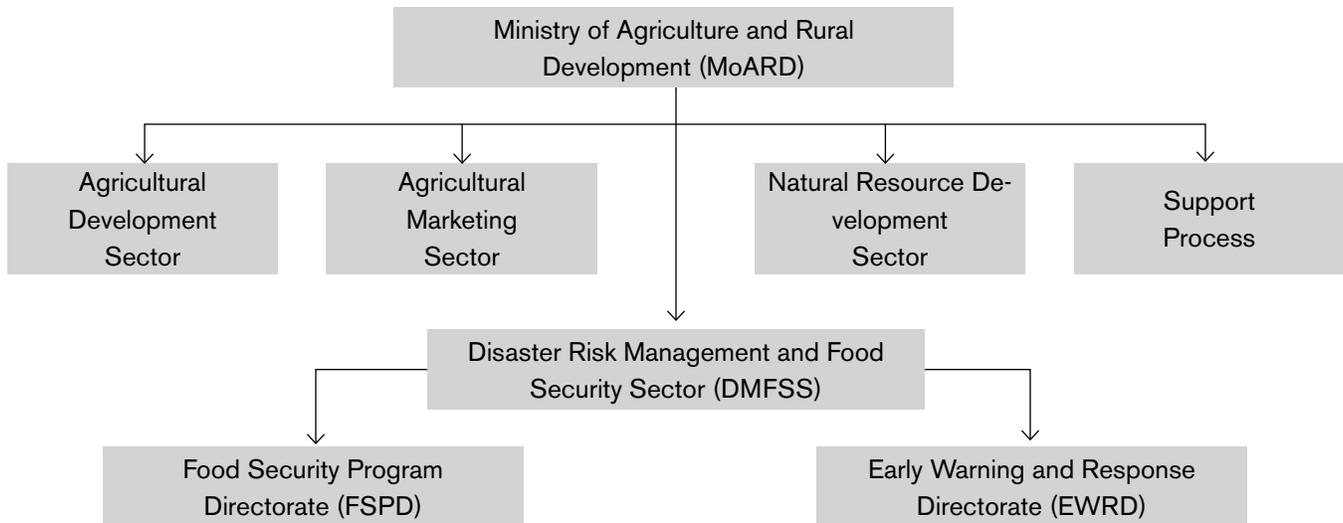
In 2004, DPPC was renamed the Disaster Prevention and Preparedness Agency (DPPA), with a revised and more restricted mandate to focus on acute cases of emergency response. The responsibility to coordinate employment generation, one of the major strategies that link relief with development, was reassigned from DPPC to the

3 Ethiopian Strategic Investment Framework for Sustainable Land Management (Draft). SLM Secretariat. August 2008.

4 Ethiopian Strategic Investment Framework for Sustainable Land Management (Draft). SLM Secretariat. August 2008.

5 In the 1990s, several important documents were created to guide the early warning system and food security: 1) the National Food Security Policy; 2) the 1993 National Policy for Disaster Prevention and Preparedness Management (NPDPM); 3) General Guidelines for the Implementation of the National Policies on Disaster Prevention and Preparedness Management; and 4) the Five-Year Disaster Prevention Plan 1998-2002.

6 See Climate Risk Management in Africa: Learning from Practice, edited by M.E. Hellmuth and others. (2008) International Research Institute for Climate and Society. The chapter "Food Security in Ethiopia" provides a good overview.



newly created Food Security Coordination Bureau (FSCB). As such, DPPA was no longer responsible for addressing the underlying causes of disasters, and was responsible only to respond to fast-onset disasters or unpredictable events. FSCB addressed national food security through a productive safety nets program, other food security-related projects that attempted to enhance assets and livelihoods, and a voluntary resettlement program. At the institutional level, DPPA was responsible for transitory vulnerability, while FSCB dealt with chronic vulnerability. In practice, though, many perceive that this distinction between chronic and transitory vulnerability is not so clear-cut in reality, and that there is some movement of households between categories.⁷

The recent (and ongoing) Business Process Re-engineering (BPR) process throughout the government during 2008-2009 has again restructured the institutional arrangement for disaster risk management, and established the Disaster Management and Food Security Sector (DMFSS) under the Ministry of Agriculture and Rural Development (MoARD), with a significant shift in policy direction. DMFSS now assumes all responsibilities of the former DPPA and FSCB. DMFSS oversees two directorates: the Food Security Program Directorate (FSPD) and the Early Warning and Response Directorate (EWRD). The diagram on the following page illustrates the current structure of DRMSS within MoARD.

BPR, which began more than a year ago, has had a major impact on government capacity, resources, and continuity, and has resulted in staff reductions across ministries. Staff of DMFSS in the national-level MoARD

was streamlined to reduce 60 percent of the staff, including some of the most experienced and skilled staff. There was less turnover at the regional DMFSS level, and a new cadre of DMFSS staff was created at the woreda (district) level. Thus, many of the current staff in DMFSS are new, and/or lack significant practical experience in disaster risk management. As some donors and NGOs are now beginning to re-engage with Government and try to re-establish partnerships with new staff, the DMFSS is in need for large-scale institutional and capacity building during this transitional and transformational phase.

Under the new structure, DMFSS is undergoing a major shift in its approach from traditional reactive ex-post emergency response and relief work to pro-active ex-ante preparedness and disaster risk reduction. The new approach to DRM is highlighted in the new DRM Policy, which is a revision of the 1993 NPDPM. The new

⁷ Burg, Jericho. 'Measuring Populations' Vulnerabilities for Famine and Food Security Interventions: the Case of Ethiopia's Chronic Vulnerability Index.' *Disasters*, 2008.

DRM Policy is still not completed and needs to be submitted to the legislature for approval. The new and ambitious DRM policy is organized according to Hyogo Framework for Action (HFA) priority areas and addresses some of the weaknesses of the 1993 policy, including the focus on drought and lack of information on community vulnerability and flood preparedness. Despite DMFSS's shift toward proactive ex-ante disaster risk management and explicit attention to HFA principles in the new policy, Ethiopia is not yet a signatory to HFA and has not established a national platform. Becoming a signatory to HFA would demonstrate Ethiopia's commitment to the broad principles and strategies outlined in HFA, and would constitute an important political gesture for the new unit. It is anticipated that the new national DRM policy will be presented to Parliament in mid-late 2009 and potentially ratified in 2010.

Government capacity at all levels, but particularly at the national level, is a critical issue in the establishment and implementation of this new mandate and proposed DRM policy. Successful implementation of the new DRM policy will require the development of a concrete and detailed strategic framework and implementation plan. The failure to fully implement the existing NPDPM has been attributed to the chronic capacity problem at all levels and lack of legislation to enforce the implementation of the Policy. Major stakeholders, particularly key line departments, do not always accept and support the main DRM strategy - the Employment Generation Scheme (a mechanism to link relief and development) - as part of their mandates. Links between responsibility, authority and accountability have not been clearly understood and observed. This is a major priority for making the new DRM Policy an effective vehicle for DRM.

Lack of coordination and cooperation among development partners and among government branches, and the lack of a coherent, comprehensive approach to DRM, are the main challenges to the implementation of the new DRM mandate. DMFSS needs to take a strong lead in providing a coherent framework and policy for DRM at the national, regional, and local levels. There is also a need for DMFSS to play a significant coordination role among the many actors involved in DRM, and to provide the donor and NGO community with a clear picture of how the various DRM investments and interests in the country are aligned.

There is also a strong need for greater coordination by DMFSS for sectoral-level DRM activities within the line ministries. DMFSS is the lead agency for dealing with hazards including drought, flood, and food insecurity, and the coordination of DRM across the ministries. Line ministries address the integration of DRM issues at the sectoral level. The Ministry of Water Resources, for example, is responsible for flood preparedness and the coordination of responses to water and sanitation-related disasters including floods. The National Meteorological Agency (NMA) falls under this ministry and prepares and disseminates monthly, seasonal, and annual climate bulletins and seasonal and annual hydro-meteorological bulletins; NMA also finalized the Government's National Adaptation Program of Action (NAPA) in 2008 and is mobilizing financial resources for its implementation.⁸ The Ministry of Health oversees an emergency preparedness, early warning, response and recovery system for health emergencies linked to hazards including floods and drought. These DRM activities at the sectoral level need to be better coordinated by DMFSS to avoid duplication of efforts and develop common methodologies and baselines for risk profiling (see next section for more details on risk profiling)

There is a recognition that food security and early warning activities must be decentralized to regional and woreda (district) levels. In 1995 the new constitution established a decentralized federal system that divided the country into a series of semi-autonomous Regional States. Most responsibilities for the planning and implementation of development policies and programs were decentralized to this level. Each region has its own set of government institutions which largely replicate those at the federal level. Resources and responsibilities for service delivery and

8 Other environmental strategies and policies include: (i) the 20-year Ethiopian Forestry Action Program (EFAP) formulated in 1994; (ii) the Ethiopian Water Sector Strategy formulated by the Ministry of Water Resources in 2001 and its 15-year (2002-16) water sector development program; and (iii) the Ethiopian National Biodiversity Strategy and Action Plan prepared in 2005 in fulfillment of the country's obligations following ratification of the UN Convention on Biodiversity.

project implementation have been moved to the woreda offices. In practice, however, both woreda and regional policies are still guided by federal sector policies and by cross-sector strategies and programs.⁹

A second phase of decentralization in 2002 established the woredas as the center of socio-economic development and empowered woreda administrations. The woredas now have economic autonomy and receive direct block grants from the regional level. Each woreda now has an elected council, from which are elected a woreda administrator and deputy who exercise overall leadership. The administrator chairs the woreda cabinet, which consists of the heads of the various government departments found at this level.¹⁰

There is a Task Force on DRM, led by DMFSS, that is supposed to bring together all of the Ministries that deal with DRM at the sectoral level:¹¹ Ministry of Water Resources, Ministry of Health, Ministry of Agriculture and Rural Development, Ministry of Environment, and NMA. This forum and other similar working groups and platforms, including the Early Warning Working Group (EWWG), Rural Economic Development – Food Security (RED-FS) Group, and the Sustainable Land Management (SLM) national platform, need to be better coordinated and integrated, with the clear establishment of roles and responsibilities. However, during and immediately after the BPR, this Taskforce has not been functioning. It is important to re-establish a functioning Taskforce on DRM to help finalize the new DRM Policy and to help lead the process for developing a detailed operational strategy and implementation plan.

HFA Priority # 2: Disaster Risk Assessment, Monitoring, Early Warning

RISK ASSESSMENTS

A major priority of the DMFSS is to develop risk (hazard/vulnerability/coping) profiles at the woreda level. The purpose of the profiles would be to integrate the baseline data on livelihood zones (disaggregated by livelihood groups) developed by the USAID-funded Livelihoods Integration Unit (LIU) with historical woreda-level data on hazards (e.g., floods, drought, malaria outbreaks, livestock disease) provided by the line ministries to determine multi-hazard risk profiles at the woreda level. Ultimately, this information can serve as a source of forecasting and early warning information based on historical data and also based on real-time data. In addition, the risk profiles can serve as a tool for analyses and planning exercises based on the interface between sustainable land management (SLM), DRR and CCA, and incorporate information on other sectors such as water balances, health and nutrition, land use, etc.

As such, DMFSS is seeking a common methodology for its proposed risk profiling. The existing early warning system places more emphasis on the livelihood zone database (i.e., vulnerability profiles), and how climate variability (notably lack of rainfall) can impact household well-being in terms of food production and consumption. It is possible to have more detailed historical and “real-time” multi-hazard data to estimate the potential disaster risks, and to extend the number of household well-being variables under consideration and to better model coping mechanisms and other household adjustments to changing conditions (including changing prices). Thus, the woreda-level risk profiling could provide a vast amount of information to integrate monitoring, forecasting, early warning systems, contingency plans and contingency financing for multi-hazard analyses that cover many sectors.

EARLY WARNING SYSTEM

The National Early Warning System (EWS) has been in place in Ethiopia since 1976. It is supported by a National Committee for Early Warning (NCEW), whose members, as stipulated in ‘Directives for Disaster Prevention and

9 Ethiopian Strategic Investment Framework for Sustainable Land Management (Draft). SLM Secretariat. August 2008.

10 Ethiopian Strategic Investment Framework for Sustainable Land Management (Draft). SLM Secretariat. August 2008.

11 Additional ministries and agencies with relevance to DRM include the Ministry of Federal Affairs, Ministry of Transport and Communication, Ministry of Works and Urban Development, Ministry of National Defense, Ministry of Mines and Energy, and Environmental Protection Authority.

Management,' include senior staff members of EWRD, Ministry of Agriculture and Rural Development, Ministry of Health, Central Statistical Authority, Ethiopian Mapping Authority, and NMA. In 1996 the multi-agency Early Warning Working Group (EWWG) was established to coordinate early warning activities related to food-insecurity among government agencies, donors, UN agencies, and NGOs. Early warning committees at all levels, including woredas, gather information and report to higher-level committees.

The EWS conducts hazard assessments periodically and yearly by monitoring social, economic, cultural and physical indicators. The EWS was established to “monitor and warn the threat of disasters ahead of time to trigger timely, appropriate, and preventive measures.” However the primary focus of the EWS has been to monitor causal factors of food insecurity. Thus it monitors the occurrence of drought, rainfall, pests, and the outbreak of human and livestock diseases that affect the availability of, and access to food. The existing EWS is not well-suited to fast-onset natural disasters such as floods, and certain rapidly spreading diseases and pests, and conflicts.

Communication among the kebele (community), woreda, regional, and federal levels is at the core of the early warning system and must be strengthened for effective functioning of the system. This includes improved systems for data collection, analysis, and dissemination to end users, as well as strengthening of the communication channels from the community to national levels.

There is widespread recognition, among Government and development partners, of the need to develop a more unified, transparent, coordinated, and objective early warning system, that has a system of “checks and balances.” Although more than 30 early warning systems, methodologies, and approaches exist in the country, there is no coordinating framework that brings together the different streams of information into a multi-sectoral early warning system that assesses hazards in, e.g., agriculture, health, nutrition, and natural resources management.¹² There should be one major unified early warning system that assesses multi-sectoral hazards across the country, including monitoring of drought risk, food insecurity, health epidemics, malaria outbreaks, livestock diseases, and market information. This requires the coordination of early warning activities from the community level up to the federal levels, across line Ministries at the federal level, and among the many actors and donors working on early warning issues at the community, regional, and national levels.

There has been some progress toward the development of unified early warning systems. In recent months the USAID-funded FEWS NET and the WFP-funded Vulnerability Analysis Mapping (VAM) have joined forces to generate a unified monthly Early Warning Bulletin. This is a major stride toward streamlining and integrating existing monitoring and early warning systems in Ethiopia. In addition, DMFSS has requested technical assistance from FEWS NET and VAM to help in preparation of monthly reports by Government.

The Government has made a strategic decision to decentralize the early warning system to the woreda level, particularly with regards to slow-onset risks such as drought and food insecurity. Given the importance of data captured and used at the woreda level, DMFSS needs to focus on woreda-level capacity building for monitoring and early warning, along with contingency planning and financing. In the existing system, the key information gathered and potential decision-making is at the woreda level. This allows information gathered at the community level to be used by those at the community level. One potential mechanism for the transfer of information between the community, regional, and national levels is through the WoredaNet system, an initiative to connect the woredas through a network. This system is largely non-functional at present but has the potential to be an important mechanism for information dissemination.

¹² Sue Lautze, Yacob Akalilu, Angela Raven-Roberts, Helen Young, Girma Kebede and Jennifer Leaning.: Risk and Vulnerability in Ethiopia: Learning from the Past, Responding to the Present, Preparing for the Future. A report for the U.S. Agency for International Development, 2003.

Improved data collection at the local level and a strengthened multi-hazard early warning system require reliable information on climate monitoring. The National Meteorological Agency (NMA) currently has about 1,000 hydro-meteorological stations of various classes located throughout the country,¹³ however, information at the local level is seen as unreliable, and not captured in a way that would allow the community itself to use the data for early warning and forecasting, and for planning of crop-livestock systems. There is a need to provide capacity building for better and more reliable climate information at the local level through climate downscaling, expansion of hydro-meteorological stations, and support for new technologies.

The NMA is promoting the “Mali model” for community-based climate monitoring whereby climatic data, along with other data (e.g., on vegetation, crops and livestock status, human and animal health and nutrition, water resource availability and quality, environmental indicators, etc) are collected at the community level to help in forecasting and early warning, and also to better understand local conditions. In turn, this information can be used together with agriculture and health extension agents for planning farming systems and livelihoods that have higher returns, are more resilient to hazards, and are environmentally sustainable.¹⁴

CONTINGENCY PLANNING

Along with capacity building for the early warning system, there is a clear need to strengthen the entire contingency planning process, including the development of contingency plans at all levels, formulation of

objective and transparent “triggers” for the plans, and integration of the plans into the EWS. Woreda level risk profiles can be key for linking EWS and contingency plans. Contingency plans are currently developed at the national level to guide emergency responses, and are activated by the Policy and Planning Department of DMFSS and the associated regional Disaster Prevention and Food Security Bureau. The movement toward decentralization of the EWS and the transfer of more responsibilities to the woreda level, including the collection of early warning information, requires greater capacity and responsibility at grassroots levels to develop appropriate and actionable contingency plans. This includes the development of alternative contingency planning and funding mechanisms, along with risk financing and risk transfer mechanisms (including index-linked insurance) to strengthen and complement contingency funds.

RISK FINANCING

Within the framework of the NPDPM, a National Disaster Prevention and Preparedness Fund (NDPPF) has been established as an emergency fund that provides resources for carrying out relief measures. The Fund is owned at the federal level and is managed by a National Disaster Prevention and Preparedness Fund Administration (NDPPFA). The Fund, which is guided by a Board of Directors and with technical involvement of major donors, intends to provide loans to agencies involved in disaster reduction. The NDPPFA has been operational and supported relief measures in three instances in 2003; however, this fund is relatively new and has limited capacity.

A risk financing mechanism is being established through the LEAP (Livelihoods, Early Assessment and Protection) index, supported by the World Food Program and the World Bank. The LEAP index is intended to harmonize key components of a risk management framework designed to translate early warning information into early emergency response. LEAP produces good indicators of yield shortfalls and livelihood stress and has been used by the Government for early warning and crop stress monitoring during 2008, while the World Bank has used the index to help

¹³ There are about 18 synoptic “full-service” stations, 180 “indicative” stations, 300 rain and temperature gauge stations, and 500 rain gauge stations.

¹⁴ See *Climate Risk Management in Africa: Learning from Practice*, edited by M.E. Hellmuth and others. (2008) International Research Institute for Climate and Society. The chapter “Agriculture in Mali” provides a good overview of the “Mali model” for community-based climate monitoring.

determine regional allocations of a US\$25 million contingent grant to livelihood-stressed beneficiaries. The framework is designed to protect five million livelihoods and would scale up the existing Productive Safety Net Program (PSNP) to reach transient food insecure beneficiaries.

To quote Ato Mathewos Hunde, Director of the EWRD of DMFSS:

“Early warning systems are useless unless backed up by contingency plans and financing”

HFA Priority #3: Knowledge and Capacity Enhancement for DRM

Ethiopia’s undergraduate and graduate program on DRM at Bahir Dar University is an important mechanism to increase knowledge and capacity enhancement for DRM, and should be supported as a critical element of an overall national DRM strategy. The Department of Disaster Risk Management and Sustainable Development (DRMSD) was developed within the Faculty of Agriculture and Environmental Sciences at Bahir Dar University (BDU) as a response to an identified need to build more resilient communities through strengthened capacity and sustainable development in Ethiopia. The three-year interdisciplinary undergraduate DRMSD curriculum was created in 2005 by a joint committee of experts (BDU, Save the Children/UK and Canada and DPPC).

By strengthening and expanding upon the undergraduate DRMSD program at Bahir Dar University, USAID is funding an interdisciplinary Disaster Risk Science and Sustainable Development Masters of Science program. The curriculum is structured broadly to have both a proactive component that develops the skill to assess the underlying vulnerabilities of different livelihood systems, contributing to sustainable development, and a reactive component that addresses all stages of the disaster risk cycle.

Continued support for applied research and studies on DRM-related issues conducted by other Ethiopian research institutes is important to further the DRM agenda in the country and to build capacity of local institutions. Such institutions include the Ethiopian Development Research Institute (EDRI) and the Ethiopian Institute of Agricultural Research (EIAR).

HHFA Priority # 4: Disaster Risk Reduction and Financing

RISK REDUCTION

Disaster risk reduction in Ethiopia is closely linked with poverty reduction, food security, and sustainable land management (SLM) initiatives at the community and local level. Programs to reduce vulnerability include: increase crop and livestock production and productivity of vulnerable population through moisture retention, soil and water conservation (SWC), water harvesting and pasture development activities and improvement of extension services; programs that improve the access of poor people to food in chronically food insecure areas through implementing diversified income generating and cash based safety net, provision of credit and skill training; programs that improve health and nutrition including water and sanitation, nutrition education, and preventive health activities; and resettlement programs to provide access to land to the landless and/or to those who are settled in agriculturally marginal areas.

Although Ethiopia is mainly a rural country and largely dependent on agriculture, in urban risks are increasing because of increasing hazards and vulnerabilities (e.g., increased population and informal settlements, industrialization, and changing land use patterns). In particular, the Environmental Protection Agency (EPA) has emphasized that industrial water and air pollution could contribute to a major environmental disaster. Also, lack of adequate household and industrial solid waste management contributes to poor sanitation and drainage and

increases exposure and vulnerability to flooding and disease. EPA expressed urgency to address industrial water and air pollution and solid waste management as a means to address risk reduction in urban areas.

HFA Priority # 5: Disaster Preparedness and Recovery

Given the restructuring caused by the Business Process Re-engineering (BPR) and shift toward decentralization, there is a need to assess the best mechanisms for logistics, funding, and distribution of relief supplies during a disaster response. At present DMFSS has institutionalized a Strategic Relief Fleet that provides transport services in areas that are not accessible by long-haul trucks. In addition to short-haul trucks the logistics plan is to mobilize pack animals to transport relief commodities. This system needs to be reviewed for upgrading of the relief fleet; enhancement of delivery mechanisms; and improvement of the logistical system for distribution.

The community level storage facilities known as Relief-Food Outlets (RFOs) are established so that affected populations receive assistance within their vicinity. The Government-owned storage capacity throughout the country is around 1.7 million MT. Primary warehouses are placed in seven strategic locations and have 23,500MT capacity. At regional states level the total storage capacity is nearly 1.3 million MT.

However, most drought-prone areas are inaccessible, forcing beneficiaries to travel long distances to collect food rations. During emergencies, it is a common practice to use schools and other public facilities for storing food as necessary. However, transportation of relief food from ports to the primary warehouses has not caused a major problem so far although port congestions have been reported periodically.

The UNDP, though UNDP/BCPR, has just initiated a new integrated early recovery program that is a multi-sectoral, multi-level and multi-stakeholders response mechanism to risk and disaster management. The UNDP's new integrated early recovery program aims at restoring the livelihoods of disaster-affected communities and provides basic social services. The objective is to strengthen disaster response systems by lessening the negative impacts of disasters and enhancing the positive development process.

3. INTEGRATION OF DISASTER RISK MANAGEMENT IN DEVELOPMENT STRATEGIES

The FY 2008-2010 Ethiopia CAS recognizes the risks posed by climatic shocks, including droughts and floods, and the need to reduce poverty and strengthen livelihoods for food-insecure Ethiopian households to withstand adverse climatic shocks. The CAS identifies the potential entry points for reducing household vulnerability from food insecurity. These include existing programs such as the Productive Safety Nets and Food Security program as well as proposed programs such as the Land Management Project and the Tana Beles Integrated Water Resource Development Project. The CAS also emphasizes urban development and extending infrastructure for poverty reduction.

The Ethiopia Plan for Accelerated and Sustainable Development to End Poverty (PASDEP, 2006-2010) provides an overarching policy strategy for reducing poverty and addressing food security. PASDEP builds on the initiatives pursued under the Sustainable Development and Poverty Reduction Program (SDPRP), particularly in promoting agricultural and rural development, developing human capital, promoting local capacity building in support of the decentralization process, increasing household access to primary health care, and responding more effectively to the HIV/AIDS pandemic.

4. KEY DONOR ENGAGEMENTS

There are many ongoing donor activities in DRM in Ethiopia. A major challenge is to better coordinate efforts between Government, donors, NGOs and civil society to provide a more integrated and effective DRM program that is synergistic and not duplicative and/or contradictory.

World Bank and Other Donor-Supported Projects Related to DRM in Ethiopia		
Ongoing Projects and Organizations	Indicative budget, years	HFA activity area(s)
World Bank Projects		
Facilitating Provision of Baseline Vulnerability Information on Flood-Exposed Communities in Ethiopia (GFDRR Track II)	\$550,000 2008-2010	2
Mitigating Impacts of Adverse Shocks on Nutrition and Health (GFDRR Track II)	\$745,000 2008-2010	2, 4
Weather Risk Management Framework using Weather-Based Indices (GFDRR Track II)	\$660,000 2008-2010	2, 4
WMO/IGAD Climate Predictions and Applications Center (ICPAC) (GFDRR Track I)	\$473,000 2008-2010	1, 2
Economics of Adaptation to Climate Change (EACC) – Ethiopia Case Study	\$80,000 2008-9	2,3,4
Food Security Project (World Bank, CIDA; DFID; Italy)	\$85 million IDA, with other donor funds to a total of \$110 million, 2002-2009	1,2,4,5
Productive Safety Net Program (PSNP) II (multi-donor project) ➔ includes a specific component for risk management	\$175 million WB/IDA contribution with other donor funding to a total of \$906 million; 2007-2010	1,2,4,5
Pastoral Community Development Project (PCDP) II APL ➔ includes a specific component for risk management	\$80 million 2008-2013	1,2,3,4,5
Protection of Basic Services in Ethiopia (PBS) II	\$540 million IDA plus donor contributions, 2009-2014	2,4,5
Ethiopia Financial Sector Capacity Building (National Bank of Ethiopia; NMSA; Ethiopia Inst of Banking & Insurance; IMF; IFAD)	\$15 million 2006-2009	4
Rural Capacity Building Program (WB/CIDA program)	\$54 million WB/IDA, \$17 million CIDA 2006-2011	1,4
Ethiopia National Nutrition Project	\$21 million IDA, 2008-2013	2,4
Irrigation and Drainage Project	\$100 million IDA, 2007-2015	2,4,5
Eastern Nile Flood Preparedness and Early Warning	\$3.5 million (Phase I) 2007-2010	2,4,5
Sustainable Land Management (SLM) Country Program (IDA, GEF, GTZ)	\$19.6 million IDA 2008-2013	1,2,4,5
Tana and Beles Integrated Water Resources Development Project (World Bank, Finland; MoWR; river basin organizations; regional BoARDs; ENTRO) ➔ includes a specific component for risk management	\$45 million IDA 2009-2013	2,4,5

(Cont.)

World Bank and Other Donor-Supported Projects Related to DRM in Ethiopia		
Ongoing Projects and Organizations	Indicative budget, years	HFA activity area(s)
World Bank Projects		
Donor Projects		
UNDP Program for Food Security and Recovery	\$4.4 million for 2009 2009-2011	1, 2, 4, 5
UNDP Recovery Strategy for Ethiopia	Salary for 1 international and 3 national, 2009	1, 4, 5
UNDP Technical Assistance (IT Support) for DMFSS	\$300,000 (estimated), 2009	1, 2
UNDP/BCPR Early Recovery Program	\$3 million, 2009-2011	1, 2, 4, 5
WFP Managing Environmental Resources to Enable Transition to Better Livelihoods Project (MERET)	Planned budget for 2009: about 32,000 MT food	1, 2, 4, 5
WFP Relief Program (save lives and livelihoods in emergencies through food and non-food relief)	\$4.9 million	4, 5
WFP HIV/AIDS (multi-donor fund, PEPFAR, Global Fund)	\$22 million; \$43 million with other donor contributions, 2008-2010	3, 4
WFP Food for Education (CIDA, US Government)	\$43 million, (2007-2011)	4, 5
WFP Targeted Supplementary Feeding Program	\$1.2 million	4, 5
USAID Livelihoods Integration Unit	\$5 million 2004-2009	1, 2, 3, 4, 5
USAID Miscellaneous Activities: Support for Preparation of New DRM Policy, support for Preparation of Multi- Hazard Profiles	2008-2009	1, 2
USAID Support to Bahir Dar University	\$300,000 per year 2008-2010 (?)	
USAID Famine Early Warning Security Network (FEWS NET)	???	1, 2, 3
FAO SLM Activities (Land tenure/administration, Participatory Forestry Management (PFM)/Natural Resource Management (NRM), watershed management)	\$1.6 million 2009-2011	2, 4, 5
DFID: Productive Safety Nets Project	Approx \$30-40 million per year 2006-2012	1, 2, 3, 4, 5
DFID: Risk Transfer	Approx \$15 million 2010	2, 5

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

HFA Priority Areas	Key Partners*	Estimated GFDRR Budget for 2009-2011	Already Approved GFDRR Funding for 2008-2010
HFA 1: Strengthen national disaster risk management strategies and institutions			
<ul style="list-style-type: none"> a) Support for Ethiopia to become a signatory to the Hyogo Framework for Action (HFA), and to establish a National Platform for DRM by strengthening existing platforms dealing with issues related with DRM b) Finalization of new DRM Policy, with process of awareness building and advocacy c) Support for development of DRM Implementation Strategy and Plan d) Support for preparation of DRM legislation e) Institutional and capacity assessment of DMFSS, line ministries, and regional, and woreda levels to implement new DRM approach f) Support to line ministries to mainstream DRM into sectoral strategies and plans g) Capacity needs assessment and subsequent capacity building at national, regional and woreda levels (e.g., training, computers, transport logistics and communication equipment including cellphones and PDA) to implement DRM h) Develop software and application packages to use woreda.net and other IT technologies/systems an integrated DRM information and communication links between kebele, woreda, regional and national levels i) Funding for DRM Technical Advisor for DMFSS j) Funds for selected short-term consultancies 	UN-ISDR, IGAD, ECA, UNDP, USAID, DFID	\$1,300,000	
HFA 2: Ensure risk and vulnerability assessments, early warning and contingency planning and financing – in both rural and urban areas			
<p>1) Risk Assessments:</p> <ul style="list-style-type: none"> a) Technical support to develop methodology and implementation modalities of risk profiling (hazard/vulnerability/coping) at woreda level (including collection of additional data to build upon existing livelihood zone baselines and hazard profiles) b) Technical support to develop methodology and implementation modalities to link recently developed WB-DFID financed climate change computable general equilibrium (CGE) models to woreda level risk profiling c) Training, experience sharing (with other countries), and capacity building for DMFSS staff (and other relevant persons and institutions) to support of a) and b) d) Piloting of woreda level risk profiles that aggregate community/ kebele level risk profiles (in areas with different hazards and different livelihood zones, both inside and outside areas supported by World Bank projects) e) Support for preparation of woreda level integrated DRM and Environmental Plans to be mainstreamed into woreda-level Development Plans 	WFP, UNDP, UNICEF, IGAD, ECA, DFID, IFPRI, TerrAfrica/ SLM Network, NGOs	\$1,400,000	\$550,000 (GFDRR Track II Funding for Flood Hazard Risk Assessments, GFDRR \$350,000 plus co-financing)

Ethiopia (Cont.)			
HFA Priority Areas	Key Partners*	Estimated GFDRR Budget for 2009-2011	Already Approved GFDRR Funding for 2008-2010
HFA 2: (Cont.)			
<p>1) Risk Assessments (Cont.):</p> <p>f) Piloting of woreda level risk profiles that aggregate community/ kebele level risk profiles (in areas with different hazards and different livelihood zones, both inside and outside areas supported by World Bank projects)</p> <p>g) Support for preparation of woreda level integrated DRM and Environmental Plans to be mainstreamed into woreda-level Development Plans</p>			
<p>2) Early Warning Systems: Multi-Hazard Forecasting and Warning</p> <p>Support to the National Meteorological Agency (NMA and others):</p> <p>a) capacity building for improved timeliness, reliability and local specificity of climate forecasting through use of new information (e.g., climate downscaling) and technologies (e.g., satellite imagery), and expansion of meteorological stations including communities-based "stations",</p> <p>b) improve flood monitoring, forecasting and early warning system</p> <p>c) improved systems for data collection, analysis and dissemination to end users</p> <p>d) improved access to NMA data by DMFSS through networking and improved coordination</p> <p>e) improved application of climate information and forecasts for DRM by end users at various levels, including the community</p> <p>f) link to other DRM monitoring and forecasting systems (e.g., health epidemics and malaria forecasting)</p> <p>g) adopt relevant climate risk modeling techniques and tools, and build capacity for their application (e.g., LEAP)</p> <p>h) improve capacity for preparation of early warning bulletins at national, regional and woreda levels</p>	IGAD, ACPC (ECA), WMO UNICEF, WHO, WFP, FAO, USAID FEWSNET	\$600,000	<p>\$473,000 (GFDRR Track I IGAD regional project, part of which to benefit Ethiopia)</p> <p>\$750,000 (GFDRR Track II funding for Health Early Warning Systems to support National Nutrition Project, \$350,000 GFDRR funding plus co-financing)</p>
<p>3) Contingency Planning and Financing: Moving from Early Warning to Response</p> <p>a) Support for design of community and woreda level integrated multi-sectoral monitoring, early warning, contingency planning and contingency financing mechanisms (using objective and transparent "triggers" that are linked to the community and woreda risk profiling)</p> <p>b) Review and revise early warning guidelines in line with new DRM approach</p> <p>c) Capacity building to implement integrated early warning system that includes monitoring, forecasting, warning, contingency planning and financing linked to rapid response at community, kebele, woreda, regional and national levels</p> <p>d) Support for development of different risk financing and risk transfer mechanisms (e.g., index-linked insurance) to strengthen and complement contingency funds (e.g., for catastrophic events)</p>		\$700,000	\$330,000 (GFDRR Track II funding for Risk Financing piloting to support Productive Safety Project)

(Cont.)

Ethiopia (Cont.)			
HFA Priority Areas	Key Partners*	Estimated GFDRR Budget for 2009-2011	Already Approved GFDRR Funding for 2008-2010
HFA 3: Increase and sustain awareness creation, education and capacity building			
a) Support to strengthen BA and MA Programs in DRM at Bahir Dar University, including applied research	USAID, DFID, IGAD	\$400,000	
b) Support for specialized training programs in DRM at Bahir Dar University in DRM			
c) Support for DRM-related applied research and studies at other Ethiopian institutions (e.g., EIAR, EDRI)			
HFA 4: Reduce underlying risk and vulnerability (and integrate DRR into sector planning and practices for example in water, agriculture, health, environment)			
Design and implement pilot programs to reduce industrial water and air pollution, and to improve solid waste management in Addis Ababa and Bahir Dar (linked to climate change programs that provide "credits" for pollution reduction)	UNDP, DFID, GEF	\$300,000	
HFA 5: Improve emergency preparedness and response through capacity strengthening			
a) Conduct study to propose optimal logistics and funding mechanisms for decentralized rapid response and recovery (e.g., identify needs for warehouses for pre-positioning of food and non-food items, maintenance of strategic reserves, relief fleet, and management/administration of the system)	WFP, UNDP, UN-OCHA, UNICEF, IGAD, ECA, USAID, NGOs	\$300,000	
b) Support for implementation of a), above			
c) Support for development of appropriate post-disaster needs assessment methodologies and techniques for rapid onset disasters, and implement training and capacity to facilitate early recovery focusing on community, kebele, woreda, regional levels			
d) Support for design of decentralized emergency rapid response systems based on all of the above, that also strengthens regional collaboration and information exchange			
GFDRR Track II Funding:		\$5,000,000	\$1,030,000**
Co-financing for GFDRR Track II Projects			\$400,000
Total GFDRR Track II Funding and Co-financing			\$6,430,000
GFDRR Track I Funding			\$473,000

Note: this matrix reflects the overall priorities of the DMFSS. The proposed GFDRR funding can, obviously, only provide some of the required funds to carry out the activities.

* Key Partners: This refers to key partners for ongoing or potential funding and/or technical support. There are many ongoing and proposed activities in DRM in Ethiopia. There is expressed interest to provide support for the activities detailed in this matrix in different parts of the country. There are also ongoing World Bank projects funding activities in these priority areas in different parts of the country.

** Only a very small part of these budgeted funds have been utilized to date.

See: www.gdfr.org for details about GFDRR Track I and II Projects in Ethiopia and other countries, along with Track III and South-South Cooperation

GHANA

In order to prepare the Country DRM Plan for Ghana the Africa DRM Team agreed with UNDP on beforehand to undertake a joint UNDP-World Bank mission. The mission was also accompanied by a representative from ECOWAS and a member of the donor coordination group on Environment. This joint mission held extensive meetings with the National Disaster Management Organization (NADMO), and met representatives of the Ministry of Interior (MoI), Environmental Protection Agency (EPA), Ministry of Lands and Natural Resources (MoLMNR), Ministry of Food and Agriculture (MoFA), Ministry of Local Government and Rural Development (MoLGRD), Ministry of Water Resources (MoWR), Ministry of Finance (MoFEP), National Meteorological Agency, and various development partners, including UNICEF, WFP, the Danish Embassy and UNDP. The team undertook a field visit to a District Office of NADMO. The Mission also met with the technical team leading the development of the Northern development Initiative (NDI), and included a one day workshop with staff of the Country Management Unit.



1. DISASTER RISK PROFILE

Hazard Risks¹

Ghana ranks high amongst African countries most exposed to risks from multiple weather-related hazards.

Ghana is exposed to floods and droughts, particularly in the Northern Savannah belt. Epidemics, pests, infestations and wildfires occur across the country.² There are risks of land slides, urban hazards, and coastal hazards (e.g. storms, storm surges, and coastal erosion). Coastal erosion has become more pronounced, especially along the Eastern coastline. Seismic hazards are most pronounced in areas around Accra, including the Akosombo Dam. The catastrophic floods in the North in 2007 affected more than 325 000 people with close to 100 000 requiring assistance in some form or another to restore livelihoods. The 2007 floods followed immediately after a period of drought that damaged the initial maize harvest, and were indicative of the high variability in climate and hydrological flows in Northern Ghana. The long-term and economy-wide impacts on the regional economy are still not well known, but an estimate of damage alone exceeds USD 130 million. Between 1991 and 2008 the country experienced six major floods; the largest number of people affected being in 1991

1 Some key sources for the Country DRM Plan: Amoako, P. Y. O. and S.T. Ampofo (eds) 2009 Hazard Mapping in Ghana, Report to NADMO, Accra; NADMO website: www.nadmo.org, www.preventionweb.net, HFA Regional Summary of Africa, self-reported data; EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium; UNDP-Ghana: <http://www.undp-gha.org/project.php?page=25>;

2 Between 1995 and 2008 the country experienced six major floods in the following years (number of people reported affected in brackets); 1991 (2.0 mill), 1995 (700 000), 1999 (325, 000), 2001 (144 000), 2007 (325 000), and 2008 (58 000). The last major drought was in 1982-83, affecting more than 12 million people..

(2.0 million people). The floods have revealed weaknesses in the disaster preparedness and emergency response system, and exposed vulnerabilities of people, land use systems and infrastructure.³ In this regard, it is important to understand the interface between risk, hazard, vulnerability, and capacity (risk = hazard x vulnerability/capacity).

Vulnerability and Exposure to Hazards

Current development dynamics and demographic changes put more people at risk of disasters in Ghana, related to increasing rural poverty, rapid urbanization, growth of informal urban and coastal neighborhoods, poor urban governance, and declining ecosystems.⁴ The high dependence on natural resources in rural areas (more than 60 percent of Ghana's 20 million people depend directly on agriculture), lack of secure livelihoods, and limited informal and formal social safety nets add to these vulnerabilities. Moreover, there are widespread epidemic diseases, often in combination with HIV/AIDS and malaria. The impacts of localized disasters (droughts, local floods, epidemics and wildfires) are likely to have accumulated impacts on rural livelihoods over time as a consequence of climate change, in particular on communities in the North.

To this end, the severity and depth of poverty is highest in the three Northern regions (Northern, Upper West and Upper East). Out of 18 percent of the total population that live in extreme poverty, 54 percent live in Northern Ghana.⁵ Poverty is highest among food crop farmers. Northern Ghana, especially Upper East Region, is also most exposed to land degradation and soil erosion. Land degradation accelerates run off, reduces soil productivity, and capacity of ecosystems to provide critical functions and services, including regulation of floods in key watersheds and resilience to climate variability.⁶

Rapid population growth and pressure on land resources are often accompanied by unsustainable agricultural intensification, including expansion of (shifting) cultivation, deforestation, and depletion of vegetation cover due to overgrazing. The majority of rural households depend on small-scale agriculture for their livelihoods, while they often lack access to markets and infrastructure necessary to improve farming practices, diversify livelihoods, and build up their assets and coping capacity. Hence, many households engage in non-farm income generation, urban migration (temporary or permanent), or become dependent on formal or informal safety nets through family or neighbors.⁷

Climate Change

Overall, there is evidence that the agriculture sectors (including fisheries, cocoa, cereals, and root crops), and water resources sectors as well as human health and women's livelihoods will be negatively impacted by climate change; the poor being most vulnerable. Moreover, climate change may also contribute to accelerated storm surges and coastal erosion, to which Ghana is particularly vulnerable (World Bank et al. 2006, Dasgupta et al 2009)⁸. Coastal fisheries are undergoing severe changes due to change in sea temperature and currents combined with overfishing and non-functioning resource regimes. Similar issues face Lake Volta, with important implications for the lake

3 The catastrophic floods in 2007 destroyed thousands of houses, and key sections of bridges and roads and other infrastructures including treatment plants and pumps for water supply. It also damaged crops and agriculture lands.

4 The UNDP Human Development Report ranked Ghana 129th of 175 countries and approximately 45 percent of the population live below the poverty line of one USD per day.

5 Northern Ghana has only about 17 percent of the total Ghanaian population.

6 Past studies estimate that 69 percent of the total land surface is prone to severe or very severe soil erosion (EPA 2002), the main manifestation of land degradation in Ghana. A recent study estimated soil erosion to cost around 2 percent of the national GDP (World Bank et al. 2006).

7 Population almost tripled over the last 40 years, from 6.7 million in 1960 to 18.4 million in 2000 (Ghana Statistical Service 2000).

8 Dasgupta, S, Laplante, D, Murray, S, and D. Wheeler, 2009: Sea-Level Rise and Storm Surges. A Comparative Analysis of Impacts in Developing Countries, Policy Research Working Paper 4901, DRG, Environment and Energy Team, The World Bank

ecology and livelihoods of fishermen. Disaster risk and poverty are strongly linked in Ghana, and are in turn intertwined with the reality of climate change. Climate change is expected to expose people to higher rainfall variability, water stress, drop in agricultural yields, and depletion of resource-based livelihoods. This would increase the risk of drought periods, increase evaporation and reduce agricultural productivity (10% lower rainfall is expected by 2050; IPCC 1997). Moreover, climate change will probably result in rising temperatures (1.4-1.6 higher temperature is expected by 2050; IPCC 1997), potentially increasing the risk of forest and bushfires. At the same time, Ghana's economy and rural population depend on sustainable growth in these climate-sensitive sectors.⁹

The impacts of climate risks are likely to magnify the uneven social and spatial distribution of risk in Ghana, and possibly amplify poverty in the North. At the same time, the links between disaster risk and poverty

—in a changing climate—means that reducing disaster risk can help reduce rural and urban poverty, further sustainable development and growth and improve adaptation to climate change.

2. ACTIVITIES UNDER HYOGO FRAMEWORK OF ACTION

HFA Priority # 1. Policy, Institutional Capacity and Consensus Building

Confronted with a variety of natural hazards, and prompted by the recent floods in the North, the Government of Ghana has initiated actions on several fronts in order to develop strategies and strengthen institutional capacity in disaster risk management with increasing donor support. Disaster risk reduction has its main institutional home within the National Disaster Management Organization (NADMO) in the Ministry of the Interior. NADMO was established in 1996 under a National Security Council, chaired by the President of the Republic of Ghana. NADMO functions under a National Secretariat, ten Regional Secretariats, one hundred and sixty-eight District/municipal Secretariats and nine hundred Zonal offices. The NADMO Committees at National, Regional and District levels implement the policies, and are supported by Technical Advisory Committees. NADMO has a dual objective of i) to manage disasters by coordinating the resources of Government institutions and non-governmental agencies, and ii) developing the capacity of communities to respond effectively to disasters and improve their livelihood through social mobilization, employment generation and poverty reduction projects (ref. Amendment to the NADMO Act).

Since its inception under the NADMO Act (Act 517, 1996), NADMO has contributed considerably to the management of disasters across the country, despite a constant struggle to obtain resources and maintain response capacity on the ground. A draft National Disaster Management Plan (NDMP) has recently been prepared (as a revision of the 1997 NDMP), along with an Amendment to the Act. These documents will be considered revised to reflect a stronger role of NADMO in DRR and CRM. NADMO has also prepared draft Operational Procedures will also be finalized in view of this. OCHA has helped develop the modalities for a national relief fund, through a three days workshop, which are intended to be captured in the Amendment of the Act. As an organization, NADMO possesses a country-wide structure with representation at regional, district, and zonal levels with about five staff members in each district. As such, the structure of NADMO makes it relatively well positioned to play a key role in disaster response and preparedness – as well as in disaster risk reduction. NADMO does however lack required capacity at all levels and budgetary support to play such a key role (see below).

⁹ While Ghana's growth was historically furthered by natural resources exploitation (agriculture, forestry, energy), this growth cannot be sustained in face of the alarmingly high rates of degradation, which represents a cost to Ghana's GDP of about 10 percent per year (Ghana Country Environmental Analysis (CEA), World Bank, cited in NREG program document).

Beyond strengthening its capacity in emergency response and relief work, a main challenge for NADMO and its stakeholders is to keep reinforcing the approach to ex-ante preparedness and disaster risk reduction. This approach would need to address the critical factors that drive the increasing exposure to risk in communities of Ghana linked to vulnerable rural livelihoods, poor urban governance and declining ecosystems. Such a shift in focus would need to involve an institutional transformation in NADMO related to e.g. management, capacity, mindsets of staff, and communication systems. It would imply that national disaster management policies and strategies be coordinated with sector programs in policies, legislation, and practice. The choice of approach would need to exploit synergies and ensure mutual reinforcing measures across ministries and agencies more so than what has been achieved in the past. This needs to be done at the national, regional and district level – with outreach mechanisms to engage the community level. This is a tall order that requires sustained Government interest and commitment across all key sector agencies (for further details on institutional capacity building opportunities, see under section HFA 4 and HFA 5).

There is also a need for more regular and substantive exchange of risk information and knowledge across boundaries with e.g., Burkina Faso, Togo, Cote d'Ivoire on floods and other hazards. There is scope for transboundary collaboration on issues of climate change, coastal zone and fisheries management, drought management, and issues related to epidemics and pests. ECOWAS can potentially play an important role in this regard, given its recent strengthening in areas of DRM&CCA.

HFA Priority # 2. Disaster Risk Assessment, Vulnerability Assessment, Monitoring, Early Warning

Ghana has recently undertaken country-wide hazard mapping that covers the broad geographical distribution of disaster exposed areas for key hazards, such as for ge logical (seismic, coastal erosion, and landslides), hydrometeorological (floods), pests and insects, and fires (wild bush fires, domestic, industrial).¹⁰ Other hazards have not yet been mapped. Moreover, the interface between hazard exposure and vulnerability is poorly mapped, and the information is not analyzed and brought together and made available for different audiences on a regular basis, except in some pilot programs. Vulnerability and capacity assessment is ongoing by the National Development Planning Commission (NDPC), and WFP has engaged MoFA and MoH in a Food Security Monitoring System for Northern Ghana.

Climate predictions linked to hazard exposure and vulnerability need to be improved as an information service for targetted early warning systems. NADMO has established Technical Advisory Committees that has the mandate to identify, monitor, and assess hazards. However, these committees need to be strengthened through training and support. The capacity of NADMO to monitor and forecast hazards, and provide early warning and mechanisms for preparedness and early response is limited at all levels. Messages do not reach out. The 2007 floods indicated weak communication and coordination among key stakeholders engaged in emergency response or risk management. There are elements of EWS in place, for example, for river-level monitoring.

A key recommendation would be to assess the need for an effective and decentralized multi-hazard early warning system, including how to design such a system, linked to stronger monitoring, information analysis, communication, and outreach. Such a system would need to start from improved climate predictions and information services from an upgraded National Meteorological service. An early warning system would need to be supported by contingency plans and improved response capacity at local and district levels (and tested through rehearsals and simulations). This would require a coordinated effort by several agencies including between NADMO, Ministry of Environment (EPA), which coordinates work with the National Climate Change Strategy, and the Ministries of agriculture, water, energy and health, which would depend on improved climate information services for decision making.

¹⁰ Amoako, P. Y. O. and S. T. Ampofo (eds) 2007: Hazard Mapping in Ghana, UNDP/NADMO, Accra

An early warning system is however no better than its weakest link. Hence, any EWS would need to be accompanied by systematic institutional capacity strengthening and conscious efforts to link e.g. climate information to multi-media communication systems e.g. cell-phones, radio, television, and tailor information to different audiences.

It would be particularly useful to carry out urban hazard mapping – linked to ways of improving urban governance – in one or two coastal cities. This could be done by testing a World Bank Cities Primer methodology (carried out already for Dakar). Flooding in urban areas, especially in informal settlements due to lack of proper drainage system is a key issue; drains often being clogged by solid waste. There is also a need to consider piloting participatory risk mapping in hazard prone areas of vulnerable rural and urban communities.

There is also a need to identify and map key assets and infrastructure at risk as basis for spatial planning, sectoral, or integrated urban or regional planning. This could involve focused mapping of assets in urban and coastal areas and river basins; areas which are most exposed to hazards.

HFA Priority # 3. Knowledge and Capacity Enhancement for DRM

A risk aware population is essential to promoting risk reduction behavior at different levels of society. Hence, public awareness and education about hazard risks and vulnerabilities are essential for effective disaster risk management. Ghana is known for its relatively strong education system and independent think tanks. Some of these institutions conduct specific research in the areas of water resources, pest and insect infestations, epidemiology and geology, and there are experts from academic institutions as members of NADMO's Technical Advisory Committees. However, there are at present no educational programs that directly address DRM. A strategic approach to the inclusion of disaster risk management and climate change in school curricula should be developed, including an approach to the training of teachers.

NADMO has a history of engaging in public awareness building and social mobilization, and received some funding from UNDP recently to revitalize public awareness campaigns (2007/8). A general awareness and sensitization program on DRR & CRM should be designed for different audiences within Government and outside the Government. Initially, community volunteers and leaders could be key target groups of such campaigns, including also Local Assembly representatives. This work is intended to be stepped up with UNDP funding in particular.

HFA Priority # 4. Reducing Underlying Risk Factors and Integration Across Sectors

An increasing number of Government and donor sector programs in Ghana are addressing disaster risk reduction – and related issues of vulnerability and sustainable land management (see below).

To this end, there exists a set of innovative approaches and tools across sectors in the areas of agriculture and rural livelihoods, watershed management, ecosystem management, urban governance, risk transfer, and community-based development that might be applied to a variety of local context in Ghana. The main challenge is to reinforce and mainstream new approaches by linking national policy and governance systems for disaster risk reduction, poverty reduction and climate change adaptation through a coordinated approach. A selection of piloting exercise could be initiated related to for example flood protection; water harvesting/watershed management in drought prone areas; coastal erosion in selected sites; and social infrastructure using safe building norms in collaboration with sector programs.

Development strategies to address hazard risks and vulnerabilities, however, cut across the Government's sector forms of organization, and require coordination and types and scales of programs well beyond NADMO's mandate and capacity. This is for example recognized in the draft Development Plan for the North, which covers all key sectors and includes a strong focus on mainstreaming disaster risk reduction. Various new sector programs are being planned, including for the North, within which NADMO could usefully play a proactive role and become partner (including new programs with World Bank funding in integrated river basin management, social protection, and carbon finance/forestry).

However, until recently, where NADMO has been capable of engaging sector agencies in the DRR&CRM agenda, it is more from an emergency response perspective rather than from a perspective of mainstreaming DRR/CRM in sector programs and strategies. The National DRR Platform has not started functioning, and few substantive linkages have been built across sector agencies since its inception in 2005. Coordination is relatively weak and there are no focal points for DRM in most of the sector agencies; while there is a fairly active Environment Sector Group.¹¹ Relevant

stakeholder agencies also lack resources and appreciation of what constitutes hazard risks, hampering effective engagement. Hence, the strengthening of NADMO alone would not be sufficient for effective emergency response, say integration of DRR & CRM in planning and development at different levels of society. For example, there is at present no system of integrated physical/environmental/ land use planning at district level which is a responsibility of the Ministry of Environment; a mechanism that could help bring actors together around issues of land use planning, zoning, and codes for climate/risk resilient infrastructure and buildings. Moreover, decentralization processes have moved slowly, and vertical linkages between national sector ministries and local state bodies and local assemblies are not well developed (including between NADMO, the Ministry of Local Government Rural Development, Environment, and MoFA). It is also not clear what role traditional authorities (Chiefs and local leaders), play or can play in this regard.

HFA Priority # 5. Disaster Preparedness and Recovery

In Ghana, the disaster response structure has four levels of organization beyond the community level. Response to a given natural hazard starts with the local level (Zonal Offices of NADMO) determining whether the event is of a magnitude that require outside assistance from the District, Regional or National levels. In reality, due to limited capacity of the Zonal Offices, emergency warnings at local level often rely on ad hoc messages from community volunteers, and/or District Assembly representatives with contacts in rural locations.

The 2007 floods revealed that effective disaster preparedness and recovery operations in NADMO face critical challenges related to coordination and implementation capacity at all levels, due also to inadequate and late release of government funding.¹² NADMO has been underfunded for years, and has received limited government support. Institutional capacity strengthening is required at all levels, including in management, logistics, and transport. The systems of hazard monitoring, early warning and communication are not well-functioning and the hardware is outdated. The system of warehouses, logistics and equipment for effective disaster response is weak – in particular at the level of the regional and district offices. Training and capacity building are lacking, and rehearsals and simulation exercises are done only rarely. There is no substantive DRM planning at district and regional levels. The recent capacity assessment of NADMO concludes that the organization faces low human resources capacity, lack of training opportunities, low remuneration, and weak coordination power in terms of engaging relevant sector agencies in disaster response and emergencies.

¹¹ The National Platform was established in 2005 and a program of action prepared, involving all the key objectives of the HFA (ref. Report on the Establishment of a National Platform for Disaster Risk Reduction in Ghana, Sept. 2005).

¹² Sync Consult 2008: Capacity Assessment, Disaster Preparedness of NADMO, Accra (with UNDP funding)

Given that volunteers at local level play a critical role in local level disaster response, it is important to test community-based approaches to disaster risk reduction that may enable volunteer groups and communities and local government to identify and explore appropriate community-based solutions to DRR&CRM.

A main challenge, beyond strengthening the institutional capacity of the response system at different levels, is to mobilize funding and ensure capacity for rapid and early recovery in the aftermath of a disaster e.g. a flood event.

The Government, related to its work with OCHA on establishing a relief fund, expressed an interest in examining various mechanisms for risk transfer and risk financing. Mechanisms for risk financing and risk transfer are still insignificant, reflecting that such measures are still in their early stages also in neighboring countries. There are still no mechanisms developed for private or sovereign catastrophe insurance. In certain coastal areas or water basin areas, where the level of risk and infrastructure exposure is high, financial risk transfer mechanisms can be considered an area for future development in Ghana.

3. INTEGRATION OF DISASTER RISK MANAGEMENT IN DEVELOPMENT STRATEGIES

The mission met strong Government commitment to the integration of DRR & CCA in development policy and programs across key ministries. However, it is fair to say that DRR & CCA have only recently attracted more substantive attention in development planning, even if for example NADMO – as well as key sector ministries – have in various manners been engaged in disaster risk reduction for several years. The renewed attention to these agendas reflects concerns over the 2007 floods as well as observed changes in climate variability. It may also be a response to global trends and increased opportunities for external funding to these agendas. DRR & CCA are increasingly manifest in new donor programs and policies, and have also started to become more firmly reflected in Government sector programs. The National Planning Commission has recently raised the issue of CCA in long term development planning, while DRR has not yet been internalized. The Government budget allocations to disaster management, as a measure of commitment, is limited; NADMO being provided only about \$ 5 million annually; less than 5% of this budget set aside for investments and programs.¹³

The 2003-2005 Ghana PRSP does however refer to the potential impacts of climate change and the importance of DRM, early warning, and flood prevention. The Joint Staff Advisory Note, commenting on the PRSP progress in 2006, commends the focus on addressing environmental decline and natural resources degradation, which is seen to severely undermine economic growth, and refers to the need for effort to manage land, forests, mining and urban environment better. But the report does not raise issues of climate risks and variability and effects on sustainable land use. Moreover, the Ghana Growth and Poverty Reduction Strategy – GPRS II (2006-2009) refer to these themes only indirectly with reference to the degrading environment and declining agricultural productivity and its impact on poverty. The focus is on economic growth, human resource development and governance. Hence, DRM is not well integrated in these key planning documents. Similarly, UNDAF (2006-2010) does not refer to DRM and climate change – although issues of environmental degradation and vulnerable groups in the North are addressed.

In the recent years, however, as the next section indicates, the attention to DRR&CCA has moved higher up on the development policy agenda in Ghana, manifest in a set of new innovative donor supported programs and government commitment to the agenda. The most recent World Bank Country Assistance Strategy

¹³ More than 85% of the budget is for personnel and administrative expenses, according to a review of the 2009 budget presentation. Another example of lack of priority accorded to this field is the fact that the National Action Program to Combat Drought and Desertification (NAPCDD), which was prepared in 2004, only received some funding with the initiation of the UNDP program starting in 2009 (see matrix of donor engagements).

(CAS) (FY08-11) has explicit reference to the need for assisting vulnerable populations, and support measures towards minimizing the impact of climate variability and climate change. This increased attention is evident, for example, in several new UNDP programs, which followed in the aftermath of the recent floods in 2007, and UNDP Annual Work Plan 2009 has a special focus on institutional support to integrated CC and DRR into national development plans. Moreover, the Second Natural Resources and Environmental Governance policy operation (NREG) raises climate risks and climate change adaptation and the need for a new climate change strategy as key issues.

4. KEY DONOR ENGAGEMENTS

Overall, the integration of DRR&CCA in new donor supported programs, some of the most important are listed here, is a clear indication that the “new” development agenda in Ghana has started firmly addressing these cross-cutting fields. The list is not complete.

World Bank and Other Donor Supported Projects in Ghana		
Ongoing Projects and Organizations	Indicative budget (where available, details on years covered)	HFA activity area(s)
World Bank supported projects		
Ghana North- Sustainable Development, Disaster Prevention, and Water Resources Management (GFDRR)	US\$ 660,000 (2008-2011)	4, 5
Community Co-Management for DRM of Marine Resources in West Africa (GFDRR) (multi-country program; Ghana involved)	US\$ 900, 000 (2008-2011)	1, 3, 4, 5
TerrAfrica (Sustainable Land Management – knowledge creation)	(multi-country)	2, 3, 4
Economics of Adaptation to Climate Change (EACC)	(multi-country study) (2009-2010)	2, 3, 4
Natural Resources and Environmental Governance (NREG)	US\$ 60 million (2008-2010)	1, 2, 3, 4, 5
Ghana Productive Safety Nets Project	US\$ 30-50 million (under preparation)	4, 5
Integrated Water Resources Development and Agricultural Competitiveness Project, Planned (FY10)	US\$ 50-100 million (under preparation)	
Ghana Community Based Rural Development Project (CBRDP)	US\$ 60 million (ending Dec. 2010)	3, 4
Ghana Urban Water Project	US\$ 103 million (2004-2010)	2, 4
Carbon finance project	US\$ 30 million (under preparation)	4
UNDP funded projects		
UNDP-Ghana: Mainstreaming DRR and CCA (mainly capacity building)	US\$ 700,00 (2009)-	1, 2, 3, 4, 5
UNDP-BCPR: Early Recovery Program for Northern Region	US\$ 1,2 million (2009-2010)	1, 2, 5
UNDP-GEF Impacts of CC on Health	US\$ 2,0 million (2010-2013)	4
UNDP-UNEP: CC-DARE (for preparation of National CCA Strategy)	US\$ 150,000 (2009-2010)	1
UNDP Africa Adaptation Program (AAP)	US\$ 2,5-3,0 million (2009-2012)	1, 2, 3, 4, 5

(Cont.)

World Bank and Other Donor Supported Projects in Ghana		
Ongoing Projects and Organizations	Indicative budget (where available, details on years covered)	HFA activity area(s)
Other donor projects (incomplete)		
Food and Agriculture Budget Support (FABS) and the Agricultural Development Policy Operation (Ag DPO)		4
Ghana Environmental Management Project (GEMP)		2, 3, 4
UNDP-GEF – for sustainable land management (in support of National Action Plan to Combat Drought and Desertification)	(2009-2013)	2, 3, 4

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Given the substantial number and scale of new donor engagements, including those of the World Bank and UNDP, it is essential to consider the GFDRR support within a broader national framework that ensures a coordinated and harmonized approach. It was thus agreed to develop a *National Program Framework for Disaster Risk Management and Climate Risk Management* which would help ensure a comprehensive and integrated programmatic approach.¹⁴ The World Bank and UNDP agreed to prepare together with Government a program document to this end, under which the UNDP-World Bank/GFDRR projects would be implemented.

The total UNDP-World Bank support for this National Program will be about \$ 12 million. Under this national framework program there would be five UNDP supported operations, and the new World Bank/GFDRR “Country DRM Plan” conceptualized as a joint program (See Annex 1 for more details about the joint UNDP-World Bank programmatic approach). The program could later include additional projects, even from other partners.

The new program will include two on-going GFDRR funded programs; i) Ghana North: Sustainable Development, Disaster Prevention, and Water Resources Management (2008-2010).¹⁵ The original funding of US\$ 660 000 has been agreed allocated as follows; i) US\$ 400 000 for the integrated flood prevention and watershed management strategy for the Volta basin with a focus on developing irrigation potentials (about US\$ 25 000 has so far been utilized for a scoping mission). The remaining funding would be utilized to: a) advance work under the Country DRM Plan, including the funding of a consultant to prepare a Government program document as an umbrella for the joint UNDP-World Bank funding; and b) to strengthen capacity for planning and implementation of the new SADA; ii) The second GFDRR funded program is a multi-country program with a component in Ghana: Community Co-Management for Disaster Risk Management of Marine Resources in West Africa (US\$ 900, 000). The project will strengthen the capacity of coastal and sea-shore communities in marine and coastal resource management in face of local risk factors, effects of climate change and marine resource over-exploitation. The project combines support for local-level resource management strategies with interventions at national policy and institutional levels. The project includes a component for management of marine resources of Lake Volta.

¹⁴ This in recognition of the fact that the two agendas of DRR and CCA are interwoven (yet distinct) – one focusing mainly on emergency response, and early recovery, disaster preparedness and reduction of risks – the other mainly on medium- and long-term adjustments to climate change through adaptation and mitigation. But both agendas meet under the objective of addressing climate risks management (CRM).

¹⁵ The Ghana specific GFDRR grant, approved in the context of the post-2007 floods, supports three work-streams: (i) support to the development of the Northern Development Initiative (NDI); (ii) development of an integrated water resources and flood management plan for the Volta Basin; and (iii) capacity building for Ghana’s national disaster management structures in particular NADMO, and b) The other GFDRR supported project is

It is essential that the new National Program be coordinated closely with the Natural Resources and Environmental Governance (NREG) Development Policy Operation – which is supported by all key bilateral donors and the World Bank – and which constitutes the main coordination mechanisms for program support on the environment and climate change.

On this background, the indicative program areas identified for specifically for GFDRR financing – here denoted the GFDRR “Country DRM Plan” - are listed in the matrix below, with reference to the sharing of responsibilities between the World Bank/GFDRR and UNDP – but referring only to the allocation of costs for GFDRR funding. The GFDRR program would largely be Government-executed for a duration of three to five years, and implemented under the umbrella of the National Program Framework.

In conclusion, a comprehensive approach to DRM will require national policy coordination for DRR, CCA, poverty reduction, and human development led from the highest political and organizational level with a focus on risk reduction as a means to promote sustainable development in all sectors.¹⁶ Bridging the North-South divide in development requires addressing risk management, combined with a growth and rural poverty strategy, in the Northern regions of Ghana. The approach would place considerable demand on governance systems from national to local level across a set of ministries. A key challenge is for the Government to be able to link national policy and governance frameworks for disaster risk reduction, poverty reduction, and CCA through a new approach to sustainable development.¹⁷ A first mechanism for different agencies to rally around would be the development of a national multi-hazard early warning system linked to communication and contingency plans from the national to the local level, possibly with an initial focus on the North.

Indicative new program areas for GFDRR/World Bank funding under the “Country DRM Plan” for Ghana*	Potential output/outcomes	Indicative budget for GFDRR funding US \$	Partnerships
1. Strengthening national disaster risk management strategies and institutions		550,000	UNDP, ISDR, NREG, ECOWAS
<ul style="list-style-type: none"> - Review and finalize new DRR/CRM policy/strategy based on review of existing sectoral policies and new climate change strategy - Establish inter-ministerial coordination mechanism - Validate and publish policy and ensure passage of the revised Amendment Bill - Sensitize key stakeholders on new policy directions, including with the NADMO Committee members - Prepare a government-owned National Program Framework for DRR&CRM under which the joint UNDP-World Bank program will be implemented - Follow up the NADMO capacity assessment with a plan for systematic institutional strengthening at all levels 	<ul style="list-style-type: none"> Policy on DRR/CRM mainstreamed Coordination improved DRM policy and CC strategy integrated 	200,000	UNDP will continue to take a lead role in finalizing policy and legal acts and build capacity.

(Cont.)

¹⁶ Commission on Climate Change and Development, 2009: Closing the Gaps: Disaster risk reduction and adaptation to climate change in developing countries, Report to the CCDC, info@ccdcommission.org, Stockholm)

¹⁷ See 2009 Global Assessment Report on Disaster Risk Reduction: Risk and Poverty in a Changing Climate: Invest today for a safer tomorrow, UN-ISDR, 2009.

Indicative new program areas for GFDRR/World Bank funding under the “Country DRM Plan” for Ghana*	Potential output/outcomes	Indicative budget for GFDRR funding US \$	Partnerships
<ul style="list-style-type: none"> - Establish 9 Regional Platforms for DRR and CRM and develop plan for systematic capacity strengthening - Establish District Platforms for DRM/CRM, initially in the North - Develop Regional and District DRM plans - Support and monitor the implementation of plans - Develop program for capacity strengthening and provide specialized training in DRM/CRM and damage/loss assessment - Develop and test low-cost communication systems (internet, cell-phone) between District, Regional, and National levels within NADMO – linked to community outreach (relates to actions listed under HFA 5 below) 	<p>National Platform for DRR/CRM strengthened</p> <p>Regional and District level platforms in operation</p> <p>Efficient communication systems in operation</p>	300,000	GFDRR support will include communication equipment and capacity building (in tandem with UNDP)
<ul style="list-style-type: none"> - Undertake exchange programs and visits in neighboring countries and consider to establish Platforms for regional coordination - Improve information sharing with neighbors on climate related risks – related to specific program needs - Strengthened networks with sub-regional organizations 	Trans-boundary and regional cooperation on DRR/CRM strengthened	50,000	UNDP will take the lead
2. Ensure risk and vulnerability assessments, early warning and contingency planning and financing		2, 450,000	UNDP, WFP, Met. Station
<ul style="list-style-type: none"> - Review and update existing hazard assessments and maps - Develop an overview of key infrastructure and assets threatened by hazards - Provide technical support to develop methodology and implementation arrangements for relevant hazard/vulnerability/ risk profiling at district level related to integrated DRM and resource management plans (pilot in hazard prone flood areas and coordinated with the Sustainable Land Management Network/MoFA) - Conduct pilot exercise in urban hazard mapping and urban governance (based on Cities primer) - Training and capacity building for the above 	<p>Hazard, vulnerability and risk assessments and relevant maps carried out for all climate related hazards</p> <p>Risk profiling at district level undertaken (on pilot basis)</p>	<p>400,000</p> <p>200,000</p>	UNDP has funded the initial hazard mapping, while World Bank/GFDRR will take the lead in taking these activities forward

(Cont.)

Indicative new program areas for GFDRR/World Bank funding under the “Country DRM Plan” for Ghana*	Potential output/ outcomes	Indicative budget for GFDRR funding US \$	Partnerships
<ul style="list-style-type: none"> - Undertake an inventory of existing EWS, assessment of future needs, and design of a multi-hazard EWS, including infrastructure/communication needs. A major gap accepted by all parties is the fragmented monitoring and early warning system (EWS) in Ghana. This activity will related closely to the CCA agenda and the work of EPA. - Support to National Meteorological Agency (capacity building and renovation of weather stations) - Technical support and capacity building for EWS and contingency planning - Assess, improve and modernize EWS in communities - Review of existing contingency plans and develop suggestions for new plans that include DRR/CRM at Regional, District and community levels 	<p>Early warning systems (multi-hazard) updated, and capacity for management created at all levels</p> <p>Contingency plans for DRR/CRM piloted and scaled up</p>	1,850,000	<p>UNDP will mainly support capacity building, while World Bank/ GFDRR will mainly support logistics and hardware. WFP/MoFA has developed a food security monitoring system that can be built on.</p>
<p>3. Increase and sustain public awareness creation, education, and capacity building</p>		300,000	UNDP, NGOs, UNICEF, ISDR
<ul style="list-style-type: none"> - Organize workshops and seminars for policy makers and professional bodies on DRR/CRM - Equip Regions and selected Districts with communication and outreach equipment - Seek to standardize and harmonize communication equipment between NADMO and potential stakeholders - Organize durbars and outreach programs for hazard-exposed groups and civil society organizations - Carry out community-based outreach programs - Develop and distribute handbooks/text books on DRR/CRM to educational institutions - Collaborate with tertiary institutions to develop or provide courses on DRR/CRM 	<p>Increased awareness of DRR&CRM, and ways of coping</p> <p>Improved communication networks</p> <p>Improved public education and increased awareness Courses designed at different levels of education</p>		<p>UNDP will take the lead</p>

(Cont.)

Indicative new program areas for GFDRR/World Bank funding under the “Country DRM Plan” for Ghana*	Potential output/ outcomes	Indicative budget for GFDRR funding US \$	Partnerships
4. Reduce underlying risk and vulnerability factors		200,000	UNDP, WFP, ISDR, ECOW-AS, TerrAfrica
<ul style="list-style-type: none"> - Sensitize stakeholders across sectors and within civil society on the need to integrate DRR&CRM into planning and program design - Establish focal points in all sector agencies (MDAs) and – encourage key sector ministries to prepare sectoral DRR/ CRM strategies and integration in programs (linked to CC agenda) - NADMO to engage with key sector programs including with NREG on environment, forestry and mining - NADMO to engage with Savannah Accelerated Development Authority (SADA) and the Northern Development Initiative which has adopted an integrated DRR perspective in the development plan for the North. - Revitalize the Technical Advisory Committees (TACs) - Identify and sensitize women on DRR and CRM - Train and resource women in vulnerable communities in viable economic activities to build assess and coping capacity - Train and resource youth groups and other CBOs 	<p>Improved collaboration and integration of DRR & CRM into sector planning and programs</p> <p>Sector ministries more aware of DRR & CRM linkages</p> <p>Community-based DRM pilot projects established for women and other vulnerable groups</p>	200,000	<p>Joint UNDP and World Bank/ GFDRR engagement</p> <p>UNDP to take the lead</p>
5. Improve emergency preparedness and response		1,800,000	UNDP, UN-OCHA, ISDR, ECOWAS
<ul style="list-style-type: none"> - Develop a program for systematic strengthening of NADMO in emergency preparedness and response - Organize regular consultative and coordination meetings with key stakeholders through Platforms at all levels and inter-ministerial committee – strengthen coordination by NADMO - Establish MoU with relevant stakeholders related to contingency plans and emergency response - Update inventory of logistics and equipment of NADMO and stakeholders for rapid deployment and support - Identify and improve warehouses at strategic locations - Finalize the data preparedness work for appropriate post-disaster needs assessments - Assess training needs and provide specialized training for rapid response and early recovery - Equip NADMO Operations Room with digitized risk/hazard maps and key communication equipment for effective hazard monitoring, outreach and response - DRM technical advisor in NADMO for design and implementation of emergency preparedness and response 	<p>Improved capacity of NADMO and key stakeholders to respond to emergencies and integrate DRR/CRM in preparedness</p> <p>Improved logistics for emergency supplies and data readiness</p>	1 100,000	<p>Major area for GFDRR support. UNDP has supported capacity building of NADMO, including support for ICT in three Districts in the North (UNDP/ BCPR Early Recovery Project).</p>

(Cont.)

Indicative new program areas for GFDRR/World Bank funding under the “Country DRM Plan” for Ghana*	Potential output/ outcomes	Indicative budget for GFDRR funding US \$	Partnerships
<ul style="list-style-type: none"> - Conduct study to propose optimal institutional arrangement, logistics and funding for decentralized rapid response and recovery (linked to EWS, contingency plans, warehouses for prepositioning, logistics) - Support design and implementation of integrated multi-sectoral monitoring, early warning, contingency plan – linked to the new EWS – based on a programmatic approach and piloting of community-based DRM - Design community-based DRM pilot exercises and sensitize vulnerable communities on DRR/CRM, hazard monitoring, mapping and contingency planning to engender volunteerism - Introduce systematic training of Disaster Volunteer Groups (DVGs) and provide minimum equipment and support - Review and simulate community-based contingency plans for effective response at all levels based on an examination of various mechanisms for risk transfer and risk financing. 	Improved capacity at community level of DRM approaches and strengthened capacity among DVGs to respond to and prepare for disasters	700,000	World Bank will work closely with UNDP/ BCPR
Total new GFDRR funding		5,300,000	

* Note: This matrix represents key priorities put forward by NADMO for a comprehensive program on DRR & CRM – with a few adjustments. Given the limited GFDRR funding, not all of these activities can, obviously, be fully covered or carried out.

ANNEX 1

A joint World Bank-UNDP framework program

The World Bank and UNDP agreed to prepare together with Government a National Program Framework for Disaster Risk Reduction and Climate Risk Management under which the UNDP-World Bank/GFDRR projects would be implemented.

The total UNDP-World Bank support for this National Program will be about \$ 12 million. Under this umbrella there will be five UNDP supported operations, and one new World Bank/GFDRR program (which would include the two on-going GFDRR program – one Ghana specific and one multi-country program on coastal/marine resources management). The combined support from UNDP and the World Bank/GFDRR would help ensure that the work of lead government agencies become linked, integrated and coordinated with the view to exploit synergies between them.

The coverage of these six programs in relation to the two main agendas – DRM & CCA – and along the five priority areas of the Hyogo Framework of Action (HFA) would be as in the matrix below.

Coverage of World Bank/GFDRR and UNDP supported programs across Disaster Risk Management (DRM) and Climate Risk Management (CRM)/Climate Change Adaptation (CCA)

HFA/ Project	GFDRR ¹⁸	BCPR	UNDPa ¹⁹	AAP	CC DARE	UNDP-GEF (health)	UNDPb
Funding Mill. \$	5,900	1, 200	0,350	2,500	0,150	0,350	0,350
HFA1	x	x	x	x	x	x	x
HFA2	x	x	x	x			x
HFA3		x	x				x
HFA4	x	x	x			x	x
HFA5	x	x	x	x			x

¹⁸ While the lion share of GFDRR funding would be for DRM, a substantial amount would be for the CCA/CC agenda related to HFA 2 on hazard assessment and early warning system, to accompany the AAP and the NREG projects, for example. The EWS would be national in scale and support also agencies such as EPA and GMet and the CC agenda.

¹⁹ The UNDP Annual Work Plan 2009 has, for illustrative purposes, been divided equally between DRM and CCA – and denoted UNDPa and UNDPb respectively in the matrix.

MALAWI

Malawi is one of the priority countries for the World Bank Disaster Risk Management (DRM) Team. The Malawi DRM Country Note serves as a framework for investments in DRM activities in Malawi, which are expected to be about \$5 million over a three-five -year period (2010-2014). The Country Note identifies key gaps, challenges, and priorities in the existing DRM situation within the context of the five priority action areas of the Hyogo Framework of Action (HFA),¹ and proposes an indicative action plan for possible Global Facility for Disaster Reduction and Recovery (GFDRR) financing.



Malawi at Glance	2008
Population (millions)	14.8
Population growth (annual %)	2.8
Urban population (% of total population)	17
GDP (current US\$ billions)	4.3
GDP per capita (current US\$)	288
GDP growth (annual %)	9.7
Agriculture (% of GDP)	34.3
Prevalence of HIV, total (% of population ages 15-49)	11.9

Source: World Bank

1. DISASTER RISK PROFILE

Malawi is particularly exposed and vulnerable to drought and floods, and the associated hazards of epidemics and landslides (Figures 1 and 2). From 1979 to 2008, natural disasters affected nearly 21.7 million people and killed about 2,596 people.

Figure 1. Natural Disaster Occurrence
Reported from 1982 to 2008

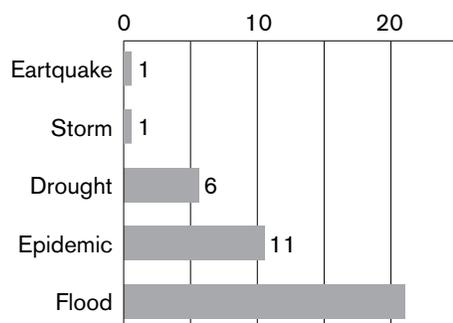


Figure 2. Risk profile Malawi: Human Exposure to main natural hazards
(Modelled in number of people present in hazard zones and subject to potential loss)

Hazard type	Population exposed	Country ranking
Droughts	1,142,090	48th out of 184
Flood	18,591	76th out of 162
Landslide	924	69th out of 162
Earthquake	122,021	52nd out of 153

Source of data: 2009 Global Assessment Report (Source: Preventionweb website: <http://www.preventionweb.net>) – Data displayed does not imply national endorsement

¹ The five Hyogo Framework of Action priority action areas are: 1) Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2) Identify, assess, and monitor disaster risks – and enhance early warning; 3) Use knowledge, innovation, and education to build a culture of safety and resilience at all levels; 4) Reduce the underlying risk factors; 5) Strengthen disaster preparedness for effective response at all levels.

Malawi's vulnerability is linked to specific geo-climatic factors: (i) the influence of the El Niño and La Niña phenomena on the country's climate, and the positions of tropical cyclones developing in the Mozambique Channel, resulting in highly erratic rainfall patterns; (ii) the existence of a hydrological network composed of 78 Water Resource Units (WRUs) contributed by three lakes (Malawi, Chilwa, Chiuta) and three rivers (Shire, Ruo, Songwe), shared with the neighboring countries of Mozambique and Tanzania; and (iii) the location of the country along a tectonically active boundary between two major African plates within the great East African Rift System, causing earthquakes and landslides.

This physical vulnerability is accentuated by socio-economic and environmental factors. The country is highly dependent on rain-fed agriculture, principally for maize cultivation, which represents 52% of the total agricultural crop area, 34% of Gross Domestic Product (GDP), and 85% of employment.² Reliance on maize, which is vulnerable to drought, along with limited livelihood strategies, have resulted in a high rate of food insecurity. Furthermore, Malawi faces low levels of economic and social development, and it was ranked 160 out of 182 countries by the UNDP Human Development Index in 2009. Finally, the country suffers from environmental degradation due to a combination of agricultural expansion into marginal lands and rapid deforestation.

Droughts and dry spells in Malawi cause on average about 1 percent annual GDP loss. The six drought episodes occurring in 29 years (1979-2008) killed about 500 people and affected 19.7 million people.³

Most droughts have occurred during El Niño years, during which the country experiences rainfall deficits. The use of crops that are vulnerable to drought and very low levels of irrigation render the economy vulnerable to prolonged dry spells even during a relatively good rainfall year. Droughts occur on local, regional and national scales, causing food shortages and water scarcity, declines in national maize production, and reduced harvests. On average, droughts cause a 1.3 percentage point increase in poverty, rising to almost 17 percentage points during a 1-in-25 year drought (RP25), which is similar to that experienced in 1991/92 in Malawi (this is equivalent to an additional 2.1 million people falling below the poverty line).⁴

Floods in Malawi cause on average about 0.7 percent annual GDP loss.⁵ The 23 flooding events occurring in 29 years (1979-2008) killed about 581 people and affected 1.9 million people.⁶

Floods are mainly due to lakes flooding and rivers overflowing, and have consequences such as sediment deposit in river channels, reservoirs and floodplains originating from catchment degradation, loss of arable land, and damage to irrigation infrastructure. Although severe floods occur mainly in six river basin systems, the highest flood frequency is in the Lower Shire Valley, mainly in Chikwawa and Nsanje districts, due to flooding of the Shire River which joins the Zambezi River in Mozambique. Flooding is exacerbated by high rainfall due to La Niña events, and to tropical depressions/cyclones originating in the Mozambique Channel or the Indian Ocean, causing widespread, torrential rainfall and flooding. Floods in 2007/08 impacted 20 of the 28 districts and damaged 11,138 ha of crops, as well as infrastructure.⁷

Landslides are a cause and consequence of flooding in Malawi. The deadliest flood in March 1991 in Southern Malawi was the result of a major landslide, killing about 500 people.

This landslide across the river drainage channel resulted in the breaching of a temporary dam, displacing 8,041 people and affecting 128,140 people. A number of historical landslides have been documented such as those in the Rumphi district of Northern Malawi in the catchments of the Vunguvungu and Banga rivers. Malawi is at risk of landslides due to its location on active fault lines, as well as its vulnerability to flooding.

2 *Malawi: Economic Vulnerability and Disaster Risk Assessment: Drought and Flood Risk Atlas* – January 2010 – WB/GFDRR/RMSI

3 *Malawi: Situation Analysis of Disaster Risk Management Programmes and Practice* - Final report – November 2008 – WB/GFDRR Track II/ E. Rowena Hay and M. Alexander.

4 *Malawi: Economic Vulnerability and Disaster Risk Assessment* - Final Report (Volume 1: Main Report) – January 2010 – WB/GFDRR /RMSI.

5 *Ibid.*

6 *Malawi: Situation Analysis of Disaster Risk Management Programmes and Practice* – Final report – November 2008 – WB/GFDRR Track II/ E. Rowena Hay and M. Alexander.

7 National Contingency Plan – Malawi (2009-2010) – Government of Malawi – December 2009.

Damage from the two earthquakes that occurred over the last 30 years (1979-2009) cost about USD 28 million in Salima (1989), and about USD 13.6 million in Karonga (2009).⁸ The Salima earthquake killed 9 people and affected over 50,000, and the four Karonga earthquakes killed 4 people and affected about 145,436 people.⁹ Between 1964 and 2005, over 1,350 earthquake events were recorded even if most (1268) had magnitudes less than 4.5. According to geologists, Malawi is likely to experience earthquakes of much greater magnitude in the future.¹⁰

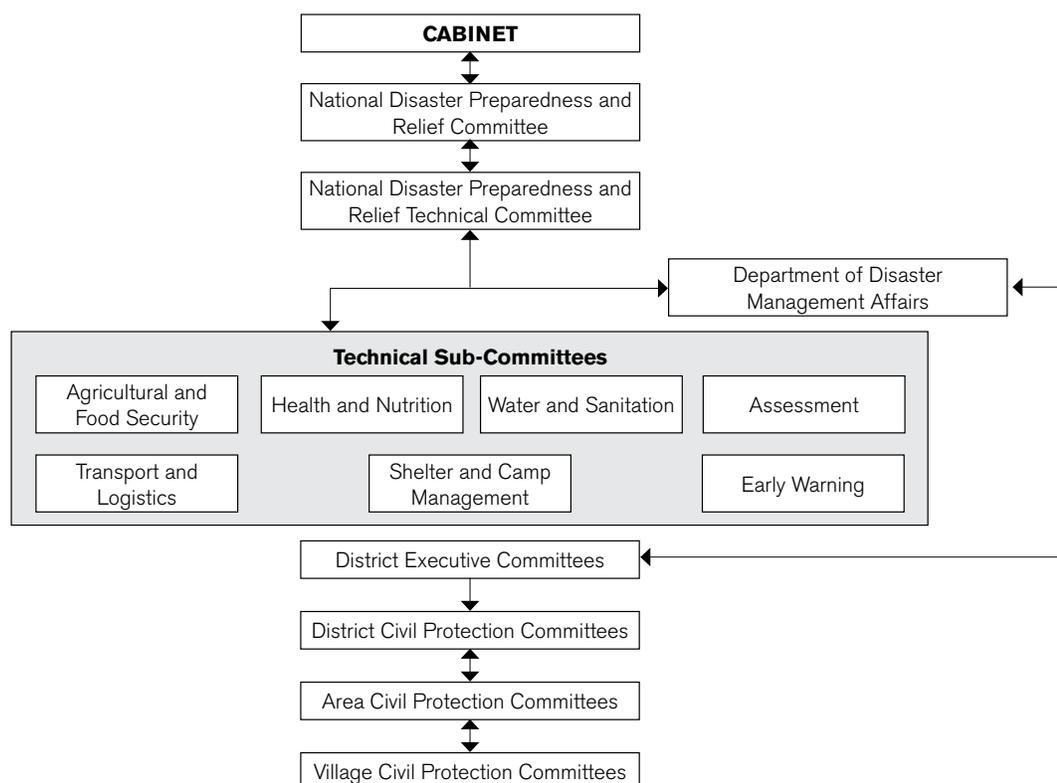
Climate variability and climate change will continue to affect the incidence of drought and floods. Malawi receives an average of 850 mm of rainfall annually, with 95% of rainfall during the main rainy season between November and April. Although this level of rainfall is adequate for rain-fed crop production and for recharging underground aquifers, Malawi has a high degree of inter-annual variability in rainfall and limited water storage capacity. Consequently, the country is at frequent risk of intermittent droughts/dry spells and floods.

2. ACTIVITIES UNDER HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Policy, Institutional Capacity and Consensus Building

The National Disaster Preparedness and Relief Committee (NDPRC), attached to the Office of the President

Figure 3: National DRM Institutional Structure (Source: DoDMA – 2010)



8 Malawi: Situation Analysis of Disaster Risk Management Programmes and Practice – Final report – November 2008 – WB/GFDRR Track II/ E. Rowena Hay and M. Alexander.

9 Memo: Report of the USGS/OFDA Earthquake Disaster Assistance Team (EDAT) *Post-Earthquake Site Visit to Karonga, Malawi* – January 2010.

10 Malawi : Situation Analysis of Disaster Risk Management Programmes and Practice – Final report – November 2008 – WB/GFDRR Track II/ E. Rowena Hay and M. Alexander.

11 The Disaster Preparedness and Relief Act, 1991” – Government of Malawi.

and Cabinet, is the highest-level decision-making body for directing and coordinating DRM (Figure 3).¹¹

Chaired by the Chief Secretary, and comprising principal Secretaries of line ministries, NDPRC is responsible for providing recommendations on disaster declarations; formulating and updating the national disaster risk management policy and mobilizing resources for its implementation; submitting reports to the President on disaster risk reduction (DRR) and post-disaster activities; and managing recovery initiatives.¹²

The Department of Disaster Management Affairs (DoDMA), within the Office of the President and Cabinet, is the central DRM coordinating institution. As the secretariat of the NDPRC, DoDMA coordinates and supports the planning and execution of DRM activities throughout the country. Although DoDMA was initially formed to focus on disaster response and preparedness, its mandate now covers the entire DRM cycle, including DRR. DoDMA is responsible for ensuring that all stakeholders adhere to DRR principles; coordinating resource mobilization for DRR programmes; overseeing early recovery needs assessment and recovery, rehabilitation and reconstruction activities; and coordinating action at and between national and district levels.¹³

Technical Committees were established to provide support to DoDMA for the coordination of DRM activities.

Comprising technical experts representing member institutions of the NDPRC, the committees consider improvements to DRM activities, and develop institutional capacity for effective and efficient DRM. There are seven technical sector-oriented sub-committees (see Figure 3 and Annex 1).

DRM structures are also decentralized and include district, area and village Civil Protection Committees (CPC).

CPCs are chaired by the Director of Planning and Development of the District Assembly at the district level, and by elected chairpersons at area and village levels. Members include representatives of all existing sectoral administrative departments and DRM stakeholders. Through the District Commissioner's office, the District Assembly oversees and supports CPC actions at the district, area, and village levels, and a Desk Officer acts as the Disaster and Relief Officer responsible for disaster impact assessment and liaison with DoDMA.

A National Platform for DRR is planned to be established in 2010.

This platform would support agreement between stakeholders on the common purpose of integrating DRR into development policy and planning, and facilitate coordination and interdepartmental programmatic design and management. The National Platform is expected to include representatives from the government, UN agencies, civil society, donors, academia, the media and the private sector. However, consultations on its establishment have yet to take place, and the reporting structure and its position within the national DRM structure have not yet been worked out.

Malawi does not have a DRM policy, though development of such a policy is planned for 2010-2011.

An initial diagnostic "*Situation Analysis of Disaster Risk Management Programmes and Practices in Malawi*" was completed in 2008, with support from the World Bank/GFDRR. This document identifies strengths, weaknesses, and needs, and suggests the main potential actions to be included in a national DRM Policy.

Pending the development of this DRM Policy, a National Disaster Risk Reduction Framework (DRRF) for 2010-2015 and an Operational Guideline (OG) for DRM were designed in 2009.

Providing common strategic direction to government and non-government stakeholders, the DRRF (expected to be validated in 2010) states five strategic goals (see Annex 2). The interim OG provides a clear description of the DRM institutional structure and outlines DRM stakeholders' roles and responsibilities. These guidelines were conceived to meet immediate operational needs and present the Government of Malawi's current expectations of national agencies' roles and responsibilities as

¹² *Draft Operational Guidelines for Disaster Risk Management* – August 2009 – DoDMA/UNDP – Draft.

¹³ *Ibid.*

¹⁴ *Ibid.*

a basis for discussion. When the DRM Policy is validated, the interim OG will be revised and finalized accordingly.¹⁴

The Disaster Preparedness and Relief Act of 1991 (DPR Act 1991) is the main legal reference document related to DRM implementation in Malawi, though it is considered outdated. The DPR Act, which focuses on disaster preparedness and response, covers the composition and functions of the Commissioner's Office for Disaster Preparedness of the NDPRC and the National Disaster Preparedness and Relief Fund. Updating the DPR should be carried out in tandem with the development of required legal and regulatory tools to enable effective implementation of the Act.

Malawi's National Adaptation Programme of Action (NAPA) was developed in 2006 under the leadership of the Ministry of Mines, Natural Resources and Environment, and launched by the State President in 2008.

The NAPA identifies five priority activities (see Annex 3) to address Malawi's urgent adaptation needs to climate change and extreme weather events for vulnerable communities. However, none of these activities have been implemented to date. Climate change adaptation interventions are implemented by various stakeholders. A National Climate Change Committee (NCCC) chaired by the Department of Climate Change and Meteorology, with its Secretariat in the Environmental Affairs Department, reviews policies and programs on climate change.

Significant efforts and achievements have been made to set up adequate strategic framework and institutional mechanism, but a number of challenges remain to be addressed. The Malawi DRM system is in a transition phase from ex-post disaster risk management to a comprehensive ex-ante approach of disaster risk reduction. Although significant efforts have been made to establish supporting strategic frameworks and institutional mechanisms, key needs and challenges remain. The main needs include:

- I. The development of a national policy, strategy and action plan for DRM to guide the implementation of DRM priorities and objectives stated in the MDGS (2006-2011);
- II. The finalization and adoption of an adequate institutional scheme and framework (*planned*), based on a comprehensive and objective analysis of the existing situation;
- III. The definition and adoption of an adequate legal framework, including the revision of the DPR Act 1991, with a set of legal and regulatory instruments and tools to fully operationalize the new institutional framework;
- IV. The adoption of appropriate operational mechanisms, including the definition of proposed roles and responsibilities for each DRM phase, and the definition and adoption of appropriate organizational arrangements, operating mechanisms and related tools; and
- V. The enhancement of the technical and material capacities of DoDMA, and its organizational and structural capacity, based on a comprehensive and objective situation diagnosis vis-à-vis its overall mandates and responsibilities, considering it as a reform.

HFA Priority # 2: Disaster Risk Assessment, Monitoring and Early warning

Disaster risk assessment

DoDMA is charged with coordinating and facilitating vulnerability and risk assessments. The assessment technical sub-committee is responsible for undertaking risk assessment and mapping. DoDMA also manages a National Disaster Profile, a database covering all natural disasters in the country. In 2009, DoDMA, with World Bank/GFDRR support, conducted a country-wide scientific risk assessment and mapping for drought and floods, "*Economic Vulnerability and Disaster Risk Assessment Study in Malawi*," and developed a country risk atlas. The study assisted the Government of Malawi to determine the extent of economic vulnerability to floods and droughts. The drought and risk atlases were produced portraying the spatial characteristics of drought and flood risks in terms of the extent of the

hazard, exposure and vulnerability, and the probable losses for various return period scenarios of disaster events.

From 1992 to 1998, Malawi benefited from “The Global Seismic Hazard Assessment Program (GSHAP)”, among other African countries prone to earthquake. Launched in 1992 by the International Lithosphere Program (ILP) with the support of the International Council of Scientific Unions (ICSU), and endorsed as a demonstration program in the framework of the United Nations International Decade for Natural Disaster Reduction (UN/IDNDR), this programme undertook earthquake hazard assessment to be used as a primary input for the implementation of risk mitigation strategies¹⁵.

Risk assessment and mapping in Malawi are not currently conducted systematically for both hydro-meteorological and geological hazards, and are less relevant at the local level. Current tools are less useful at the local level versus the national level for strategic and operational planning because the resolution does not allow for understanding the local spatial distribution of risk. Furthermore, the tools do not take into consideration the characteristics of risk, socio-economic and environmental factors, and coping capacity at the local level. The existing database on natural risks and disasters is static and difficult to access/update.

Main needs to support disaster risk assessment efforts include the following:

- I. There is a need to develop local scientific risk assessment tools for drought and floods, along with local Participatory Vulnerability Assessments (PVA) and Participatory Risk Appraisals (PRA). These allow for a higher level of detail on hazards and vulnerability, which are important for preparedness and prevention strategies at the local level.
- II. A multi-hazard online DRM geospatial database is needed, with dynamic risk mapping, through the development of a Geographic Information System (GIS) for DRM.
- III. A comprehensive, countrywide seismic risk assessment is needed, including scientific risk assessment at macro and micro (local) levels, and PVAs and PRAs at the community level.
- IV. A sustainable risk assessment mechanism combined with technical capacity building for national institutions is needed, as risk assessments are currently carried out with external technical assistance. The country does not yet have a formal mechanism to undertake such an exercise despite existing skills and specialized institutions.

Early Warning Systems

A drought monitoring and early warning system is well developed in Malawi. Several actors are involved: the Ministry of Agriculture and Food Security (MoAFS) disseminates warnings, and the Department of Climate Change and Meteorological Services (DoCCMS) ensures continuous climate observations and seasonal forecasts with an emphasis on drought monitoring, in collaboration with the Southern African Development Community (SADC) Drought Monitoring Centre in Gaborone, Botswana. Rainfall data of excellent quality are provided, and the government plans additional investments in infrastructure to further improve the performance and communication of weather stations. The Department of Water Resources (DoWR) is partly involved through monitoring groundwater levels.

A flood monitoring and early warning system exists but is not fully operational. The DoDMA issues warning information to relevant districts, and the Ministry of Irrigation and Water Development (MoIWR) provides alerts based on river water levels through the Department of Water Resources (DoWR), which provides systematic though limited hydrologic monitoring and forecasting. DoWR has technical capacity weaknesses, mainly related to the lack of adequate equipment, weak station coverage, and lack of a flood forecasting and warning system with real time data and flood forecast modeling. Rainfall observation, monitoring, analysis and forecasting are overseen by the DoCCMS.

Earthquake monitoring is carried out on a very limited scale. The Department of Geological Survey (DoGS), in

charge of geological hazard monitoring, ensures dissemination of information in case of earthquakes, in collaboration with DoDMA. However, the coverage and quality of earthquake observation and monitoring are limited mainly due to a lack of adequate technical and material capacities. In 2008, only one of the five seismic observation stations was operational. In 2009, DoGS used only two borrowed broadband seismic stations (three stations are required to accurately locate an earthquake). At the time of the 2009 earthquake in Karonga district, the only seismic station located at the Karonga Airport was out of service.¹⁶

A food security and livelihoods vulnerability monitoring and early warning system is in place but needs support. The Malawi Vulnerability Assessment Committee (MVAC), chaired by the Ministry of Development Planning and Cooperation, manages the Vulnerability Analysis System (VAS). VAS assesses and provides early warning information on the food security and livelihood context, although the 2004 livelihoods baseline data needs to be updated. The Famine Early Warning Systems Network (FEWS NET) provides technical assistance to the Ministry of Agriculture and Food Security in carrying out annual crop estimates and building and managing its Market Information System; supports capacity building of MVAC staff; and operates a monitoring tool through its participation in the MVAC.

Main needs to support the development of early warning systems include:

- I. The establishment of a comprehensive and effective flood Early Warning System (EWS), including the establishment of formalized organizational and operating mechanisms, and strengthening of key institutions and structures, mainly the DoWR, based on a comprehensive and objective situation diagnosis;
- II. A stronger earthquake monitoring system, following an adequate technical and material capacity strengthening (see detailed needs in Annex 4);
- III. The establishment of a multi-hazard early warning coordination and monitoring unit, which would be in charge of the early warning consolidation and monitoring at the central level; and
- IV. The enhancement of the quality of food security and livelihoods early warning information issued by MVAC through support to its livelihoods baseline updating.

HFA # 3 Knowledge and Capacity Enhancement for DRM

Public awareness-raising interventions for risk reduction and management are regularly carried out at the local level. DoDMA undertakes regular public awareness meetings with communities in flood-prone areas every year to sensitize them to the need to be prepared for the rainy season. In some instances, communities have agreed to relocate before rains and even permanently upland from low-lying flood prone areas, substantially reducing the number of households affected by floods. Many NGOs undertake public awareness raising actions as part of their DRM community-focused projects. The local NGO CADECOM has initiated a programme to train community members in Participatory Appraisal and Risk Assessment by sending selected members to the University of Cape Town to become trainers themselves within their own community, thereby initiating a peer-to-peer learning process.¹⁷

DRM and climate change adaptation (CCA) education has been introduced at the primary and secondary school levels. Some aspects of DRM, such as agricultural environmental issues, are taught within public schools, to help students understand environmental factors influencing agriculture production, with an emphasis on soil and water conservation sustainability. Disaster preparedness for earthquakes and fires is also taught. DoDMA has introduced

¹⁵ *The Situation Analysis of Disaster Risk Management and Practice*: E.R. Hey and A. Phiri: Final Consultant Report. World Bank / GFDRR program for Malawi, 2008

¹⁶ Report of the USGS/OFDA Earthquake Disaster Assistance Team (EDAT) *Post-Earthquake Site Visit to Karonga, Malawi* – January 2010

¹⁷ *Malawi: Situation Analysis of Disaster Risk Management Programmes and Practice* – Final report – November 2008 – WB/GFDRR Track II/ E. Rowena Hay and M. Alexander

a DRR quiz competition in primary schools as one way of introducing DRR in schools. A number of NGOs have initiated education in schools that have a community outreach element, such as Action Aid, which advocated for the institutionalization of DRM initiatives in Nsanje district.

The teaching of DRM and CCA concepts is integrated in university curricula through course modules. The two main institutions of higher learning in Malawi, the University of Malawi and the University of Mzuzu, currently provide courses related to environmental and climate change issues, which are also linked to hydro-meteorological hazard risk issues. At Chancellor College, it's the Department of Geography and Earth Sciences offer courses on climatology, hydrology, and meteorology, and Mzuzu has established a new faculty dealing with renewable energy sources.

Research has been undertaken in the field of DRM and CCA but is limited in scope and application. Often carried out by university research institutions in collaboration with governmental and NGO counterparts, such research relates mainly to hydro-meteorological hazards, the environment, and climate change. For example, the University of Malawi carries out a research programme on "Mainstreaming Climate Change Adaptation and Mitigation in Sectoral and National Development Plans and Strategies in Malawi," at Bunda College of Agriculture, by the Centre for Agricultural Research and Development (CARD), in conjunction with Christian Aid-Malawi. The National Research Council of Malawi (NRCM) is the umbrella organization responsible for coordinating and overseeing all types of research in the country.

Despite these efforts, public awareness-raising of all hazards in priority risk areas is not yet systematically undertaken. DRM and CCA are not fully and systematically integrated in primary and secondary education curricula, even as components of other subjects. DRM and CCA are also not widely taught at the university level as specialized disciplines. Access to funding, and results dissemination and use, are the main weaknesses for research development in the fields of DRM and CCA.

Main needs to support knowledge and capacity building include:

- I. The development and implementation of a systematic and comprehensive public awareness program;
- II. Support for the integration of DRM and CCA in national education curricula at primary and secondary levels (currently stated as a key priority by the Government); and
- III. Support for the introduction of specific DRM and CCA training/courses at the university level, as planned by the Government.¹⁸ Malawi recognizes the need to have current and future staff within government ministries and institutions who understand and master DRM and CCA theoretical and practical concepts and issues.

HFA Priority # 4: Disaster Risk Reduction and Financing

Disaster Risk Reduction

Several interventions aimed to reduce natural disaster risk are currently being implemented in Malawi in natural resource management and protection of the environment, forests, water resources, soil and land, energy; land use planning; agriculture; education; health; food security; livelihoods; and social protection. National-level interventions are guided by governmental sectoral policies and strategies, mainly: the Food and Nutrition Security Policy, National Environment Policy, Agriculture Sector Policy and Strategy, Irrigation Policy and Development Strategy, National Water Policy, National Forestry Policy, Energy Policy, National Land Use Planning and Management Policy, and Social Protection Policy.

¹⁸ Malawi: National progress report on the implementation of the Hyogo Framework for Action for the period (2007-2009) – DoDMA – April 2009

In addition, there are several interventions aimed at specifically reducing and protecting against major hazards. These initiatives generally include both structural and non-structural mitigation measures, such as: (i) the GEF-funded project “Capacity Building for Soil and Land Management in Shire River Basin” implemented by the Ministry of Lands to address catchment degradation and rehabilitation issues in the Lower Shire Valley and land degradation in the Shire River Basin through Payment for Ecosystems Services (PES) arrangements¹⁹; (ii) the “Presidential Green Belt Initiative” launched in 2008 to reduce vulnerability to drought and boost production by irrigating a million hectares of land and by investing in crop diversification. Despite Malawi’s exposure to earthquakes, no specific mitigation interventions have been systematically implemented to reduce the impacts of earthquakes.

An evaluation of possible mitigation options and scenarios for drought and floods was undertaken as part of the recently completed study “Economic Vulnerability and Disaster Risk Assessment in Malawi” (2010). Two drought mitigation measures, irrigation and crop calendar shift, were evaluated through simulation in terms of their economic benefits. A set of flood mitigation measures specific to Malawi, categorized in two groups of structural and non-structural measures, was proposed.

Although disaster risk reduction is a stated priority for Malawi, comprehensive implementation of major initiatives remains limited. The main weaknesses are due to the lack of a systematic and comprehensive diagnosis of underlying risk factors, especially at the local level; the lack of systematic identification and evaluation of appropriate mitigation options (structural and nonstructural) at macro and micro levels; the lack of a DRR strategy and clear guidance; the weakness of technical leadership for DRR, and finally the lack of resources to support implementation.

Main needs to support disaster risk reduction efforts include:

- I. Implementation of a holistic approach is needed to address recurrent flooding in the Lower Shire Valley. Although the subject of many studies, flooding in the Lower Shire Valley has typically been addressed in a fragmented manner, often by project-to-project. Flooding in this area could be a good starting point and reference for the implementation of a DRM integrated approach. All DRM phases should be covered, with a good balance of structural and non-structural measures.
- II. Implementation of priority flood, drought and earthquake DRR measures is needed. Many of these have been proposed by the various completed studies, such as the use of improved maize varieties and water management through irrigation.²⁰ Structural measures, such as storage dams and the construction of levees, and non structural measures such as flood zoning, development of national, provincial, and local building standards, and flood insurance are needed to address flood risks. In terms of earthquake hazards, the establishment of building codes with seismic loading provisions, and seismic risk studies, and long-term teaching programs for Malawi architects and building contractors about retrofitting and earthquake-resistant structures are needed.

Disaster Risk Financing

The DPR Act 1991 stipulated the establishment of a National Disaster Preparedness and Relief Fund as a financing mechanism for DRM. The objectives of the Fund are the development, promotion, management and administration of civil protection, and the funding of any scheme considered to be in the interest of civil protection. It is mainly a bank account with sums appropriated by Parliament for the purposes of the Fund, and received from voluntary contributions or donated from any foreign government, international agency or foreign institution or body, or from

advances made by the Minister in charge of finance. In reality, national budgetary resources are annually appropriated for potential emergency relief and rehabilitation activities under the Vote for Unforeseen Expenditure whilst the DoDMA receives a regular annual budgetary allocation under the 'other recurrent transactions' (ORT) budget for core funding of its operations (including DRR and preparedness activities). The Government of Malawi allocates further resources for disaster response, longer-term reconstruction, preparedness and, in part indirectly, for mitigation to other government agencies.

Malawi has adopted pilot weather risk management instruments (risk transfer), namely the “National Drought Insurance”²¹ and “Drought Insurance for Subsistence Farmers.”²² The *“Malawi National Drought Insurance”* is developed to help the Government manage the financial impact of drought-related national maize production shortfalls. The first for a sovereign entity in Africa, this tool is an index-based weather derivative contract designed to transfer the financial risk of severe and catastrophic national drought that adversely impacts the Government's budget to the international risk markets. The pilot was initiated in 2008 and several piloting seasons will be necessary to understand the scope and limitations of a weather derivative contract, and its role within the Government's evolving strategy, contingency planning and operational drought response framework.

The *“Drought Insurance for Subsistence Farmers”* pilot project gave 892 subsistence farmers the opportunity to purchase insurance covering drought risks for their valuable groundnut crop. This is the first initiative selling index-based weather (micro) insurance to smallholder farmers in Africa. The project also helps farmers to obtain certified and higher-yielding seeds with greater disease resistance. If a drought leads to insufficient groundnut production, the bank pays the loans of insured farmers directly. If there is no drought, the farmers benefit from selling the higher-value production. However, the analysis of this experience demonstrated that complementary investment in financial and non-financial services, including microfinance products and effective marketing channels and supply chains, are necessary to sustain this model of micro level index-based weather insurance.

Main needs to support disaster risk financing include:

- I. Reviewing and improving the current National DRM funding mechanism, including budgetary arrangements and allocation, based on a clearly defined DRM financing strategy to address existing shortcomings. These shortcomings include delays in accessing emergency funding by the DoDMA; limited emergency funding options for sectoral ministries; inadequate funding for DoDMA's core activities; lack of adequate DRR funding options and mechanisms, at all levels; and finally lack of adequate budget allocations for District Assemblies.
- II. Continuing the piloting of risk transfer mechanism for drought at macro and micro levels.
- III. Investigating possible extension of the pilot risk transfer tool to other hazards, mainly floods.
- IV. Strengthening financial mechanisms that promote the link between social protection and DRR at the community level and the protection of livelihoods and economic post-disaster recovery.
- V. Exploring feasibility and advantages of adopting a financial risk transfer regional mechanism, comparable to the CCRIF (Caribbean Catastrophic Risk Insurance Facility).

HFA Priority # 5: Disaster Preparedness and Recovery

DoDMA is the central body in charge of coordinating preparedness and post-disaster emergency response and recovery. Its main responsibilities include coordinating, monitoring and assisting the development of preparedness plans by all stakeholders, including national and district-level contingency plans; activating the National Disaster

21 J.Syroka, A. Nucifora. National Drought Insurance for Malawi. World Bank Policy Research Working Paper, 2010

22 National Hazards Observer Volume XXXIII-Number 5 « Focus on drought and Climate Change” – May 2009 – National Hazards Center.

Contingency Plan; leading and facilitating joint rapid assessments; providing overall coordination and leadership in emergency response; and coordinating recovery needs assessment, implementation, and monitoring. The technical sub-committees provide support to DoDMA and are in charge of coordinating and assessing preparedness activities, and monitoring and directing disaster relief programmes implemented by line ministries and other stakeholders.

National and district contingency plans are developed at central and district levels. Covering the period from November 2009 to October 2010, the current National Contingency Plan outlines the Government of Malawi's response to emergency flood and drought situations to prevent and help reduce any potential negative impacts. For each hazard, three scenarios have been developed, based on seasonal rainfall forecasts and experience gained from similar past weather patterns. District contingency plans cover only floods in 9 of the 15 flood-prone districts (as of 2008). The development of flood contingency plans in the remaining districts at risk is already planned for 2010/2011.

DoDMA is responsible for activating the contingency plan at the central level; the District Commissioner's Office activates the plans at the district level. Post-disaster responses are provided based on the results of post-disaster damages and emergency needs assessment, and post-emergency damages and recovery needs assessments. At the central level, emergency responses are provided in the framework of the « cluster » approach, to facilitate the planning and coordination of response implementation. Stakeholders are grouped in eight sectoral groups called « clusters » co-led by line Ministries and specialized UN Agencies. The post-disaster recovery plan is defined together with concerned stakeholders.

Effective preparedness efforts need to be strengthened, mainly for rapid onset hazards, to avoid weak or limited emergency response and recovery initiatives, which are sometimes delayed or address only some needs or affected populations. DRR is not always systematically considered and integrated in response interventions, which leads to the continuation or rebuilding of pre-existing vulnerability factors, or to well-intentioned but unsustainable recovery interventions. The current main weaknesses of current preparedness and recovery mechanisms include the lack of continuous and effective stakeholder ownership and commitment; a formal and institutionalized mechanism with clear organization for the implementation of preparedness, post-disaster assessment, emergency response and recovery; effective resource allocation; and standardized processes, methods and tools.

Main needs to support disaster preparedness and recovery include:

- I. The enhancement of the efficiency and effectiveness of preparedness mechanism and actions, based on participatory evaluation of past and existing situations and regular testing of preparedness plans (simulation exercises);
- II. Enhancement of capacity for post-disaster needs assessment and response implementation through the establishment of adequate and formalized mechanisms for post-disaster assessment and response planning, based on a comprehensive and objective diagnostic of existing situation; and
- III. The establishment of Emergency Operations Centers in the three regions – North, Centre and South.

3. INTEGRATION OF DISASTER RISK MANAGEMENT (DRM) IN DEVELOPMENT STRATEGIES

“Improving disaster risk management” is an important part of the second key thematic area of the Malawi Growth and Development Strategy (MGDS) for 2006-2011 (“Social protection and disaster risk management”).²³ “Preventing disasters where possible and mitigating the negative impact of disasters on the vulnerable”

²³ *Malawi Growth and Development Strategy: From Poverty to Prosperity (2006-2011)* – Government of Malawi.

is one of the four main fronts of action to be undertaken. The expected outcome is the “reduction in the socioeconomic impact of disasters, as well as building a strong disaster management mechanism.” In addition to promoting the integration of DRM into sustainable development planning and programming at all levels, the key stated strategies are: developing and strengthening institutions responsible for DRM; instituting necessary DRM mechanisms; implementing mitigation measures in disaster prone areas; developing and strengthening coordination of institutions in disaster management and relief services; establishing an early warning system for Malawi; and timely provision of emergency relief assistance to affected populations. The development and implementation of the Disaster Risk Reduction Framework is an important step towards the implementation of the MDGS's priorities, but the development of a specific DRM policy is still a key need.

Mainstreaming DRM in country development plans and policies is not yet fully in place, even if it is a priority objective for the country. Some priority actions have been identified and planned, and a first step has been achieved in this regard through the completion of the study on the economic vulnerability of the country to floods and drought. The study provides quantitative and scientifically-based outputs to inform decision makers and serves as a powerful advocacy tool at the macro level. Other actions are planned such as the inclusion of disaster risk analysis in the economic appraisal and planning process of all projects included in the Government of Malawi's Public Sector Investment Programme (PSIP), and the support for the systematic integration of disaster risk reduction in vulnerable districts' operational and budgetary planning.

The World Bank has contributed to DRM efforts in the country within the framework of the fourth Country Assistance Strategy (CAS) for 2007-2010. The CAS supports the MGDs by focusing on the achievement of four outcomes. The programs implemented to achieve the first CAS outcome “improve smallholder agricultural productivity and integration into agro-processing”, focus specifically on helping Malawi to improve total food output and productivity, and strengthen risk management systems mainly related to floods and drought. The World Bank provides technical assistance and carries out analytical work to help improve agricultural productivity and build resilient communities, mainly by supporting Government efforts to offset the risks of maize price variability with the use of various hedging instruments, test markets for national weather insurance, and strengthening trade efficiency through the establishment of a warehouse receipt system. Micro-level weather insurance has also facilitated the successful pilot of weather insurance. Several projects supported by the World Bank contribute to DRM, such as the Agricultural Sector Development program, Community-Based Rural Land Development Project, Second National Water Development project, Irrigation, Rural Livelihoods and Agricultural Development project, and Malawi Third Social Action Fund (MASAF 3).

Disaster risk management is a priority area of support for the United Nations System (UN System) for 2008-2011. The United Nations Development Assistance Framework (UNDAF) 2008-2011 aims to help Malawi achieve the MDGs. DRM is covered under the second UNDAF outcome, “care and protection for the ultra poor and reduction in the impact of economic shocks and disasters on the most vulnerable”, and the related Country Program Outcome 2, “the Government will have disaster risk reduction and emergency management systems and practices for efficient response at national and sub-national levels by 2011”. Disaster risk reduction is also considered a cross cutting issue, mainstreamed in each UNDAF outcome.

4. KEY DONOR ENGAGEMENTS

World Bank and Other Donor Supported Projects in Malawi		
Major Ongoing Projects and Organizations	Indicative budget, years	HFA activity area(s)
World Bank Projects		
Community-Based Rural Land Development Project	\$29.78 million - (2004-2011)	1, 3, 4
Community-Based Rural Land Development Project (Loan & Credit)	\$10 million - (2009- n/a: active)	1, 3, 4
Agricultural Sector Development	\$47.5 million - (2008-2013)	1, 3, 4
Agriculture Development Program SLM	\$37.8 million - (2008-2013)	1, 4
Malawi Third Social Action Fund (MASAF 3) APL II (LDF Mechanism)	\$51 million - (2008-2013)	1, 4, 5
Second National Water Development Project - Additional Financing (ACGF)	\$25 million - (2008-2011)	1, 4
Second National Water Development Project	\$173 million - (2007-2012)	1, 3, 4
MW - Avian Influenza prevention and control	\$1 million - (2007-2010)	1, 3, 4, 5
The Shire River Basin Management project (under preparation)	\$70 million - (2011-2016)	1, 2, 3, 4, 5
GFDRR funded Projects		
Mainstreaming Disaster Reduction for Sustainable Poverty Reduction: Malawi (GFDRR Track II: single country focus project)	\$914,000 - (2006 – 2010)	1, 2, 3, 4
Karonga Earthquake Post-Disaster Support		3, 5
Disaster Risk Management in the Sub-Saharan Africa Region (GFDRR Track II: Burkina Faso, Comoros, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mozambique, Seychelles, Swaziland)	\$300,000 - (2007 – n/a: active)	1, 2, 3, 4, 5
Phase 1 of an Activity to Support National Red Cross and Red Crescent Societies (GFDRR Track II: Albania, Armenia, Ecuador, Malawi, Pakistan, Philippines, Rwanda, Solomon Islands)	\$200,000 - (2008 - n/a: active 2011)	1, 3, 4, 5
Disaster risk management in Africa: strategic framework-good practice-communication (GFDRR Track II: Burkina Faso, Comoros, Congo Democratic Republic, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Niger, Rwanda, Senegal)	\$395,000 - (2008 – n/a: active)	1, 2, 3, 4, 5
Selected donor projects		
DFID-World Bank- Norway Aid-Irish Aid: Community Resilience to Natural Disasters and Climate Risks	£10 million - (planned: for 4 years)	1, 2, 3, 4, 5
DFID/CHASE: "Community based Disaster Risk Reduction Projects" (through 3 NGOs Christian Aid, Action Aid and Tear fund in partnership with local civil society organizations)	£2.3m - (2006-2010)	3, 4, 5
UN (through mainly UNDP, but also WFP/UNICEF/UNHabitat/FAO/UNRCO): One UN Disaster Risk Reduction Programme	\$2.7 million (for 2009-2010) (2008 – 2011)	1, 3, 4, 5
UNDP-UNEP Poverty and Environment Initiative (PEI) – Phase I	US\$ 2.7m - (2008-2010)	1, 3, 4
World Bank /GOM/IFAD: Irrigation, Rural Livelihoods and Agricultural Development (IRLAD) Project	\$52.5 million - 2006-2012	1, 3, 4, 5
GEF/ Ministry of Lands : Capacity Building for Soil and Land Management in Shire River Basin (23,000 sq km)	US \$11, 770,750 - (2009-2013)	1, 3, 4
DFID: Integrated Food Security Programme	\$15.4 million - (2003-2010)	3, 4
ADF: Smallholder Crop Production and Marketing Project	\$26.44 million - (2006-2014)	3, 4
EU: Improved Forest Management for Sustainable Livelihoods Programme	\$13.21 million - (2005-2012)	3,4
DfID (through NGOs : Evangelical Association of Malawi / Tear Fund UK): Food Security and Community Based Disaster Risk Mitigation Project	\$2.55 million - (2006-2010)	3, 4, 5

(Cont.)

World Bank and Other Donor Supported Projects in Malawi		
Major Ongoing Projects and Organizations	Indicative budget, years	HFA activity area(s)
Selected donor projects (Cont.)		
ADF: Rural Income Enhancement Project	\$20.77 million - (2000-2011)	3, 4
DfID (through NGOs : River of Life Evangelical Church / Tear Fund UK) Community-based disaster Mitigation and Preparedness project	\$431,580 - (2006-2010)	3, 4, 5
Hunger Project Globe: Sustainable Livelihood Security project	\$5.72 million - (1999-2010)	3, 4
EU : Income Generating Public Works Programme	\$22.77 million - (2005-2011)	3, 4
CORDAID/CADECOM: Disaster Risk Management project	\$1.47 million - (2008-2010)	3, 4, 5
World Bank, AfDB, FAO, Italy, Belgium, Norway: National Programme for Food Security	\$ 363.9 million - (2005-2015)	1, 3, 4
AfDB : Smallholder Crop Production and Marketing Project	\$25 million - (2007-2013)	1, 3, 4
IFAD : Rural Livelihoods and Economic Enhancement Programme	\$16.8 million - (2008-2014)	1, 3, 4
EU: Farm Income Diversification Programme	\$20 million - (2005-2011)	3, 4
GoM/ICP: Integrated Water and Rural Agricultural Credit (pipeline project)	US\$5.29 million - (2009-2014)	1, 3, 4
AfDB /GEF/LDCF: Climate Adaptation for Rural Livelihoods and Agriculture (CARLA) (pipeline project)	US\$24.3 million - (2009-2015)	1, 3, 4, 5
DIPECHO (through NGOs): DIPECHO's support to Disaster Risk Reduction – Phase 2	n/a - (2010-2011)	1, 2, 3, 4, 5
IFRC/ICRC/Finnish Red Cross: Disaster Management programme	\$ 1,38 million - (2009-2010)	1, 3, 4, 5
WFP: PRRO 105860: Assistance to food insecure people suffering from the effects of natural disasters and HIV and AIDS	\$118 million - (2008-2010)	4, 5
DFID (through NGOs): Disaster Risk Reduction Project design	£125,000 - (2009- n/a: active)	-
DFID (through NGOs and multilateral organizations): DFID Malawi Climate Change Programme	£300,000 - (2009-2011)	3, 4
DFID (through NGOs and emergency aid): Support for Victims of Storms and Floods	£1.2 million - (2008- n/a: active)	5
DFID: Support to MVAC – Phase II	£400,520 - (2007- n/a: active)	2
USAID-OFDA/IFRC/WMO: Zambezi River Basin Initiative project (Angola, Botswana, Malawi, Mozambique, Namibia, Zambia, Zimbabwe)	\$1 million (FY 2009) - n/a: active	3, 4
USAID-OFDA/WMO/IFRC: Zambezi River Flood Early Warning and Mitigation project (Angola, Botswana, Malawi, Mozambique, Namibia, Zambia, Zimbabwe)	\$451,000 (FY 2009) - n/a: active	1, 2, 3, 4, 5
USAID/CARE: Drought Mitigation through Irrigation Promotion and Conservation Agriculture Extension Project	\$1.51 million (FY 2009) - (2009- n/a: active)	5
USAID-OFDA: Technical Support for Vulnerability Assessment Committees (VACs) in Southern Africa, through USAID-funded Famine Early Warning Systems Network (FEWS NET) (Southern African countries)	\$698,656 (FY 2009) - n/a: active	1, 2, 5
NORAD/USAID/Total Land Care: Management Adaptation for Climate Change Projects in Chia Lagoon in Nkhotakota district (integrated watershed management project)	\$5 million? - (2008-2012)	3, 4
NORAD/ LEAD and World Fish Center : Lake Chirwa Basin Project (integrated watershed management project)	\$5.2 million? - (2009-2013)	3, 4

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Given the substantial number of donor engagements, it is important to consider GFDRR within the broader framework of a disaster risk management and adaptation program in Malawi. While the table below is a tentative and may not be complete, centered on Hyogo Framework for Action priorities, it helped identify areas where GFDRR is best placed to leverage its expertise and resources.

Hyogo Framework for Action Area	Potential Main Partners	Comments
HFA Priority 1. Policy, Strategy and Capacity Building		
Policy, Strategy, Master Planning	UNDP, GFDRR	Draft DRR Framework prepared; Preparation of the National DRM Policy is necessary; preparation of the National Master Plan for DRM. GFDRR: Assistance with preparation of the Master Plan (after the Policy is developed).
Mainstreaming DRM and Adaptation into Development	UNDP, DIFD, IRISH AID, NORAD, GFDRR	DRM mainstreaming into the national and sectoral development plans and projects, district level development activities. GFDRR: to support the preparation of the sectoral DRM strategies (as a follow-up on the completed work under GFDRR Phase 1); mainstreaming DRM into investment strategies and projects (preparation of the WB Shire basin project).
Capacity building and coordination among stakeholders	UNDP, DIFD, DIPECHO, GFDRR	Finalization of the Operational Guidelines for DRM; Mapping of all stakeholders in DRM and Climate Change Adaptation; Establishment of the DRR National Platform; DRM. capacity building at central and district levels. DRM sensitization activities for main line ministries. The capacity building program to be mainly supported by UNDP GFDRR: to possibly finance some follow-up on the GFDRR / WB on-going training / capacity building program.
HFA Priority 2: Risk identification, Assessment and Monitoring – Early Warning System		
Risk assessment and mapping	UNDP; DIFD; IRISH AID; NORAD; DIPECHO; GFDRR	Developed Atlas of Drought and Flood risks for Malawi (World Bank / GFDRR); Development of GIS database on hazard and vulnerability at district level (UNDP); Detailed Participatory Risk Assessment mapping for disaster most prone areas (DIPECHO?); Flood zoning mapping for selected rivers in highly vulnerable areas; Data harmonization and exchange between relevant agencies. GFDRR: to possibly support detailed risk assessment and mapping in selected areas in relation to the WB operations; climate change risk assessment and mapping.
Risk monitoring and Early warning system (EWS)	UNDP; DIFD; IRISH AID; NORAD; DIPECHO; USAID/OFDA; WMO;IFRC; GFDRR	Establishment and strengthening of Early warning systems for rapid onset disasters (national and community level); Design of an integrated EWS linking together different districts / regions; Technical Support for the Malawi Vulnerability Assessment Committee(MVAC); earthquake monitoring and early warning. GFDRR: assistance with the design of ESW for floods.
DRM and Climate Change Adaptation	DFID, Irish Aid, NORAD, MDPC, DoDMA, Malawi MetService, EAD	Linking DRM and Climate Change Adaptation agendas.
HFA Priority 3. Education and awareness to build a Culture of resilience		
Community awareness and capacity building	UNDP, DIPECHO	Development and dissemination of DRM Handbook and flyers for community use; Community awareness raising program using community radios, awareness campaign.
DRM Education, Training and Research Program	UNDP, DIPECHO	Development of DRM courses for Schools and Universities; Standardized DRR training materials for CPCs; DRR handbooks for teachers and school children.

(Cont.)

Hyogo Framework for Action Area	Potential Main Partners	Comments
HFA Priority 4. Reduction of underlying risks		
Land use planning and management	DIFD; IRISH AID; Norway; GEF, WB, Others, GFDRR	Flood zoning mapping for selected rivers in vulnerable areas (DIFD-IRISH AID-NORWEGIAN AID); Community-based rural Land Development project (WB); Improving soil and land management in Shire river basin; Integrated watershed management (Norway). GFDRR: support to developing a regional approach to coordinated watershed management.
Building and infrastructure safety and protection	UNDP; UN-HABITAT; DIPECHO, Others, GFDRR	Development of building guidelines (UNDP/UN Habitat); Development of National policy on building codes – Increasing safety of health centers and schools in vulnerable areas (DIPECHO). GFDRR: to support the development and adoption of earthquake-resistant houses construction techniques and standards.
Infrastructure development for disaster risk reduction	World Bank, DIPECHO, Others, GFDRR	Irrigation development and construction of rain water harvesting structures (DIPECHO); Land irrigation and crops diversification (Presidential Green Belt Initiative) – Water resources development projects (WB). GFDRR: mainstreaming of DRR into the Bank investment operations
Agriculture, livestock and fisheries adaptation	DIPECHO; USAID/CARE; AFDB/GEF/LDCF; MoH, GFDRR	Seed silos in flood prone areas - use of improved seed varieties for community recovery – promotion of appropriate livestock for flood prone areas (DIPECHO); Drought mitigation through irrigation promotion and conservation agriculture extension (USAID/CARE); Climate adaptation for rural livelihoods and agriculture (AFDB/GEF/LDCF). GFDRR: to support the mainstreaming of DRR into the WB operations in the agricultural sectors projects.
Specific hazard protection	DIPECHO, Others, GFDRR	Development of evacuation points and construction of foot bridges, dykes, and gabion walls (DIPECHO). GFDRR: support through WB investment operations.
Integrated disaster risk management	GFDRR, others	Completed studies: "Analysis of Lower Shire Floods" and "A floods risk reduction and recovery program proposal for the Lower Shire Valley" & "Economic Vulnerability and Disaster Risk Assessment study in Malawi" (GFDRR). GFDRR: to support a preparation of an Integrated Disaster Risk Management Action Plan in the Shire Basin.
Risk Financing and Transfer	NORAD; DFID; IRISH AID; Others; GFDRR	Partly covered: Support to the Government for budgetary allocation to disaster risk reduction (DIFD - IRISH AID - NORWEGIAN AID); Support for the implementation of innovative weather risk financing and transfer instruments: "National Drought Insurance" & "Drought Insurance for Subsistence Farmers" (WB). GFDRR: pilots on examine risk transfer mechanisms to flood management; Exploration of the feasibility of a regional risk transfer mechanism for floods, shared with neighboring countries; dissemination and scaling up of the results so far.
HFA Priority 5. Strengthening disaster preparedness for effective response		
Disaster Preparedness	UNDP; WFP; UNICEF; FAO; DIPECHO; GFDRR, MoH	DoDMA's capacity strengthening at central & district levels (coordination, material, logistic, technical); Strengthening of the Joint Emergency Food Assistance Programme consortium performance; Development / strengthening of Emergency Operation Centers (EOCs) for districts; Strengthening of Contingency planning at district level; Early recovery framework dissemination; Stock piling of highly required relief items; Development & advocacy for community preparedness activities package; Development of community disaster preparedness and management plans; Provision of rescue & first aid kits/training to Civil Protection Committees.
Post-disaster Needs Assessment and responses	GFDRR, others	No initiatives reported to enhance post disaster needs assessment and responses quality. GFDRR: to strengthen the national capacity in post-disaster needs assessment and response.

The program areas identified for GFDRR financing and indicative funding are listed below for duration of five years (2010-2014). Preparation of the Integrated Disaster Risk Management Action Plan for the Shire basin is indicated by the Government as an immediate priority for GFDRR support (3A in the table below):

Indicative New Program Areas and Projects for GFDRR Funding	Potential Partnerships	Indicative Budget for GFDRR Funding and years covered (US\$)	Potential outcomes and comments
1. Policy, Strategy and Capacity Building			
1.A. Strategy, Policy and Institutional Coordination	DoDMA; UNDP; DFID; MDPC	350,000 (2011-2013)	Possible limited support to the development of sectoral DRM strategies; coordination under DoDMA of the DRM – related databases and their linkages UNDP to be in lead for DRM policy development
1.B. Linking DRM with Adaptation to Climate Change	DoDMA; UNDP; DFID; MDPC	350,000 (2010-2012)	Support to the Government in further analysis of the climate risks related to climate variability and change and adaptation strategies, in coordination with Government's CC Framework
2. Risk identification, Assessment and Monitoring – Early Warning System			
2.A. Detailed Risk assessment and participatory risk mapping for selected areas	DoDMA; MoE, MoA, MoWR	750,000 (2010-2014)	Support detailed risk assessment and participatory mapping in selected areas (possibly, linking to the WB Shire basin project); technical assistance on climate change risk assessment and mapping
2.B. Strengthening of Malawi HydroMet capacity	DoDMA; Malawi Met Service, Ministry of Water Resources;	1,000,000 (2010-2014)	Migration to the automatic weather systems; improvement of communication systems; improvement of forecasting (in terms of higher resolution data); training / capacity enhancement; establishment of regional (area specific) Met Centres; Establishment of Integrated Met-Hydro-DRM system.
2.C. Establishment of EWS for floods	DoDMA; DoWR – DoGS – DoCCMS - MVAC	550,000 (2012-2014)	Technical assistance to the Government in strengthening the Flood EWS
3. Reduction of underlying risks			
3.A. Development and implementation of an Integrated floods and drought disaster risk reduction program for the Lower Shire Valley (LSV)	DoDMA; World Bank /GFDRR	1,000,000 (2010-2012)	GFDRR to support preparation of the Integrated Disaster Risk Management Action Plan for the Shire basin;
3.C. Strengthening of DRM financing and risk transfer Mechanisms	DoDMA; Ministry of Finance, Ministry of Agriculture; UNDP, DFID	600,000 (2010-2014)	UNDP and DFID to continue supporting the establishment of an adequate budgeting system for DRM and contingency funds GFDRR / WB to further assess feasibility of different risk transfer mechanisms at the national scale and regionally (for example, regional catastrophe insurance mechanism for the Southern African countries sharing the same risk of floods / droughts)
4. Strengthening disaster preparedness for effective response			
4.B. Specialized training	DoDMA; UNDP; Relevant Line Ministries	350,000 (2011-2012)	UNDP to fund most activities under the Hyogo Priority 5 GFDRR to support Damage, Losses and Needs Assessment training (following UN/ECLAC Methodology) and possibly other specialized trainings)
TOTAL:		4,950,000 (2010-2014)	

6. BIBLIOGRAPHY

- Charles Mpaka, 2010. *Malawi: Green Belt Initiative Taking Shape* - IPS website.
- CORDAID, 2009. *Climate adaptation and Disaster Risk Reduction in practice: Malawi and Zambia* – CORDAID Flyer.
- CRID, 2008. *Case studies II: National-level drought risk management in Malawi* – CRID website
- DoDMA, 2009. *Malawi: National progress report on the implementation of the Hyogo Framework for Action for the period (2007-2009)*.
- DoDMA, 2010. *Update report on Karonga earthquake 25th January 2010*.
- DoDMA-UNDP, 2009. *Operational Guidelines for Disaster Risk Management* – Draft.
- DoDMA-Ministry of Finance-UNDP-Charlotte Benson and Ronald Mangani, 2008. *Economic and Financial Decision Making in Disaster Risk Reduction: Phase I - Malawi Case study* – Draft report.
- Farming First website, 2009. *Drought insurance programme reduces risks for Malawi Smallholder farmers*.
- Government of Malawi, 1991. *The Disaster Preparedness and Relief Act, 1991* – Act N°27 of 1991.
- Government of Malawi, 2006. *Malawi Growth and Development Strategy: From Poverty to Prosperity (2006-2011)*.
- Government of Malawi, 2009. *Malawi National Contingency Plan (2009-2010)*.
- Government of Malawi, 2009. *National Disaster Risk Reduction Framework 2010-2015* – First Draft.
- <http://www.seismo.ethz.ch>, 1998. *The Global Seismic Hazard Assessment Program (GSHAP) – Closing report to the IDNDR/STC (1998)*.
- IRIN Africa, 2010. *Malawi: Green belts to boost food production* - IRIN Africa website.
- Joanna Syroka and Antonio Nucifora, 2010. *National Drought Insurance for Malawi* - The World Bank Africa Region Southern Africa Poverty Reduction and Economic Management Unit - World Bank Policy Research Working Paper 5169.
- M.Alexander R. Phiri and Patrick S. Kambewa, 2009. *The Malawi Vulnerability Assessment Committee: MVAC Operational Guidelines* – Final Draft Report.
- Ministry of Education, 2005. *Initial primary teacher education teaching syllabus « Science and technology » and «Agriculture»*.
- Ministry of Lands and Natural Resources, Environmental Affairs Department, 2009. *The Second National Communication of the Republic of Malawi*.
- Ministry of Mines, Natural Resources and Environment-Environment Affaires Department-GEF-UNDP-UNFCCC, 2006. *Malawi's National Adaptation Programmes of Action (NAPA)*.
- MVAC, 2009. *Malawi Vulnerability Assessment Committee Strategic Plan 2010-2015*.
- National Hazards Center, 2009. *Focus on drought and Climate Change* – National Hazards Observer Volume XXXIII-Number 5.
- Rachele Pierro and Bina Desai, Christian Aid, 2008 – *The potential role of Disaster Insurance for disaster risk reduction and climate change adaptation*.
- SERVIR Africa website, 2008. *Regional Center for Mapping of Resources for Development (RCMRD) strengthens Malawi government capacity in flood forecasting and management*.
- UN System Malawi, 2007. *United Nations Development Assistance Framework in Malawi: UNDAF 2008-2011*
- World Bank, 2007. *Malawi: 4th Country Assistance Strategy 2007-2010*.

UN System Malawi, 2009. *One Plan Malawi (2009-2011)*.

World Bank, 2007. *The World Bank in Malawi "Helping to Build the Foundations of Prosperity – World Bank flyer*.

USGS/OFDA, 2010. *USGS/OFDA Earthquake Disaster Assistance Team (EDAT)'s report on the Post-Earthquake Site Visit to Karonga, Malawi – Memo*.

World Bank-GFDRR-DoDMA, 2008. *Analysis of Lower Shire Floods and a Flood risk reduction and recovery programme proposal for the Lower Shire Valley*.

World Bank-GFDRR- E. Rowena Hay and M. Alexander, 2008. *Malawi: Situation Analysis of Disaster Risk Management Programmes and Practice - Final report*.

World Bank-GFDRR-RMSI, 2010. *Malawi: Economic Vulnerability and Disaster Risk Assessment - Final Report (Volume 1: Main Report)*.

World Bank-GFDRR-RMSI, 2010. *Malawi: Economic Vulnerability and Disaster Risk Assessment: Drought and Flood Risk Atlas*.

ANNEX 1**Composition of Technical Sub Committees**

<p>AGRICULTURE AND FOOD SECURITY</p> <ul style="list-style-type: none"> • Ministry of Agriculture and Food Security – Chair • National Food Reserve Agency – Vice Chair • Department of Environmental Affairs • Department of Forestry • Department of Surveys • FAO • WFP • Ministry of Irrigation and Water Development • Department of Climate Change and Meteorological Services • ADMARC • National Food Reserve Agency • Representative of Civil Society Organization – CISANET • University Representative – Bunda • Grain Traders Association of Malawi • Department of Disaster Management Affairs 	<p>HEALTH AND NUTRITION</p> <ul style="list-style-type: none"> • Ministry of Health – Chair • Department of Nutrition and HIV and AIDS – Vice Chair • Malawi Red Cross Society • Ministry of Education, Science and Technology • Ministry of Information and Civic Education • Ministry of Irrigation and Water Development • WFP • Ministry of Irrigation and Water Development • Ministry of Local Government and Rural Development • Representative of Civil Society Organization – Malawi Health Equity Network • University Representative – KCN, Bunda, CoM • WFP • UNICEF • WHO • UNAIDS • UNFPA • Department of Disaster Management Affairs
<p>WATER AND SANITATION</p> <ul style="list-style-type: none"> • Ministry of Irrigation and Water Development– Chair • Ministry of Education, Science and Technology – Vice Chair • Department of Forestry • Department of Surveys • Ministry of Lands, Housing and Urban Development • Ministry of Health • Ministry of Local Government and Rural Development • Ministry of Irrigation and Water Development • Department of Climate Change and Meteorological Services • Malawi Defense Force • Malawi Red Cross Society • Representative of Civil Society Organizations – OXFAM, AFRICARE, Water Aid • University Representative – Chancellor College, The Polytechnic, KCN, CoM • UNICEF • WHO • Department of Disaster Management Affairs 	<p>TRANSPORT AND LOGISTICS</p> <ul style="list-style-type: none"> • Ministry of Transportation and Public Infrastructure – Chair • Office of the President and Cabinet – Vice Chair • National Roads Authority • Roads Traffic Directorate • Malawi Confederation of Chambers of Commerce and Industry • Malawi Defense Force • Malawi Police Service • Malawi Red Cross Society • Ministry of Information and Civic Education • Ministry of Local Government and Rural Development • Ministry of Gender, Children and Community Development • Local Transporters Association of Malawi • WFP • Department of Civil Aviation • Department of Immigration • Ministry of Foreign Affairs • Ministry of Finance • Department of Disaster Management Affairs

<p>ASSESSMENT</p> <ul style="list-style-type: none"> • Department of Disaster Management Affairs – Chair • Office of the President and Cabinet – Vice Chair • Ministry of Agriculture and Food Security • Ministry of Transport and Public Infrastructure • Ministry of Health • Ministry of Local Government and Rural Development • Ministry of Irrigation and Water Development • Ministry of Education, Science and Technology • Ministry of Gender, Children and Community Development • Ministry of Development Planning and Cooperation • Geological Survey Department • Department of Surveys • Malawi Defense Force • Malawi Police Service • UNDP • WFP • FAO • FEWSNET • Representative of Civil Society Organizations • Malawi Red Cross Society • University Representative – Chancellor College, Bunda • National Statistical Office 	<p>EARLY WARNING</p> <ul style="list-style-type: none"> • Department of Climate Change and Meteorological Services – Chair • Ministry of Irrigation and Water Development – Vice Chair • Ministry of Agriculture and Food Security • Ministry of Development Planning and Cooperation • Department of Environmental Affairs • Department of Surveys • Geological Survey Department • Malawi Defense Force • Malawi Police Service • Ministry of Information and Civic Education • Representative of Civil Society Organizations – CISANET • University Representative – Bunda • FEWSNET • Department of Disaster Management Affairs
<p>SHELTER AND CAMP MANAGEMENT</p> <ul style="list-style-type: none"> • Ministry of Lands, Housing and Urban Development – Chair • Malawi Red Cross Society– Vice Chair • Department of Forestry • Malawi Defense Force • Malawi Police Service • Ministry of Education, Science and Technology • Ministry of Irrigation and Water Development • Ministry of Local Government and Rural Development • Ministry of Gender, Children and Community Development • Ministry of Transport and Public Infrastructure • Ministry of Persons with Disabilities and the Elderly 	<ul style="list-style-type: none"> • Malawi Police Service • Fire Brigades (Blantyre, Lilongwe, Mzuzu and Zomba) • World Vision International • Representative of Civil Society Organizations – CCODE • WFP • UNDP • UNICEF • WHO • UNHabitat • Habitat for Humanity • Malawi Human Rights Commission • UNHCR • Department of Disaster Management Affairs

ANNEX 2**The five (5) strategic goals stated by the National Disaster Risk Reduction Framework (DRRF) for 2010-2015**

- (i) DRR is mainstreamed into policy, strategy, program and annual planning and their implementation at all levels.
- (ii) An effective system is in place to identify, monitor and assess risk (national and cross-boundary).
- (iii) An effective and national early warning system is strengthened.
- (iv) Underlying risk factors of community and household are systematically identified and addressed.
- (v) Disaster preparedness capacity is strengthened for effective response at all levels.

ANNEX 3**The five (5) priority activities of the Malawi's National Adaptation Programmes of Action (NAPA)**

- (i) Improving community resilience to climate change through the development of sustainable rural livelihoods.
- (ii) Restoring forests in the Upper, Middle and Lower Shire Valleys catchments to reduce siltation and the associated water flow problems.
- (iii) Improving agricultural production under erratic rains and changing climatic conditions.
- (iv) Improving Malawi's preparedness to cope with droughts and floods.
- (v) Improving climate monitoring to enhance Malawi's early warning capability and decision making and sustainable utilization of Lake Malawi and lakeshore areas resources.

ANNEX 4**Key Department of Geological Survey or DoGS' capacity strengthening needs identified following the last 2009 Karonga earthquake**

- (i) Equipping Malawi with its own seismological equipment.
- (ii) DoGS' technical capacity strengthening through the establishment of a position of Principal Seismologist responsible for seismic network operations and the interpretation of seismic data.
- (iii) Implementation of a long-term capacity building program for DoGS professionals in network operations, seismic hazard assessment, geological effects of earthquakes, and remote sensing, and for DoGS technicians in seismic network maintenance and repair, to maintain and repair existing stations in Malawi.

ANNEX 5

Other ongoing projects which can be relevant to disaster risk reduction

Major Ongoing Projects and Organizations	Indicative budget, years	HFA activity area(s)
World Bank Projects		
MAP or Multi-Sectoral AIDS Project Additional Financing	\$30 million - (2009- N/A active)	1, 3, 4, 5
Infrastructures Services	\$41.3 million - (2006-2011)	1, 3, 4, 5
Education Sector Support Project 1	\$32.2 million - (2005-2010)	1, 3, 4
Selected donor projects		
TROCAIRE /CADECOM: Integrated Food Security Programme	\$293,946 - (2007-2010)	3, 4
USAID: Malawi Horticulture Network	\$2.0 million - (2008-2011)	3, 4
Global Environment Facility (GEF), the Danish International Development Agency (DANIDA) and the Southern African Development Community (SADC): National Sustainable and Renewable Energy Programme (NSREP)	n/a - active (n/a)	3, 4
GTZ/EU: SADC Regional Programme on Biomass Energy Conservation (ProBEC)	n/a - active (n/a)	3, 4
IFRC/Danish Red Cross/Irish Red Cross/Netherlands Red Cross: Health and Care programme	\$611,952 - (2009-2010)	3, 4, 5
IFRC/Danish Red Cross/Irish Red Cross/Netherlands Red Cross: Organizational Development/Capacity Building programme	\$92,045 - (2009-2010)	1, 3
USAID-OFDA/CRS: Rehabilitation through Irrigation and Production Extension II (RIPE II) project	\$400,000 (to date) - active	5
Canada CIDA: Canada Fund Local Initiatives Malawi - CFLI - FCIL Malawi 2008-2009	\$128,336 - (2008-2013)	4
Canada IDRC: Community Based Adaptation in Africa (CBAA)	\$40,577 - (2008-2011)	3, 4, 5
Canada IDRC: Legume diversification in smallholder tobacco systems in Malawi: Climate risk management and market opportunities	\$295,731 - (2008-2010)	3,4
Canada CIDA: Malawi Floods WFP PRRO 10586.0	\$464,986 - (2008-2010)	5
Canada IDRC: Strengthening local agricultural innovation systems	\$173,229 - (2007-2011)	3, 4
Canada IDRC: Soils, Food and healthy Communities in Malawi (Phase II)	\$381,851 - (N/A: active)	3, 4
World Meteorological Organization (WMO): Managing Risks Related to Weather/ Climate Extremes in Southern Africa (Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe)	Euro 2.3 million - (n/a: 48 months – active)	1, 2

MALI

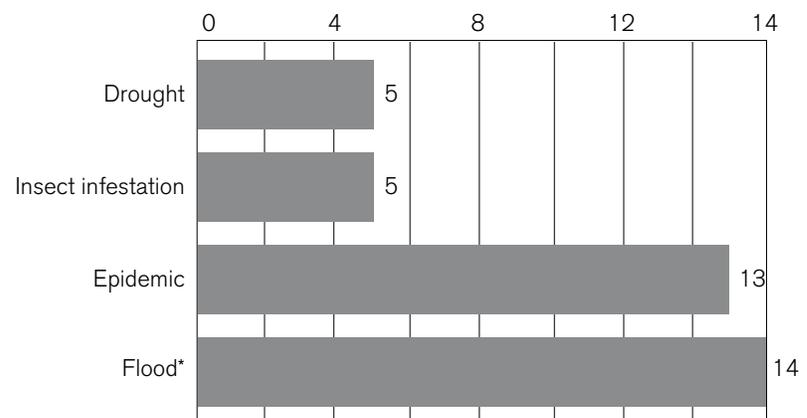
Mali is one of the priority countries for the World Bank Disaster Risk Management (DRM) Team for year 2009-2011. The Mali DRM Country Note is a document which will serve as a framework for investments in DRM activities in Mali, which are expected to be about \$5 million over a three-five year period. It identifies key gaps in the existing DRM situation and interventions, according to the five priorities of actions of the Hyogo Framework of Action (HFA)¹, and proposes an indicative action plan for possible GFDRR financing. It includes the overview of major risks, the overview of existing institutions, policies and investments that will provide the basis for identification of priorities, challenges, and gaps in DRM and recommendations for an indicative action plan proposed for GFDRR investments. This Country Note has been developed through a participatory process led by the Directorate General of Civil Protection (DGPC) which is the official institution in charge of DRM coordination, and involving main governmental and nongovernmental stakeholders in Mali.



1. DISASTER RISK PROFILE

Vast Sahelian country representing 1/24th of the total area of Africa (1 241 238 sq km), with a population of 12.3 millions (in 2007)², Mali is exposed to multiple natural hazards, but is particularly vulnerable to drought, locust invasion and floods³ (figure 1). Its vulnerability is mainly linked to its position at the heart of West Africa surrounded by seven countries, and its Sahelian climate, dry tropical, with high variability alternating drought and intense rainfall. It is also linked, during the rainy season, to the flooding of the two great rivers Niger and Senegal and their tributaries, which form a major river system, included in large watersheds that Mali shares with twelve countries. There are considerable potential groundwater resources but difficult to access because of a very irregular spatial distribution and the water table depth.

Figure 1. Natural Disaster Occurrence Reported from 1980 to 2007



Source of data: OFDA/CRED International Disaster Database - Data version: v11.08

*: Including tsunami - Data displayed does not imply national endorsement.

1 The five Hyogo Framework of Action (HFA) priority action areas are: 1) Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2) Identify, assess, and monitor disaster risks – and enhance early warning; 3) Use knowledge, innovation, and education to build a culture of safety and resilience at all levels; 4) Reduce the underlying risk factors; 5) strengthen disaster preparedness for effective response at all levels.

2 World Bank Data and Statistics on Mali: <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/MALIEXTN/0>

3 Source: *Plan d'Action National d'Adaptation aux Changements Climatiques – Juillet 2007.*

This physical vulnerability is accentuated by socio-economic and environmental factors, mainly: the dependence of a rain fed agriculture, key sector of the Malian economy, to a capricious rainfall⁴; A high poverty rate with an income per capita estimated at U.S. \$ 380 (in 2007) and a low UNDP's Human Development Index, ranking Mali at 175 among 177 countries (in 2006)⁵; People settlement in flood plains formed by river basins and beds, indicating a failure in land use planning and zoning⁶; And finally, environment destruction and soil deterioration⁷.

In 27 years (1980-2007), natural disasters, including drought, floods and epidemics, affected nearly 3 million people and killed about 3,300 people in Mali⁸. In 2003, floods caused about 20 deaths, destroyed 6052 dwellings, flooded 12 000 ha cultivation fields, and destroyed roads and bridges⁹. While in 2003, floods affected nearly 10 000 people, in 2007 they affected about 88 000 people¹⁰. The main flood prone areas are located in the Delta Interior of Niger (64 000 sq km) which is particular ecosystem because of the hydrographic profile. In addition, to the capital Bamako, the regions of Tombouctou, Gao, Mopti, Segou, Kayes, Koulikoro and Sikasso are among the most exposed¹¹. In 2004, some regions were heavily affected by locust invasion, including Koulikoro, Segou, Tombouctou and Mopti regions. The damages were varying among the affected areas, but millet, sorghum and cowpea were the most affected with respectively 37 000, 9 000 and 3 000 tones of losses¹². This 2004 locust invasion severely affected Mali economic growth which was 2% instead of forecasted 5%¹³.

The most important drought episodes in 1980 and 2005 affected respectively 1.5 million and 1 million people with important economic consequences (figure 2).

Two thirds of the territory of Mali consists of arid and semi-arid areas in the North, experiencing a persistent drought since 1970¹⁴. Mali is characterized by an important spatial variability of temperature and rainfall. In normal time, the temperature rises from the South-West to North-East with a maximum recorded during the year about 45°C, while the minimum is rarely below 10°C. Rainfall is decreasing from the South to the North from over 1000 mm per year, in the Sudano-Guinean Southern area, to less than 200 mm per year in the Saharan northern area. Furthermore, there is high rainfall inter annual variability resulting in recurrent dry years becoming increasingly frequent since 1968¹⁵. In 27 years (1980-2007), the country experienced five major drought episodes. The persistent drought resulted in a significant population migration from the North to the South, but also in the practice of rain fed agriculture in the lowlands and the flood prone valleys of the rivers and creeks, especially for rice growing¹⁶.

Disaster	Date	Affected (no. of people)
Drought	1980	1,500,000
Drought	2005	1,000,000
Drought	1991	302,000
Flood	2007	47,255
Flood	2007	41,603

Source of data: OFDA/CRED International Disaster Database
Data version: v11.08 *: Including tsunami
Data displayed does not imply national endorsement.

4 It is to be noticed that agriculture contributes to 50% of GNP, to 40% of GDP and is practiced by 70% of people living in rural areas - Source : "Appui de la Banque Mondiale aux efforts de Développement du Mali" - Ministère de l'Economie et des Finances et Bureau de la Banque Mondiale.

5 CAS World Bank: 2007-2011.

6 NAPA

7 NAPA

8 OFDA/CRED International Disaster Database - Data version: v11.08,

9 *Renforcer la résilience des systèmes énergétiques et des écosystèmes en Mali* - Observatoire de la viabilité énergétique 2007 - Cheick Ahmed SANOGO.

10 OFDA/CRED International Disaster Database - Data version: v11.08

11 IFRC Information Bulletin September 2003 and Maliweb.net July 2007 « Suite aux inondations au Mali : L'USAID offre 23 millions de FCFA au gouvernement (source : Service d'information de l'Ambassade des Etats Unis au Mali) ».

12 Source « Leçons d'une crise alimentaire annoncée au Mali - Pierre Janin, UMR 201 « Développement et Sociétés » - UD1/IRD -Sénégal.

13 C.A. DIA - « l'Essor n°16413 - 2009-03-31 ».

14 National Programme of Action for Adaptation to the adverse effects of Climate Change (NAPA)

15 NAPA

16 NAPA

Mali suffered from regular locust invasions, the worst and most recent was in 2004.

Mali is a country of both locust invasion and locust development. If the invasion covers the whole country, locust development is located in specific areas (outbreak areas)¹⁷ which are mainly: the Adrar Iforas (Kidal region), Timetrine (border with Algeria), the Tamesna (border with Niger), North East Tombouctou and the Tilemsi Valley¹⁸. They are the ordinary locust regeneration and living spaces¹⁹. The important 2004 locust invasion, affected negatively agricultural production which was less 30.2% than the forecasts. Finally, it caused an increased country budgetary expenditure²⁰ of 7 billion CFA francs²¹.

Mali experienced fifteen floods events in 27 years (1980-2007), affecting usually between 10 000 and more than 45 000 people for each event²² (figure 2).

Occurring in both rural and urban areas, flooding is usually due to rivers and waterways overflowing and swelling combined or not with a drainage system failure. They occurred generally following a high rainfall and are usually linked to a failure of land use planning and control, leading to an uncontrolled occupation of flood prone lowland, rivers beds and floodplains²³. The environmental and soil degradation, with silting and erosion following deforestation and bush fires, are major underlying risk factors. Important arable soil loss has been reported: about 6.5 tons / ha / year, ranging from 1 tone in the North, to over 10 tones in the South²⁴.

Like the other Sahelian countries, Mali was facing for many years climate variability, even in normal time, and this will be continuing in the future. It consisted in alternating dry and wet periods, characterized respectively by a low rainfall compared to the normal and a relatively abundant rainfall.

Mali is also undergoing Climate Change phenomenon for several decades²⁵. In fact, a downward trend of annual rainfall average was observed over the period from 1921 to 1980s. The rainfall average was about 700 mm per year between 1921 and 1941, and 400 mm per year in 1980. In addition, analysis of abnormalities of reduced temperature, calculated on the basis of maximum and minimum temperatures data in 13 stations, from 1961 to 2004, showed a decreasing trend of maximum and minimum temperatures from 1961 to 1986 and an increasing trend of maximum and minimum temperatures from 1986 to 2004. According to climate scenarios developed for Mali, a temperature rise of over 2 °C throughout the country for the 2005-2100 periods would be expected. The persistent drought in 1970 has resulted in fairly significant rainfall deficits and a continuous shift of the isohyets to the South. The average flow of the Niger River which reached 1300 m³ in 1978 was only 895 m³ in 2002. Water resources and agriculture are among the most vulnerable sectors to climate change, with a projected overall yields decline between 2005 and 2025 (maize, rice, cotton, millet / sorghum). Mali has been and will be exposed, continuously, to an uncertain and inadequate rainfall, but at the same time to successive floods, which frequency seems to steadily increase.

¹⁷ *Aires grégarigènes*

¹⁸ CNLCP

¹⁹ *Actu Criquet* Ministry of Agriculture Web site.

²⁰ C.A. DIA – *l'Essor* n°16413 - 2009-03-31.

²¹ About USD 16,279,070 (for 1 USD = 430 FCFA)

²² OFDA/CRED International Disaster Database - Data version: v11.08

²³ NAPA

²⁴ NAPA – source: Bishop and Allen, 1989

²⁵ The source of all the following data related to climate change used in this section is NAPA.

2. ACTIVITIES UNDER HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Policy, Institutional Capacity and Consensus Building

Created in 1998, the Directorate General of Civil Protection (DGPC) is the coordinator body for disaster and risk prevention and management interventions²⁶. Attached to the Ministry of Interior Security and Civil Protection, the DGPC's primary mission is to develop elements of the National Civil Protection Policy and to ensure its implementation. As such, the DGPC is mainly in charge of: Organizing and coordinating prevention, forecasting and relief interventions - Developing and implementing disaster management plans – Managing logistics means related to the implementation of these missions – Coordinating and monitoring relief interventions of departments responsible of the execution of the civil protection national Policy – Undertaking rehabilitation operations following disasters. The DGPC acts as the Permanent Secretariat of the Permanent National Commission for Prevention and Fight against Disasters and for Relief Organization.

Sectoral specialized institutions are mandated to manage risk according to their nature. Focal points managing specific risks include the National Center for the Fight against Locust (CNLCP)²⁷, the Institute of Sahel²⁸, and the Permanent Technical Secretariat of the Institutional Framework for the Management of Environmental Issues (STP/CIGQE)²⁹ as the focal point for desertification, and the DGPC is the focal point for floods. Specialized structures address food security issues mainly the Food Security Commissariat (CSA)³⁰.

A project of law, currently under review before its submission to the National Assembly, stipulates the establishment of the Permanent National Commission for Prevention and Fight against Disasters and for Relief Organization. Attached to and chaired by the Ministry of Interior Security and Civil Protection, the Commission³¹ will be responsible for developing the national plan for disaster prevention, for relief organization, and for its implementation. It will be composed of representatives from the Prime Minister Office and all Ministries involved in disaster and risk management but also any person or institution invited by the Commission's president, whose experience, competencies and resources are deemed necessary. At decentralized level, regional (region), local (cercle) and communal (commune) Commissions will be established.

These Commissions would also serve as meeting and exchange forums for stakeholders at various levels, called **"Platforms for disaster prevention and management"**. They promote sustainable development through interventions that promote resilience to disaster³². **A national platform and regional platforms for disaster prevention and management in Mali (temporary yet), have been developed** following process undertaken since 2005. The DGPC with PRECARICA project support³³ is currently underway to strengthen management and coordination capacity of institutions' representatives composing the Platforms.

The development of national, regional and local Plans for on the Prevention of Disasters and the Relief Organization are scheduled according to the project of law currently under review. The DGPC, with the support of

26 Ordonnance N°98-026/P-RM of 25 August 1998, ratified by the law N°98-057 of 17 December 1998, modified by the law N°06-004 of 06 January 2006.

27 Centre National de Lutte contre le Criquet Pèlerin

28 Institut du Sahel

29 Secrétariat Technique Permanent du Cadre Institutionnel de la Gestion des Questions Environnementales

30 Commissariat à la Sécurité Alimentaire (CSA)

31 The DGPC acts as its Permanent Secretariat.

32 DGPC and PRECARICA Prodoc.

33 Co Financed by the Government –UNDP- DANIDA and GEF: National Capacity Strengthening in view of Disaster Risk Reduction or *Projet de Renforcement des Capacités Nationales en vue de Réduire les Risques de Catastrophes*.

its support project PRECARICA, started and are pursuing the process of developing these plans. The National Action

Plan will enable an overview of the coordination activities and of the monitoring and evaluation of the country disaster risk reduction status and finally will define the strategy for integrating disaster risk reduction into both adaptation to climate change strategies and development programs and projects³⁴.

The National Programme of Action for Adaptation to the adverse effects of Climate Change (NAPA) was finalized and approved in July 2007, under the guidance of the National Directorate of Meteorology (DNM), attached to the Ministry of Equipment and Transport. Its development was conducted within a group of experts according to a participatory process. The Program identifies nineteen priority adaptation options presented through project sheets (see list in Annex 1).

In 2009, the project proposal submitted by Mali to the UNFCCC has been selected for a funding of \$ 5 million, for an implementation period of 5 years, expected to start in 2010. Under the direction of the DNM, the country is currently formulating the related project document. This project will be directed towards strengthening the capacity and resilience of the Food Security in Mali against climate change. It is intended to implement a package of priority actions provided in several projects sheets of the NAPA, particularly those of the project sheets 1, 2, 4, 5, 7 and 8. The document project formulation is expected to be finished in October 2009, which will be followed by submission to UNFCCC's Board. The project implementation is expected to start in 2010. Several partners have been also invited to take part in the financing of priority actions of the NAPA. It is to be noted that, although the NAPA as such, has not been officially implemented earlier in 2007, many climate change adaptation undertaken with Mali's technical and financial partners support, cover and contribute to the achievement of most of the priority actions identified in the NAPA³⁵.

Since funding of NAPA through UNFCCC is secured and implementation is starting in 2010, it would be a good starting point to strengthen links between disaster risk management (DRM) and adaptation to climate change (CCA) agenda, as they are currently still treated as separate part and agenda. In fact, all NAPA priority actions already aim and contribute to reduction of climate-induced disasters risk in Mali, mostly the promotion of: the resilience of key sectors of agriculture and livestock; fighting against the underlying risks factors such as deforestation, land degradation; supporting community vulnerability reduction and preparedness; promoting the use of information and knowledge for better disaster preparedness.

Despite the strong DGPC and sectoral actors' commitment and the significant progress made by the country, major challenges remain to address. Several efforts have been initiated to institutionalize disaster risk reduction and management but need to be strengthened.

The DGPC's current profile would be a limiting factor for the effective implementation of its mandate of coordination, advocacy and facilitation of interventions and sectoral actors involved in Disaster and Risk Management (DRM). In fact, its organization and human resources current profile seem primarily oriented towards the implementation of prevention and relief operations on the ground. But despite DGPC current efforts, they need strong support to lead and implement more conceptual, multisectoral and systemic vision and approach, for a medium and long terms risk and disaster reduction. Better adaptation and optimization of its capacities to better meet the multisectoral nature and scope of its missions need to be ensured. This will further strengthen DGPC's authority and full recognition, among the various stakeholders.

³⁴ PRECARICA Prodoc.

³⁵ See: Part 4 of this document "Key donors engagements".

A better clarification and formalization of the stakeholders' responsibilities will further optimize coordination effectiveness. Concrete legislative measures, including the establishment of an appropriate legal framework for disaster management by the adoption of the project of law submitted by the DGPC, will ensure effective commitment and coordination of stakeholders. It will also ensure the implementation of a National Disaster Risk Reduction and Management Plan and the national and regional Relief Organization Plans (ORSEC Plans). The systematic implementation of the national initiative to develop institutional frameworks and the improvement and strengthening of the national platform will be success factors.

The establishment of a comprehensive disaster risk management vision for Mali, commonly adopted as a Global National Strategy, will provide a reference frame and guide for of all stakeholders' interventions and will facilitate DGPC's coordination and facilitating roles. It is to be noted that the implementation of capacity building efforts by the DGPC is only at its beginning.

The Mali adheres to the implementation of decentralized disaster risk management interventions and in this sense, DGPC and its decentralized structures are particularly active. But local level risk management and decentralized authorities' capacities will need to be strengthened. Efforts are made by DGPC, to promote authorities responsibility implementation and involvement at decentralized levels: including Governors, of Cercles Commanders and Mayors, within the disaster risk management and reduction system. This seeks to ensure that the DRR/DRM system now revolves less around the DGPC and its decentralized structures, and functions also less from Bamako (central level). But to ensure successfully this desired effective decentralization of DRM, resources and skills adequacy to efficiently carry out those decentralized authorities' responsibilities and optimization of the partnership with the community would be critical priorities.

HFA Priority # 2: Disaster Risk Assessment, Monitoring and Early warning

From 2004 until now, DGPC undertakes a participatory identification of risks in all Communes of Mali in view of realizing a risk mapping and establishing an organized and dynamic database. This exercise allowed to localize the various existing risks from the ground, and to engage the local level in the planning of future risk reduction actions. The results of this risk identification were collected through the Risk Identification Form/Sheet (FICAR)³⁶ and validated. Their use will be complemented by specialized databases and satellite images use³⁷.

Technical risks assessment and monitoring are undertaken by specialized agencies but are frequently limited to hazards assessment and monitoring, especially for flooding.

The National Center for the Fight against Locust (CNLCP) evaluates and continuously monitors the locust invasion risks. Using modern facilities, radar and advanced transmission techniques combined with field monitoring by agents in the fields base and support points, with support from population through standby locust brigade, the CNLCP carries out real-time and permanent monitoring of the locust threat. From a technical view, locust risk assessment and monitoring are well secured. The limiting factor is the fact that it is not possible, for now, to physically cover the entire country. In fact, ground displacement of monitoring teams in certain locust outbreak areas in the northern part of the country, is still difficult even impossible, because of major security concern.

The National Meteorology Directorate continuously evaluates and monitors rainfall and temperatures and makes forecasts, especially for locust invasion, drought and floods prone areas. But the lack of observation stations that

³⁶ Fiche d'Identification des Risques

³⁷ PRECARICA Prodoc.

do not exist in all cercles as required, could affect the forecasts quality and accuracy. Improvement in some characteristics of the used radars could also improve the institution's performance.

The National Hydraulics Directorate assesses and monitors the levels of rivers and major waterways, through observatories. But even if this monitoring is continuously undertaken, it provides information only two times a day, in the morning and evening. Setting up a multifunctional platform for data collection would improve this continuous monitoring by enabling information availability at more frequent intervals, even hourly.

The National Hydraulics Directorate carries out also, behavior modeling of the major rivers and waterways and mapping, based on these behaviors assessment and monitoring. However, a spatial vulnerability analysis of exposed elements (geo-referenced), combined with a potential socio-economic impact analysis would provide a complete flood risks assessment and mapping.

It is to be noted that through regular meetings, those specialized agencies coordinate, and do not present functions overlapping. **But coordination mechanism should be more formalized and improved to strengthen quality of risk monitoring and mapping.**

It could be said that with regard to Early Warning System, **Mali has a good experience in terms of risk assessment, detection, monitoring and prediction of the two hazards that are the locusts and drought. But a number of needs must be addressed for flooding risk assessment, monitoring and mapping.** The hazard analysis and mapping already done should be supplemented by a vulnerability analysis and mapping of the main assets at risk, including their inventory (geo referenced) and the consideration of their level of vulnerability (exposure level - level of resistance to destruction). It should also include the probability and degree of potential socio-economic damage and losses caused by floods according to the various probable scenarios. Spatial flooding risk analysis and assessment should be extended to other highly exposed areas including the city of Bamako to guide all decisions and future planning. Finally, to ensure the reliability of the mapping generated from the participatory identification data (FICAR); their combination with technical and scientific risks evaluation data is needed. A geographic information system on disaster and risk management (for floods, but would be extended to other hazards later), dynamic, easy to use and regularly updated, with open access, should be established and capitalize the substantial experiences existing in the different sectors. The material capacity of both the National Meteorology Directorate and the National Hydraulics Directorate is to be strengthened by setting up multifunctional platform for data collection and synoptic observation stations in some priority areas. This would optimize the national coverage and enhance the quality of the rainfall, temperature and water level forecasts.

For the three hazards (locust invasion, drought, and flood), alerts communication and dissemination to concerned technical institutions and to the public are ensured at all times. The National Center for the Fight against Locust (CNLCP), regularly disseminates information on the locust situation through newsletters. The CNLCP can, at any time, react and disseminate warnings to technical agencies, authorities or to populations if necessary, for the implementation of response actions in case of emergency. The National Meteorology Directorate ensures the regular transmission of information and warnings through newsletters, TV and radios (daily, weekly, etc) but also the National Hydraulics Directorate about water levels in rivers and waterways. Information on hazards (location, intensity, evolution) and some instructions on measures and attitudes to be adopted, are issued. **The current problem lies in monitoring the effective use by populations, of the transmitted information and alerts.** Field verification missions are carried out but they are usually far too late (a few weeks after release) in order to ensure proper and timely use of information. The lack of feedback about the adequacy of transmitted information content to targeted recipients' needs on the ground is one of the constraints raised by the technical institutions.

The media, particularly local radios, plays also an important role in transmitting information and warning to the population. But sometimes, information and alerts are not adapted to real needs of the population (content and format), and did not provide any options as a reaction to the alert, besides the fact that they are often not translated in local languages. This often encourages people to rely on traditional warning measures and response system to deal efficiently with the situation. However, their effectiveness is rather limited at present, because that younger generation does not know these codes and organizations traditionally in place within their communities. Moreover, their inclusion and integration into official (state) warning system at local level is not yet ensured.

The important efforts undertaken towards the early warning system would need to be strengthened, particularly for rapid onset hazards such as flooding. Coordination of the various existing early warning systems, mainly for messages content, format and transmission monitoring, for the coverage and the effective use by the final recipients, needs to be permanently maintained (monitoring system) through an appropriate mechanism. The system and mechanism for transmission, reception and use of warning at the community level need to be strengthened, through a well defined organization and adequate equipments. Strengthening traditional measures of alert and response at community level would maximize the effectiveness of the early warning system. The existence of a food security early warning system (SAP) is crucial whatever the natural hazards nature, particularly for slow-onset hazards management (e.g. drought, locust invasion). But its place within the mechanism for managing rapid-onset hazards such as flooding, particularly its level involvement and implication in the decision making process to trigger relief operations should be streamlined.

HFA Priority # 3: Knowledge and Capacity Enhancement for Disaster and Risk Management (DRM)

From this year 2009, the DGPC will organize national and regional training seminars on disaster and risk management. They will target high level administrative officials and elected officials at both central and local levels, and finally key stakeholders within the National Platforms for Disaster Prevention and Management. These seminars aim at disseminating DRM knowledge, but also the knowledge by the stakeholders of their respective roles and responsibilities as defined in the laws and regulations. Training booklets will be produced and distributed to participants³⁸.

Training on Civil Protection is organized annually by the DGPC. Open to the public, it is realized with the support from the International Civil Protection Organization (OIPC)³⁹.

Awareness booklets for pupils and teachers have been developed by the DGPC during the Global Campaign for Disaster Prevention 2008-2009. **Despite this relevant initiative, the disaster risk management and reduction, is not yet included in school curricula.** At university level, there is no specific DRM training, but aspects and themes relating to the issue are treated and integrated into courses conducted in the various university departments. The development of such specific university training is not yet currently an expressed country priority or need.

Researches contribute to disaster risk management and reduction in Mali. Generally, a research unit or institution is attached to a line Ministry for supporting the implementation of its mandate and achieving its work program. The Center is also involved in disaster risk reduction actions such as the Institute for Rural Economy (IER)⁴⁰. This is attached to the Ministry of Agriculture and is working on the production, testing and extension seeds adapted to extreme

38 PRECARICA Prodod.

39 Organisation Internationale de la Protection Civile.

40 Institut d'Economie Rurale

events including recurrent drought. But like the institutional “sectoriality” of DRM in Mali, the research also appears generally fragmented and sectoral. It is to be noted that the Ministry of Environment is one of the key ministries which have not yet an attached research center.

Many relevant actions and initiatives such as TV and radio programs, workshops and conferences are implemented by the authorities to raise public awareness. However, awareness of available options in the field of disaster and risk management is generally restricted at the population level. This is partly due to weak communication means and channels used by disaster managers to inform and educate public about potential hazards, the ways to reduce their impacts and to cope with. The media are actively involved in the promotion and awareness within the population through special broadcasts and news bulletins. But in some cases, topics include subjects not of much interest about daily risks experienced. Otherwise, often they are translated in only one to two local languages (among about ten local languages).

Despite these efforts, gaps are to be filled in the dissemination of knowledge and increasing public awareness. In the case of Mali, where resources are limited, community participation in managing and reducing disaster risk is crucial. This requires awareness and adoption of the required adapted way of life. In this regard, **the establishment of a more comprehensive and systematic communication and public awareness raising plan is needed.** The adequacy of the messages content, the used methodology and approach to the targets’ needs and specificities, should be strengthened. **Cooperation with local radio stations and NGOs with experience in this field should be promoted⁴¹.** **The integration of the disaster risk reduction in the primary and secondary education curricula is recommended,** to establish a good foundation for the future, in collaboration with the National Education Center⁴², which shown its enthusiasm. Multisectoral research on disaster and risk reduction, and climate change carried out by multidisciplinary teams and coordinated by the National Center for Scientific and Technological Research (CNRST)⁴³ should be promoted to fill the potential limitations of the sectoral research approach in the domain.

HFA Priority # 4: Disaster Risk Reduction and Financing

Interventions contributing or aiming specifically at reducing underlying natural disaster risk factors are implemented in Mali, particularly in the areas of: environment and natural resource management, soil management and land use planning, energy and food security. **These interventions are performed mainly through the implementation of the National Environment Policy,** which is composed of nine National Action Programs mainly related to: land use planning; natural resources management; water resources management; life environment improvement; development of new and renewable energy resource; environmental information program; environment information, education and communication; monitoring of conventions implementation; and the fight against desertification and environmental protection research.

Disaster risk reduction activities are also conducted through the implementation of the Agricultural Orientation Law (LOA)⁴⁴ which establishes elements of the Agricultural Development Policy in Mali, in particular, through its objectives which are: economic and social promotion of women, men and young people in rural and suburban areas; country sovereignty and food security; reduction of rural poverty; modernization of family farming and industry development; environmental protection and sustainable natural resources management; increasing of the rural sector contribution to economic growth; and balanced and coherent agricultural development planning of the country.

41 Islamic Relief’s Experience.

42 Centre National de l’Education.

43 Centre National de Recherche Scientifique et Technologique

44 Loi d’Orientation Agricole.

While risks associated with drought are widely addressed, the long-term reduction of flood risks is only partially addressed. An enhanced land use control and a better sites development planning should be ensured to avoid that flood plains are used for settlement in urban, suburban and rural areas. The establishment of appropriate drainage and sanitation systems is needed particularly in urban areas, such as Bamako, where rains, often short but intense, may cause rapid flooding of low level located areas. Land use and urbanization plans and schemes exist but are often facing with difficulties for practical implementation. The main stated reasons include the weakness of laws and regulations implementation. But this is also due in some cases, the inadequacy of these plans and schemes to the real situation requirements, in the concerned areas.

Measures encouraging people to leave these areas and a better participatory land use and urbanization planning should be adopted. Measures to ensure the technical quality and adequacy of developed plans and schemes, particularly **through better understanding and mapping of risk prone areas (especially in flood prone areas in case of flooding) should be also taken.**

In several regions of Mali, people is already living in flood areas formed by rivers and streams beds and basins, especially in Bamako and in the Niger Delta. To protect life and mitigate future disasters, **measures aiming at increasing people awareness about the risks they face and encouraging them to leave these threatened places to get into more secure areas should be undertaken.** Meanwhile, measures (temporary) to strengthen the homes resilience in these areas at risk, at accessible costs to the public, might be needed to be taken to avoid injuries and casualties in case of the disasters occurrence.

Although interventions currently undertaken, in the fields of environment and natural resource management, land management and land use planning, energy and food security, undoubtedly contribute to reduce risks in general, it seems necessary to strengthen them with actions addressing more specifically and systematically the reduction and the management of each risk⁴⁵ that Mali faces, including the climate change dimension. Moreover, the protection of those actions themselves against the effects of natural disasters is not systematically considered and should be ensured. The implementation of pilot action incorporating all of these sectoral and multisectoral measures, dimensions and approaches to achieve a systemic and integrated reduction flooding risk, would be recommended for reference.

The disaster and risk management financing mechanism is not yet sufficiently developed and adapted. The Agricultural Orientation Law provides for the establishment of a National Fund for Agricultural Development, amounting about seven billion CFA francs⁴⁶, which includes a component designed to be used as a National Risks and Disasters Fund. The Government is still undertaking in depth reflections on how to establish and make it operational. The modalities of implementation of its National Risks and Disasters Fund component are not yet known at present⁴⁷.

The establishment of an Emergency Anti Locust Invasion Fund⁴⁸ is currently under study. Expected to be about 500 million CFA francs⁴⁹, this fund would be dedicated to manage the beginning of a locust invasion. It would not exist at this time any designed financial provision or mechanism to ensure its relay⁵⁰.

45 The nature of risk varies according to the concerned areas and can be related to floods, drought and locust invasions, with a specific context

46 About USD 16,279,070 (for 1 USD = 430 FCFA)

47 Ministry of Agriculture

48 Fonds d'Urgence anti Acridienne

49 About USD 1,162,791 (for 1 USD = 430 FCFA)

50 CNLCP

A National Solidarity Fund exists but it is exclusively dedicated to the implementation of specific social protection interventions. A Food Security Fund also exists.

To carry out response to potential disasters such as floods, the mechanism currently in place is the use of funds from the state budget, by reallocation or creation of relevant budget lines. Each ministry also has budget lines that could be mobilized for response as well as municipalities which have funds for relief needs. The call for international partners' funds in case of State capacity overwhelming is part of the financial response strategy of Mali⁵¹.

Despite the efforts made so far, significant challenges need to be addressed. A more appropriate financial arrangement, flexible and easy to mobilize, providing funds for multisectoral needs of various natures is necessary, to optimize the disaster response,. The multisectoral and multi-hazard nature of disaster response and the required speed of funds mobilization, generally call for the establishment of an independent fund managed at high level. For a country like Mali continually confronted to permanent natural hazards, good disaster risk financing and risk transfer strategy and mechanism are key element of a successful disaster risk management Strategy. To accompany the country, a support providing the government officials with the knowledge and information about existing experiences and options, and helping them to explore and thus identify the appropriate mechanism for Mali would be recommended.

HFA Priority 5: Disaster Preparedness and Recovery

The Directorate General of Civil Protection (DGPC) is in charge of coordinating, at the national level, the disaster response. Equipped with an Operational Center, the DGPC is particularly responsible for coordinating and monitoring relief operations and for implementing post-disaster rehabilitation operations⁵². Crisis management is carried out through the Permanent National Commission for the Prevention, the Fight against Disasters and the Relief Organization. At decentralized levels, crisis and disasters are managed through the Regional, Local and Municipal Permanent Commissions for the Prevention, the Fight against Disasters and the Relief Organization.

The ORSEC Plan (Relief Organization Plan)⁵³ is the main disaster response tool. The ORSEC Plan includes a sequential interventions programming of public and private predetermined means, whose intervention is envisaged, given the speed and efficiency imperatives⁵⁴. The **ORSEC Plan exists at national, regional, local (cercle) and communal levels.** At the national level, the Minister responsible for Civil Protection is in charge of launching alert and triggering the ORSEC Plan implementation, once he has the necessary information to identify and assess the danger, its importance and its immediate consequences. Similarly, the Governor, the Prefect and the Mayor are in charge of triggering respectively ORSEC Plans implementation at regional, local and municipal levels. **The DGPC is currently continuing its effort, undertaken since 2004, to develop ORSEC plans for the various regions** of Mali, with the support from the PRECARICA project.

The DGPC was initiated in early September 2009, the development of a National Contingency Plan based on three scenarios: floods, drought and cholera. It is also planning to proceed to the development of Regional Contingency Plans.

The National Center for the Fight against Locust (CNLCP) is now developing the National Plans for locust invasion Prevention and Emergency Response.

⁵¹ State Secretary in charge of Budget

⁵² Ordonnance N°98-026/P-RM of 25-08-98, ratified by the Law N°98-057/17-12-98, modified by the Law N°06-004/06-01-006

⁵³ Plan d'Organisation des Secours (Plan ORSEC)

⁵⁴ Projet de Décret fixant les modalités d'élaboration et d'application du Plan National, des Plans Régionaux et Locaux relatifs à la prévention des calamités et à l'organisation des secours, actuellement en cours d'examen au niveau Ministériel avant sa soumission à l'Assemblée Nationale.

The DGPC is planning to carry out three disasters simulation exercises annually, during the next three years. These exercises will be conducted based on scenarios that will be defined later. But they will address the major risks the country is facing, mainly: floods, drought, locust invasion, avian flu and industrial accidents. These exercises will be carried out with PRECARICA project support, following the various training seminars.

Despite these achievements, significant needs should be addressed, particularly related to the implementation of post-floods recovery. In reality, the practice of post-disaster recovery is a relatively new experience for most of the authorities at municipal level as well as at central and regional levels. **Knowledge, guidance and reference models (examples and practical experiences) on the implementation of recovery are great needs expressed by these authorities.**

The recovery needs assessment is usually carried out, one to two weeks after the emergency needs assessment needs, but the same evaluation form is used for both types of evaluation.

Strengthening system and capacity for Post-Disaster Needs Assessment (PDNA) and medium and longer term recovery response, would be indicated. It would include strengthening of needs assessment and recovery planning and implementation mechanisms, but also know how enhancement.

In terms of recovery needs assessment methodology, it would be necessary to include the standard DALA methodology (Damage, Losses and Needs Assessment)⁵⁵ among available assessment tools for Mali. In fact, it will also allow strengthening the risk exposure data that can be used as a basis for probabilistic risk assessment, hazard mapping and financial risk transfer (especially insurance if needed).

3. INTEGRATION OF DISASTER RISK MANAGEMENT (DRM) IN DEVELOPMENT STRATEGIES

Disaster and Risk Management, and Civil Protection are stated, but discreetly, as priorities in the GPRSF / Growth and Poverty Reduction Strategy Framework (2007-2011). They are not strategic nor priority sectors nor cross-cutting issues themselves, but they are strategic pillars of the crosscutting theme "Peace and Security" of the GPRSF. Strategic pillars under this theme include: disaster management strategy strengthening; capacity strengthening for interior security and civil protection forces; establishment of an effective interior security and civil protection governance; strengthening the prevention and management of community conflicts. But the systematic mainstreaming of disaster and risk management in the planning and implementation of GPRSF priority sectors is not clearly specified.

The exposure of the Malian economy to external shocks, including natural disasters, is raised in the World Bank Country Assistance Strategy to Mali (CAS 2008-2011), but no specific action was planned in this regard. In the economic prospects and challenges analysis, it is reminded that the vulnerability to rainfall and desertification and other exogenous factors, are perpetual challenges for the Malian economy. It is also told that the budget does not contain provisions for the fiscal impact of these exogenous shocks. The Bank also recommends that special attention should be paid to urban areas, which are facing failure and lack of roads, drainage and basic services (water, sanitation and electricity) while the urban population produces 50% of the country's GDP.

⁵⁵ Developed by UN ECLAC.

But the Bank's interventions contribute to disaster and risk reduction, particularly through actions in the "Rural Development and Environment" sector and the "Energy and Transport" sector. Promoting sustainable land management, the reduction of agricultural pressure on natural resources and promoting the use of alternative sources of energy to wood are among the actions undertaken in this framework.

Disaster and risk management is a priority intervention within the UNDAF (2008-2012)⁵⁶. It is part of the UNDAF outcome number 4 "The most vulnerable rural areas benefit from the food security and sustainable development strengthening, the provision of sustainable alternative energy services and the job creation", in the following Country Programs Result: "The national system for the prevention and management of food crisis and other natural disasters is strengthened."

The UN system is planning the implementation of interventions strengthening and operationalizing the early warning system, allowing to monitor the food situation and to timely warn in case of crisis. The system will support the development and implementation of strategic plans for natural disaster prevention and response, which will be strengthened through establishment of efficient coordination mechanisms.

Despite the apparent priority given to disaster and risk management, its systematic integration into the planning and implementation of GPRSF priority sectors should be clearly stated. Its appropriate anchorage within the GPRSF document and more information provided about the country's vision for its effective implementation, also appear necessary to allow its effective transversal integration into GPRSF sectoral priority policies and programs priority sector the GPRSF. This will finally, give the opportunity to partners to officially integrate it, considering its required importance, within their cooperation strategies and programs with Mali.

4. KEY DONOR ENGAGEMENTS

Ongoing Projects and Organizations	Indicative budget ⁵⁷ , years	HFA activity area(s)
World Bank Projects/Studies		
Study for the Public Expenditures Review/ Cost Benefice Analysis of Sustainable Land Management (GDT).	\$200 000 2009 – 2010	3, 4
ML-BioCarbon Fund MASPP & Biomass: Promotion of Acacia Senegal Plantation, Arabic gomme production, and Carbon sale.		4
Agriculture and Producers Organization Project(PASAOP)	\$175.4 million 2008-2011	1, 3, 4
Agricultural Competitiveness and Diversification (PCDA)		3, 4
Conservation and Valorization of Gourma Biodiversity (PCVB-GE)		3, 4
Domestic Energy and Access to Basic Facilities in Rural Area (PEDASB)	FCFA 37.55 milliards – (~USD 87,325,581) 2004 – 2012	3, 4
Study on the Cost Assessment of Climate Change Adaptation through Local Institutions	2009 – 2010	1, 4
Senegal River Basin Multi-Purpose Water Resource Development Project-APL2 (regional: Guinea, Mali, Mauritania, Senegal)	\$ 200 million (from 2010)	4
Niger Basin Water Resources Development and Sustainable Ecosystems Management Program-APL2 (regional: Niger River Basin Authority Member Countries)	\$ 200 million (from 2011)	1, 4
Strengthen capacity of beneficiary countries to implement their Integrated Disease Surveillance and Response Strategies (regional: ECOWAS countries plus Mauritania)	\$60 million (starting 2009)	1, 4

⁵⁶ United Nations Development Action Framework or Plan Cadre des Nations Unies pour l'Aide au développement

⁵⁷ Change rate used: 1 USD = 430 FCFA

Ongoing Projects and Organizations	Indicative budget ⁵⁷ , years	HFA activity area(s)
World Bank Projects/Studies (Cont.)		
Africa Emergency Locust Project (regional: Burkina Faso, Chad, Gambia, Mali, Mauritania, Niger and Senegal)	\$60 million 2004-2010	1, 5
GFDRR funded Projects (planned)		
Support for the Development of Capacity of Regional Economic Communities (RECs) in Africa for Linking Climate Change Adaptation and Disaster Risk Reduction (DRR): ECCAS – ECOWAS – SADC.	\$ 1,163,700 ⁵⁸ (2010 – 2011)	1, 2, 3
Other selected donor projects		
WB-FIDA-EU-FEM : Agricultural Productivity Increasing Project (PAPAM)	\$130 million (planned)	1, 3, 4
Selected Donor Projects		
UNDP – DANIDA – FEEM – Government: National Capacity Strengthening in view of Disaster Risk Reduction (PRECARICA)	\$1.5 million 2008-2011	1,2,3,4,5
GTZ: « Community management of crop diversity to enhance resilience, yield stability and income generation in changing West African climates »	EUR1.2 Mio 2008-2010	3, 4
GTZ : Support Project to the Environmental Policy (PAPE)	2008-2011	4
GTZ : Climate Change Adaptation Policy and Strategies Strengthening	EUR 800 000 2009-2010	1, 4
GTZ : Climate Hazard Insurance Pilot Project	EUR 70.000 2009	4
GTZ : MDP's capacity strengthening (sub regional approach: Mali, Senegal, Ruanda, Benin, Burkina Faso)	EUR 75 000 2009	3, 4
EU: Tropical Forests and Climate Change Adaptation or CIFOR/ TroFCCA for three regions (West Africa: Mali, Burkina, Ghana - . Central America, South east Asia)	EUR 1.000.000 ⁵⁹ 2005-2009	1, 4
DANIDA: Green Facility CDM Project	FCFA 88 million - (~USD 204,651) 2008- 2009 ⁶⁰	1, 4
DANIDA : Capacity Strengthening for Decision Makers, Technical Departments, and Local Actors, for a better consideration of Climate Change	FCFA 440 million - (~USD 1, 023,256) 2008-2010	1, 4
DANIDA : Development of the « pourghere filière “ in Mali Project	FCFA 440 million - (~USD 1,023,256) 2007-2010	1, 4
DANIDA : Temporary Renewable Energy Resources Map of Mali Project	FCFA 399 million - (~USD 927,907) 2007-2011	4
Inter Cooperation Suisse: Project proposal: Reduction of local actors' vulnerability to disaster risks and climate change in the regions of Sikasso, Tombouctou and Mopti	FCFA 800 million- (~USD 1,860,465) (planned)	2, 3, 4
Inter Cooperation Suisse: Integrated Agriculture and Breeding for Food Security Project	FCFA 350 million - (~USD 813,953) (planned)	3, 4
Inter Cooperation Suisse: Country Study on « Climate Change and in Forest Sector Governance in Mali ».	FCFA 8 million - (~USD 18,605) From 2009	1, 4
UNDP : Second National Communication on Climate Change	\$405.000 2008-2009	2, 3, 4
UNDP-FAO-LCDF: Strengthening Food Security against Climate Change in Mali	\$200.000 (Project preparation fund starting 2009) Future Project amount : \$5 million (2010-2015)	2,4
Sweden/SIDA :New Climate Change Initiative-ICC	FCFA 5.1 milliard - (~USD 11, 860,465) (2009-2011)	2,4

58 Co financing with GFDRR: \$536,500 – ECCAS: \$40,000 – ECOWAS: \$40,000 – SADC: \$ 240,000

59 Total budget for West Africa: Euro 80.000 /year/per country

60 Will be probably followed by a second phase from 2009 to2010

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

UNDP (in collaboration with the GEF and DANIDA), through PRECARICA project, is the main actor in the specific area of disaster and risk management and reduction (DRM/R)⁶¹. The other actors are more involved in adaptation to climate change and in reducing sectoral disaster risk, mainly in the following areas: environment, sustainable natural resources management (soil, land, forests, and water), rural development and food security.

The table below, based on the priority of the Hyogo Framework of Action (HFA), helps identify where GFDRR is best placed to provide its resources and expertise, particularly in relation to PRECARICA project's interventions⁶² and to existing adaptation to climate change interventions. This table also shows the extent to which, interventions proposed to GFDRR funding, fit with the priorities and dynamics of DRM/R and Adaptation to Climate Change implementation in Mali, and complement with the main interventions already undertaken or planned in these areas (Government and Partners).

HFA Priorities	Main partners	Comments
1. Policy, Strategy and Consensus building		
Master Plan, Policy, Strategy, Regulations	UNDP - DANIDA – GEF, World Bank – FAO – GTZ GFDRR	<ul style="list-style-type: none"> • UNDP / DANIDA / GEF will finance: the development and monitoring of a National Action Plan for Disaster and Risk Management and Reduction (DRM/R) - and the establishment of an adequate DRM/R legal framework. • FAO provides material and technical strengthening support to the National Center for the Fight against Locust (CNLCP). • GTZ will finance: Support for mainstreaming climate dimension in Strategic Environmental Assessment. • World Bank (/ CALI) supported: the analysis of the institutions in adaptation. • GFDRR will finance: The Development of a National Policy and Strategy for DRM/R, upstream to the National Action Plan above-mentioned - and The additional support for the development of this planned National Action Plan for DRM/R.
Mainstreaming DRM/R and Adaptation into Development	UNDP - DANIDA – GEF – World Bank – UE GFDRR	<ul style="list-style-type: none"> • UNDP / DANIDA / GEF will finance: national and regional training seminars on DRM/R, which may include mainstreaming. • World Bank (/ CALI) supports: the development of recommendations for adaptation policies at micro and macro levels. • EU supports the integration of adaptation and forests management in development policies. • DANIDA funds: information, training and support to several key ministries involved in environmental and socio-economic issues, for the consideration of the climate change impacts into their projects and programs. • GFDRR will finance capacity building and support for the practical implementation of the DRM/R mainstreaming at all levels.
Coordination enhancement	UNDP - DANIDA - GEF GFDRR	<ul style="list-style-type: none"> • UNDP / DANIDA / GEF fund: capacity strengthening of DGPC and local governmental authorities by the provision of technical assistance (a project coordinator) to support DGPC's interventions implementation. • GFDRR Track I is planned to finance the collection of information for inventory of existing national coordination mechanisms, legal frameworks and national plans for DRR and CC adaptation for ECOWAS sub region, including Mali. • The proposed GFDRR support will finance: (i) Support for DRM/R institutional mechanism strengthening – (ii) Support for DGPC's organizational, technical and material capacities strengthening – (iii) Support for operational capacities strengthening of decentralized authorities at communal level, for the implementation of their DRM/R missions and mandates.

61 Because of the Mali stakeholders' request during the Country note development and validation, along this section of the document, the term DRM/R or Disaster Risk Management and Reduction is used instead of DRM or Disaster Risk Management. Stakeholders understood that "Reduction" is already included in DRM according to UNISDR definition, but for advocacy purposes, they requested clearly that "Reduction" should appear in order to capture politicians and decision makers' attention on the crucial needs for prevention/reduction but not only "management" which they often still understood as only "post-disaster reaction".

62 Co financed by the Government, UNDP, DANIDA and GEF.

HFA Priorities	Main partners	Comments
2. Risk identification, Assessment and Monitoring		
Climate trends and hazard risks mapping	ICRISAT – UNDP – GEF – DANIDA – SIDA - Inter Coopération Suisse GFDRR	<ul style="list-style-type: none"> • ICRISAT funded a study on the characterization of climate variability and change patterns and trends for smallholders' agriculture. • UNDP supports: studies on vulnerability and adaptation to Climate Change (CC) in different sectors: agriculture, livestock, health, water, wetlands in relation to the NAPA • SIDA will support for: The fulfillment of a collection study of climate projections made on Mali, in particular by the IPCC and the proposition of related support projects / programs - The development of statistical climate change data collection and analysis tools. • UNDP / DANIDA / GEF are funding: (i) participatory local risk inventory (at communal level) in all communes of the country (using FICAR sheet) – (ii) the establishment of an online and dynamic database with mapping of risks identified at the local level (FICAR). • GFDRR Track I planned to strengthening National Platform capacities for risk assessment and risk mapping through discussion of data-sharing protocols at sub regional training workshops on the integration of DRR and CC adaptation, and/or use of hydro meteorological and geo-spatial information and data • The proposed GFDRR support will finance: (i) Technical and scientific risk assessment (especially floods), with different scenarios (forecasts), combining: hazard analysis and vulnerability analysis with the losses probabilities according to scenario – (ii) The development of a geographic information system on DRM/R, with the mapping of technical risk assessment (Atlas)- (iii) - Capacity strengthening of DRM/R key institutions; especially: the National Directorate of Meteorology and the National Directorate of Hydraulics, for the detection and monitoring of hazards.
Early warning system	UNDP - DANIDA - GEF GFDRR	<ul style="list-style-type: none"> • UNDP / DANIDA / GEF funding: transmission equipment for the DGPC's regional structures. • GFDRR will fund actions for strengthening the Early Warning System, through: (i) Support for DGPC's technical capacity strengthening, mainly for coordination and monitoring of alert release and the reaction following its release – (ii) Support for capacity strengthening of key institutions, especially: the National Directorate of Meteorology and the National Directorate of Hydraulics, for the production and dissemination of alert – (iii) Support for early warning system strengthening (organizational, technical and material) at communal and community levels (warning of the population), as a component of "an integrated disaster risk management pilot project" – (iv) Support for the inclusion of "Early warning" as a strategic pillar/axe in a future national DRM strategy.
3. Education and awareness to build a Culture of resilience		
Stakeholders' awareness	ICRISAT – UNDP – DANIDA – GEF – SIDA GFDRR	<ul style="list-style-type: none"> • ICRISAT provides: support to strengthening adaptation capacities of stakeholders, including policy makers at the local level through a regional network of learning and a community of practice. • DANIDA supports: The strengthening of skills and level of information on the climate change related risks and the climate change and adaptation measures to be adopted (policy makers and administrative officers, technical services at national and regional levels, grassroots actors (local officials, private sector and civil society) – The promotion of maximum access of the populations to climate change information - The inventory and dissemination of local adaptation to climate change knowledge and practices. • UNDP / DANIDA / GEF fund: information, awareness raising and training of populations on DRM/R, through the organization of official events (Civil Protection World Day, DRR International Day) and policy makers awareness raising through national and regional seminars. • SIDA will support the strengthening of the NGO Network on Climate Change and their field initiative. • GFDRR will support: The development and implementation of systematic stakeholders' awareness raising interventions (including: policy makers, technicians, population and civil society at all levels).

HFA Priorities	Main partners	Comments
3. Education and awareness to build a Culture of resilience (Cont.)		
DRM/R Education, Training and Research Program	UNDP GFDRR	UNDP will finance: the development of an information, advocacy, education, training and research program in the framework of preparation of the Mali second national communication on Climate Change (CC). GFDRR will fund the integration of DRM/R and climate change adaptation (CCA) in the educational curriculum at the primary and secondary education.
4. Reduction of underlying risks		
Land use planning, zoning, urbanization	GFDRR	GFDRR will fund: <ul style="list-style-type: none"> Capacity strengthening of the National Directorate of Land Use Planning and Management (DNAT). Support for the improvement of zoning, land use planning and urbanization schemes and plans, in vulnerable areas (through the pilot project below).
Revision of hazard norms	GFDRR	<ul style="list-style-type: none"> GFDRR will finance: support for the definition of improved standards of dwelling construction locally made, more resistant to flood, in the flood prone areas (technical construction, location, layout) and demonstration (through the pilot project below) .
Sustainable Land Management (GDT)	GTZ – World Bank – SIDA GFDRR	<ul style="list-style-type: none"> GTZ finances: support for the elaboration and implementation of the “Sustainable Land Management” Investment Strategic Framework - and the analysis and the systematic capitalization of experiences related to the process. The World Bank supports: the fulfillment of a study on Public Expenditure Review and the cost benefit analysis in the field of Sustainable Land Management. SIDA will fund a project for the rehabilitation of degraded ecosystems in the “Niger Interior Delta” (REDDIN). GFDRR will support related actions under the integrated project below.
Natural resources management and protection	DANIDA – World Bank – UNDP – GEF – SIDA	<ul style="list-style-type: none"> World Bank (/ PEDASB⁶³) supports: the use of modern energy in rural and suburban areas, the promotion of community-based forest management, the support to the inter-fuel substitution and energy economy initiatives. DANIDA supports: the politico-strategic framework strengthening in the field of renewable energy, through the development of a national strategy for the development of biofuels (jatropha industry). - And the achievement of temporary of renewable energy resources UNDP / GEF / PMF ensure the financing of rehabilitation micro projects. SIDA will provide support to the adaptation measures of the Decentralized Forest Management Program (GEDEFOR) and bio Camp - And The Water Resources Integrated Management. GFDRR support related actions under the integrated project below.
Agriculture and fisheries adaptation	Multi Bailleurs/ PAPAM – Inter Coopération Suisse GFDRR	<ul style="list-style-type: none"> A multi-donor financing (/ PAPAM⁶⁴) will support the consideration of climate change impacts on agricultural productivity. Inter Cooperation will finance a integrated livestock farming for food security project, aiming at reducing the vulnerability of smallholder farms in the region of Segou. GFDRR will support related actions under the integrated project below.
Integrated management of Natural hazards	Inter Coopération Suisse GFDRR	<ul style="list-style-type: none"> GTZ supports: the reduction of climate risk in sectoral investment programs for a sustainable natural resources management Inter Cooperation will finance: A country study on “climate change and governance in the forestry sector in Mali” - and a project to reduce the vulnerability of local actors with regard to disaster risks and climate change in regions 3 regions (Sikasso, Timbuktu and Mopti): risk assessment, capacity building, integration into planning, integration “disaster risk-climate change-food security”, watershed protection and management, and sustainable agriculture. GFDRR will finance: a pilot project for vulnerable communities protection, through hazards “integrated management” (floods, drought and locust invasion) at communal and community levels.

63 Projet Energie domestique et accès aux services de base en milieu rural (PEDASB)

64 Programme d'Appui à la Productivité Agricole au Mali (PAPAM)

HFA Priorities	Main partners	Comments
4. Reduction of underlying risks (Cont.)		
DRM/R and adaptation financing	GTZ - World Bank GFDRR	<ul style="list-style-type: none"> • GTZ: funded the fulfillment of insurance products testing and the design of a concept note paper on possible "climate" insurance. • World Bank is funding the evaluation of adaptation to climate change costs through Local Institutions (CALI). • GFDRR will finance support for the identification of an improved mechanism of DRM/R financing (and flexible risk transfer if necessary, including the exploration of disaster insurance mechanisms).
5. Strengthening disaster preparedness for effective response		
Emergency Preparedness	UNDP - DANIDA – GEF – FAO GFDRR	<ul style="list-style-type: none"> • UNDP / GEF / DANIDA will finance: the development national and regional ORSEC plans, contingency plans and their testing (simulations). • FAO provides support to CNLCP for the development of locust invasion prevention and emergency response Plans. • GFDRR will fund, through the pilot integrated natural hazards management, the implementation of measures enhancing preparedness at communal and community (authorities and community).
Post- disaster Needs Assessment	GFDRR	<ul style="list-style-type: none"> • GFDRR will fund: strengthening of post-emergency damages and needs assessment system and the recovery responses implementation mechanism: mechanisms and knowledge for the needs assessment and planning and implementation of response interventions.

Classified by priority order (See adopted criteria in Annex 2), the eight (8) indicative proposed actions for GFDRR funding, are listed in the table below with their main global and specific objectives (The main activities to be undertaken for each proposed action could be viewed in Annex 3).

Proposed actions for GFDRR funding	Potential partnership	Indicative budget for GFDRR funding (USD)	Potential outcomes and comments	HFA Area(s)
(1) Strengthening Disaster Risk Reduction and Management institutional framework.	DGPC – UNDP - DANIDA – GEF – GTZ – European Union (EU) – all concerned Ministries – all concerned decentralized authorities – NGO – National Platform for Disaster Prevention and Management.	250,000 (2010-2015)	<ul style="list-style-type: none"> • GO (Global Objective): Optimize DRM/R stakeholders' engagement and coordination through a better clarification and formalization of stakeholders' responsibilities and concrete legislative measures (for all levels: central, decentralized and local levels). • SO (Specific Objectives): (1) Develop an appropriate national institutional framework, involving and adopted by all stakeholders (at all levels) – (2) Develop a more appropriate legal framework with a proposition of a more adequate legal basis and especially enforcement, for all levels, supporting the implementation of the adopted institutional framework – (3) Set up the adopted and validated DRM/R institutional framework – (4) Support the functioning of the established DRM/R institutional framework. 	1, 2, 3, 4, 5

Proposed actions for GFDRR funding	Potential partnership	Indicative budget for GFDRR funding (USD)	Potential outcomes and comments	HFA Area(s)
(2) Fulfillment of a systematic populations and stakeholders' awareness raising, for information advocacy and technical capacity building	DGPC – DNM - STP/ CIGQE – UNDP – DANIDA – GEF – SIDA – NGO – National Platform for Disaster Prevention and Management.	250,000 (2010-2015)	<ul style="list-style-type: none"> • GO: Improve the knowledge and understanding, by all categories of DRM/R stakeholders at all levels, of the DRM/R concepts and aspects in Mali, and their respective roles and responsibilities. • SO: (1) Develop an awareness raising and communication Plan, targeting all categories of DRM/R stakeholders in Mali (for information, advocacy and technical capacity building), including local vulnerable populations using the existing participatory risk assessment and early warning systems using local languages and modern media; Authorities at all levels, including decentralized levels; and Civil society and private sector – (2) Support the implementation of the designed awareness raising and communication Plan. 	1, 2, 3, 4, 5
(3) Strengthening key institutions' material and technical capacities	DGPC – UNDP – DNM – DNH – DNAT – ICM (Mapping Institute of Mali or Institut cartographique du Mali) – IER (Institute of Rural Economy or Institut d'Economie Rurale) - DANIDA – GEF – SIDA – FAO – Inter Cooperation Suisse – National Platform for Disaster Prevention and Management.	2,300,000 (2010-2015)	<ul style="list-style-type: none"> • GO: Optimizing the efficiency of key Disaster and Risk Management and Reduction (DRM/R)'s institutions in Mali, in the implementation of their roles and responsibilities. • SO: (1) Ensure that the Directorate General of Civil Protection (DGPC) has optimum organizational, technical and material capacities, to achieve its mandates and missions (<i>USD 300,000</i>)– (2) Ensure that the National Directorate of Meteorology (DNM) has optimal technical and material capacities to achieve its mandates and missions (<i>USD 750,000</i>) – (3) Ensure that the National Directorate of Hydraulics (DNH) has optimal technical and material capacities to achieve its mandates and missions (<i>USD 350,000</i>)– (4) Ensure that the National Directorate of Territorial Planning (DNAT) has optimal technical and material capacity to achieve its mandates and missions (<i>USD 250,000</i>) - (5) Ensure that information and knowledge on risks related to natural hazards, are available, updated and accessible to all stakeholders at any time, including the development of a Geographic Information System for Disaster and Risk Management (GIS for DRM - for floods at the beginning) (for decision making and early warning uses) (<i>USD 650,000</i>) . 	1, 2, 3, 4, 5

Proposed actions for GFDRR funding	Potential partnership	Indicative budget for GFDRR funding (USD)	Potential outcomes and comments	HFA Area(s)
(4) Integration of Disaster risk management and reduction, and adaptation to climate change ⁶⁵ in primary and secondary school curriculum.	DGPC - Ministry of Education – DNM – all financial and technical partners involved in the field: GTZ, DANIDA, SIDA, EU, UNDP, GEF, Inter Cooperation Suisse - NGO – National Platform for Disaster Prevention and Management.	400,000 (2010-2015)	<ul style="list-style-type: none"> • GO: Mali has future adult citizens aware and active from their childhood, regarding risk and disaster, and climate change issues, mainly through teaching Disaster and Risk Management and Reduction (DRM/R), and climate change adaptation (CCA) from the primary and secondary schools. • SO: (1) Develop DRM/R and CCA teaching courses and programme – (2) Allow the country to have efficient DRM/R and CCA trainers for the school sphere – (3) Officialise and ensure DRM/R and CCA training throughout the national territory. 	1, 3, 5
(5) Strengthening post-emergency assessment and recovery implementation system.	DGPC – UNDP – FAO – NGO – National Platform for Disaster Prevention and Management.	300,000 (2010-2015)	<ul style="list-style-type: none"> • GO: Improve the management and implementation of appropriate post-emergency recovery responses. • SO: (1) Strengthen the technical capacity of institutions involved in post-emergency responses implementation – (2) Set up an improved mechanism (organization) for post-emergency assessment and recovery implementation – (3) Optimize the operational efficiency of the improved mechanism for post-emergency assessment and recovery implementation. 	1, 2, 3, 4,5
(6) Development of a National Policy, Strategy and Action Plan for disaster and risk management and reduction (DRM/R)	DGPC – UNDP - all concerned Ministries – all concerned decentralized authorities – all financial and technical partners involved in the field: DANIDA – GEF – GTZ – EU – Inter Cooperation Suisse – SIDA –UN (United Nations) Agency – NGO – National Platform for Disaster Prevention and Management.	250,000 (2010-2015)	<ul style="list-style-type: none"> • GO: Define common global vision and roadmap, to be used as a reference framework, for the implementation of Disaster and Risk Management and Reduction (DRM/R), for all hazards in Mali (multi-hazard), for a given period. • SO: (1) Adopt National Policy and Strategy for Disaster and Risk Management and Reduction (DRM/R) for Mali – (2) Support the development of a National Action Plan for Disaster and Risk Management and Reduction (DRM/R) for Mali – (3) Support the implementation of the Mali National Action Plan for Disaster and Risk Management and Reduction (DRM/R). 	1, 2, 3, 4,5

Proposed actions for GFDRR funding	Potential partnership	Indicative budget for GFDRR funding (USD)	Potential outcomes and comments	HFA Area(s)
(7) Implementation of a pilot project for vulnerable communities' protection through an integrated disaster risks management (floods, drought, locust invasion, and bush fires).	DGPC – Local Authorities (Cercles and Communes) – STP/ CIGQE – CNLCP - All concerned Ministries – all concerned decentralized authorities – DNAT (National Directorate of Land Use Planning) - all financial and technical partners involved in the field: DANIDA – GEF – GTZ – EU – Inter Cooperation Suisse – SIDA –UN Agency – NGO – National Platform for Disaster Prevention and Management.	1,150,000 (2010-2015)	<ul style="list-style-type: none"> • GO: Ensure better local management of natural hazards and bush fires through systematic coverage of all components and aspects of risk and disaster management and reduction: prevention, risk reduction, preparedness, emergency response, recovery. • SO: (1) Strengthen the local level institutional and legal frameworks for the implementation of Disaster and risk management and reduction (DRM/R) for natural hazards and bush fires – (2) Strengthen all local stakeholders' awareness raising and capacities (including vulnerable populations) – (3) Enhance knowledge and monitoring of natural hazards and bush fires – (4) Strengthen the reduction of disaster risk underlying factors, and its integration into local development planning – (5) Strengthen local level early warning system – (6) Strengthen disaster preparedness at local level for an effective response – (7) Prepare the reproduction/replication of the pilot in other prone areas. Considering the possible effects of a changing climate, the incorporation of various climate change scenarios for the Niger River and basin will be ensured. 	1, 2, 3, 4, 5
(8) Support for strengthening disaster risk management and reduction financing mechanism.	DGPC – Ministries in charge of Finance and Budget – Ministry in charge of Social Development – NGO -- National Platform for Disaster Prevention and Management.	250,000 (2010-2015)	<ul style="list-style-type: none"> • GO: Facilitate and optimize the mobilization and use of Government funds, allocated to DRM/R, including post-disaster responses funding. • SO: (1) Inform Malian authorities and technicians on the types of funding mechanisms that can be adopted and their efficiency – (2) Identify a more appropriate improved DRM/R funding mechanism – (3) Exploring the advantage and feasibility of developing a catastrophe insurance facility among the West Africa sub region countries, like the Caribbean Catastrophe Risk Insurance Facility (CCRIF) between Caribbean countries – (4) Exploring disaster insurance mechanisms that can be implemented for the population in Mali. It will build on the previous World Bank's experience and activities on agricultural insurance schemes in the Sahelian countries and other relevant experiences worldwide. 	1, 2, 3, 4, 5
Total funding requested from GFDRR		5,150,000 (2010-2015)		

ANNEX 1:**The (19) nineteen priority adaptation options project sheets of the National Programme of Action for Adaptation to the adverse effects of Climate Change (NAPA)⁶⁶:**

- (1) Popularization of improved varieties of major food crops adapted to the climatic conditions (millet, sorghum, maize and rice)
- (2) Popularization of animal and plant species adapted to climatic conditions.
- (3) Promotion of income generating activities and mutual associations.
- (4) Aquaculture development and equipping.
- (5) Grain banks promotion.
- (6) Use of weather information to improve agricultural production and contribute to food security.
- (7) Lowland development.
- (8) Realization of boreholes equipped with solar pump or wind powered pump.
- (9) Energetic valorisation of *Typha australis*.
- (10) Contribution to the removal of barriers about the promotion of solar energy applications.
- (11) Capture of streaming water and restoration of water points (backwater, sick and lakes).
- (12) Awareness raising and organization of people for the natural resources preservation (development of local agreements for reforestation and agro forestry).
- (13) Forest fire management.
- (14) Development of farming CES / DRS and composting activities.
- (15) Development of fodder crops.
- (16) Development of a technology package of training for people on practicing simple adaptation to climate change activities.
- (17) Promotion of animal feeding banks.
- (18) Promotion of jatropha oil.
- (19) Establishing an information system on climate change related health risks.

66 NAPA

ANNEX 2

Classification criteria adopted and the ranking of the proposed actions.

The proposed actions for GFDRR funding have been classified and scored according to the five (5) following criteria by stakeholders involved in the DRM Country Note development process:

1. If the action is not implemented, it implies negative impacts on the on-going DRM/R interventions in the country.
2. The action implementation improves the quality of current and future DRM/R interventions in the country.
3. The quality of the other DRM/R actions proposed to GFDRR funding depends on the implementation of this action
4. The implementation of the action will have a positive impact on populations.
5. The action implementation will have a positive impact on the economy at national and decentralized levels.

ANNEX 3

Main activities to be undertaken for each proposed action for GFDRR funding.

Rank	Priority proposed actions
1	Strengthening Disaster Risk Management and Reduction institutional framework.
2	Fulfillment of a systematic populations and stakeholders' awareness raising, for information, advocacy and technical capacity building
3	Strengthening key institutions' material and technical capacities
4	Integration of Disaster risk management and reduction, and adaptation to climate change ⁶⁷ in primary and secondary school curriculum.
5	Strengthening post-emergency Assessment and Recovery implementation system.
6	Development of a National Policy, Strategy and Action Plan for disaster and risk management and reduction (DRM/R)
7	Implementation of a pilot project for vulnerable communities' protection through a integrated disaster risks management (floods, drought, locust invasion).
8	Support for strengthening disaster risk management and reduction financing mechanism.

Proposed actions for GFDRR funding	Main activities include:
(1) Strengthening Disaster Risk Reduction and Management institutional framework.	<ul style="list-style-type: none"> ■ (for Specific Objective 1 or SO1): <ul style="list-style-type: none"> • an institutional analysis of the DRM/R system in Mali (strengths, weaknesses and needs) and the proposition of an improved institutional scheme and framework. ■ (for SO2): <ul style="list-style-type: none"> • a diagnostic analysis of the existing DRM/R legal framework (strengths, weaknesses and needs) and the proposition of a more appropriate legal framework ■ (for SO3): <ul style="list-style-type: none"> • the support for the implementation of the improved institutional and legal frameworks ■ (for SO4): <ul style="list-style-type: none"> • the design and dissemination of reference materials presenting all information on the new institutional mechanism/framework • the design and dissemination of materials on the new institutional mechanism/framework, on the basics of DRM/R concepts and on the implementation of DRM/R mainstreaming • the fulfillment of a series of information workshops for central and decentralized actors, presenting the adopted DRM/R institutional mechanism, the related legal framework and all other organizational and operational aspects of DRM/R in Mali.
(2) Fulfillment of a systematic populations and stakeholders' awareness raising, for information advocacy and technical capacity building	<ul style="list-style-type: none"> ■ a diagnostic analysis of DRM/R related awareness rising and information interventions (strengths, weaknesses and needs) • the development of a Plan for a systematic stakeholders' awareness raising, with the related communication plan • the support for the Plan implementation.
(3) Strengthening key institutions' material and technical capacities	<ul style="list-style-type: none"> ■ For each key institution: <ul style="list-style-type: none"> • a diagnostic analysis of the current organizational, technical and material capacities, regarding its mandates and responsibilities (strengths, weaknesses and needs) • the development of a capacity strengthening Plan with detailed description of actions to be undertaken and a proposed timetable • the support for the implementation of the designed capacity strengthening Plan. ■ For ensuring availability of data information and knowledge related to natural hazards (for decision making and early warning uses): <ul style="list-style-type: none"> • a Risk assessment for natural hazards (flooding to start) in key risk prone areas of the territory (to be identified) • the development of a Geographic Information System for Disaster and Risk Management or GIS for DRM (for floods at the beginning) • The definition of the modalities and action plan for the replication of the experience of developing GIS for Flooding risk and disaster Management, to other natural hazards.

(Cont.)

Proposed actions for GFDRR funding	Main activities include:
(4) Integration of Disaster risk management and reduction, and adaptation to climate change⁶⁸ in primary and secondary school curriculum.	<ul style="list-style-type: none"> ■ Design and development of the DRM/R-CCA training module (courses) and program • Design and development of DRM/R-CCA teaching materials and documents • trainings of trainers at central level and in different regions of the country • implementation and monitoring of DRM/R-CCA teaching and program.
(5) Strengthening post-emergency assessment and recovery implementation system.	<ul style="list-style-type: none"> ■ (for SO1): <ul style="list-style-type: none"> • lessons learned exercises with all stakeholders' participation, assessing the implementation of past post-emergency assessments and recovery interventions (strengths, weaknesses, strengthening needs: participatory evaluation) • trainings in accordance with the identified needs, mainly related to: post-emergency assessment of damage and required recovery actions; post-disaster economic assessment of damages, losses and needs; and recovery planning and implementation • practical exercises related to the provided trainings. ■ (for SO2): <ul style="list-style-type: none"> • a diagnostic analysis of the existing system for post-emergency assessment and recovery implementation and the proposition of an improved more appropriate mechanism – the development of improved standard tools and documents to be used for the post-emergency assessment and recovery implementation. ■ (for SO3): <ul style="list-style-type: none"> • regular practical simulation exercises testing the adopted mechanism for post-emergency assessment and recovery implementation, and using the developed and validated tools • regular evaluation exercises of the achieved simulation tests, to get lessons learnt and make improvements to the system and the tools • Stakeholders' technical coaching by trainers, for the implementation of, at least the first two real cases, of post-emergency assessment and recovery implementation.
(6) Development of a National Policy, Strategy and Action Plan for disaster and risk management and reduction (DRM/R)	<ul style="list-style-type: none"> ■ (for SO1): <ul style="list-style-type: none"> • an in-depth diagnostic analysis of the DRM/R situation in Mali, which will include the diagnostic of strengths, weaknesses, gaps, challenges, constraints, needs, and the proposition of purposes, overall principles and approaches to be adopted by the country and strategic pillars / axes with the related strategic priority actions to be achieved⁶⁹ (participatory process) • the design, writing and validation of the National Policy and Strategy for DRM/R document, based on the validated strategic priorities pillars/axes. ■ (for SO2): <ul style="list-style-type: none"> • the participatory development of the DRM/R National Plan of Action for a 5 years period • the design, writing and validation of the National Action Plan for DRM/R document ■ (for SO3): <ul style="list-style-type: none"> • the support for the implementation and monitoring of the National Action Plan for DRM/R.

(Cont.)

Proposed actions for GFDRR funding	Main activities include:
<p>(7) Implementation of a pilot project for vulnerable communities' protection through an integrated disaster risks management (floods, drought, locust invasion, and bush fires).</p>	<ul style="list-style-type: none"> ■ (for SO1): <ul style="list-style-type: none"> • a diagnostic analysis of the existing institutional mechanism in the area and the development of a more appropriate institutional framework with the tools for its implementation • a diagnostic analysis of the existing legal and regulatory framework and the development of a more appropriate one allowing to implementing the new improved institutional framework • the support for the establishment and functioning of the improved institutional and legal frameworks; ■ (for SO2): <ul style="list-style-type: none"> • a diagnostic Analysis of stakeholders 'awareness raising needs (for each category) and the development and implementation of a stakeholders' awareness raising Plan • a stakeholders' capacities assessment (organizational, material, financial, and technical) particularly for territorial collectivities and decentralized government technical services/ departments and the development and implementation of a stakeholders' capacities strengthening Plan. ■ (for SO3): <ul style="list-style-type: none"> • the assessment of information needs for each stakeholder's category (nature, regularity, size, format, channels) • a comprehensive technical risks assessment for these four hazards in the area, including mapping (hazard, vulnerability, scenarios, socio-economic impacts) • the setting up of a system, mechanism for disseminating risk assessment information to stakeholders, with the required format, using the appropriate means • support for the setting up of a "local, on-ground" permanent risk monitoring for these four hazards. ■ (for SO4): <ul style="list-style-type: none"> • a diagnostic analysis of implemented measures to reduce underlying risk factors related to the four concerned hazards (floods, drought, locust invasion, bush fires) • the development and implementation of a medium and long term, multi sectoral risk Reduction Plan⁷⁰ for the four hazards • support for the integration of sectoral actions in the local development plan and budget (communal). ■ (for SO5): <ul style="list-style-type: none"> • a diagnostic analysis of the current early warning system⁷¹ • the development and implementation of a Plan to strengthen local early warning system, related to the three concerned natural hazards and to bush fire. ■ (for SO6): <ul style="list-style-type: none"> • a diagnostic analysis of: the preparedness status; the preparedness implementation; and the preparedness needs for an appropriate response at local level, in case of natural disasters and bush fires • the development and implementation of a disaster preparedness Plan, which would allow coping with potential disasters caused by the four concerned hazards. The Plan will include actions targeting each stakeholder's category, mainly populations, territorial collectivities, decentralized government technical services/departments and civil society. It will also include actions related to material capacity strengthening (such as emergency equipments for communication, relief and rescue, evacuation and others) • regular simulation exercises. ■ (for SO7): <ul style="list-style-type: none"> • a capitalization of acquired experiences (positive and negative) during the pilot implementation process • the development of concept note and reference materials/documents (guidelines for the preparation and implementation of a similar project), for each aspect and action covered, achieved under the pilot project • the definition and support for the implementation of an action plan and the approach to be adopted for the replication of the pilot to all areas in the country, exposed to the same types of risks covered in the pilot (floods, drought, locust invasion, bush fires).

(Cont.)

Proposed actions for GFDRR funding	Main activities include:
<p>(8) Support for strengthening disaster risk management and reduction financing mechanism.</p>	<ul style="list-style-type: none"> ■ (for SO1): <ul style="list-style-type: none"> • presentation of and discussion on existing DRM/R funding mechanisms: available options and experiences worldwide. ■ (for SO2): <ul style="list-style-type: none"> • a thorough diagnostic analysis of the existing DRM/R financing mechanism covering national and decentralized levels, and the development of a proposition for an improved financing mechanism • support to the implementation of the proposed new financing mechanism (if adopted). ■ (for SO3): <ul style="list-style-type: none"> • experience sharing between Malian authorities and technicians, and the Caribbean Catastrophe Risk Insurance Facility (CCRIF)'s responsible and initiator • a study on the feasibility, the advantages and disadvantages of developing a catastrophe insurance facility for the West African sub region's countries and the approaches that can be adopted • presentation and discussion of the study results and preparation of implementation stages, if agreed. ■ (for SO4): <ul style="list-style-type: none"> • presentation and discussion of worldwide experience on public disaster insurance types, for the same hazard and disaster types as in Mali • a diagnostic study of (i) the types of disaster insurance available to the population in Mali (mechanism, weaknesses, strengths, needs, and recommendations for Mali); and (ii) the types of insurance disaster that can be implemented for the public in Mali, with their development modalities and approaches • presentation and discussion of the study results and preparation of the implementation stages, if agreed.

Catherine,

I am missing footnotes 68 through 71 (pages 94 and 95) and I can't tell which ones they are, please help.

(Footnotes)

- 1 Change rate used: 1 USD = 430 FCFA
- 2 Co financing with GFDRR: \$536,500 – ECCAS: \$40,000 – ECOWAS: \$40,000 – SADC: \$ 240,000
- 3 Total budget for West Africa: Euro 80.000 /year/per country
- 4 will be probably followed by a second phase from 2009 to2010
- 5 Projet Energie domestique et accès aux services de base en milieu rural (PEDASB)
- 6 Programme d'Appui à la Productivité Agricole au Mali (PAPAM)
- 7 Adaptation aux Changements Climatiques
- 8 Adaptation to Climate Changes
- 9 Adaptation aux Changements Climatiques
- 10 The process will include consultations with all DRM/R stakeholders' categories involved at all levels of intervention.
- 11 It will consist mainly in supporting the implementation of non-structural measures such as: organizational strengthening, technical capacity building (knowledge and skills), support for responsibilities implementation, reforms implementation, methodologies and regulations development; but also in supporting resources mobilization for the implementation of structural measures (physical infrastructure protection).
- 12 including: organization; mechanism for alerting the public (formal and traditional/internal to the community); links and communications with the warning system at the central level; equipments, means and channels used to disseminate warnings; disseminated alerts quality (content, format, adequacy with the public and concerned technical departments needs); actual use of alerts by people (reaction); and the media role and place within the local early warning system.

In 2007, flooding in Mozambique killed at least 29 people and affected 285,000 people, the worst since 2000-2001, when 700 people died and half a million lost their homes.³ In 2008, heavy rains in Zambia, Zimbabwe and Malawi caused flooding in Mozambique that displaced tens of thousands of people and destroyed almost 100,000 hectares of crops. As a result of the floods and consecutive droughts in 2002/03, 2003/4 and 2007/08, the World Food Programme placed 300,000 people under food assistance. Some 35 percent of the population is now thought to be chronically food insecure. Disaster costs to the national economy have been estimated at US\$1.74 billion during 1980-2003, but this largely underestimates economic losses and impacts on the poor⁴.

Climate change will increase extreme weather patterns, based on observed trends and future scenarios.

Historical records from 1960-2005 point to a warming trend in central and north Mozambique of 1.1-1.6° C in maximum temperatures and to significant increases in duration of heat waves, as well as a delay in the start of the rainfall season. By 2040-2060, maximum temperatures are expected to increase by 2.5-3.0°C in the interior. *Thus, the future weather is expected to exacerbate current climate variability, leading to more intense droughts, unpredictable rains, floods and uncontrolled fires.* Depending on global sea level rise scenarios, critical urban centers such as Beira and Maputo would need to significantly strengthen their coastal defenses or plan a retreat of urban infrastructure. Future models predict a 25 percent increase in magnitude of large flood peaks in the Limpopo and Save and a reduction in Zambezi river flow of 15 percent, requiring a major rethinking in power consumption strategies. With population growth, per capita water availability is expected to decline in the major hydrographic basins, placing critical stress on water resources. The Zambezi, Save and Limpopo rivers could experience saline intrusions up to 30 km inland. The intensity of hurricane-strength cyclones is also expected to increase in a future climate.⁵ Hence, critical sectors that will be at increasing risk include agriculture, infrastructure, power, water and sanitation, and health and nutrition.

2. ACTIVITIES UNDER HYOGO FRAMEWORK OF ACTION

HFA Priority # 1. Policy, Institutional Capacity and Consensus Building

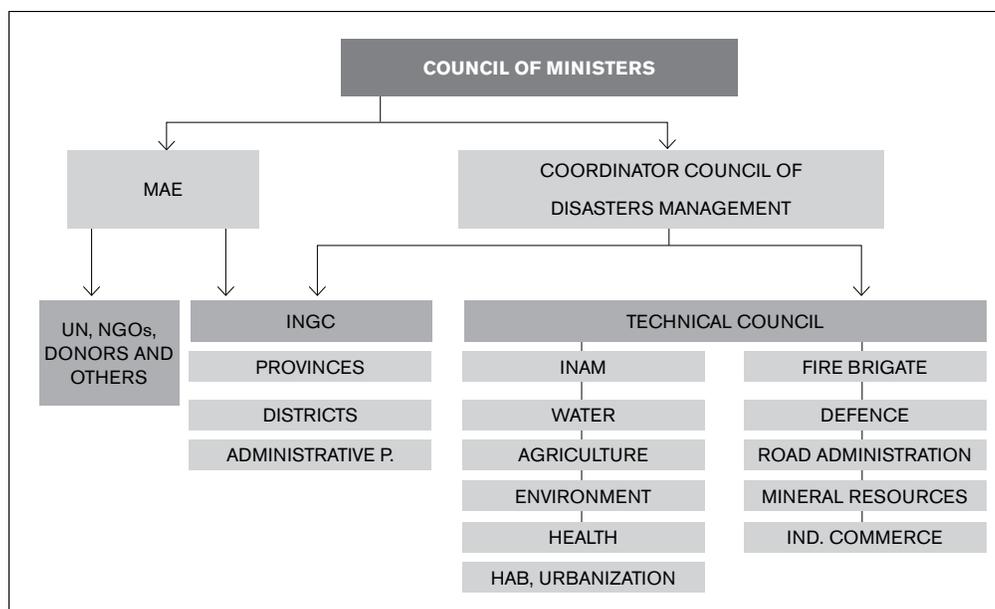
The National Institute of Disaster Management (INGC), established in 1999, coordinates disaster risk management activities in Mozambique. INGC operates under the Ministry of State Administration (MAE) and is mandated to coordinate emergencies, promote disaster prevention through population and government mobilization; protect human lives; ensure multisectoral coordination in disaster emergency; coordinate early warning systems; carry out public awareness; and re-utilize arid and semi-arid zones. They are responsible for coordinating disaster risk management at the national, provincial and district levels. Three regional emergency operation centers handle cyclones and droughts (Vilankulos), floods (Caia) and cyclones (Nacala). There are also four multiple use centers (CERUM) at the district level specializing in reducing vulnerability to droughts. At the community level, INGC acts through local Committees for Disaster Risk Management that are empowered to deal with both disaster prevention and preparedness.

The Coordinating Council for Disaster Management (CCGC), chaired by the Prime Minister, ensures multi-sectoral coordination in disaster prevention, assistance to victims, and disaster rehabilitation. It receives advice from a Technical Council for Disaster Management (CTGC). The CTGC, composed of technical staff from sector Ministries represented in the CCGC, proposes technical responses to disasters which are then submitted for analysis and approval to the CCGC. The CCGC decision is then forwarded to the operating body of INGC for action through its regional, provincial and district representatives. The CTGC is also active at the provincial level, where it advises the local INGC and the Provincial Government and conducts disaster evaluations.

³ OCHA Situation Report 2, 9 February 2007.

⁴ Abrams, Len. Long-term Strategic Planning for Disaster Risk Reduction in Mozambique and Malawi.

⁵ INGC, 2009. Study on Impact of Climate Change on Disaster Risk in Mozambique (draft).



Mozambique adopted a National Master Plan for Prevention and Mitigation of Natural Calamities in 2006.

The Master Plan followed the Disaster Management Policy of 1999 and became the country's operative strategy for disaster risk management. It specifically emphasizes the links between development policies and preparedness, prevention, mitigation and vulnerability reduction. Attention is paid to developing arid zones through introduction of conservation agriculture and non-agricultural income generation activities, water supply and rainwater harvesting. For flood protection in risky area, water resources infrastructure such as dams and dikes are considered keys elements for flood prevention.⁶

The Ministry for the Coordination of Environmental Affairs (MICOA) finalized a National Adaptation Programme for Action (NAPA) in 2007. The plan, prepared by an inter-agency NAPA team, reviewed Mozambique's vulnerability to key hazards and identified four adaptation priorities:

1. Strengthening early warning systems;
2. Strengthening the capacity of farmers to deal with climate change
3. Reduction of the impacts of climate change along the coastal zone, and
4. Water resources management.

Despite this progress, a number of critical institutional weaknesses remain: the 2008 *Interim National Progress Report on the Implementation of the Hyogo Framework for Action* cites weak institutional capacity to manage the relationship between Disaster Risk Management, and Climate Change and Environmental Issues. The main capacity constraints are unresolved coordination issues between INGC and MICOA to address disasters as an environmental issue, and the fact that most line ministries lack a legal mandate to participate in the Master Plan. A national disaster management law is in draft form, but has been awaiting ratification by parliament for a number of years. As a result the responsibilities of various government departments in disaster risk management are not yet clearly defined. Partially as a consequence of this, Mozambique continues to depend heavily on international technical assistance to implement disaster risk management plans.⁵ The UNDP project "*Strengthening Local Risk Management and Mainstreaming Disaster Risk Reduction*" seeks to address some of these weaknesses by strengthening capacity for integrated emergency response at the national and regional levels.

⁶ Interim national progress report on the implementation of the Hyogo Framework for Action, 2008.

HFA Priority # 2. Disaster Risk Assessment, Monitoring, and Early Warning

In March 2009 INGC completed the first phase of a major report, “Study on the Impact of Climate Change on Disaster Risk in Mozambique,” funded by the Government of Denmark, UNDP and GTZ. This study is expected to help set priorities for the Pilot Program from Climate Resilience (PPCR) as well as other national programs in climate change adaptation and disaster risk management. It researched extensively the projected effects of climate change by 2040 and 2060, and the adaptation measures needed to reduce vulnerability to these impacts. It is being complemented by the *Economic Vulnerability and Disaster Risk Assessment Study* and the *Economics of Adaptation to Climate Change Study*, funded by the World Bank.

Mozambique has also made progress on risk mapping. Recently, INGC completed a major risk atlas for the Limpopo Basin, in collaboration with FEWS NET and Universidade Eduardo Mondlane (UEM). The resulting atlas offers access to maps, charts and images, and identifies the hazards that could affect the Limpopo river basin. Flood Risk Maps have also been developed by the Water Administration unit, for the Limpopo and Incomati Basins.⁵

There is a further need, however, to identify and map key assets at risk as a basis for spatial planning. According to the 2008 review of the Hyogo Framework, however, there is a need for a comprehensive risk analysis of the 13 river basins in Mozambique. INGC and CTGC agencies also need to complete the identification and mapping of the basic assets at risk in the major sectors of the economy – e.g. schools, health centers, transport infrastructure, etc. – so that contingency plans and risk maps can be produced readily for areas exposed to major hazards. There is also a need for better participatory risk mapping to ensure that communities are involved in the process and accept the mitigation measures recommended by the studies. Given the vulnerability of coastal cities, INGC has also identified participatory urban mapping of Inhambane, Maxixe, Maputo, Beira, Xai-Xai, and Quelimane, and coastal erosion and adaptation studies of Maputo, Beira and Inhambane, as major priorities for future assessments.

While much is known about flood, drought and cyclone risks, relatively little is known about seismic hazards and the risks they pose to major cities. Seismic risk has become a particular concern since the 2006 earthquake, which struck the southern province of Manica with an intensity of 7.5 in the Richter scale, causing 4 dead and 36 injured⁷. The impact was also felt on the major metropolitan city of Beira, home to 600,000 inhabitants. Seismic modeling and the development of seismic-resistant norms is an area of growing importance, particularly for the main urban centers of the central region (Quelimane, Beira and Chimoio).

Mozambique has a well developed Early Warning System. INGC holds overall coordination responsibilities for the system, but monitoring is carried out by specialized agencies. Hence, the National Directorate of Water is responsible for **flood forecasting**, in collaboration with INGC and the National Institute of Meteorology (INAM). INAM and its regional center are responsible for **cyclone monitoring**. Once Southern Africa Climate Regional Climate Outlook Forum forecasts are released, the national institutions draw specialized forecasts, and INGC launches a Contingency Plan preparation. The Technical Secretariat for Food Security and Nutrition platform (SETSAN) is responsible for the **food security early warning system**. SETSAN is composed of most ministerial institutions under the leadership of the Ministries of Agriculture and Health. It carries vulnerability surveys nationwide to assess community food insecurity and requirements for emergency relief. GTZ/Munich Re and UNDP fund specialized flood early warning systems in the basins of Save and Licungo.

A reported weakness of the early warning system is a lack of investment in the information and communications needed to properly feed the system. The flood warning system, for example, depends on the in-

7 OCHA Integrated Regional Network Report, 1 March 2006.

volvement of the national television system, radio, and local government working with flood-affected communities.⁸ The system is also hampered by lack of continuous funding, poor maintenance and lack of insurance for equipment and operations. Moreover, the process of information exchange amongst agencies is uncoordinated: for example, the National Directory of Water does not use the rainfall information available from INAM to predict expected rainfall, but instead relies on data from the U.S. Geological Survey. These weaknesses in information harmonization also permeate across the disaster risk management network. The current UNDP assistance aims to address them through an information sharing platform on disaster preparedness, contingency planning and early recovery which includes a loss data observatory.

Mozambique needs to optimize the use of its meteorological radars. Following the 2000 floods, Mozambique received two radars covering the southern (Xai-Xai) and central (Beira) regions. Each has a 300 km outreach. There is a need to invest in their further in their calibration, product development and training to optimize their application to the early warning system covering these two regions.

HFA Priority # 3. Knowledge and Capacity Enhancement for DRM

Newly created post-graduate academic programs are expected to greatly assist the development of national risk assessment and adaptation strategies. The Department of Geography at Universidade Eduardo Mondlane is carrying out a project on the application of RadarSat-1 SAR data for flood mapping in cooperation with the Canadian Space Agency and IUCN. The Department of Physics at the same University is active in research on Adaptation to Climate Change in cooperation with INGC. Nonetheless, there is still a need to support short-term international post-graduate degrees in highly specialized fields that may not be available in-country (such as hydrology modeling).

Community awareness and education projects are being carried out on a pilot basis. With GTZ support, INGC has carried out pilot awareness projects in primary schools in Buzi River, Sofala, training students and teachers in risk management. GTZ/INWENT also helped INGC prepare school training materials for pilot in Chókwe. In 2007, MICOA, in cooperation with UN Habitat, produced training materials for local communities living along river basins, using the Limpopo River as a pilot. This set of materials (“O jogo do rio”, or River Game) are used to train communities through the Local Committees for Risk Management.

There is still a need, however, for a more comprehensive public communications strategy. Most disaster risk management documents are still not written or translated into Portuguese. More effective public outreach programs need to be established in partnership with the media. INGC is presently carrying out an advocacy campaign based on sharing information with national Universities, but further efforts are needed to support public communications strategies around key disaster management themes (e.g. improved construction norms).

HFA Priority # 4. Disaster Risk Reduction and Financing

While significant progress has been done to mitigate flood impact in key basins, Mozambique needs to revise its building and infrastructure norms to take into account hazard risks. A number of flood protection measures are being adopted in the transport sector (see below), but construction regulations are out of date, do not properly take into consideration key risk such as cyclone wind or storm damage, and are weakly enforced. Technologies used by the construction industry therefore fail to protect common facilities from heavy storms and cyclones along the coast line, resulting in frequent economic damages. A revision of norms would therefore be important at the national level, both for buildings as well as for other infrastructure likely to be affected by cyclone winds, fire, flooding and seismic damage. Of particular importance would be to review standards for social infrastructure such as schools and health centers.

⁸ Interim National Progress Report on the Implementation of the Hyogo Framework for Action, 2008.

After completing a substantial number of background studies, the Government is now placing high priority on piloting risk reduction on key sectors. These include:

- (a) *Flood protection measures* such as dams, settlement protection dikes, and increased drainage in transport infrastructure. The Massingir dam recently rehabilitated in the Limpopo river prevented floods in 2008 which could have affected Chókwe and Xai-Xai Cities, and small towns along the river basin. The dam was also perceived as having protected the largest irrigation scheme in the country in Chókwe. Protection dikes have also been popular measures to protect settlements from floods: during 2007 and 2008, for example, dikes along the Zambezi were seen to have protected Luabo and Marromeu towns from inundation. New technologies for road construction using drifts and drainage have also reduced road cuts during floods. As a result, trade has become less affected and traffic has been re-established in the immediate post-disaster period, stabilizing food security and access to markets.⁹
- (b) *Water management in arid lands*, including the construction of small retention dams and ponds to increase water availability for irrigation purposes and for cattle in dry land areas. Investments in pilot adaptation measures for water management in arid lands, however, are not yet as developed as in flood-prone areas.
- (c) *Coastal erosion control measures*. These pilots are still incipient and closely linked to coastal inundation control. They are urgently needed in vulnerable coastal cities such as Beira, Maputo, Inhambane, and Quelimane. Given that the vulnerability of certain low-lying areas may leave no choice but to consider retreat, involvement of urban communities in participatory mapping is considered essential.
- (d) *Social infrastructure using safe norms*. Once hazard risk management guidelines are incorporated into building codes and infrastructure safety standards, the Government would like to promote “safe pilots” - such as model houses, schools, health centers and other social infrastructure. These would serve to show to communities and the private sector how their infrastructure can be protected against common hazards.

Mechanisms for risk financing and risk transfer are still incipient. The Government of Mozambique is presently studying mechanisms for the establishment of a prevention and disaster contingency fund, under UNDP assistance. While some preliminary work has been done in this regard, there is as of yet no clear mechanism for private or sovereign catastrophe insurance. Given the level of risk and infrastructure exposure in the coastal cities, and the likely balance between private and public damages, financial risk transfer mechanisms should be considered a priority area for future development in Mozambique.

HFA Priority # 5. Disaster Preparedness and Recovery

The National Emergency Operations Center, CENOE, under INGC, coordinates disaster response activities. CENOE is supported by a National Civil Protection Unit (UNAPROC) to assist with search and rescue activities.

INGC prepares Annual Contingency Plans in a participatory manner involving central and regional government, donors, the UN System and civil society. The Plans are prepared following the issuance of the hydro-meteorological forecast by the Meteorological National Institute in coordination the National Directorate of Water and consider four main hazards: floods, droughts, cyclones and earthquakes. They include a profile of the most vulnerable districts and priority needs.

According to the scenarios established by the Contingency Plan, pre-positioning of goods takes place in the most vulnerable and least accessible areas. The early warning mechanism is refined and a national, regional

⁹ Interim National Progress Report on the Implementation of the Hyogo Framework for Action, 2008.

and local simulation takes place, as a signal to launch Mozambique's disaster response. Training to Local Committees for Risk Management is accelerated. In addition, CTGC weekly meetings are held to exchange information among disaster risk response stakeholders. The CENOE information team is activated to monitor information sharing among all disaster risk reduction institutions, including high-level decision makers who are members of the CCGC, chaired by the Prime Minister (Figure 6). INGC, UNDP, GTZ and INWENT are currently taking the lead in financing the strengthening and training of local risk management committees and the expansion of this network to other high-risk districts.

Even though disaster response institutions are well developed in Mozambique, there is still a need to strengthen damage and loss assessment applications as a basis for reconstruction. Post disaster assessments tend to rely on rapid sectoral evaluations that typically under-estimate economic losses. Mozambique could therefore benefit from capacity building in standard Post-Disaster Needs Assessment training, particularly standard UN/ECLAC Damage, Loss and Needs Assessment. This could enable it to gradually strengthen its risk exposure data and use it as a basis for probabilistic risk assessment, risk mapping, and eventually financial risk transfer (insurance).

3. INTEGRATION OF DISASTER RISK MANAGEMENT IN DEVELOPMENT STRATEGIES

Disaster Risk Management is integrated, although not yet fully mainstreamed, into major development strategies. The Government's Five Year Plan (2005-2009) addresses some of the challenges related to disaster risk management and climate change adaptation. It identifies as priority objectives the reduction of number of human victims and amount of property loss, and it emphasizes a culture of prevention and mitigation. As part of the Plan, the Government committed to mapping zones at high risk, strengthening early warning systems, increasing resources for the prevention and mitigation of natural disasters, reinforcing capacities for inter-sector coordination, strengthening river basin management, establish a database for information on climate change trends and impacts, promote water storage systems in drought-prone areas, and increase training and civic education.

The national Second Poverty Reduction Support Strategy (PARPAII 2006-2009) recognizes disaster risk management as a cross cutting issue thereby acknowledging the need for a long-term strategy to reducing the vulnerability of communities and infrastructure exposed to extreme natural phenomena. Disasters are also part of the **Medium-Term Fiscal Framework (MTFF)**. However, the priorities identified by the Master Plan for Disaster Prevention and Mitigation were not reflected in the PARPA II. With the recent release of the NAPA and INGC's "*Study on Impact of Climate Change on Disaster Risk*," adaptation strategies are expected to be much more closely mainstreamed into the next Poverty Reduction Support Strategy which is starting to be prepared.

Disaster mitigation and enhanced resilience are specific objectives under the World Bank's Country Assistance Strategy. The Mozambique Country Partnership Strategy (2008-2011) specifies "*mitigation of risks from disasters and shocks*" as one of the objectives and "*enhanced capacity to respond to disasters*" as one of the outcomes under the pillar on Sustainable and Broad-Based Growth. The establishment of early warning and emergency preparedness systems is specified as a goal. The CPS also recognizes that future economic growth depends on the prevention of a major natural disaster. The Joint Staff Advisory Note, commenting on the PRSP progress, indicates a need to integrate disaster risk management in sectoral plans at all levels, and strengthen inter-sectoral coordination. While it compliments Government efforts in mitigating the impacts of climate shocks in 2007, it recognizes the financial limitations of the Government in facing major disasters, and therefore recommends the establishment of a National Disaster Fund, including mechanisms for risk transfer.

The Government annually provides USD \$3.5- \$5 million to INGC for disaster risk management and response, which may be increased depending on the magnitude of a disaster. This is equivalent to about 0.2 percent of the annual State Budget. The Contingency Plan is also funded by international donors. Additional resources are also allocated to other sectors for disaster risk management activities, such as irrigation schemes, small dams, construction of ponds and environmental protection.

Since 2006, provinces and districts have gradually integrated disaster risk management into their annual plans and budgets. The Government allocates direct financing to provincial and district plans in accordance with the Decentralization Law of 8/2003. District land use plans have been developed by local governments (districts) with the support of provincial governments and integrated into District Development Strategic Plans. However, regional INGC delegations are still considered to be weak and need considerable support and capacity building to respond adequately to the numerous disaster risk management challenges.

Despite these challenges, disaster risk management and adaptation to climate change have unquestionably become a central issue to economic development in Mozambique, and are expected to continue to grow in importance in the future.

4. KEY DONOR ENGAGEMENTS

Ongoing Projects and Organizations	Indicative budget (where available, details on years covered)	HFA activity area(s) ¹⁰
World Bank Projects		
Mainstreaming Disaster Reduction for Sustainable Poverty Reduction: Mozambique (GFDRR)	USD \$900,000	1, 2, 4
Economics of Adaptation to Climate Change (EACC) – Mozambique Case Study (funded by DFID and Netherlands and executed by the World Bank) will be launched shortly	US\$800,000	1, 2, 4
Pilot Program for Climate Resilience (under preparation)	USD \$30-70 million (2009-)	1,2,3,4
Donor Projects		
UN Joint Programme for Strengthening Disaster Risk Reduction and Emergency Preparedness	USD \$10 million 2007-2009	1, 2, 3, 4, 5
UN Joint Programme on Environment Mainstreaming and Adaptation to Climate Change	USD \$7 million 2008-2010	1,2,4
UNDP/GEF: Coping with Drought and Climate Change (Special Climate Change Fund)	USD \$ 1.8 million 2008-2011	1, 2, 4, 5
UNDP: Climate Risk Management Technical Assistance Support Project (CRM-TASP) (executed by Asian Disaster Preparedness Center, ADPC)	US\$2.75 million 2008-2009	1,2,4
UNDP (funded by Government of Japan Africa Adaptation Programme) Mainstreaming Climate Change Adaptation Mechanisms in Policy, Development and Investment Framework in Mozambique	US\$ 5.0 million 2009-2011	1,2,4
GTZ: PRO-GRC Institutionalizing DRR in Mozambique (<i>Projecto da Institucionalização da Gestão de Risco de Calamidades em Moçambique</i>)	USD \$ 3.9 million 2007-2009	1, 4, 5
UNDP, Denmark, GTZ: Impact of Climate Change on Disaster Risk Study (executed by INGC)	USD ~0.5 million	2
DIPECHO Projects: several disaster preparedness project implemented by UN-Habitat, Oikos, OXFAM GB & Intermon OXFAM, Concern, German Agro Action)	USD \$ ~3.1 million	1, 3, 4, 5

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Given the substantial number of donor engagements, it is essential to consider GFDRR within the broader framework of a disaster risk management and adaptation program in Mozambique. While the framework below is still preliminary and centered on Hyogo Framework for Action priorities, it helped identify areas where GFDRR was best placed to leverage its expertise and resources.

Hyogo Framework For Action Area	Major Partner	Comment
1. Policy, Strategy, and Institution Building		
Master Plan, Policy, NAPA, Regulations	UNDP	Already developed, except for law and regulations (under preparation with assistance from UNDP)
Mainstreaming DRM and Adaptation into Development	UNDP and WB/ AfDB (PPCR)	Considered to be adequately covered by UNDP and PPCR
Capacity Building	UNDP and GFDRR	UNDP to finance capacity building for CTGC and regional DRM committees GFDRR to fund specialized and academic training in DRM
2. Risk Identification, Assessment, and Monitoring		
Climate Trends, and Hazard Risks	UNDP, Denmark, GTZ, World Bank GFDRR	Completed by Stage I study. Economic impact to be completed by WB study. GFDRR to help fund Stage II Study (Adaptation Options)
Risk Mapping	UNDP/GRIP, FEWS/NET, UEM GFDRR	Risk atlas completed for Limpopo UNDP/GRIP will fund data harmonization GFDRR to fund mapping of key assets at risk
Early warning system	UNDP, GFDRR	UNDP to fund information sharing platform GFDRR to optimize use of radars in early warning
3. Education and Awareness to build a Culture of Resilience		
DRM School Education Programs	GTZ/INWENT	
Community Awareness	DIPECHO	GFDRR to fund promotion and awareness of revised norms as part of Hyogo 4 activity below.
4. Reduction of Underlying Risk Factors		
Revision of Hazard norms	GFDRR	GFDRR to help revise safety norms for earthquakes, cyclonic winds, and floods
Risk mitigation using revised infrastructure norms	GFDRR PPCR, Others	GFDRR to pilot PPCR and other larger investments to expand
Flood protection	GFDRR PPCR, Others	GFDRR to pilot along Zambeze PPCR and other larger investments to potentially expand
Water management in arid areas	GFDRR PPCR, Others	GFDRR to pilot PPCR and other larger investments to potentially expand
Fisheries adaptation	UNDP PPCR, Others	UNDP to pilot PPCR and other larger investments to potentially expand
Health adaptation	UNDP PPCR, Others	UNDP to pilot PPCR and other larger investments to potentially expand
Risk financing and Transfer	UNDP, GTZ GFDRR	UNDP and GTZ helping to develop contingency funds GFDRR to assist in exploring catastrophe insurance mechanisms
5. Strengthening Disaster Preparedness		
Emergency Preparedness	UNDP, DIPECHO	Considered to be adequately covered
Post Disaster Needs Assessment	GFDRR	Capacity Building in Damage, Loss and Needs Assessment

The program areas identified for GFDRR financing and indicative funding are listed below. Once the detailed proposal is developed, an estimated 10 percent of the budget will be earmarked for project management. The project would be Government-executed, for a duration of five years (2010-2015).

Indicative New Program Areas and Projects for GFDRR Funding	Partnerships	Indicative Budget for GFDRR Funding and years covered (USD)	Potential outcomes and comments
1. Policy, Strategy, and Institution Building			
1.A. Strategy, Policy and Institutional Coordination	INGC, UNDP, PPCR	150,000 (2010-2015)	This would be a limited budget for strategic activities of the CTGC UNDP and PPCR would take the lead role in this area.
1.B. Studies for National Program of Disaster Risk Management and Adaptation to Climate Change	INGC, UNDP, GTZ, Denmark	200,000 (2010)	This would be a complementary support to Phase II of the INGC study, focusing on risk reduction options and strategies.
1.C. Strengthened Sector Capacity in Disaster Risk Management	INGC, UNDP	350,000 (2010-2015)	UNDP would fund most of the capacity building for CTGC and regional DRM committees; GFDRR funding would focus on specialized training and seminars, and in selected master level degrees not available in Mozambique (e.g. hydrology modeling).
2. Risk Identification, Assessment and Monitoring			
2.A. Risk Mapping for Vulnerable Assets	INGC, UNDP	500,000 (2010-2013)	This financing would complement ca. US\$200,000 in UNDP/GRIP funding to enable INGC to complete its geo-referencing of vulnerable assets in key sectors (e.g. schools, health centers, transport infrastructure), and thereby build an integrated platform for risk mapping
2.B. Participatory Urban Mapping	INGC, MICOA, Urban Municipalities	150,000 (2010-2011)	This would involve participatory urban rezoning of the cities of Maxixe and Inhambane taking into account major hazards. Most of the studies would be financed by a reallocation of Track II funds (US\$400,000).
2.C. Early Warning System Radar Applications	INAM, UNDP	500,000 (2010-2013)	This would include calibration of the two existing radars of Xai-Xai and Beira, development of software, technical assistance and training to optimize their use for the early warning system serving the southern and central regions. UNDP would co-finance some of the training.

(Cont.)

Indicative New Program Areas and Projects for GFDRR Funding	Partnerships	Indicative Budget for GFDRR Funding and years covered (USD)	Potential outcomes and comments
4. Reduction of Underlying Risk Factors			
4.1. Review of Hazard Norms	INGC, MOPH, MICOA, INAM	350,000 (2010-2012)	Revised construction norms taking cyclone winds, earthquake hazards and inundation risks into account. Revised infrastructure norms taking flood risk into account
4.2. Pilot Demonstration Projects Applying New Norms	INGC, MOPH, MICOA	800,000 (2011-2014)	These would focus on social infrastructure (e.g. schools and health centers) as well as low-cost houses in highly vulnerable areas able to serve as models to stakeholders
4.3. Flood Protection for Vulnerable Communities (pilot)	MOPH, INGC, MINAG	600,000 (2010-2013)	The pilot is envisaged to focus along the Zambezi. While dykes have been the measure of choice, other flood management measures would be considered on a pilot basis
4.4. Water Management in Arid Areas (pilot)	MOPH, MINAG	600,000 (2010-2013)	This could involve small water reserves (for livestock) and other water and rain retention measures
4.5. Risk Transfer Mechanisms	Ministry of Finances, INGC, UNDP	600,000 (2010-2013)	While UNDP assistance has focuses on establishing a contingency fund, GFDRR would focus on the feasibility of catastrophe insurance (both private and sovereign mechanisms)
5. Strengthening Disaster Preparedness			
5.1. Specialized Training	INGC and CTGC UNDP	250,000 (2010-2013)	This would target primarily Damage, Losses and Needs Assessment (UN/ECLAC Methodology) as well as other specialized disaster response training. UNDP is funding most activities under Hyogo Priority 5.
Total Funding Requested from GFDRR		5,050,000	Leveraged Funding: ca. US\$58 million

SENEGAL

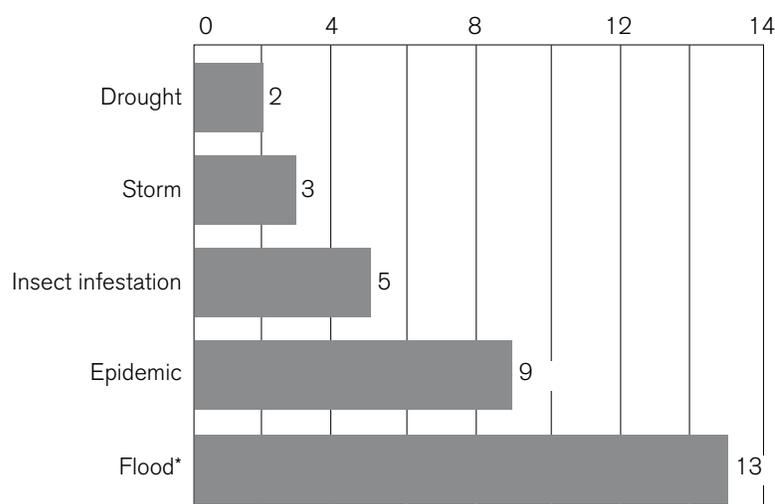


Senegal is one of the priority countries for the World Bank Disaster Risk Management (DRM) Team for year 2009-2011. The Senegal DRM Country Note is a document which will serve as a framework for investments in DRM activities in Senegal, which are expected to be about USD 5 million over a three-five year period. It identifies key gaps in the existing DRM situation and interventions, according to the five priorities of actions of the Hyogo Framework of Action (HFA)¹. It includes the overview of major risks, the overview of existing institutions, policies and investments that will provide the basis for identification of priorities, challenges, and gaps in DRM and recommendations for an indicative action plan proposed for GFDRR investments. This Country Note has been developed through a participatory process led by the Directorate of Civil Protection (DPC) which is the official institution in charge of DRM coordination, and involving main governmental and nongovernmental stakeholders in Senegal.

1. DISASTER RISK PROFILE

Senegal is vulnerable to four main natural hazards: drought, locust invasion, flooding with its often associated epidemics (figure 1)², and finally (sea level rise (storm surge) which combination with sediment deficit and human activities along the coast causes important coastal erosion. This is mainly linked to its 700 km coastline largely open to the Atlantic Ocean, its latitude position in a transition zone between Sahelian climate and Guinean climate which causes an important rainfall variation within the country, and finally the existence of two major river systems and a high potential of groundwater, very superficial in some places³. **This physical vulnerability**

Figure 1. Natural Disaster Occurrence Reported in Senegal 1982 to 2007



Source: EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium.

- 1 The five Hyogo Framework of Action (HFA) priority action areas are: 1) Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2) Identify, assess, and monitor disaster risks – and enhance early warning; 3) Use knowledge, innovation, and education to build a culture of safety and resilience at all levels; 4) Reduce the underlying risk factors; 5) strengthen disaster preparedness for effective response at all levels.
- 2 Do not include 2009 disaster situation data.
- 3 «ADM (Municipal Development Agency) – PRECOL (Local Collectivities Equipment and Strengthening Program): Framework for Social and Environmental Management (CGES)» - final report May 2005 – Mbaye Mbengue FAYE ».

is exacerbated by: a low economic development with GDP per capita of US\$710 in 2005⁴, and a low UNDP's Human Development Index, ranking Senegal at 156 (with 0.499) among 177 countries in 2005⁵; a dependence on non irrigated rain-fed agriculture; and a land-use planning failure. Senegal's current population of almost 11 million is distributed very unevenly across the country. As a result of enduring internal migration, Senegal's population was already over 48 percent urban in 2001. Over 76% of this urban population lived in areas classified as slums, which were growing at over 4 percent p.a.⁶.

In 28 years (1980-2008), floods have affected over 600 000 people, killed over 45 people and caused damage estimated at over USD 42 Million⁷. Occurring in both urban and rural areas, floods affect all the country's 11 regions but particularly 7: Dakar, Saint Louis, Matam, Kaolack, Thies, Diourbel and Tambacounda⁸. They have various causes: flood and rivers overflowing (of main rivers such as Gambia river and Senegal river) following heavy rains (Saint Louis and Matam), or a combination of high rainfall and a lack of drainage infrastructure (Kaolack) or the sea flooding causing salinization of arable land (Saloum Delta region)⁹. In urban areas like Dakar, the underlying causes of the recurrent floods are complex and involve not only the recent increase of rainfalls, but also the lack of efficient rainwater drainage systems, the rising groundwater, the uncontrolled urban sprawl and the occupation of depressions and wetlands areas. They affect people, often poor in suburban areas every year. In 2008, floods have affected over 250 000 families and caused extensive damage, with 88 schools and 12 basic health centers under water. In late August 2009, due to heavy rainfall severe floods affected again Senegal¹⁰. Underequipped and low-lying peri urban areas were the most affected and according to the Ministry of Interior, and it seems that the situation is worse than in 2008. The number of affected people in 2009 represents about 43% of the total number of affected people during the last 28 years (1980-2008)¹¹.

Drought affects mainly arid and semi-arid Sahelian areas in the northern part of Senegal. In 25 years, until 2002, the country has experienced six years of major shocks in terms of rainfall, characterized by the late arrival of rains, an irregular spatial distribution and an early end of the rainy season¹². They caused a considerable decline in crop yields with losses of about 17.4 to 68.4 billion FCFA¹³ for peanuts and 12 to 30 billion FCFA¹⁴ of revenue for the millet/sorghum¹⁵. The degradation of soil quality and other factors contribute also to the occurrence of droughts. Even in normal times, the duration of the dry season increases from 5 and 9 months, from the South to the North. The precipitation also is varying from about 1000 mm per year in the South to less than 300 mm per year in the North¹⁶.

Senegal undergoes regular locust invasions, originated from breeding areas located in neighboring countries: Mauritania, Niger, Chad and Senegal. In June 2004, the locust plague has covered an estimated area of 1 million hectares¹⁷. It has affected all the 11 regions of the country but more severely 7 regions: Saint Louis, Diourbel,

4 CAS World Bank: 2007-2011.

5 "Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a divided world" – UNDP.

6 "Preparing to manage natural hazards and climate change risks in Dakar, Senegal: a spatial and institutional approach 6 Pilot Study Report" – June 2009 – World Bank – The Géoville Group – Institut Africain de Gestion Urbaine

7 EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium

8 Plan National de Contingence (National Contingency Plan)

9 SNPSGR (National Strategy for Social Protection and Risk Management 2006-2010).

10 PRSP Annual Review – Summary Report – Final version – July 2009.

11 Calculation using OFDA-CRED-EMDAT data on CRED website (Nov 2009).

12 National Strategy for Social Protection and Risk Management (2006-2010).

13 About USD 40 to 159 million (for 1USD = FCFA 430)

14 About USD 27 to 69 million (for 1USD = FCFA 430)

15 National Strategy for Social Protection and Risk Management (2006-2010).

16 «ADM (Municipal Development Agency) – PRECOL (Local Collectivities Equipment and Strengthening Program): Framework for Social and Environmental Management (CGES)» – final report May 2005 – Mbaye Mbengue FAYE ».

17 Information Note on AELP Project (African Emergency Locust Project) – For the Minister of Agriculture and Aquaculture (May 2009/AELP project).

Thies, Matam, Fatick, Louga and Dakar¹⁸. The loss of basic production was about 22 percent including 34 percent for millet and 30% for sorghum¹⁹. The overall loss of agricultural production is estimated at less than 50,000 tons equivalent to a loss of about 7 billion CFA francs²⁰. Fighting locusts cost 1 1.868 billion FCFA with 4 billion from the Government²¹.

From its combination with sediment deficit, natural instability of slopes, surface runoff, and mainly with human activities along the coast, rising sea level, causes coastal erosion which is a very serious threat for the population and the economy of Senegal. It threatens 74% of households in Senegal living in coastal areas and economic activities undertaken: fishing, tourism, agriculture. Human activities along the coast are main triggering and aggravating factors of coastal erosion²². They include the removal of sand and other sediment on the coast, building constructions on the beaches as well as building structures perpendicular to the coast that hinder sedimentary transits. The observed decline rate of the shoreline varies between 1 to 2 m per year for sandy beaches. More important rate is recorded in exceptional circumstances, such as the opening of the Lagoba breach in the Sangomar arrow (rate of 100 to 150 m/year; Diara, 1999) but they are usually followed by stabilization. Saint-Louis and the Mbao-Bargay are among the most affected by coastal erosion²³.

Climate change has influenced and will influence negatively the availability of water resources, agriculture and coastal zones²⁴. According to studies, the overall rainfall quantity has decreased by 35%, combined with a decrease in the duration of the rainy period and a decrease in the frequency of rainy days between the period 1950-1965 and 1970-1995. A downward trend in groundwater levels was also noted in the last 30 years of drought (1968-1998). The vulnerability is mainly due to the high dependence of Senegalese agriculture to a rarefying rainfall over time for which, variability is difficult to predict. Research predicts a warming of about 2 to 4 ° C, a decrease in cloud cover of 5 to 10% and correspondingly, a in rainfall decrease of 5 to 25%. In 2100, there would be a decrease of the ground water level ranging from 5m (for an average climate sensitivity baseline scenario) to 10 m (for a high sensitivity scenario of doubling of the current rainfall deficit). This requires better management of water resources, through the revitalization of the river and protection of available water reserves, and a strengthening of the fight against drought and desertification with the use of appropriate agriculture technologies. It is expected that climate change will increase coastal erosion, flooding of low-lying coastal areas²⁵, and salinization of soil and water with the risk of loss of mangroves.

18 Mission of formulation and conception of the National Program of Prevention and Reduction of Major Risks and Natural Disasters Management: major risks context analysis in Senegal and strategic orientations for the reduction of risks and disasters – Stage 1: Formulation» – December 2008 – PAPNGRC/DPC/MGP

19 Compared to the average production during the past 5 years: National Strategy for Social Protection and Risk Management (2006-2010).

20 National Strategy for Social Protection and Risk Management (2006-2010) – About USD 16 million (for 1USD = FCFA 430)

21 Information Note on AELP Project (African Emergency Locust Project) – For the Minister of Agriculture and Aquaculture (May 2009/AELP project) – so, about respectively 27 and 9 million (for 1USD = FCFA 430).

22 Formulation of a National Integrated Program of Fight against Coastal Erosion” – Final Report – January 2008 – Ministry of Environment and Protection of Nature, Retention Basins and Artificial Lakes – Direction of Environment and Classified Establishments– Senegalese Society for Natural Resources Operation – Senior Consultants Associates.

23 NAPA or National Action Plan for Adaptation to Climate Change

24 All data presented in this section is from NAPA.

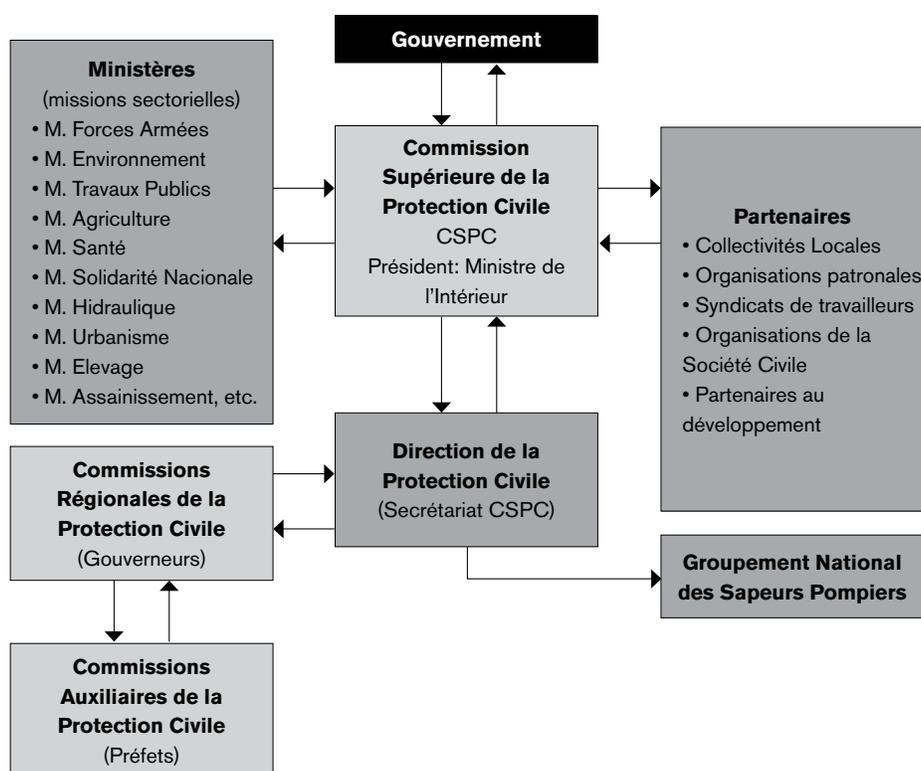
25 The possible positive impact of rainfall decrease on the reduction of flooding occurrence and intensity is not mentioned in the various available studies on climate change impacts.

2. ACTIVITIES UNDER HYOGO FRAMEWORK OF ACTION

2.1. Policy, Institutional Capacity and Consensus Building

Chaired by the Minister of Interior, the High Commission for Civil Protection is the consultative organ in the field of civil defense, especially for disaster prevention and management²⁶ (figure 2). In charge of advising the Minister of Interior on all civil protection issues, it contributes to the coordination of sectoral activities for disaster prevention and relief organization. Its members include representatives of all ministries. The High Commission is also responsible of examining the implementation conditions of laws and decrees related to civil protection, and for ensuring the execution of tasks assigned to its decentralized branches which are the Regional Civil Protection Commissions headed by the Governors, and the Auxiliary Civil Protection Commissions²⁷ headed by the Prefects.

Figure 2. Disaster Risk management Coordination Scheme in Senegal



Specialized department within the Ministry of Interior, the Directorate of Civil Protection (DPC) is the focal point in charge of the coordination of risk and disaster prevention and management activities within the country. Executive arm of the Minister of Interior for civil protection matters, the DPC acts also as the secretariat of the High Commission of Civil Protection²⁸, and then its operational body (figure 2). DPC is responsible for ensuring the protection of people and the conservation of public and private facilities and resources²⁹. Its main tasks include the development of legislation regulating the field of civil protection in Senegal. It is also in charge of the identification and the mobilization of additional resources to be engaged to support the rescue teams in times of

26 Decree N° 99-158 - 22 February 1999

27 Commissions Régionales et Auxiliaires de Protection Civile

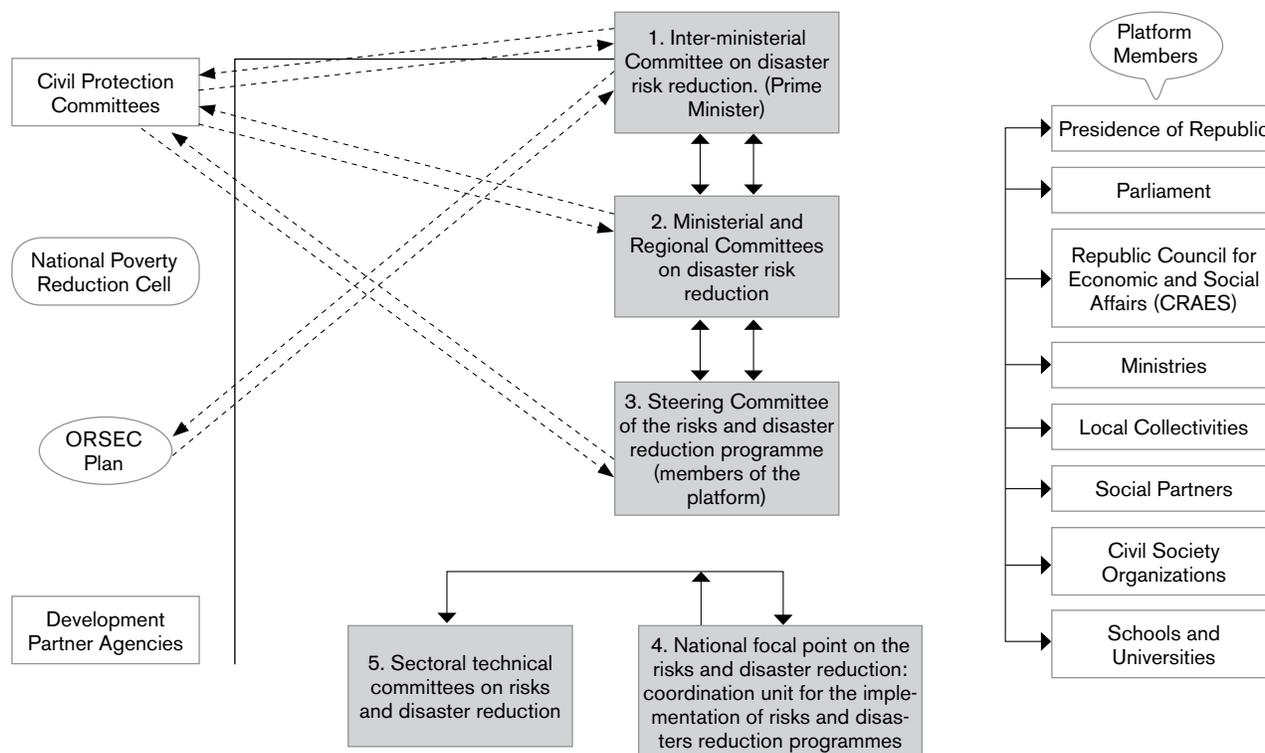
28 Commission Supérieure de la Protection Civile

29 Decree n° 64-563 – 30 July 1964, completed by decision n° 539/MINT - 12 January 1990.

disaster. The DPC chairs the Sub commission “Intervention Plans” of the High Commission of Civil Protection³⁰ and is the coordinator of the National Committee in charge of managing the Relief Organization (ORSEC) Plan Means³¹.

Chaired by the Prime Minister, a National Platform for the Prevention and the Reduction of Major Disaster Risks³² (figure 3) has been recently established (2008)³³. Through its Inter-ministerial Committee for disaster risk reduction, the National Platform is responsible for promoting the sustainable integration of the prevention and disaster risk reduction dimension into development policies, plans and strategies of good governance and poverty reduction. It is also in charge of validating the national disaster risks prevention and reduction program which is the medium term vision in the field, and of ensuring the effective articulation of the Poverty Reduction Strategy Program (PRSP) and the disaster risk reduction Program. Composed of five bodies (figure 3) it includes as members representatives of all ministries.

Figure 3. Senegal National Platform for Disaster Risk Reduction



Source: Gueye, Ndèye Fatou D. African Urban Management Institute (IAGU). Hotspot Characterization and Assessment of Institutional Capacities in Peri-Urban Areas of Dakar, Senegal. February 2009.

Floods are current stated priority of the Government. Numerous inter ministerial structures have been established to address floods issues. Recently, the creation of a High Commissariat in charge of Flooding was announced following 2009 floods. Practically, following each catastrophic flood event, a structure grouping all concerned sectoral institutions were set up, such as: in 2001, the National Commission for the Forecast Management

30 Sous-commission Plans d'Intervention

31 Comité national de gestion des moyens du plan ORSEC

32 Une plateforme nationale pour la prévention et la réduction des risques majeurs de catastrophes

33 Decree n° 2008-211 - 4 March 2008

of Floods (CONAGPI)³⁴, coordinated by the Ministry of Urbanization and Land Use Planning - in 2003, a National Unit for the Prevention and the Fight against Floods (CNLPI)³⁵ headed by the Ministry of Interior and Local Collectivities - in 2007, a National Commission for Prevention, Supervision and Monitoring of the Fight against Flooding headed by the Prime Minister³⁶ - and finally, following the 2009 floods, a High Commissariat in charge of Flooding, will be created as stated by the State Minister, Minister for Urban Development, Housing, Hydraulics, and Sanitation³⁷. The last one would be responsible for the definitive resolution of the flooding problems in the country. All those structures are grouping practically the same institutions and ministries concerned by floods issues.

In 2005, Senegal developed a National Strategy for Social Protection and Risk Management (SNPS / GR), covering the period 2006-2010, in which the “management of major risks and disasters” is the fourth pillar. Its main aim is to reduce the impact of shocks directly threatening the population, especially the most vulnerable groups by helping households to better manage the risks that could lead to the irreversible loss of life or capital and to promote access of the most vulnerable segments of the population to basic social facilities.

In 2009, Senegal is currently developing a “National Program of Prevention and Reduction of Major Risks and Natural Disasters Management” through a process led by the Ministry of Interior through the Directorate of Civil Protection (DPC), which would serve as the operational framework for interventions in the field of DRM. The PRSP and a preliminary study for the formulation of this national program states its four components: (i) legal and institutional framework strengthening – (ii) disaster risk prevention and reduction (DRR) – (iii) national and local capacities strengthening in terms of preparedness and disaster response – and (iv) implementation of communication strategies for DRR. Expected to be completed at the end of 2009, the development of this National Program would be followed by a round table meeting with potential donors for resource mobilization purpose.

The National Action Plan for Adaptation to Climate Change (NAPA) in Senegal was developed in 2006 by the Ministry of Environment and Nature Protection. Developed following an analysis of vulnerable sectors to climate change, through a participatory process within a multi-disciplinary team, the NAPA identified 4 priority programs related to: (i) agro forestry development; (ii) rational use of water; (iii) coastal protection; and (iv) public education and awareness rising. From the NAPA, several projects have been designed and funded by various technical and financial partners, including projects: for reducing vulnerability to climate change, focusing on the integration of climate change into the national planning, on the agriculture, on the use of coastal areas but also on coastal erosion and on local environment with a territorial approach, etc³⁸. The country is planning to revise its strategy in terms of adaptation to climate change³⁹.

Despite the efforts and progress made by the country, a number of challenges need to be addressed.

DRM mechanism is not fully successful due to the institutional scheme complexity and lack of clarity, the weakness of the supporting legal, regulatory and operational mechanisms, and to the stakeholder’s ignorance of the current DRM organization. Defining a more appropriate rationalized institutional framework, with a strengthened supporting legal, regulatory and operational frameworks and tools, combined with the promotion of stronger stakeholders’ information, awareness and involvement, are key

34 Commission Nationale de Gestion Prévisionnelle des Inondations (CONAGPI) : created by Prime Minister’s « arrêté » n°006124 - 01/07/2001

35 Cellule Nationale de Prévention et de Lutte contre les Inondations (CNPLI) : created from Decision of the President of the Republic – Decree N° 2003-685 - 12/09/2003, modified by Decree N° 2004-1153 - 18/08/ 2004

36 Commission Nationale de Prévention, de Supervision et de Suivi de la Lutte contre les Inondations : created by «arrêté » n° 006440 - 16/07/2007.

37 « Quotidien Le Soleil (Sénégal) - Article intitulé : « Oumar Sarr au Conseil Economique et Social : Un Haut commissariat contre les inondations annoncé » (24/09/09) by E. KALY ».

38 Directorate of Environment and Classified Establishments (DEEC) - Ministry of Environment.

39 Directorate of Environment and Classified Establishments (DEEC) - Ministry of Environment.

needs. The respective mandates and roles of the various existing structures and institutions within the DRM system and the links between them are not often clearly defined and formalized, such as the formal operational and/or hierarchical links between the National Platform and the High Commission of Civil Protection. The weakness of tools and operating mechanisms limits an effective operationalization of the institutional arrangements and mechanisms put in place, and does not allow a clear coordination between stakeholders, vertically (between the central, regional, departmental and local levels) and horizontally (across sectors, and between inter ministerial structures). The existing legislation and regulations contribute to the implementation of disaster and risk management but does not cover systematically all the required aspects for operationalizing the mechanism. Number of stakeholders does not know exactly the existing DRM mechanism and their responsibilities within it.

For floods management specific case, all the above mentioned statements apply. The various established structures seemed to be not operational as the years go by, despite legal texts putting them in place. No clear one strong specialized institution has been officially mandated to take the technical lead.

Directorate of Civil Protection (DPC)'s current structure and profile are weak and do not allow it to effectively implement its mandate of coordination, mobilization and facilitation of interventions and sectoral actors involved in Disaster and Risk Management (DRM). Defining more appropriate DPC's profile and structure, for both central and decentralized levels, through its reform and its technical, organizational and material capacity strengthening, are priority needs. Its anchorage as a directorate within the Ministry of Interior makes it difficult to mobilize stakeholders in other ministries, which are often of a higher level (often Directorate General level). Moreover, its internal organization and human resources current profile seem primarily oriented towards the implementation of prevention and relief operations on the ground. But they seem fairly limited to implement more conceptual, multisectoral and systemic vision and approach, for a medium and long terms disaster and risk reduction. At the decentralized level, there are no Civil Protection regional or communal offices, representing the DPC. Its mandates and missions are there implemented, within the Regional and Auxiliary Civil Protection Commissions, by the decentralized representatives of the Fire Brigades National Group, which are mostly operational structures. Authorities recognized already the DPC's institutional weakness and planned to implement measures, including the reform of the DPC as a Directorate General⁴⁰.

Local disaster risk management is still weak because of a weak decentralization of DRM capacities and resources to local authorities. Defining clearly the local authorities' responsibilities, strengthening their capacity to successfully implement them, and promoting local populations and stakeholders' awareness and commitment are crucial needs. Local authorities, mainly decentralized territorial collectivities at communal level, do not have sufficient capacity to implement the mandates and tasks assigned and transferred to them. There is mainly a lack of knowledge, operational concrete tools, guiding reference and models, financial and material resources, which will need to be notably enhanced. Given specifically their responsibility in aggravating flooding in some high flood prone areas, local authorities should be provided with adequate technical capacity to better control factors which could cause or exacerbate flooding at the local level (land use planning, sanitation, drainage, and soil occupancy). Defining at the local level, a more clarified DRM institutional mechanism, with the appropriate supporting legal, regulatory and operational framework, modalities and tools, would be also a preliminary priority that should be addressed within a more comprehensive framework of the national DRM institutional mechanism, above-mentioned.

2.2. Disaster Risk Assessment, Monitoring and Early warning:

Senegal has a relatively strong capacity and experience for the regular assessment and monitoring of risks related to drought and locusts' invasion, but remains weak for flooding and coastal erosion.

⁴⁰ Announced (to the mission) by the General Secretary of the Ministry of Interior.

Mechanisms are in place to ensure regular assessment, monitoring of drought levels and trends, and early warning, mainly: (i) the Information System on Desertification/System of Information and Monitoring of Senegal Environment (SID/SISEI)⁴¹ which aims among others to facilitate the monitoring of desertification and environmental degradation, to assess the impact of projects against desertification, to provide and measure the impact of disasters related to drought and to allow access to data and information⁴² - (ii) the Center for Ecological Monitoring (CSE) which ensures regular monitoring of Senegal environment, particularly plant and animal resources, using monitoring tools like satellite imagery combined with field work, which results are recorded in an environment database feeding a Geographic Information System, and (iii) the Committee of the Permanent Inter-State Committee for the Fight against Drought in the Sahel (CILSS), with a mandate to invest in research for food security and the fight against the effects of drought and desertification for a new ecological balance, which coordinates through its National Coordination (CONA CILSS), crop and food situation assessment and monitoring missions in relationship with the FAO, WFP and FEWS-NET (USAID), providing then a framework for understanding of impacts on individual households or groups of current or potential shocks including drought.

The National Committee for the Fight against Locust Invasion⁴³ carries out analysis and regularly follows the locust situation. This Committee is coordinated by the Directorate of Plant Protection⁴⁴, of the Ministry of Agriculture. **The National Agency of Meteorology carries out regular monitoring and analysis of temperature and rainfall for drought, floods and locust invasion assessment and monitoring uses. But rainfall forecast data accuracy and coverage need to be strengthened.** Discrepancies between rainfall forecast and actually reported rainfall were sometimes observed. Data calibration is thus necessary to ensure a better adaptation of the general data used by the agency to real Senegal specific context and situations. More synoptic observation stations might also be needed to enhance coverage of data collection on the ground.

The Directorate of Water Resources Management and Planning carries out regular hydrologic situation analysis and monitoring (rainwater, rivers, and groundwater)⁴⁵. But data accuracy and the coverage need to be strengthened. The existing hydrologic forecasting system would need to be formalized and hydrologic observation geographical coverage would need to be improved to optimize hydrologic monitoring quality. Existing observation stations are currently limited to a few important river courses⁴⁶.

Collaboration between the National Agency of Meteorology and the Directorate of Water Resources Management and Planning should be enhanced through the development of consolidated hydro-meteorological products, allowing the optimal use of both hydraulic and climatologic data. Currently those two institutions provide data to institutions in charge of drought, floods and locust situation monitoring, separately without real cooperation.

Significant efforts have been made in risk assessment and mapping, but they need to be strengthened for flooding and coastal erosion, by a more accessible, complete and dynamic risk atlas, including a comprehensive hazard and vulnerability spatial analysis (geo referenced).

Regarding drought risk, maps on crop production monitoring, pastoral monitoring and agricultural monitoring are regularly produced by the Center for Ecological Monitoring⁴⁷ (CSE). These maps provide

41 Système d'Informations sur la Désertification/Système d'Information et de Suivi sur l'Environnement du Sénégal

42 Multi source, multi format, multi scale, multi media using classical and modern communication and information means (hard and electronic supports: CD ROM, internet).

43 Le Comité National de Lutte Anti Acridienne

44 Direction de la Protection des Végétaux

45 Through mainly its Hydrologic Division.

46 Even sometimes underequipped, such as limnometric stations (stations limnométriques) for the Gambia River.

47 Centre de Suivi Ecologique

information on drought situation, enabling to monitor its evolution and to identify appropriate anticipatory and corrective measures regarding agriculture and farming.

Regarding coastal erosion, some vulnerability analysis and risk mapping initiatives have been undertaken. But they will need to be completed and capitalized to get full spatial risk analysis and assessment.

Vulnerability analysis carried out in the framework of NAPA preparation process (1998) allowed identifying risk prone areas, understanding the development mechanisms of coastal erosion in these areas and its consequences, and having estimates of the potential impacts of a sea level rising, based on different scenarios. A spatial analysis of coastal erosion risk for the capital Dakar was carried out through a pilot study on a spatial and institutional approach of DRM⁴⁸ using new tools of spatial analysis based on geographic information system (GIS) data. Other studies and mapping were undertaken for specific vulnerable areas, mainly Saly Portudal and the Senegal estuary by the CSE⁴⁹.

Regarding flooding, some floods risk mapping initiatives have been carried out. But they will need to be completed and capitalized to get a full flood risk spatial analysis and assessment. Coordinated by DPC,

an inventory of flood prone areas has been carried out in 2002 in order to identify the nature of these risks and the preventive measures to implement and to proceed to their mapping. In 2009, DPC⁵⁰ proceeds to the development of a methodology for flood risk mapping and its application to the regional level in the Dakar region. The new risk spatial analysis tools based on GIS data were also applied for floods in Dakar (the same mentioned pilot study). The Ministry of land use planning would be also having developed flood prone areas mapping in Dakar region.

The development of a Geographic Information System for disaster and risk management (GIS for DRM), multi hazard but focusing initially on floods, including complete analysis of hazard, vulnerability and likely impacts according to scenarios, is a key identified need.

Free of access for everybody, this GIS for DRM should provide a risk analysis and mapping covering the national territory to get a comprehensive overview. But it should be established for the local level (city level, or at least communal level) to really serve as an effective decision-making and planning tool. It should also include detailed information on infrastructures vulnerability such as roads, housing, electricity, sanitation, and a detailed information and analysis of probable socio-economic impact according to developed scenarios. The development, from this year, of a National Geomatics Plan⁵¹ would be a good opportunity to promoting collaboration and sustainability as it aims to create a harmonized framework for the production and dissemination of geo spatial referenced data in Senegal.

Early Warning System (EWS) is operational for drought and locust invasion but is weak for flooding. Setting up an appropriate effective flood early warning system, and a permanent, multi hazard early warning coordination and monitoring Unit to ensure optimal success, use and coordination of all established specific early warning systems, is a key expressed need.

To this end, the Government, through DPC carried out a study in 2008⁵² to make a proposal on their missions, organization, structure, functioning and operating procedures.

Regarding the Early warning coordinating and monitoring Unit, most of the stakeholders recognize the need of such a proposed structure, which plays a key facilitating and coordinating roles. But support was

48 Pilot study entitled "Preparing to manage natural hazards and climate change risks in Dakar, Senegal: a spatial and institutional approach" carried out through GFDRR Funding.

49 Studies entitled: "Study and mapping of the coastal erosion phenomenon in the area of Saly Portudal" and "The sea-level rise: the Senegal estuary, a vulnerable area".

50 With UNDP's support

51 This work will be fulfilled within an Inter Institutional Coordination and Consultation Group (Groupe interinstitutionnel de Coordination et de Concertation) coordinated by the State Data Processing Agency who chairs the Steering Committee.

52 Study entitled "the Early Warning System for floods, industrial accidents and maritime disasters" was conducted by the DPC and its support project in September 2008.

requested for the preliminary identification of gaps and needs in the field of EWS and for the identification of the subsequent responsibilities and tasks of such a structure, and the adapted mechanism for coordination with other existing warning systems related to specific hazards or themes (such as the EWS related to locust invasion, wildfire, food security, etc.). This would be necessary to ensure consistency with country realities.

Official flooding early warning system is still weak. In addition to traditional mechanism, civil society such as the network of women leaders involved in DRM, are still playing key roles in the transmission of alerts to the population and even to the authorities when necessary. Setting up an appropriate, formalized flooding EWS is thus a key priority⁵³. It is crucial to ensure that this flooding EWS would be able to develop and maintain a formalized and efficient local EWS. It should be institutionalized and based on a clear established mechanism, involving concerned local authorities, and specialized technical officers at all levels (local collectivities, central and decentralized technical departments, regional development agents⁵⁴, etc.) But it should also include all stakeholders including media, civil society, community leaders and private sector, who could play a role in the collection, analysis and transmission of the alert to people and designed departments, as well as in the implementation of response/reaction measures following the warning reception.

Regular simulation exercises should be carried out, to ensure ownership of the required reactions following the reception of an alert. Collaboration with the National Meteorology Agency, the Directorate of Water resources management and Planning, and the local media, for the development of messages and warning information easily understandable and usable by the community and their transmission to the village level should be strengthened.

2.3. Knowledge and Capacity Enhancement for DRM

Some Disaster risk management (DRM) Training initiatives targeting various audiences were undertaken in Senegal with support from partners. DPC provided DRM training sessions for: the members of the Network of Parliamentarians involved in DRM, the members of the women leaders in DRM Network, municipal technicians, territorial administration staff, elected officials and other policy stakeholders, partners of the Municipal Development Agency (ADM)⁵⁵. **An action plan for integrating DRM teaching in the curriculum at primary and secondary education was prepared** by a multisectoral committee chaired by the Ministry of Education, under the coordination of the DPC. It would be implemented within the framework of the future National Program of Prevention and Reduction of Major Risks and Natural Disasters Management.

A National Center of Civil Protection exists in Senegal, but has no local premises. It offered annual training courses with the support of the International Organization of Civil Protection (OIPC). The DPC's support project would provide support for the effective implementation of this training center. **A training seminar on "crisis communications"** was organized by the DPC **for the press and communication officers** from several governmental agencies and departments (police, armies, national group of firefighters, ministries) and for thirty press bodies. **There is currently no disaster risk management specialized university training in Senegal**, but training modules relating to specific sectoral aspects and techniques of risk reduction are an integral part of training curricula.

⁵³ Such as for Gambia River overflowing following 2009 Floods experience.

⁵⁴ Agents de Développement Régional (ARD).

⁵⁵ Agence de Développement Municipal.

Research Centers and Institutes contribute to disaster and risk reduction in Senegal. Research results contributed to convince authorities to adopt concrete measures promoting the preservation of marine/coastal sand and the use of sustainable and profitable alternative. Among those relevant researches which aim at reducing pressure on the coastal and marine sands, there are⁵⁶: (i) The geotechnical characteristics studies of various substitution sands, particularly sand hill (dune sand), conducted by the Directorate of Mines and Geology, which showed that reserves are available in the border areas of Niayes zones, outside the casuarinas trees areas; and (ii) the studies and experiments on recycling of rubble from old buildings demolition, and on valorization of local materials and careers debris uses, conducted by the Experimental Center of Researches and Studies for Equipment (CEREEQ)⁵⁷.

Then, **the Direction of Environment and Classified Establishments provided instructions, for the preparation of regional action Plans to combat illegal extraction of marine/coastal sand** by the regional Divisions of Environment which have coastline. The action Plan for Dakar region has been validated in last August 2009.

Despite these achievements, it seems that awareness directly targeting local vulnerable populations was not yet carried out systematically. A communication and awareness Plan should be developed and clearly established to cover those populations and all relevant stakeholders not yet covered. Clear messages, with content tailored to the targets' needs and profiles, should be sent with the adapted format, through the appropriate support. The training modules developed till now for local authorities' awareness raising are a possible starting point, but their content and structure will need beforehand an important improvement and adaptation to optimize their understanding and ease of use by the target. The dissemination of research results should be strengthened, especially to policy makers to enable their transformation into practical decision.

2.4. Disaster Risk Reduction and Financing

Interventions aiming specifically at reducing drought underlying risk factors and consequences (including desertification), are implemented in Senegal, mainly in the areas of: environment and natural resources management, including water resource management, sustainable land and soil management, agriculture, energy and food security. They are mainly carried out through the implementation of the National Program of Actions of Fight against Desertification (PANLCD)⁵⁸ and the National Environmental Action Plan (PNAE)⁵⁹. They are also implemented through the continental Program of Green Great Wall in the Sahel and Sahara (GMV)⁶⁰, of 7,000 km long and 15 km wide, from Dakar to Djibouti, for which Senegal is in charge of coordination. It aims at strengthening implementation of existing continental frameworks and action plans for the fight against soil degradation threats and desertification, and its mechanisms include the detailed Program for agriculture development in Africa (PDDAA)⁶¹ and the regional, sub regional and national Programs of actions to fight against desertification (RAP, SRAP and NAP)⁶². Soil erosion slowing down, degraded soils restructuring, reforestation increasing rate with eco-climatic balance and biodiversity restoration, and water supply sources control,

56 "Formulation of a National Integrated Program of Fight against Coastal Erosion" – Final Report – January 2008 – Ministry of Environment and Protection of Nature, Retention Basins and Artificial Lakes – Direction of Environment and Classified Establishments– Senegalese Society for Natural Resources Operation – Senior Consultants Associates.

57 Centre Expérimental de Recherches et d'Etudes pour l'Équipement.

58 Programme National d'Actions de Lutte contre la Désertification

59 Plan National d'Actions Environnementales

60 Programme Grande muraille verte au Sahel et au Sahara

61 Programme détaillé pour le développement de l'agriculture en Afrique

62 Programmes régionaux, sous-régionaux et nationaux d'action pour la lutte contre la désertification

are among its objectives⁶³. The initial phase would begin soon, waiting for financial resources. But Senegal already built about 525 km of the great green wall, and decided to develop about 250 rainwater ponds along the wall⁶⁴.

While drought and desertification issues are sustainably addressed, the long-term reduction of floods risk and coastal erosion needs to be enhanced.

Protection against flooding is stated as a current priority by the Government. A “short and medium terms Program for protection of communities at risk of flooding by rain water and/or overflowing river” was developed in 2005. Expected to be carried out over a period of 5 years (until 2010), its implementation is not yet starting now. It proposes measures for sustainable prevention and protection of the population in the eleven regions of Senegal, such as the construction and rehabilitation of protection dikes, the development of hillside ponds, the establishment of sewage systems, the transfer of villages at risk of flooding, the construction, repair and rehabilitation of some bridges and roads, to avoid the isolation of risk prone areas - and the strengthening of pumping equipment. Its implementation would require further investigations and evaluations.

A project intending to develop a Liquid Sanitation (sewerage) Master Plan for Dakar Region, on the horizon 2025, is currently being prepared by the National Office of Sanitation (ONAS)⁶⁵. It would consist in technical assistance for carrying out a study updating the sanitation master plan of Dakar and its surroundings, developed in October 1994 (horizon 2010) with funding from Japan (JICA)⁶⁶. It is expected that during the project implementation process, protective measures against flooding will be assessed and a protection system (primary pipeline/channels, infiltration areas, retention basins, etc.) to complement sewage evacuation measures, will be proposed. This study undertaken by ONAS is timely welcome following the recent floods experienced by Senegal.

However, since the flooding problem is multisectoral, it requires integrated solutions through the development of a comprehensive framework of medium and long term integrated solution to flooding (integrated program). Thus, it is important to seize the momentum generated by this study to gather and mobilize all concerned sectoral actors to this end (in sectors such as: urban planning, land use management, environment, water, roads and other infrastructure, waste management, etc.). Support for funding complementary studies in this regard, which themes are still to be determined, might be required.

Senegal adopted in 2008 a “National Strategy for the Protection and the Fight against Coastal and Marine Erosion”, which corresponds to an integrated view of protection of its coastline⁶⁷. This strategy intends (i) to minimize the damage caused by the phenomenon, and (ii) to identify and apply institutional, regulatory and structural measures that will address some human causes of coastal erosion, like construction on beaches and marine/coastal sand extraction. It has been formulated within the framework of a National Integrated Program of Fight against Coastal Erosion, with six (6) strategic axes/pillars, namely: (i) Design a master plan for coastal development and planning, (ii) Ensure the consistency of institutional arrangements, (iii) Master the coastal erosion phenomenon through research and development activities, (iv) Develop a Coastal Observatory, (v) Build diversified infrastructures adapted to each local

63 « Programme Grande Muraille Verte au Sahel et au Sahara – Plan d'Action 2008-2010 » - African Union and Sahelo-Saharan States Community – on http://www.cen-sad.org/new/dmdocuments/Reunions/Tripoli_4th_MinistersofAgr/ActionPlan_GGWS_fr.doc

64 Speech of the President of the Republic of Senegal during the General Debate of the 64th ordinary United Nations General Assembly – New York, September 24, 2009.

65 «Terms of Reference: Study for the Updating of the Liquid Sanitation (Sewerage) Master Plan of Dakar (horizon 2025)” - 2009/S 33-047410, TA2009003 SNIF2 » - BEI – ONAS - project title: Sanitation of Dakar – 26 June 2009.

66 Scheduled to begin in November 2009, for a maximum duration of 14 months, the study would cover the entire Dakar region, except Rufisque department

67 “Formulation of a National Integrated Program for Fight against coastal erosion” - Final Report - January 2008 - Ministry of Environment, Nature Protection, Retention Basins and Artificial Lakes / Directorate of Environment and Classified Establishments - Senegalese Company for Natural Resources Operation - Senior Consultants Associates.

situation, (vi) Strengthen the capacity for monitoring those infrastructures. To implement this vision, through the Integrated Program, a priority actions framework and an action Plan with several phases (short, medium and long terms)⁶⁸, have been developed.

Capacity strengthening and technical support, and accompaniment for the implementation of this National Strategy for the Protection and the Fight against Coastal and Marine Erosion, have been expressed by the lead institution and stakeholders. This support/ accompaniment could include: (i) financing one phase among those in the proposed action Plan, (ii) financing feasibility studies for technical solutions in specific vulnerable sites, (iii) providing high level technical assistance, to strengthen and optimize the national implementation team, (iv) supporting the development of land use management master plans for vulnerable areas, (v) implementing some measures accompanying interventions to fight against the human causes of coastal erosion, especially against the illegal extraction of marine/coastal sand, and finally (vi) implementing a coastal erosion integrated management pilot project.

Financing mechanisms for disaster and risk management exist in Senegal, but often cumbersome to mobilize from disaster risks management's actors' views. The definition of a more flexible funding mechanism, including for local level, lightweight and harmonized to better operational efficiency is a major current expressed need. Funds to address and respond to specific disasters are in place, in particular: the Fund for Floods, the Agricultural Disaster Fund, and the National Solidarity Fund. But their mobilization procedure and, particularly, the operating procedures of their use, seem too heavy for the emergency actors, causing delays in relief and emergency responses delivery. According to *the PRSP Annual Review report 2009*, to cope with the 2008 floods, the resources earmarked by the Government, amounted to nearly 6 billion FCFA⁶⁹, which included 2.35 billion FCFA⁷⁰ mobilized through the national solidarity Fund, hosted by the Ministry of National Solidarity.

Advantage and possibility of adopting risk transfer measures for the populations and to improve the financial protection of the State⁷¹ could be explored, based on Senegal's own experiences and the World Bank's experiences in Senegal and worldwide. Senegal has undertaken for over a decade a series of studies on the feasibility of an agricultural insurance system, which in 2008 led to the creation of the National Agricultural Insurance Company of Senegal (CNAAS). From Ministry of Finance's request the World Bank conducted a feasibility study on index-based crop insurance in Senegal, and provided recommendations for its development.

2.5 . Disaster Preparedness and Recovery

Adopted, in anticipation of serious events that could endanger many lives, property, the environment or important facilities, the National Relief Organization (ORSEC) Plan is the tool for crisis and disaster management in Senegal⁷². It is an organizational framework allowing to establishing in advance the rapid implementation and efficient use of all public and private relief means available. The Minister of Interior is in charge of stating by decree the National ORSEC Plan modalities of triggering, implementation, and lifting⁷³. National ORSEC Plan arrangement comprises (i) a Command Staff, (ii) operational Groups and (iii) support Units (figure 4).

68 Short term (1-2 years), medium term (2-5 years) and long term (more than 5 years).

69 PRSP annual review Synthesis report – final version -- July 2009; Or about USD 13 million (for 1USD=FCFA 430).

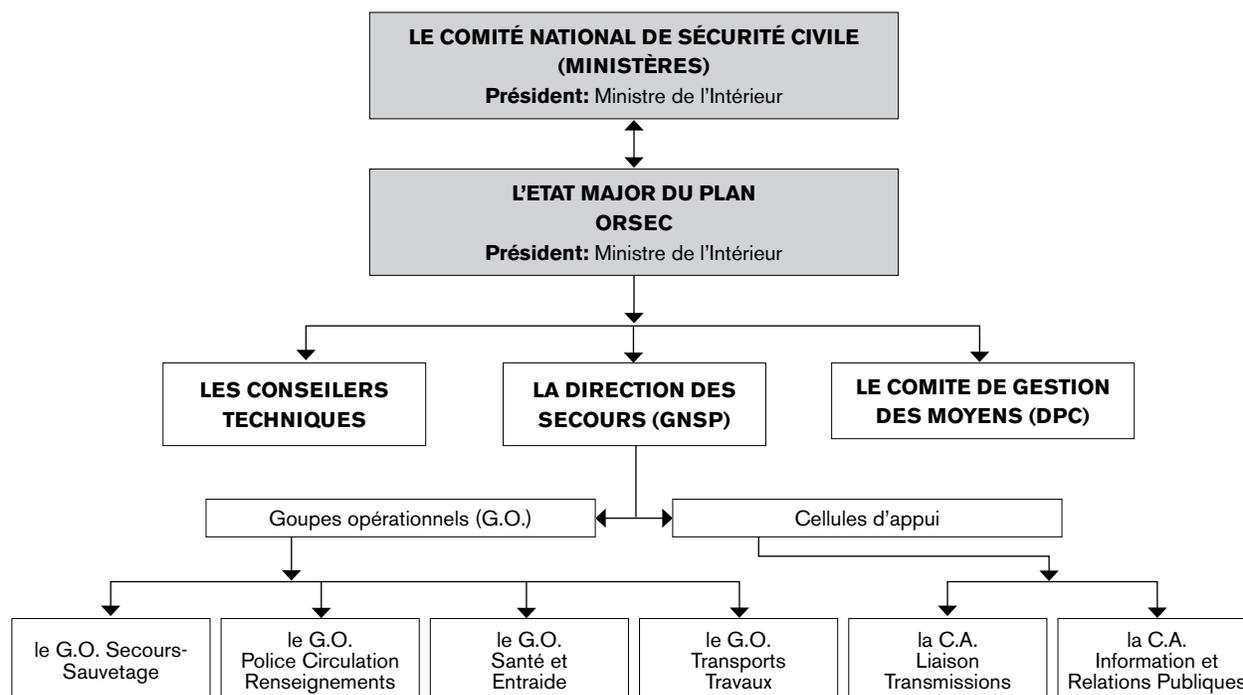
70 Or about USD 5million (for 1USD=FCFA 430). This amount was about 2 billion FCFA in 2007 (or about USD 4million for the same rate).

71 It consists in the preservation of the State/Country financial resources against the financial consequences of natural disasters. The idea is to look how to combine the various instruments available to protect the fiscal balance of the state and improve its responsiveness. There are several funding mechanisms relating to 2 categories of financial cover strategy adopted: (i) the risk retention strategy, including the use of mechanisms such as reserve funds / contingency funds, budget restructuring/reallocation, credit lines, emergency credit, donors' contribution; and (ii) the risk transfer strategy: including mechanisms such as traditional insurance, parametric insurance and catastrophe bonds.

72 Decree N° 99-172 - 04 March 1999.

73 Arrête N° 4386/MINT/DPC - 04 June 1999.

Figure 4. The ORSEC Plan (Relief Organization Plan)



Within the Staff Command headed by the Minister of Interior, the National Fire Brigade is responsible of relief operations conception and direction, and for the coordination of the four operational groups' interventions. The National Fire Brigade is also responsible of the transmission of pre warning from the Ministry of Interior for the activation of the ORSEC Plan, and for the proposition of its lifting. In charge (i) of planning, coordinating and monitoring the implementation of measures to control the situation, but also (ii) of promoting the coordinated involvement of civil and military, national and international means, at the Government's disposal, the Staff Command has two other members⁷⁴ which are the Governor of any affected area, playing an advisory role and the Director of Civil Protection (DPC).

The DPC is coordinating the Committee for the management of the National ORSEC Plan's means, which is responsible for logistical support to the Staff Command, the operational Groups and the support Units⁷⁵. It may proceed to the requisition of national private means⁷⁶, according to regulation procedures⁷⁷.

DPC is also chairing the Intervention Plans Sub-Committee of the High Commission for Civil Protection, which is responsible for the monitoring and Improvement of the National ORSEC Plan⁷⁸. Assistance to the Minister of Interior regarding to relief and assistance financing modalities, priority interventions definition, resource mobilization, and disaster evolution monitoring is also provided by the High Commission for Civil Protection

74 If necessary, the Ministry of Interior can invite any specialists, to join the Staff Command, through a technical Committee. He can also associate any Regional Council President or any concerned Mayors.

75 Decree N° 99-172 - 04 March 1999

76 Arrêté N° 04387/M.MT/DPC - 22 June 1999

77 He can also invite any person or institution whose competencies are needed.

78 Arrêté N° 04383/MINT/DPC - 22 June 1999.

At the decentralized level, the Governor adopts by decree, the Regional and Departmental ORSEC Plans, in the same way as the National ORSEC Plan. Regional and Auxiliary Civil Protection Commissions provide assistance respectively to the Governor and to the Prefect for organizing relief and managing disaster.

In 2008, Senegal developed its National Contingency Plan based on three probable disaster scenarios (floods, epidemics and locust invasion), targeting seven regions, depending on scenarios: Dakar, Saint Louis, Matam, Kaolack, Thies, Diourbel and Tambacounda, covering the period from July 2008 to June 2009. It is a joint Plan of the Government, UN agencies and specialized NGOs involved in DRM fields. Designed to generate well common coordinated response strategies, the national contingency Plan is coordinated centrally by the Directorate of Civil Protection (DPC), it is expected to support the ORSEC Plan. Its updating is scheduled for this year 2009. DPC assisted by its support project begun the implementation of a regional contingency plans development program.

Post floods response efficiency this year (2009) was limited due to a lack of sufficient and appropriate means, and to a lack of adequate preparedness. The management of the recent floods allowed identifying limitations to the optimal functioning of the existing post-disaster response mechanism in general. **So, despite the effort realized to establish a common framework for preparedness and response, weaknesses should be addressed to optimize the effectiveness of the system.**

Capacity of the ORSEC Plan's conception and direction team needs to be enhanced. Specifically, it is necessary to strengthening material and technical capacities of the National Fire Brigade, mainly for water evacuation, communication and information management, and for the establishment of adequately equipped command posts, to enable it to successfully carry out its mandates and missions. Despite all its efforts, the National Fire Brigade met technical and material constraints. The effectiveness and the geographic coverage

of the water evacuation, one priority intervention, were limited. One main reason, apart from the nature of the flooded area, was the decrepitude and the lack of available pumps, despite the allocation of additional new pumps from partners (particularly from the World Bank⁷⁹). The lack of adequate communication and information management facilities, was also impeding the implementation of an optimal coordination of relief interventions on the fields, in addition to inadequate, underequipped central and advanced operational command posts.

The implementation of a regular and systematic preparedness should be adopted and institutionalized. The National Contingency Plan prepared to support the ORSEC Plan seemed to have not actually been operational during the floods management this year. One major limiting factor of ORSEC interventions to evacuate water was the inadequate preparation of certain needed drainage infrastructure such as the prior retention basins draining and the finalization of the connection to the sea. Participatory assessment of weaknesses, strengths and improvements needs regarding the implementation of the National ORSEC Plan and the National Contingency Plan needs to be undertaken regularly. Participatory design of a common preparedness Plan and/or updating of the contingency Plan should be carried out with clear and formal allocation of responsibilities and timelines for the implementation of each defined preparedness action, but also a clear follow-up mechanism. The new preparedness Plan should be regularly tested and improved if necessary between two crises.

Strengthening recovery implementation, including post-emergency needs assessment system strengthening seems necessary. It would include stakeholders' capacity strengthening for post-emergency needs assessment and

⁷⁹ Under the first phase of the World Bank's support to the 2009 floods management (a total funding of 4 million USD from IDA funds, through the PDLF project), which is an emergency support consisting in pumping water out of the inundated areas to the natural spillway in order to mitigate immediately the severity of immediate floods, in the remainder of this rainy season.

economic assessment of damage and post-disaster needs⁸⁰, and for planning and implementing their results. But it would consist also in setting up an improved mechanism for post-emergency assessment and recovery implementation. This would contribute to ensure appropriate socio-economic recovery in the affected areas, avoiding vulnerability increasing due to cumulative effects of successive disasters that would not be fully addressed. This strengthening action would also feed the country data of risk exposure, while providing basis for probabilistic risk assessment, risk mapping and use for risk transfer (in particular insurance if necessary).

3. INTEGRATION OF DISASTER RISK MANAGEMENT IN DEVELOPMENT STRATEGIES

Disaster and Risk Management is a priority of Senegal. The second generation of PRSP (Poverty Reduction Strategy Paper) covering the 2006-2010 period, stated “Disaster and Risk Prevention and Management” as a priority pillar, and promotes its systematic integration in sectoral plans and programs linked to Social protection. It recognizes that disasters are a blocking factor for the country development⁸¹ and that disaster and risk management is one best tool for accelerated growth and sustainable reduction of poverty. It was thus included as a major element of the third PRSP axe/pillar “social Protection, disaster and risk prevention and Management” and a major component of the National Strategy for Social Protection. The PRSP calls also for the development of a National Program for prevention and management of major risks aiming among other at promoting strategies and mechanisms to prevent and manage risks and disasters, in support of national plans.

Disaster and Risk Management is not yet fully mainstreamed into the major development strategies, plans and programs at national level. In the PRSP, some sectors already include disaster risk reduction in their priority actions, such as agriculture sector which will intervene for strengthening the management of risks and disasters, and natural resources. Some sectors contribute to disaster risk reduction in other sectors, such as natural resources and environment sector, through the fight against desertification and the preservation of fauna and flora, as well as marine and coastal environment safeguarding actions. In general, all the sectors contribute to disaster risk reduction, but they are often not systematically protected against the impacts of potential disasters. They would need systematic identification of risks threatening sectors and the mitigation to be undertaken subsequently.

The funds mobilized by the Government to carry out emergency response increased in recent years, demanding better long term treatment of underlying risk factors to these recurrent disasters (mainly floods). To ensure emergency response to 2003-2004 floods, the Government has mobilized nearly USD 2 million⁸² and for 2008 floods nearly 6 billion FCFA⁸³ (about USD 14 millions⁸⁴) have been mobilized. **At the decentralized and local levels, its integration into development plans is not yet acquired**, despite the transfer of competencies operated by the Central Government. Strengthening current efforts of capacity building is highly recommended.

According to World Bank Country Assistance for the Republic of Senegal (2007-2010), the Government and the World Bank share a common vision on the overall objectives to be achieved in Senegal over the next few years. The World Bank is involved and contributes to Disaster Risk Management through its sectoral projects and through

80 Mainly through training in Post-Disaster Needs Assessment, in accordance with the standard methodology DALA (Damage, Losses and Needs Assessment).

81 The 2003 and 2004 PRSP Progress reports, reported significant progress in the implementation of the strategy in the PRSP priority sectors, which enabled the Government to achieve most of the measures accompanying the “wealth creation” pillar, and thus to put the national economy in a dynamic growth acceleration. However, the impact of this progress on poverty reduction would have been reduced because of shocks, mainly disasters experienced by the populations, such as: off-season rains, drought and floods (PRSP II).

82 National Strategy for Social Protection and Risk Management (2006-2010)..

83 PRSP Annual Review – Summary Report - Final version - July 2009.

84 For an indicative exchange rate of 1 USD = FCFA 430

some specific projects. Under the Pillar 3: “Rural and Urban synergies: Urbanization/Migration”, the World Bank provides analytical support to the Government in launching a series of studies aiming at identifying actions to reduce vulnerability of the rural population to major natural risks (such as weather-based and crop insurance schemes). The Ministry of Finance has requested that the World Bank conducts a feasibility study on index – based crop insurance in Senegal.

The World Bank is strongly engaged in water resources and environment management but also in the implementation of the National Strategy for Social Protection. A major engagement is through the Africa Emergency Locust Project (AELP) which provides support to reduce West African countries vulnerability to locust invasion in strengthening prevention and early warning strategy and in impacts reduction at national and regional levels.

For the UN System in Senegal, the 2007-2011 UNDAF recognizes the importance of both crisis and natural disaster prevention, and quick response. The UNDAF integrates it into its various components, especially by the natural resources protection, the creation of sustainable livelihoods, as well as the development of disaster risk management (DRM) capacities at the higher and lower levels.

DRM is integrated in the “Governance and promotion of partnership for development” cooperation domain. It is included in the UNDAF outcome 3: “The participation of all stakeholders, the efficiency, the transparency, the gender the equity, the promotion of human rights and the sustainable development, are enhanced in the definition, the implementation and the evaluation of development policies and programs”.

Finally, DRM is part of the following UNDAF programme effect: “The capacity of the communities and national and local institutions, to better anticipate crises, natural disasters and epidemics, and to respond quickly are strengthened”.

4. KEY DONOR ENGAGEMENTS

World Bank and Other Donor-Supported Projects related to DRM in Senegal		
Ongoing Projects and Organizations	Indicative budget ⁸⁵ , years	HFA areas ⁸⁶
World Bank Projects/Studies		
Climate Change and the Changing Role of Children in Household Risk Management Strategies (ESW)	\$210,000 Approval date: 3/2011	4
Rapid Response Child-Focused Social Cash Transfer and Nutrition Security Project	– 2009-2011	2,4
Managing Risks in Rural Senegal- Rural Livelihoods in the Groundnut Basin (ESW)	\$463,000 2006-2009	4
Bringing Vulnerability into Policy Focus -Vulnerable Youth and Children in Senegal (ESW)	\$172,000 2006-2009	4
Nutrition Enhancement Program II	\$15 million 2006-2012	4
Integrated Marine and Coastal Resources Management Project	\$10 million (IDA), \$5 million (GEF) 2004-2011	4
Senegal Long-Term Water Sector Project	\$125 million 2001-2009	4

(Cont.)

⁸⁵ Indicative Exchange rate used : 1USD = FCFA 430

⁸⁶ Hyogo Framework of Action.

Word Bank and Other Donor-Supported Projects related to DRM in Senegal		
Ongoing Projects and Organizations	Indicative budget⁸⁵, years	HFA areas⁸⁶
World Bank Projects/Studies (Cont.)		
Africa Emergency Locust Project ⁸⁷ (Burkina Faso, Chad, Gambia, Senegal, Mauritania, Niger and Senegal)	\$60 million 2004-2010	5
Sustainable Land Management Project	–	
PSAOP - Climate Change Component	–	
Emergency response, recovery, reconstruction and long term prevention, following the 2009 floods (through PDLP project – CDD project)	\$ 4 million (2009-.....)	1, 4, 5
Study for the elaboration of a 'concept note' about the economic study of adaptation to climate change and coastal erosion	–	1, 2, 3, 4, 5
Selected donor Projects		
UNDP: Support to the National Program of Prevention and Reduction of Disaster Risks	\$700 000 2006-2009	1, 2, 3, 4, 5
Japan - UNDP: Mainstreaming Adaptation to Climate Change into Sustainable Development in Senegal (INTAC).	\$ 3 103 000 (2009-2011)	1,4
UNDP / GEF - UNESCO / IOC: ACCC Project - Adaptation to climate change - response to coastal change and its human dimensions in West Africa in the context of integrated coastal management (Cape Verde, Gambia, Guinea Bissau, Mauritania, Senegal).	– (2007-2011)	1, 2, 3, 4, 5
UEMOA-SAPCO-PRIVATE: Implementation of management and planning options for Saly expansion areas	200 million FCFA (~USD 465,116) –	4
GEF/CSE: Land Degradation Assessments in Drylands project (LADA) (Pilot Studies in Argentina, China, Cuba, Senegal, South Africa, Tunisia)	– (2006-2010)	3, 4
CRDI/CSE: Participatory Adaptation to Climate Change Platform for Local Communities Project (INFOCLIM Project)	–	1, 2, 3, 4
CSE: High environmental and social risk area Project (ZARESE Project) ⁸⁸	–	2, 3, 4
CSE: Local governance and decentralized natural resources management Project (GL/GDRN Project) ⁸⁹	–	1, 2, 4
UE (European Union): Integrated Risk Management of Africa (IRMA Project): (Regional project: Morocco, Senegal, Mozambique, South Africa, Cameroon)	€3 533 633.00 (2008-2011)	1, 2, 3, 5
BEI : Study for the development of the liquid sanitation (sewerage) Master Plan for Dakar region (horizon 2025)	€40 Million (2009 – 2011: Under preparation)	1, 2, 3, 4, 5
UNEP/RISOE: DARE Climate Change Adaptation project on vulnerability reduction to Climate Change (CC) ⁹⁰	–	1, 2, 3, 4
EU: Coastal erosion Project		
PCRPE / JAXXAY Plan (Senegalese Government: Realization of rainwater drainage infrastructures in suburban areas of Dakar.	–	4, 5
BADEA : Rain water Drainage infrastructure in Pikine	– Ongoing (until the end 2010)	4, 5
AFD : Study of a Master Plan for mobilization of Water Resources for the AEP in Dakar and la Petite Côte for the period 2011-2025.	– Ongoing (till the end 2009)	1, 4
AFD : Institutional Study of the Water Sector and Sanitation	– Ongoing (till October 2010)	1, 4

(Cont.)

87 Projet Africain de Lutte d'Urgence contre le Criquet Pèlerin

88 Projet Zone A Risque Environnemental ET Social Elevé

89 Gouvernance Locale et Gestion Décentralisée des Ressources Naturelles

90 Through three pilot projects: (i) component integration of CC into national planning, (ii) agriculture component, (iii) component use of coastal space with the Directorate of Land Use Planning and Management.

Word Bank and Other Donor-Supported Projects related to DRM in Senegal		
Ongoing Projects and Organizations	Indicative budget⁸⁵, years	HFA areas⁸⁶
EU: Coastal erosion Project (Cont.)		
EU (9 th FED) : Travaux de réalisation d'un émissaire en mer pour l'évacuation des eaux épurées par la STEP de Camberene	– Ongoing (till 2010)	4, 5
EU (10 th FED) : Projet d'extension de la station d'épuration de la STEP de Camberene	– 2009-2012	4, 5
USTDA : Sanitation Study of la Corniche Ouest of Dakar	– Ongoing (till the end 2009)	4
AFD : Complementary Study APD / DAO Baie de Hann	– Ongoing (till the June 2010)	4
Netherlands : Consolidation of Rufisque and Mbao (fight against coastal erosion project)	1 billion FCFA (~USD 2, 325,581) (ongoing)	4
Netherlands: Finalization of Porte du Millénaire (fight against coastal erosion project)	400 million FCFA (~USD 930,233) (ongoing)	4
Netherlands: Enhanced technical and financial capacities enhancement of structures in charge of managing the fight against coastal erosion.	250 million FCFA (~USD 581,395) (ongoing)	1, 4, 5
Netherlands: Advisory support to the Direction of Environment and Classified Establishments (DEEC).	50 million FCFA (~USD 116,279) (ongoing)	1, 4, 5
Netherlands: Supporting the control and the monitoring of coastal protection works.	250 million FCFA (~USD 581,395) (ongoing)	4, 5
AFD/ French GEF/CILSS: Global Environment Regional Initiative to Fight against Desertification Project	3 billion FCFA (~USD 6,976,744) (ongoing)	4
Italy/CILSS: The Italy-CILSS Fund to Fight against Desertification for poverty reduction	10 billion FCFA (~USD 23,255,814) (ongoing)	4
Ongoing GFDRR funded activities		
Spatial Analysis of Natural Hazard and Climate Variability Risks in Peri-Urban Areas of Dakar (GFDRR Track II)	\$93,000 2008-2010	2
Community Co-Management for Disaster Risk Management of Marine Resources in West Africa (GFDRR Track II: Cape Verde, Gambia, The, Ghana, Guinea, Guinea-Bissau, Liberia, Mauritania, Senegal, Sierra Leone)	\$900,000 2008-2010	1, 2, 4
Proposed GFDRR funded activities (past)		
Community-Based Climate Adaptation (GFDRR South-South Project: Senegal, Burkina Faso, Niger, Nigeria, Madagascar; PROPOSED)	\$435,000 (proposed)	2, 4, 5
Collaboration of Civil Defense Agencies (GFDRR South-South Project: Senegal, Madagascar;	\$500,000 (proposed)	1

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

UNDP is the main agency undertaking actions in all the five priority actions of the Hyogo Framework (HFA). The future “National Program of Prevention and Reduction of Major Risks and Natural Disasters Management” designed with support from DPC’s UNDP funded project, is supposed to cover all the five HFA priorities and use outputs from this project. It will be submitted soon to donors for resource mobilization purpose. .

Hyogo Framework For Action	Major Partner	Comment
1. Policy, Strategy and Institution building		
Master Plan, Policy, NAPA, Regulations	UNDP	<ul style="list-style-type: none"> • UNDP undertook a study for analyzing the status of the legal framework. • GFDRR (1A) to fund: • The update of the Disaster Risk Management (DRM) Section of the National Strategy for Social Protection and Risk Management (if decided⁹¹), and the support to its implementation.
Coordination capacity enhancement	UNDP	<ul style="list-style-type: none"> • UNDP supported: the development of training modules and manual – the realization of training to local authorities, through a partnership with ADM (Municipal Development Agency) – the creation of a Network of Parliamentary active in DRM – and the realization of training for communication officers from the public administration. • GFDRR Track I is planned to finance the collection of information for inventory of existing national coordination mechanisms, legal frameworks and national plans for DRR and CC adaptation for ECOWAS sub region, including Senegal. • GFDRR (1B) to fund <i>institutional strengthening of coordination structures and mechanisms, including: (i) Support to the Direction of Civil Protection (DPC) reform and its capacity strengthening – (ii) Support to the improvement of the overall national DRM system functioning, through an exhaustive institutional review – (iii) Support for strengthening local authorities' capacities (including local collectivities and government decentralized technical services/departments).</i>
2. Risk Identification, Assessment and Monitoring		
Climate trends and Hazard Risks mapping	CSE – ANM – DGPRE – UNDP – IRMA project (UE/CSE)	<ul style="list-style-type: none"> • UNDP financed the development of a methodology for flood risk mapping and its application to the regional level in the Dakar region. • IRMA project: aims at demonstrating the capacity of standardization low cost interoperable ICT solutions to effectively mitigate disaster risk, by addressing all phases of disaster risk management; It intends to set up a platform of reference appropriate to the management of natural and environmental risks in Africa. This Platform would allow stakeholders to develop and use personalized models and tools for DRM. • GFDRR Track II financed a pilot study on a spatial and institutional approach of DRM, using new tools of risk spatial analysis based on GIS data, covering Dakar. • GFDRR Track I planned to strengthening National Platform capacities for risk assessment and mapping through discussion of data-sharing protocols through sub regional training workshops on the integration of DRR and CC adaptation, and/or use of hydro meteorological and geo-spatial information and data. • GFDRR to support: (2A) <i>the improvement of the performance of the National Agency of Meteorology for rainfall forecasting – (2B) Improving the performance of the Directorate of Water resources management and planning, for hydrologic monitoring – (2C) the development at the national level of a Geographic Information System for Disaster and Risk Management (GIS for DRM): focusing on flooding risk at the beginning, covering a given area. But would be later, multi hazard, with a national coverage – Will include the fulfillment of a complete risk analysis and mapping (combining hazard analysis and vulnerability analysis, with geo referenced inventory of vulnerable assets and elements. The likely impacts according to developed scenarios, considering different climate change scenarios would be also included) – Will use, capitalize, complete results from works already undertaken above mentioned.</i>

(Cont.)

91 Because the National Program of Prevention and Reduction of Major Risks and Natural Disasters Management might serve as the strategic framework for DRM intervention, from 2010

Hyogo Framework For Action	Major Partner	Comment
2. Risk Identification, Assessment and Monitoring (Cont.)		
Early warning system	ANM – DGPRE – CSE – UNDP – WFP	<ul style="list-style-type: none"> • UNDP funded a study on the Early Warning System for floods, industrial accidents and maritime disasters, conducted by the DPC and its support project. • GFDRR will support (2D) <i>Early Warning System strengthening, through support for the establishment of an early warning coordination and monitoring Unit, multi hazard with focus on floods -and- for strengthening performance and functioning of a national floods early warning system.</i> <p><i>All the above mentioned previous proposed actions 1A, 1B, 2A, 2B, 2C include components contributing to enhance early warning system.</i></p>
3. Education and Awareness to build a Culture of Resilience		
DRM School Education programs	UNDP	<ul style="list-style-type: none"> • UNDP supported the development of an action plan for the integration of DRM in secondary and primary school curricula, which would be implemented through the future National Program of Prevention and Reduction of Major Risks and Natural Disasters Management.
Community and stakeholders' awareness	UNDP – ADM – PNDL	<ul style="list-style-type: none"> • UNDP supported: the establishment of a Women's leaders Network in DRM – the establishment of the journalist's Network on DRM – and the provision of training on crisis communication. • GFDRR (3A) to support <i>the implementation of a public and stakeholders' awareness raising campaign in collaboration with ADM and PNDL-CDD/ Decentralized project (complementing ongoing awareness raising initiatives they are implementing).</i>
4. Reduction of Underlying Risk Factors		
Revision of Hazard Norms - Risk Mitigation using revised infrastructure norms		<ul style="list-style-type: none"> • Could be undertaken within the Integrated flood protection Program, mentioned below..
Flood protection	BEI – AFD – EU – CRDI - BADEA	<ul style="list-style-type: none"> • BEI is funding a study for developing a Liquid Sanitation (sewerage) Master Plan for Dakar Region (horizon 2025). • GFDRR to finance (4A) <i>the development and support for the implementation of an Integrated flood protection Program.</i>
Coastal erosion protection	UNDP – GEF –JAPAN– Netherlands– UEMOA– GEF	<ul style="list-style-type: none"> • GFDRR to finance (4B) <i>Technical support and accompaniment of the National Strategy for the Protection and the Fight against Coastal and Marine Erosion implementation.</i>
DRM financing and risk transfer		<ul style="list-style-type: none"> • GFDRR (4C) <i>to support DRM financing mechanism strengthening (at central and local levels).</i>
5. Strengthening Disaster Preparedness for effective response		
Emergency preparedness	UNDP - WFP	<ul style="list-style-type: none"> • The World Bank is making available over 4 million US\$ IDA through the PDLP project (a CDD operation). The Bank intervention will be charted in three phases: (i) emergency support consisting in pumping water out of the inundated areas to the natural spillway in order to mitigate immediately the severity of immediate floods, in the remainder of this rainy season; (ii) recovery and reconstruction which will be based on a light post disaster needs assessment with the eventual support of GFDRR; and (iii) long term prevention of floods which could be done in the forthcoming CAS. • GFDRR to support(5A) <i>Strengthening of national disaster preparedness status and emergency response mechanism (with initial focus on flooding), including two main components: (i)-Preparedness plan development, testing and improvement –and – (ii) Strengthening material and technical capacities of the National ORSEC Plan operational conception and command's institution, specifically the National Fire Brigade or GNSP</i>
Post Disaster Needs Assessment / Response	UNDP – WFP – UN Agencies – EU	<ul style="list-style-type: none"> • GFDRR to support (5B) <i>capacity strengthening for recovery implementation, including post disaster needs assessment (mainly post emergency).</i>

The eight (8) indicative proposed actions for GFDRR funding, are listed by priority order in the table below (the main activities to be undertaken for each proposed action for GFDRR funding are presented in Annex 1).

Proposed actions for GFDRR funding	Potential partnership	Indicative budget for GFDRR funding (USD)	Potential outcomes and comments	HFA Areas
(1)- Strengthening capacities of key institutions, structures and mechanisms (technical, organizational and material).	DPC – GNSP – National Agency of Meteorology – Directorate of Water resources management and planning – UNDP – ADM – PNDL – SONATEL – Decentralized Collectivities – Decentralized technical Services/ Departments – Ministry in charge of Decentralization	1,600,000 (2010-2014)	<ul style="list-style-type: none"> • GO (Global Objective): Optimizing effectiveness of DRM system's key institutions, structures and mechanisms, in the implementation of their roles and responsibilities. • SO (Specific Objectives): (1) Institutional review for an effective optimization of the overall DRM system/mechanism functioning (USD50,000) – (2) Ensuring that the Directorate of Civil Protection (DPC) can effectively implement its mobilization, coordination and facilitation missions through support to its reform and capacity strengthening (USD125,000)- (3) Strengthening national disaster preparedness status and emergency response mechanism (with initial focus on flooding), including three sub components: (3-1)- Strengthening material and technical capacities of the National ORSEC Plan conception and command's institution, specifically the National Fire Brigade or GNSP (USD450,000); (3-2)- Preparedness plan development, testing and improvement (USD 125,000); (3-3)-Strengthening Early Warning System (through **Support for the establishment of an early warning coordination and monitoring Unit, multi hazard with focus on floods -and- **Support for strengthening performance and functioning of a national floods early warning system⁹²) (USD150,000) – (4) Improving the performance of the National Agency of Meteorology for rainfall forecasting (USD250,000)– (5) Improving the performance of the Directorate of Water resources management and planning, for hydrologic monitoring (USD200,000) – (6) Ensuring that local authorities can effectively implement DRM at local level through strengthening of their capacities (including local collectivities and government decentralized technical services/departments) (USD250,000) 	1, 2, 3, 4, 5
(2)- Development of a Geographic Information System for Disaster and Risk Management (GIS for DRM) (dynamic, online, accessible to all).	DPC – CSE – UNDP – WFP - UE (/IRMA project)	500,000 ⁹³ (2010-2014)	<ul style="list-style-type: none"> • GO: Improve disaster and risk management (DRM) in Senegal, through the provision and use of appropriate and updated disaster risk information for decision making, planning and early warning uses. • will be carried out in three steps: (1st step in 6 to 8 months): pilot for one hazard in one given area. Proposed hazard: floods – Proposed area: Dakar; (2nd step): pilot replication (i) for all risk-prone areas within the country for the same hazard (floods) or (ii) for the same one area (Dakar) but extended to all the other threatening natural hazards (in addition to floods); (3rd step): national coverage for all natural hazards. • SO: (1) Carrying out complete risk assessment⁹⁴ and mapping, capitalizing/using the existing initiatives and results – (2) Setting up an online Geographic Information System (GIS) for DRM accessible to all (DRM geo spatial database and website) – (3) Promoting utilization of risk knowledge and risk information from the established GIS for DRM – (4) Ensuring sustainability of the GIS for DRM and its the extension to the entire Senegal territory (one hazard: floods and/or all main natural hazards). 	1, 2, 3, 4, 5 (Cont.)

92 General organization, and organization and implementation of warning production, diffusion and reception (technical and material aspects).

93 Corresponding to the indicative budget, needed for its application to the entire country, for flooding. But for the beginning, USD 150,000 would be sufficient for its development for a pilot site (Dakar) for one hazard (floods) in 6 to 8 months.

94 Including hazard analysis and vulnerability analysis, with a geo referenced inventory of exposed assets and elements but also an evaluation of the potential socio-economic damage and losses according to predictions and probable developed scenarios (including the likely impacts of different climate change scenarios).

Proposed actions for GFDRR funding	Potential partnership	Indicative budget for GFDRR funding (USD)	Potential outcomes and comments	HFA Areas
(3)- Development and support for the implementation of an Integrated flood protection Program.	DPC – All concerned Ministries – All technical and financial partners involved in DRM – Local Authorities - PNDL – ADM – UNDP – WFP	1,000,000 (2010-2015)	<ul style="list-style-type: none"> • GO: The recurrent floods issues are addressed through medium and long terms integrated sustainable approach and solutions. • SO: (1) Developing and promoting the adoption by all concerned stakeholders of a multisectoral Integrated program for medium and long terms floods prevention and reduction – (2) Supporting the implementation of the priority action Plan (part) developed during the 2009 Post Disaster Needs Assessment (PDNA) exercise (see details in Annex 2) which is not yet validated, and the related integrated program. This priority action Plan would cover the following aspects: Clarification of the floods management institutional framework - Development of regulatory framework - Financial aspects - Information Education and Communication - Optimizing emergency response - Early Warning System - Priority Capacity Building – and other priority measures. <i>Some actions of that PDNA priority actions Plan might be covered in other actions proposed to GFDRR funding in this indicative DRM Country Note action plan⁹⁵</i> 	1, 2, 3, 4, 5
(4)- Technical support and accompaniment of the National Strategy for the Protection and the Fight against Coastal and Marine Erosion implementation.	DPC– Ministry of Environment – Local authorities – All technical and financial partners involved in the domain	1,200, 000 (2010-2015)	<ul style="list-style-type: none"> • GO: Supporting Senegal to implement its vision and commitment for the fight against coastal erosion. • SO: Contributing to the achievement of the strategic axes and action Plan for the implementation of the National Integrated Program of Fight against Coastal Erosion through: (1) Financing one phase among those in the proposed action Plan – (2) Financing feasibility studies for technical solutions implementation in specific vulnerable sites – (3) Provision of high level technical assistance, to strengthen and optimize the national implementation team – (4) Supporting the development of land use management master plans for vulnerable areas – (5) Implementation of some accompanying measures to the interventions for fighting against human causes of coastal erosion, especially against the illegal extraction of marine/coastal sand – (6) Implementation of an integrated coastal erosion management pilot project (including community component and infrastructure component). 	
(5)- Implementation of a public and stakeholders' awareness raising campaign.	DPC – UNDP - ADM – PNDL – Local authorities.	250,000 (2010-2013)	<ul style="list-style-type: none"> • GO: Improving the knowledge and understanding, by all categories of DRM stakeholders at all levels, of the DRM concepts and aspects in Senegal, and their respective roles and responsibilities, • SO: (1) Developing an awareness raising and communication Plan, targeting all categories of DRM stakeholders in Senegal, including local vulnerable populations, authorities at all levels, including decentralized levels; and Civil society and private sector – (2) Supporting the implementation of the designed awareness raising and communication Plan. 	1, 2, 3, 4, 5

(Cont.)

95 According to the adopted process, activities to be undertaken will be only accurately defined when the proposed PDNA priority action Plan is validated.

Proposed actions for GFDRR funding	Potential partnership	Indicative budget for GFDRR funding (USD)	Potential outcomes and comments	HFA Areas
(6) -Strengthening post-emergency assessment and recovery implementation capacity	DPC – UNDP – all concerned stakeholders (national and international)	200,000 (2010-2013)	<ul style="list-style-type: none"> • GO: Improving the management and implementation of appropriate post-emergency recovery responses. • SO: (1) Strengthening the technical capacity of all institutions involved in post-emergency responses implementation⁹⁶ – (2) Setting up an improved mechanism (organization) for post-emergency assessment and recovery implementation – (3) Optimizing the operational efficiency of the improved mechanism for post-emergency assessment and recovery implementation. 	1, 2, 3, 4, 5
(7)- Strengthening Disaster and Risk Management (DRM) financing Mechanism.	DPC – Ministry in charge of Economy and Finances – Local Authorities	150,000 (2010-2012)	<ul style="list-style-type: none"> • GO: Facilitating and optimizing the mobilization and use of government funds, allocated to DRM, including post-disaster responses funding. • SO: (1) Informing Senegalese authorities and technicians on the types of funding mechanisms that can be adopted and their efficiency – (2) Defining and supporting the implementation of a more appropriate improved DRM funding mechanism – (3) Exploring the advantage and the possibility of using risk transfer measures, to improve the State financial protection and supporting their implementation if adopted -(4) Exploring disaster insurance mechanisms that can be implemented for the population in Senegal. It will build on the previous World Bank's experience and activities on agricultural insurance schemes in the Sahelian countries and other relevant experiences worldwide. 	1, 2, 3, 4, 5
(8)- Update of the Disaster and Risk Management (DRM) Section of the National Strategy for Social Protection and Risk Management (if decided).	DPC – UNDP – all Ministries – all local authorities – all stakeholders involved in DRM	100,000 (2010-2012)	<ul style="list-style-type: none"> • GO: Defining common global vision and roadmap, to be used as a reference framework, for the implementation of disaster and risk management and reduction (DRM), for all hazards in Senegal (multi-hazard), for the next five years (from 2010). • SO: (1) Developing and adopting a National Strategy for disaster and risk management (DRM)⁹⁷ for Senegal – (2) Developing and adopting a National Action Plan for disaster and risk management (DRM) for Senegal – (3) Launching and supporting the implementation of the adopted Senegal National Action Plan for disaster and risk management⁹⁸. 	1, 2, 3, 4, 5
TOTAL:		5,000,000 (2010-2015)		

96 Will include the provision of trainings post-emergency needs assessment, including economic assessment of post-disaster damage and needs according to the DALA methodology (Damage, Losses and Needs Assessment – DALA/UNECLAC) and other specialized training on recovery, which would be recommended and planned after the diagnosis of needs carried out previously

97 We call “National Strategy for DRM”, the “DRM Section/Component of the National Strategy for Social Protection and Risk Management”.

98 Its implementation could be done through one or several DRM programs.

ANNEX 1

Main activities to be undertaken for each proposed action for GFDRR funding.

Proposed actions for GFDRR funding	Main activities include:
(1)- Strengthening capacities of key institutions, structures and mechanisms (technical, organizational and material).	<p>-For SO1: *Diagnostic analysis of the existing national DRM system/mechanism in place in Senegal, including institutional and legal framework and mechanisms: weaknesses, strengths, constraints, and strengthening needs to enable its optimal functioning. - *Preparation, submission and validation of a more appropriate, streamlined institutional framework/mechanism, with the tools for its implementation, the steps and approaches to be adopted for setting it and making it operational - *Diagnostic analysis of the existing legal and regulatory framework that supports the existing institutional framework, and identification of the strengthening and adaptation needs allowing to implementing the new improved institutional framework/mechanism - *Preparation, submission and validation of an adequate legal and regulatory framework - * Support to the establishment and the operationalization of the designed improved institutional and legal frameworks, including the development and adoption of an action Plan for the establishment and operationalization of the designed improved institutional and legal frameworks, and the support to the implementation of the proposed and validated Plan: financing of one or all parts of the Plan and/or supporting mobilization of other technical and financial partners (participatory process required, involving all stakeholders).</p> <p>-For SO2: *Diagnostic analysis of organizational, technical and material needs (i) for its transformation into Directorate General of Civil Protection (DPC), and (ii) to make it fully operational in its new position - *Development of a support and capacity strengthening Plan (organizational, material and technical) with the detailed description of actions to be undertaken with a proposed timeline - *Support the implementation support and capacity strengthening Plan.</p> <p>-For SO3:</p> <p>(3-1): *Establishment of permanent, coordinated and efficient Information and Communication Systems (will include diagnostic analysis of needs; development and support to the implementation of a proposal for strengthening technical and material GNSP's capacities, for communication, information system and coordination) - *Establishment of efficient and equipped central and advanced command posts (will include diagnostic analysis of existing equipment and materials in all central and advanced command posts; development and support to the implementation of a proposal to strengthen and improve central and advanced command Posts equipments and materials.</p> <p>(3-2): *Capitalization of past experiences to guide preparedness interventions, including: participatory "lessons learned" exercises involving all stakeholders; definition of recommendations and concrete measures for properly ensuring adequate preparedness for an effective management of future disasters - *Regular verification and maintenance of response mechanisms effectiveness set up before disaster occurrence, including: regular simulation tests of developed preparedness plans through small scale test in rooms (using simulation software) and simulation exercises on the ground; regular simulation exercises assessment and updating of tested preparedness plans - *Establishment of a systematic, formalized preparedness approach between two crises/disasters including the setting up of a committee for monitoring the implementation of the defined planning.</p> <p>(3-3): (i)- *Diagnostic analysis of the existing situation and the needs in terms of early warning coordination and monitoring (multi hazard) - *Development and validation of a proposal of profiles, mandates, roles and responsibilities, anchorage, organization and functioning modalities of a future permanent early warning coordination and monitoring Unit (for all natural hazards, with initial focus on floods), with a proposed setting up approach - *Support to the establishment and operationalization of the adopted early warning coordination and monitoring Unit. - AND - (ii)*Diagnostic Analysis of the national flood early warning system (strengths, weaknesses, strengthening needs), including organization, mechanism, technical and material capacities for production, dissemination, reception of alert, disseminated alerts quality (content, format, adequacy with the public and concerned technical departments needs, at all levels), actual use of alerts by people (reaction), and the media role and place within the local early warning system - *Development and support to implementation of a Plan to strengthen national floods early warning system.</p> <p>- For SO 4 and SO5, for each institution: *Diagnostic analysis of the current technical and material capacities, regarding its mandates and responsibilities (strengths, weaknesses and needs) - *Development of a capacity strengthening Plan with detailed description of actions to be undertaken and a proposed timetable - *Support for the implementation of the designed capacity strengthening Plan.</p> <p>-For SO6: *Diagnostic analysis of the existing technical and material capacities of local authorities regarding their mandates and responsibilities related to DRM implementation at the local level: weakness, strengths, needs, in terms of both equipment (material) and skills (technical) - *This should include a diagnostic analysis of the basic equipment necessary for local authorities to collect, manage and use DRM information, but also to plan, manage and monitor DRM interventions in their areas of responsibility - Basic trainings for local authorities (including local collectivities and decentralized technical services) about DRM concepts and their implementation, and some technical concepts necessary for the effective implementation of DRM, which might include: planning, organization, communication and information use and management - *Developing and supporting the implementation of a strengthening proposal/plan for local authorities' technical and material capacities for DRM implementation - *Establishment of resource centers at the local level (as a small library) with a compilation of basic documents and working supports reference (theoretical and practical).</p>

(Cont.)

Proposed actions for GFDRR funding	Main activities include:
(1)- Strengthening capacities of key institutions...	<p>*Trainings for local authorities (including local collectivities and decentralized technical services) about DRM concepts and their implementation, and some technical concepts necessary for the effective implementation of DRM at local level - *Diagnostic analysis of local authorities' basic equipments needs for effective collect, management and use of DRM information, and for planning, management and monitoring of DRM interventions in their areas of responsibility - *Development and support for the implementation of a material strengthening proposal - *Establishment of resource centers at the local level (as a small library) with a compilation of basic documents and working supports reference (theoretical and practical) .</p>
(2)- Development of a Geographic Information System for Disaster and Risk Management (GIS for DRM) (dynamic, online, accessible to all).	<p>– For SO 1: *Identification and analysis of targeted users' needs in terms of risk information and maps (about hazard, vulnerability and risk) - *Inventory and analysis of existing and available data (information and maps) on disaster risk in Senegal - *Production of the missing data in carrying out a more complete risk assessment and mapping, including: Hazards analysis and mapping, including the development or acquisition of models to be used - Vulnerability analysis and mapping, with an inventory and a geo referencing of exposed vulnerable assets / elements - Evaluation of the potential socio-economic damage and losses according to predictions and probable developed scenarios (including the likely impacts of different climate change scenarios).</p> <p>– For SO2: *Setting up at national level, a DRM geo spatial database composed of various risk information and maps, with clear visibility down to the commune level – *Identification and analysis of users' needs in terms of web site content, organization, structure and presentation - *Inventory and analysis of existing web sites, which contribution can be used for the development of the DRM web site - *DRM web site design and setting up.</p> <p>– For SO3: *Presentation and popularization of the web site and the GIS for DRM (content, structure, organization, products, and access) - *Users' training for an optimized handling and use of the DRM web site.</p> <p>– For SO4: *Definition and support to the implementation of plan and modalities for the regular updating of the information on the web site (information related to hazards, vulnerability and risk) – * Assessment of the established GIS for DRM (functioning and performance) - *Assessment of activities undertaken for the development of the GIS for DRM, and capitalization of the acquired experiences (bad and good) - *Definition of indicative approaches and process for the pilot replicating/reproduction for other hazards and areas and decision making on the next step - *Development and support for the implementation of the adopted action plan for the pilot replication.</p>
(3)- Development and support for the implementation of an Integrated flood protection Program.	<p>– For SO1: *Support to the mobilization of concerned stakeholders involved in the fight against floods to consult together and jointly identify, through a comprehensive approach, the various sectoral measures to be adopted to effectively fight against flooding in the medium and long terms - * Sharing, discussing and validating the draft of the strategy for medium and long terms flood reduction proposal developed during the 2009 PDNA, with the related priority action plan - *Complementary studies as part of a situation diagnostic analysis and for identifying sustainable solutions proposals (enhancement needs for those ongoing initiatives - action proposals related to the sectors uncovered by ongoing sectoral initiatives) – * Finalizing the strategy for medium and long terms flood reduction, and the related priority action plan, and Developing the integrated multisectoral flood protection program proposal, based on the overall diagnostic study, the complementary sectoral studies results and the designed strategy - *Presentation, discussion and validation of the proposed strategy, priority action plan and integrated program.</p> <p>– For SO2: Support the implementation of priority action Plan (part) developed during the 2009 Post Disaster Needs Assessment or PDNA exercise, which is not yet validated, and the related integrated program. This priority action Plan issued from PDNA cover the following aspects: Clarification of the floods management institutional framework - Development of legal and regulatory framework - Financial aspects - Information Education and Communication - Optimizing emergency response - Early Warning System - Priority Capacity Building – Planning of primary drainage infrastructures (master plan study) - Landscaped treatment of basins and integration into the surrounding environment (see details in Annex 2). <i>Some actions of that PDNA priority actions Plan might be covered in other actions proposed to GFDRR funding in this indicative DRM Country Note action plan.</i></p>

(Cont.)

Proposed actions for GFDRR funding	Main activities include:
(4)- Technical support and accompaniment of the National Strategy for the Protection and the Fight against Coastal and Marine Erosion implementation.	<p>The activities to be implemented under this proposed action (7) will be further determined together with the authorities (Ministry of Environment) and in consultation with other technical and financial partners involved in the field to ensure better synergy and complementarities. Once decided, these activities could be described in more details.</p> <p>But generally would include: (1) Financing one phase among those in the proposed action Plan – (2) Financing feasibility studies for technical solutions implementation in specific vulnerable sites – (3) Provision of high level technical assistance, to strengthen and optimize the national implementation team – (4) Supporting the development of land use management master plans for vulnerable areas – (5) Implementation of some accompanying measures to the interventions for fighting against human causes of coastal erosion, especially against the illegal extraction of marine/coastal sand, which could include: *environmental impacts study of the exploitation of other alternatives to marine/coastal sand; *awareness raising of the different stakeholders involved in the exploitation of marine/coastal sand; *promoting the use of alternative to marine/coastal sand (e.g. sand hill, dunes sand); *implementation of actions supporting the conversion of actors living from the exploitation of coastal/marine sand (lorry drivers, carters, etc.); *realization of infrastructure facilitating the use of these alternatives to coastal/marine sand, etc. –(6) Implementation of an integrated coastal erosion management pilot project (including community component and infrastructure component).</p>
(5)- Implementation of a public and stakeholders' awareness raising campaign.	<p>*diagnostic analysis of DRM related awareness raising and information interventions targeting populations and all stakeholders (strengths, weaknesses and needs) - *Development of a Plan for a systematic stakeholders' awareness rising, with the related communication plan - *Support for the implementation of the adopted Plan.</p>
(6) - Strengthening post-emergency assessment and recovery implementation capacity.	<p>– For SO1:*lessons learned exercises with all stakeholders' participation, assessing the implementation of past post-emergency assessments and recovery interventions (strengths, weaknesses, strengthening needs : participatory evaluation) - *trainings in accordance with the identified needs, mainly related to⁹⁹: post-emergency assessment of damage and required recovery actions; post-disaster economic assessment of damages, losses and needs; and recovery planning and implementation - *practical exercises related to the provided trainings.</p> <p>– For SO2:*a diagnostic analysis of the existing system for post-emergency assessment and recovery implementation and the proposition of an improved more appropriate mechanism – *the development of improved standard tools and documents to be used for the post-emergency assessment and recovery implementation.</p> <p>– For SO3:*regular practical simulation exercises testing the adopted mechanism for post-emergency assessment and recovery implementation, and using the developed and validated tools. - *regular evaluation exercises of the achieved simulation tests, to get lessons learnt and make improvements to the system and the tools - *Stakeholders' technical coaching by trainers, for the implementation of, at least the first two real cases, of post-emergency assessment and recovery implementation.</p>
(7)- Strengthening Disaster and Risk Management (DRM) financing Mechanism.	<p>– For SO1:*presentation of and discussion on existing DRM funding mechanisms: available options and experiences worldwide.</p> <p>– For SO2:*a thorough diagnostic analysis of the existing DRM financing mechanism covering national and decentralized levels, and the development of a proposition for an improved financing mechanism -*support to the implementation of the proposed new financing mechanism (if adopted).</p> <p>– For SO3:*experience sharing between Senegalese authorities and technicians, and the Caribbean Catastrophe Risk Insurance Facility (CCRIF)'s responsible and initiator -*study on the feasibility, the advantages and disadvantages of implementing proposed risk transfer measures, including catastrophe insurance taking out for the country, and the approaches that can be adopted -*presentation and discussion of the study results and preparation of implementation stages, if agreed.</p> <p>– For SO4:*presentation and discussion of worldwide experience on public disaster insurance types, for the same hazard and disaster types as in Senegal -*a diagnostic study of (i) the types of disaster insurance available to the population in Senegal (mechanism, weaknesses, strengths, needs, and recommendations for Senegal); and (ii) the types of insurance disaster that can be implemented for the public in Senegal, with their development modalities and approaches -*presentation and discussion of the study results and preparation of the implementation stages, if agreed.</p>

(Cont.)

⁹⁹ Will include training on the DALA methodology (Damage, Losses and Needs Assessment – DALA/UNECLAC) and other recommended and planned specialized trainings.

Proposed actions for GFDRR funding	Main activities include:
<p>(8)- Update of the DRM Section of the National Strategy for Social Protection and Risk Management (if decided).</p>	<ul style="list-style-type: none"> - For SO1:*an in-depth diagnostic analysis of the DRM situation in Senegal, which will include the diagnostic of strengths, weaknesses, gaps, challenges, constraints, needs, and the proposition of purposes, overall principles and approaches to be adopted by the country and strategic pillars / axes with the related strategic priority actions to be achieved¹⁰⁰ (participatory process) - *the design, writing and validation of a document of National Policy and Strategy for DRM¹⁰¹, based on the validated strategic priorities pillars/axes. - For SO2:*the participatory development of a DRM National Plan of Action for a 5 years period - *the design, writing and validation of the National Action Plan for DRM document. - For SO3:*the support for the implementation and monitoring of the National Action Plan for DRM.

100 The process will include consultations with all DRM stakeholders' categories involved at all levels of intervention.

101 The DRM Section of the National Strategy for Social Protection and Risk Management

ANNEX 2:**Draft of the Priority Action Plan of a Strategy for Floods Management developed during the 2009 Post Disaster Needs Assessment (PDNA) (as of November 24, 2009).**

It has been designed based on strategic orientations.

Component	Objectives	Actions	Estimative Cost (\$)
Institutional Framework	Clarify the floods management institutional framework	Study of institutional aspects of floods management: *Institutional and organizational framework for the preparedness *Institutional and organizational framework for the emergency response *Institutional framework for the prevention *Concertation and validation workshop	150,000
	Clarify the institutional framework for the floods protection infrastructures and the drainage networks	Study of the institutional framework for the " <i>maîtrise d'ouvrage</i> " (<i>executive management</i>) of floods protection infrastructures and the drainage networks.	
Regulatory Framework	Complete the regulatory framework and adapt it to floods requirements	Diagnostic of the regulatory framework guiding the various floods aspects	100,000
		Definition of required amendments and complements to the urban planning texts	
		Development of instruction and rules to improve floods resistance and adaptation of local constructions	
		Amendment of the Public Procurement Code to provide appropriate procedures for goods and services purchase for emergency situations.	
Financial aspects	Mobilize sustainable financial resources for infrastructures operating and emergency response	Definition of sustainable resources to cover operating expenses of drainage and pumping infrastructures 25,000	25,000
		Rehabilitate, calibrate, and define management procedures of the emergency fund	
Information – Education – Awareness raising	Improve communication on floods	Diagnostic and review of current information and awareness raising on floods initiatives 600,000	600,000
		development, validation and implementation of a Communication on Floods National Plan	
	Reduce health impacts of floods	Development, validation and implementation of an education program on health and hygiene issues during floods	
	Réduire les impacts des inondations par une plus grande résilience des populations et autres acteurs économiques	Development, validation and implementation of a awareness raising on behavior changes and floods preparedness (resilience) program	
	Prevent settlement in flood prone areas	Development, validation and implementation of a program of information on risks of building in vulnerable areas	

(Cont.)

Component	Objectives	Actions	Estimative Cost (\$)
Emergency response ¹⁰²	Improve emergency response efficiency and coverage	Hydraulic study to optimize the pumping system in place	50,000
		Optimal dimensioning of materials dedicated to ORSEC Plan: *Inventory of equipment currently dedicated *Needs assessment and acquisition of necessary equipment according to the hydraulic study conclusions *Evaluation and acquisition of a needed spare parts and accessories stock	2,500,000
		Preventive maintenance of electromechanical equipment before wintering	50 000
		Opportunity study of the Thiaroye ground water pumping	50,000
		Validation and implementation of the adopted option for pumping Thiaroye groundwater.	
Early Warning System	Timely warn concerned departments and the populations	Conception of an early warning system adapted to Senegalese context and definition of a gradual implementation program	100,000
		Implement the priority tranche of the early warning system	500,000
Capacity Building	Strengthen capacities of all actors involved in floods management	Capacity building needs assessment for all actors involved in managing the different floods phases	Will be estimated based on the needs assessment
		Strengthening DPC's capacity in its overall coordination role	
		Strengthening capacity of communes, associations and other local actors.	
		Strengthening capacities of the ORSEC Plan's operational conception and direction team	
		Strengthening capacities of sectoral actors for emergency response (ONAS, CADAK, SONES, SDE, education, health, roads, agriculture, etc.)	
		Implementation of white operations simulation of preparedness plans and response plans and their improvement	
		Strengthening capacities of forecasting actors (ANMS, Hydrological Department)	
Prevention by Urban Planning and Management	Reduce vulnerability through the prevention	Update of urban audits and a support to PUDs achievement (\$15,000/commune)	315,000
		Mapping of areas at risk	300,000

102 The emergency response institutional measures are covered with the institutional aspects.

TOGO

To prepare the Country DRM Note, consultations were undertaken with members of the World Bank's Togo Country team and the Ministère de l'Environnement et des Ressources Forestières, Ministère de la Coopération, Développement, Aménagement du territoire, Secrétariat de la Stratégie Internationales des Nations Unies pour la prévention des Catastrophes (ONU/SIPC), Croix Rouge Togolaise, Ministère de l'Enseignement Supérieur et la Recherche, Université de Lomé, Ministère Administration Territoriale et Collectivités locales, Ministère de l'Urbanisme et de l'Habitat, UNDP, Ministère de la Sécurité et de la Protection Civile, Coopération Française, Commission Européenne, Associations des ONGS, Ministère du Commerce et de la Promotion du Secteur Privé, Ministère de l'Agriculture, de l'Elevage et de la Pêche, Secrétariat Technique du Projet de Développement Communautaire, Agence d'appui aux Initiatives de Base-AGAIB Région Savanes, Agence d'appui aux Initiatives de Base-AGAIB Région Kara, Agence d'appui aux Initiatives de Base-AGAIB Région Centrale, Agence d'appui aux Initiatives de Base-AGAIB Région Plateaux, Agence d'appui aux Initiatives de Base-AGAIB Région Maritime.



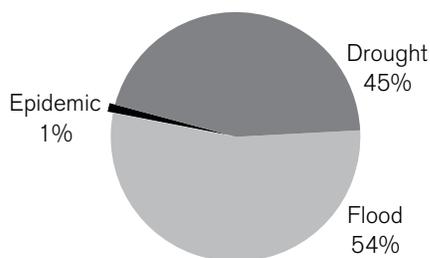
1. DISASTER RISK PROFILE

A poor country which suffered from years of weak governance. Togo is a country of 54,400 km² located in West Africa on the Atlantic coast of the Gulf of Guinea. The country's population was estimated at 6.1 million in 2006 with an average annual growth rate of 2.4 percent. The political movement toward more democratic institutions that started in the early 1990s resulted in socio-political unrest that peaked in 1993 and lasted more than a decade. This period of prolonged political instability was also marked by serious economic and financial management problems that led to the deterioration of the economy and the withdrawal of donors' support to the country. In fact, the cumulative effect of this political and economic instability led to reduced public investments which fell from 13.8 percent of GDP in 1990 to 3.3 percent in 2005; public spending in social sectors decreased dramatically. The annual growth rate of GDP averaged 1.1 percent during the same period, well below the annual growth rate of population of 2.4 percent. As a result, the living standards of the majority of the population declined sharply. Income per capita (US\$350 in 2006) is low compared to Sub-Saharan Africa (US\$842) and Low Income Countries (US\$650) averages. Moreover, Togo now ranks 152nd out of 177 countries in terms of human development, according to UNDP's 2007 Human Development Report.

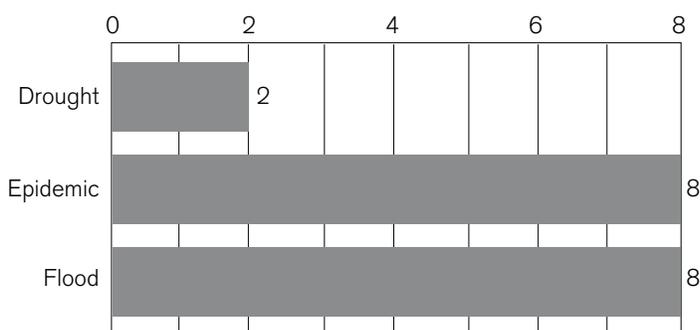
The prolonged political turmoil and governance shortfalls had adverse impacts on the environment and on natural resources. As the highly centralized public administration system crumbled in the wake of civil unrest, so did the associated policy tools that should have ensured the sustainable exploitation of natural resources and the protection of environmental services and infrastructure. Because of the crisis, there was an expansion of the informal sector, which resulted in adverse environmental consequences as rural and urban households resorted to survival strategies that relied on non sustainable exploitation of natural resources (forest resources, wildlife, fisheries) and environmental services. Key environmental challenges facing the country include land degradation and deforestation.

Natural Hazards in Togo

Percentage of people reported affected by disaster type, 1983 – 2008



Natural disaster occurrence reported, 1983 – 2008



Within Togo, there is locational differentiation of risks associated with flooding and soil and coastal erosion. In general, all watersheds are vulnerable to flooding. The northern half of Togo shares the Upper Volta River Basin with Ghana and Burkina Faso and is therefore vulnerable to water resource management decisions made in these countries. Both rural and urban areas in Togo are vulnerable to flooding. Areas along the coast, like Lomé, are subject to coastal flooding due to high levels of coastal erosion. Phosphate mines, located near the coast, also create a precarious situation in natural disasters. Deforestation is a major concern in Togo and exacerbates the effects of flooding. Trees have been cut down by individuals, communities, and companies to create farmland and to use and sell the wood. The removal of trees and other plants and the soil erosion that results from this practice can intensify flooding and worsen its effects on the land and on infrastructure.

In the past ten years, there have been no major droughts, but there have been six major floods that have had negative environmental, social, and economic impacts on the country. Both the scale and intensity of the floods, the weakness of government contingency plans and the lack of ex-ante risk mitigation measures, led to infrastructural damage and to high numbers of people affected by the floods.

Recent Flooding and its Consequences

Though Togo experiences flooding almost every year, the past two years have witnessed particularly widespread and devastating floods. In 2007, when floods occurred in most West African countries, Togo was one of the hardest hit. Most of the people affected were from the northern regions of the country with the Savanes region worst affected.¹ In particular, 127,880 people were affected, 13,764 people were displaced and 23 died as of 17 October 2007.² In 2008, severe rains led to heavy flooding in the southern, northern, and central regions (Maritime, Savanes and Centrale), with 24,500 people affected, 4,000 people were displaced in six camps, and 4 people killed as of August 4, 2008.³

Floods can have severe environmental consequences. Recent flooding in Togo led to increased soil erosion which contributed to the destruction of infrastructure and cultivated land. This soil erosion also contributes to a decrease in the arability of land by washing away essential nutrients in the topsoil. Erosion of river banks can expose the country to increased flooding in the future.

¹ A person affected by the floods is one whose house, farmland, livestock, or food stock is damaged by flooding.

² West Africa Floods map 2007, UN Office for the Coordination of Humanitarian Affairs, 17 October 07, [http://www.reliefweb.int/rw/fullMaps_Af.nsf/luFullMap/4D732D0EA69F879985257378004875E2/\\$File/ocha_FL_afr071017.pdf?OpenElement](http://www.reliefweb.int/rw/fullMaps_Af.nsf/luFullMap/4D732D0EA69F879985257378004875E2/$File/ocha_FL_afr071017.pdf?OpenElement)

³ West Africa Floods map 2008, UN Office for the Coordination of Humanitarian Affairs, 2 September 2008, [http://www.reliefweb.int/rw/fullMaps_Af.nsf/luFullMap/5598E04D6AF1AB19C12574B900467E0F/\\$File/ocha_FL_afr080902.pdf?OpenElement](http://www.reliefweb.int/rw/fullMaps_Af.nsf/luFullMap/5598E04D6AF1AB19C12574B900467E0F/$File/ocha_FL_afr080902.pdf?OpenElement)

Social infrastructure like schools and health centers can be destroyed in floods due to soil erosion, water damage, and fragile building materials. Four schools were reported as completely destroyed in the 2008 floods, and there was substantial damage to many more schools, classrooms and teachers' quarters. The destruction of a number of key bridges made it difficult for many students to reach schools and complicated access to health facilities, making it difficult for health centers to restock their supplies. Though there was no report of an outbreak of waterborne diseases during the floods of 2007/08, the proliferation of waterborne diseases is a risk of future flooding.

Floods can cause severe economic distress to a country, especially one like Togo with an economy that is heavily reliant on agriculture. Preliminary assessments estimated that 11,688 hectares of cultivated land were washed away by the rains in the floods of 2008. Many farmers lost an enormous portion of their annual income (if not all), and the affected areas suffered from food shortages. The destruction of crops and the increased price of transportation resulting from both the flooding of 2007 and 2008 combined with high global food prices will most likely continue to

have a negative impact on food availability into the future. The price of transportation increases during floods because of the destruction of roads and bridges. In the 2008 floods in Togo, eleven major bridges were destroyed.⁴ Many more small bridges and culverts were swept away by swollen rivers and streams. Over 300 km in rural roads were seriously damaged. Destroyed transportation infrastructure has inhibited the ability of rural Togolese to engage in economic activities—including the purchase of basic necessities. The destruction of roads and bridges has also hurt the national economy. Large companies working within Togo that the government relies on for tax revenue were hurt by the spike in transportation costs. Additionally, Togo lost customs and entrance fees from landlocked countries like Burkina Faso, Mali and Niger that rely on the port of Lomé for their importation and exportation of goods.

Climate Change and Hazards in Togo

Climate change is expected to have greater impacts on poorer countries such as Togo, due to their vulnerability to hazards, particularly droughts and floods. Given that the impacts of climate change are expected to exacerbate some existing hazards, as well as result in the emergence of new hazards and risk patterns, Togo needs to address climate change hazards related to the existing flood and drought risks, as well as sea-level rise. Specific fragile environments in the North and Central Regions of Togo, in particular those most exposed to soil erosion, require specific focus and attention since they are at the origin of some of the extreme consequences of recent floods.

Sea-level rise and coastal erosion are also major hazards. Moreover, the low-lying coastal area of Togo is narrow and covers an area of 1,710 square kilometers. According to the IPCC's "Climate Change 2007: Impacts, Adaptation and Vulnerability" report, low-lying coasts are likely to be especially affected by climate change, being threatened by 1) sea-level rise leading to increased risk of flooding and groundwater salinization; and 2) increased frequency and severity of storms and tidal surges. The coastal area in Togo represents an important economic zone for the country with more than 90 percent of the country's economic activities, and more than 42 percent of the country's population. Lomé, a large and growing city located on the sea, is particularly vulnerable due to overcrowding and extremely fragile structures in the unplanned parts of the city. Beach erosion is also a serious ecological problem in West Africa. Along the eastern section of Lomé harbor, an annual erosion rate of 20 m has been recorded.

4 OCHA, West Africa Floods Special Update, 2 September 2008.

2. DISASTER RISK MANAGEMENT FRAMEWORK

The institutional framework is fragmented but the Government is committed to mainstream disaster prevention in all development instruments, starting with the I-PRSP. Despite the above-mentioned highly fragmented situation, the Government is determined to strengthen the country's policy and institutional framework for environmental management. The renewed Government commitment to address the causes of environmental degradation and to make disaster prevention a priority is evidenced in the 2008 I-PRSP where the policy objectives in the area of environmental management are described under Strategic Pillar 2: Consolidation of Economic Revival and Promotion of Sustainable Development. Under this pillar, it is stated the Government's efforts towards promoting sustainable development will aim to:

- Reduce the pressure on natural resources mainly through more effective means to control land degradation and to promote biodiversity conservation;
- Promote the integrated coastal zone management, including the control of coastal erosion;
- Strengthen the capacity of national institutions for sustainable environmental management;

- Adopt effective policy instruments to control and monitor pollution and nuisance from wastes and chemical substances in order to protect the quality of life and human health in urban and rural areas; and
- Promote disaster prevention and management through the establishment of an appropriate policy and institutional framework, the development of technical capabilities for disaster prevention, preparedness, and monitoring.⁵

The I-PRSP (2007) also indicates that, as part of the social protection policy, the Government will focus on improving management of the vulnerability to different shocks and to disasters. Advanced drafts of the full PRPS (2009-2011) discuss the plans of the Government in the areas of management of natural and technological disasters and suggest two main areas of intervention: a) improvement of the political and institutional framework for the prevention and management of disasters; b) strengthening of the technical capacity (and human resources) in the areas of planning, monitoring and early warning and in the areas of managing the emergencies related to natural disasters.

The 2008-2012 UNDAF mentions the importance of disaster risk prevention, management and response. The paper states that existing climate change, urbanization and population movements expose certain regions to the effects of natural disasters, particularly floods which typically appear each year. The section on institutional capacity building and democratic management indicates that, with reference to refugees and IDPs, the UN agencies have consolidated efforts to assist the Government to reinforce national capacity for disaster preparation and response (population displacements, floods, epidemics, etc). This work will lead to: 1) an evaluation of the capacity of emergency management structures, 2) a reinforcement of capacities and structures, and 3) direct assistance to affected populations.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

Togo is a signatory to the Hyogo Framework for Action (HFA), which outlines a global strategy for disaster risk reduction from 2005 to 2015. A 2007 document prepared by the Ministry of Environment and Forest Resources, "Report on the Implementation of the HFA in Togo," states that a risk assessment is necessary in order to develop a national risk reduction strategy. Togo's 2008 Interim National Progress Report on the Implementation of the Hyogo

⁵ *Ibid.*

Framework for Action states that as of September 2008, little progress had been made on the implementation of the five HFA priority actions.⁶ The remaining of this section is organized around the five HFA priorities.

HFA Priority # 1. A strong institutional framework for implementation

There have been some encouraging progresses in this area. Successes in the implementation of this priority include: (i) the creation of the national platform for disaster risk reduction; (ii) the amendment to the national environmental policy framework to incorporate the definition of strategies of disaster prevention and risk reduction; and (iii) components of a climate change policy have been recently elaborated by the Ministry of Environment

NATIONAL PLATFORM

The national platform for disaster risk reduction and prevention was created on April 17, 2007 by the Togolese Ministry of Environment and Forest Resources. The platform is charged with developing a national strategy for disaster risk reduction, mainstreaming the strategy into sector plans, and monitoring its implementation. It is

also responsible for promoting information dissemination related to disaster risk reduction, coordinating the work of the government and non-governmental actors, and mobilizing funding from national and international donor for support in the domain of disaster risk reduction.

The platform has been active but there has been delay in developing a national strategy. The platform, which functions as a committee, is composed of representatives from ministries, scientific and learning institutions, NGOs, the Red Cross and Red Crescent societies, the private sector, and other actors in the field of disaster risk management and reduction. The platform has been active, but the development of a national strategy for disaster risk reduction has been delayed by the floods of 2007 and 2008, which forced the platform to focus its attention on disaster response and reconstruction.

There were recent attempts to revitalize the national platform. On March 3, 2009, the Ministry of Environment with the support of UNDP organized a workshop on the revitalization of the national platform. The objectives of the workshop, led by a representative from the United Nations International Strategy for Disaster Reduction (UN-ISDR), were to operationalize the platform and explain HFA and the directing principles of national platforms to Togo platform members and the role played by the actors involved in risk prevention and reduction. At the end of the workshop, several priority actions for the platform were outlined:

- Prepare a work plan for the development of a national strategy for disaster risk management and prevention;
- Improve the quality of early warning systems;
- Decentralize the platform to the regional level;
- Establish a National Institute of Cartography;
- Establish a support fund for use in case of emergencies and disasters.

POLICY AND INSTITUTIONS FOR ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT

The Ministry of Environment and Forest Resources is the body charged with the implementation of the disaster prevention strategy, according to the national law on environment management in Togo (law 2008-005,

⁶ The five Hyogo Framework of Action (HFA) priority action areas are: 1) Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2) Identify, assess, and monitor disaster risks – and enhance early warning; 3) Use knowledge, innovation, and education to build a culture of safety and resilience at all levels; 4) Reduce the underlying risk factors; 5) strengthen disaster preparedness for effective response at all levels.

article 113). Current environmental policy in Togo is based on the national environmental policy framework adopted in 1998. The policy framework has two main objectives: (i) to promote the sustainable management of natural resources and the environment, and (ii) to consolidate the measures aimed to integrate environmental aspects into economic reforms.⁷ This framework was supplemented by the National Environmental Action Plan (NEAP) finalized in 2001. The NEAP guided the formulation of the national environmental management program that includes three sub-programs (i) capacity building for environmental management, (ii) natural resources management, and (iii) coastal zone management and environmental quality improvement.⁸ Other policies related to environmental management have been developed, but with little implementation. The National Action Programme against Desertification (PAN) takes disaster risk reduction into account, but has not yet been implemented due to lack of financial resources.

CLIMATE CHANGE POLICY

The Government is committed to elaborate specific policies to address the impact of climate change. In order to reduce the vulnerability of the population to the negative effects of climate change, the Government of Togo is committed to integrate measures addressing climate change issues into national policies and interventions. A National Plan for Adaptation (NAPA) has been recently elaborated by the Ministry of Environment in collaboration with the UNDP.

The NAPA aims at identifying the most urgent interventions needed to face the negative impacts of climate change. The Ministry of Environment is the institution in charge of the follow up and implementation of the NAPA process⁹.

HFA Priority # 2. Enhance Disaster Risk Assessment, Monitoring, and Early Warning

A comprehensive study on the assessment of risks and vulnerabilities in Togo has not yet been conducted, mainly due to financial constraints. Togo's Interim National Progress Report on the Implementation of the Hyogo Framework for Action states that as of September 2008, little progress had been made on priority area 2 of the HFA, "to identify, assess, and monitor disaster risks and enhance early warning." According to the progress report, the lack of a comprehensive risk analysis is one of the main constraints to implementing priority areas 3, 4, and 5. Some initial steps toward risk mapping have taken place. The Government of Togo, with the support of UNDP, is currently working on finalizing the TORs for mapping risk zones. The NGO Plan-Togo completed a minor risk analysis in 2006.

HFA Priority # 3. Use Knowledge, Innovation and Education (Priority area 3)

No significant progress in Priority area 3. According to the 2008 Interim National Progress Report on the Implementation of the Hyogo Framework for Action, Togo has made no significant steps forward in meeting Priority Area

⁷ Concept Note for Togo Country Environmental Analysis, TTL: Remi Keni, AFTEN

⁸ Ibid.

⁹ The NAPA identifies 7 priority actions. Those actions have been ordered according to their impact in terms of vulnerability reduction, their contribution to sustainable development and their cost. The actions identified are the following:

1. Adaptation of the agricultural production system in three regions through the promotion of climate change resistant farming techniques and the enhancement of the agro-meteorological information system.
2. Setting up an early warning system to inform the local population on the risk of floods in the Savanes and Maritime regions.
3. Reinforce the protection mechanisms of the seaside on the eastern section of Lome harbor against the coastal erosion.
4. Support the rural communities in the Savanes and Plateaux regions to prevent and reduce waterborne diseases.
5. Develop small irrigation systems for group of farmers in the Centrale, Kara and Savanes regions in order to reduce rural migration.
6. Develop income generating activities for the communities of small farmers and fishermen in the coastal region in order to respond to the negative effects of climate change on their economic activities.
7. Support the development of water retention systems in the Savanes and Kara regions through the construction of appropriate water management infrastructures.

3 of the HFA, “use knowledge, innovation, and education to build a culture of safety and resilience at all levels.” Several constraints were identified to the development of research methods and tools for multi-risk assessments and cost benefit analysis, and the dissemination of disaster risk information. These constraints include the lack of information on risk areas, along with the types of risks, as well as the lack of capacity of the national platform and researchers in the areas of methodologies and adequate risk assessment instruments.

There has been little reported progress in terms of the incorporation of information on risk reduction in school programs or trainings. However, a documentary project entitled “Prevention of Disasters Begins at School” is being developed with the support of development partners. The NGO Plan Togo is reportedly developing a program to develop a “culture of disaster prevention” within schools. Financing is considered the chief constraint to this indicator.

HFA Priority # 4. Disaster Risk Reduction and Financing

There has been limited progress in Priority area 4. In terms of HFA priority area 4, “strong policy, technical and institutional capacities and mechanisms for disaster risk management, with a disaster risk reduction perspective are in place,” the country reports little progress in the 2008 Interim National Progress Report on the Implementation of the Hyogo Framework for Action. Some achievements cited by the report include the integration of risks into the PRSP and into the legal framework and the forestry code, the creation of the national platform, and the development of Plan-ORSEC. Although Plan-ORSEC outlines response plans (see below), financial reserves are not included in the national

budget to ensure that disaster assistance will be available. Thus the Government is often obliged to launch a Flash Appeal to the UN system.

HFA Priority # 5. Foster Disaster Preparedness and Recovery

Togo has a Plan in place to deal with natural and man-made disasters. In May 2008, the Ministry of Security and Civil Protection, in coordination with the UN, finalized Plan-ORSEC (*Le Plan de l'Organisation des Secours*), which outlines the Government’s response in case of a natural or man-made disaster. The objective of the Plan is to identify the potential risks to people and goods, and to define the roles and responsibilities of organizations responding to disasters in prevention, response, and reconstruction. On a national scale, the plan institutes the CNPS (*Comité National de Planification des Secours*), a body that coordinates emergency response mechanisms at the national level.

The Plan has some shortcomings. While Plan-ORSEC is a useful guide to natural disaster response mechanisms in Togo, it has three main shortcomings:

1. The plan prescribes the same response mechanisms for all five regions without any consideration of differentiation between regions.
2. The plan does not foresee a role for communities in disaster management.
3. The plan appears to be highly complex to manage, especially if one considers the limited availability of capacity and technical means.

Togo has completed an Inter-Agency Contingency Plan (IACP) with OCHA, UNHCR, UNICEF, and other agencies of the United Nations system to coordinate the assistance of development agencies to national response efforts but the institutional and physical infrastructure for emergency management remains limited.

Discussions are on-going to finalize a National Contingency Plan. In April 2009 the Ministry of Security and Civil Protection in collaboration with the UNDP organized a workshop in order to elaborate a National Contingency Plan. The

Plan will be finalized in a short period of time. The objective of the National Contingency Plan is to identify the major risks that the country faces and to plan appropriate mechanisms to face them.

4. KEY DONOR ENGAGEMENTS

Some existing projects implemented by the main donors agencies and organizations contribute to the achievement of the various HFA priority actions. Here are the main engagements of the international community in areas directly or indirectly related to prevention and response to natural disasters.

Ongoing Projects and Organizations	Indicative budget	HFA activity area(s)
World Bank – Emergency Infrastructure Rehabilitation and Energy Project (EIREP) (to be approved)	\$26.8 m	4
World Bank – Community Development Project (CDP)	\$17.2 m	4
UNDP – Risk Prevention and Management program	\$160,000	1-5
GEF- NAPA implementation	\$3 m	3-5
AFD- EU- BOAD- Urban Environment project in Lome	Euro 11 m	4
German Red Cross- Enhance early warning	FCFA 119 m	2

WORLD BANK

Emergency Infrastructure Rehabilitation and Energy Project (EIREP). The proposed grant would help finance the following activities: Component A–Infrastructure Rehabilitation, including: (i) drainage; (ii) urban roads rehabilitation; (iii) urban water supply; (iv) energy equipment rehabilitation and light bulb replacement; and Component B–Institutional Strengthening. The proposed support will address urgent and immediate needs to improve pedestrian and vehicular access to some of the city’s poorest neighborhoods, and support Government efforts to reduce their periodic flooding.

Community Development Project (CDP). The main objective of the CDP is poverty reduction, through the establishment and strengthening of basic socioeconomic infrastructure geared towards poor communities in Togo, mainly in the areas of health, education, water and sanitation, and revenue-generating activities.

UNDP

UNDP is assisting the Government of Togo through the Ministry of Environment to enhance the coordination mechanisms of the national platform and involve ministries, UN agencies, NGOs, and other civil society actors. UNDP is also assisting the Government of Togo in the development of a national strategy for disaster risk management and prevention, a national risk/hazard mapping, a contingency plan and an early warning system.

GEF- NAPA

The Global Environment Facility financed the elaboration of the National Adaptation Plan of Action (NAPA) in collaboration with the UNDP. Once the NAPA approved by the Government, the GEF will finance part of the priority projects, for a total amount of \$3m. The Project Identification Forms will be submitted at the GEF probably at the end of 2009/beginning of 2010. The NAPA process has an estimated cost of \$23m and it will need the financial assistance of others donors in order to be fully implemented. Some of the NAPA priorities of action, as the risk assessment, the enhancement of the early warning system and initiatives aimed at reducing the vulnerability of the population to natural hazards, are strictly related to the GFDRR program.

AFD (FRENCH DEVELOPMENT AGENCY)

Urban Environment project in Lomé. This project has a component that finances the drainage of the exceeding rainy water from the lagoon of Lomé. This project will help to overcome the floods caused by the water of the lagoon during the rainy season in some particularly exposed area of the capital city. The project is co-financed by the European Union (Euro 5m) and the West African Bank for Development, BOAD (Euro 3 m).

UNISDR

The UNISDR is supporting the National platform in preparing the DDR strategy. During the Togo National Platform meeting held in Lomé on March 3, 2009, the national platform requested assistance from UNISDR and ECOWAS for the development of the DRR strategy and to conduct an “institutional diagnostic.”

UN OCHA

UN OCHA is a partner of the Government in supporting response mechanisms. UNOCHA works closely with the Government of Togo through the Ministry of Environment and the Ministry of Security and Civil Protection to strengthen preparedness and response mechanisms in case of emergency. OCHA provided guidance and assistance during the 2008 floods and ran a simulation exercise recently between Togo and Benin.

OTHER PROJECTS AND SUPPORT

There are other projects – smaller in size and scope – being implemented or prepared. A project entitled “Resource Mobilization Project for the Implementation of the National Action Programme against Desertification (PAN),” funded by the Global Mechanism of the UN Convention on Desertification, is in development. The UN-SPIDER program will conduct an evaluation mission in Togo to review and draft recommendations on the use of geospatial data for DRR. The project financed by the German Red Cross and implemented in collaboration with the Togolese Red Cross aims at improving the early warning system in about 100 targeted communities. The project will put in place a mechanism to control the level of the water in some rivers and it will establish an early warning system for the communities living nearby in case of emergency. After the floods of 2007, the International Committee of the Red Cross worked with the Togolese Red Cross to prepare a National Contingency Plan. The plan includes a pilot early warning system for floods. Other organizations involved in the response to the 2007 and 2008 floods include UNICEF, Caritas, WFP, WHO, FNUAP and FAO, OCHA, TRC, OCDI, and PLAN-TOGO. These organizations have been incorporated into the disaster response mechanism outlined by the Plan-ORSEC.

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Togo is susceptible to natural disasters that have enormous destructive potential on environmental, social, and economic levels. Though a plan for natural disaster response and reconstruction exists in the Plan-ORSEC, there is no strategy for disaster risk reduction and prevention, although it is now being discussed and key actions have been identified, which are all in need of additional support and financing in particular. The proposed program is prepared with the support of the following ministries:

- Ministry of Environment and Forestry
- Ministry of Security and Civil Protection
- Ministry of Social Action, Promotion of Women and Protection of Children and Elderly
- Ministry of Internal Affairs, Decentralization, and Local Communities
- Ministry of Cooperation, Development, and Local Planning
- Ministry of Higher Education and Research

Recently, the government of Togo has been involved in the revitalization of some of the efforts to mitigate the impact of natural disasters. The Government is working on operationalizing the national platform, mapping risk zones, developing a national strategy for disaster risk reduction along with other activities. Moreover, the national platform in collaboration with the UNDP will conduct over the next months two studies in order to identify the national priorities on risk management and reduction on the short, medium and long term. A document outlining a preliminary strategy for disaster risk reduction will be ready in approximately 5 months. The results of this analysis will serve as a basis to better define the interventions financed under the GFDRR plan. In addition to that, the Government of Togo is making the effort to integrate climate change adaptation measures into national policies. The NAPA process identify the priority actions needed to face this phenomenon, among others the enhancement of the early warning system and the reduction of the vulnerability of the population to natural risks related to climate change.

The proposed program seeks to fill the gaps in these on-going activities and complement them - over a three years period - in close collaboration with other donors, in particular the UNDP. The initiative financed under the GFDRR will contribute also to the achievement of some of the NAPA priorities, mainly to set up an early warning system and initiatives addressing the issue of vulnerability to climate change. The institutional arrangement for project implementation is not yet defined, although the project will be implemented in close collaboration with the national platform on disaster risk reduction.

It is proposed that the GFDRR finances the following activities:

Component 1. Institutional and capacity building for effective natural disaster risk management and preparedness.

Risk and Vulnerability Assessment. A comprehensive risk assessment will be conducted in all regions of Togo, encompassing a hazard, asset and vulnerability analysis that takes into account locational, structural, operational, and socio-economic vulnerabilities. The assessment will include hydrologic modeling as floods are one of Togo's most frequent natural hazards and will incorporate various climate change scenarios. The objective of this assessment is to identify appropriate disaster mitigation investments and/or risk transfer mechanisms to inform the development of a natural disaster risk reduction strategy and to inform the strengthening of the national platform and the Plan-ORSEC. An update of the national cartography is also necessary in order to assess the risks and enhance the early warning system. This component will finance the purchase of satellite images receiving antennas and consulting services to update the cartography. This will also give the opportunity to have real-time images during a natural disaster. The component will finance also some equipments needed to monitor risks and meteorological conditions (measure of the pluviometry, the wind, the hydrometric network) in order to give to the country the means to conduct independent risks assessment in the future.

Capacity Assessment of the institutions involved in risk management. The national platform in collaboration with the UNDP is conducting a preliminary institutional assessment in order to analyze the existing arrangements and key institutions on disaster risk prevention and management. This component will complete this analysis and it will finance a study assessing the technical competencies in terms of financial management, procurement and human resources management of the main key institutions identified. This will highlight the strengths and weaknesses of existing institutional arrangements with the purpose of simplifying them.

Follow up of the National Platform and Implementation of Disaster Risk Reduction Strategy. The national platform is already operative but it will need some technical support (equipments, training, financials means) to assure its well functioning. A national disaster risk reduction strategy will be ready in the next months. This strategy will outline the reforms needed and the actions to be taken over the short and medium term. Once this analysis done, the platform will identify the priority of actions for the implementation of the strategy and further initiatives that will need the financial support of the GFDRR.

Training and equipment will be provided to key national, and regional, local and community actors that engage in disaster prevention, mitigation, preparedness, response and recovery based on the natural disaster risk reduction strategy and the Plan-ORSEC. A general awareness campaign about the disaster risk reduction and the new national risk reduction strategy will be undertaken within the government and the general public. The objective of this activity is to ensure human resources are prepared and equipped to implement the natural disaster risk reduction strategy and the Plan-ORSEC.

Component 2. Strengthening resilience in multi-sectoral investments.

This component will finance prefeasibility studies and other analytical work to support the upgrading of future investments to better withstand the effects of natural disasters and climate change effects. In particular this component will finance

- (i) Upgrading of building codes for climate/risk resilient infrastructure and buildings;
- (ii) A study on the integrated flood prevention and watershed management strategy, in particular on the northern half of Togo which shares the Upper Volta River Basin with Ghana and Burkina Faso. This study will be conducted in close collaboration with the Ghana authorities in charge of the watershed management strategy for the Volta basin.

Component 3. Support to local development activities to reduce vulnerability to natural disasters and climate change.

Incorporation of Risk Management in the Community Development Project

A US\$17.2 million IDA financed Community Development Project (CDP) in Togo was approved by the board on June 26, 2008. The objective of this project is to provide poor communities with improved basic socio-economic infrastructures and income generating activities, by financing at least 350 subprojects that are identified and implemented directly by communities. Community subprojects will be implemented by poor rural communities with the support of the AGAIB (*Agences d'Appui aux Initiatives de Base*). Currently, there are no guidelines in place on incorporating disaster risk reduction into the design and implementation of these subprojects.

In order to assist AGAIB with the incorporation of disaster risk reduction measures into the Community Development Project, it is proposed that the Global Facility for Disaster Reduction and Recovery (GFDRR) fund:

a. Community Assessments and Training

1. Community Risk Assessment. A consultant will be hired to conduct a risk assessment of communities in which the CDP operates. This assessment will gather information on the risks communities face and the way in which communities respond to such risks. This assessment will include also a sociological analysis that will identify the traditional early warning systems existing in the communities, the reasons behind the resistance of the population to respond in case of emergency and the role played by local authorities in this process.
2. Development of Guidelines for Incorporating DRR into the CDP. Advisory services are requested to establish a set of guidelines to incorporate disaster reduction and recovery into CDP.
3. Training and Capacity Building. Training and capacity building will be provided to key AGAIB and community actors involved in the implementation of subprojects.

b. Pilot Project

4. Community based pilot activities to mitigate impact of extreme events in fragile areas. Extensive soil-degradation, deforestation and other human activities have had a serious negative impact on agricultural productivity and on income of poor rural communities. Preliminary studies have already identified some very fragile areas, where selected public works focused on soil and water conservation activities can help mitigate the effects of floods and other extreme events, and provide an example to replicate in other sites of Togo. Interventions would include: soil embankment construction; stone embankment construction; pond construction and maintenance;

spring development; land rehabilitation through area enclosure; small-scale irrigation canals; tree nursery site establishment; rural road maintenance; and tree planting. The pilot project will include early-recovery safety nets initiatives after a disaster.

Component 4: Project Management.

This component will finance project management costs relating to monitoring and evaluation, incremental operating costs for project management and costs related to project reporting and audits.

Results of activities both at the national and community level will be measured against indicators associated with HFA priorities for action. Key outputs of activities will include reports on the findings of the risk assessments (both national and community) a report on the findings of the national institutional assessment, a national cartography, the guide to incorporating disaster reduction and recovery into the Community Development Project, and the assessment of the pilots.

The program will be conducted in partnership with existing and prospected activities and partners and a US\$ 8.1 million budget is proposed. The table on page 52 gives an overview of the activities under each component, the envisaged partnership for their implementation and the HAF priorities each intervention addresses. A provisional budget to finance the interventions proposed in the Disaster Risk Management Action Plan is of US\$8.1m.

HFA Priority areas	Key Partners	Estimated Budget for 2010-2013 in US\$	Notes
HFA 1: Strengthen national disaster risk management strategies and institutions			
1.1 Institutional and capacity building for effective natural disaster risk management and preparedness	National Platform Ministry of Environment UNDP CDP Technical Secretariat	700,000	(Of which 1,500,000 at the national level and 750,000 at the local level)
1.2 Support to establish plans to reduce risks at all administrative levels		500,000	
1.3 Develop community participation approaches through decentralization of authority and transfer/mobilization of resources to local level		400,000	
1.4 Functioning multi-sectoral platform for risk reduction is in place with institutional assessment of basic implementation functions of key agencies and capacity building/systems development		650,000	
TOTAL HFA 1		2,250,000	
HFA 2: Ensure risk and vulnerability assessments, early warning and contingency planning and financing - in both rural and urban areas			
2.1 Risk assessment (national and local) based on data and information on hazards/vulnerabilities	National Platform Ministry of Environment UNDP University of Lome	500,000	Includes technology support
2.2 Updated cartography	National Platform University of Lome	1,000,000	Includes technology support

(Cont.)

HFA Priority areas	Key Partners	Estimated Budget for 2010-2013 in US\$	Notes
2.3 Study on the integrated flood prevention and watershed management strategy, in particular on the northern half of Togo	National Platform University of Lome Other institutes	300,000	
2.4 Early warning systems are in place on the majority of natural hazards and are transmitted to communities	National Platform Ministry of Environment UNDP Plan ORSEC University of Lome Civil society organizations	500,000	Includes technology support
TOTAL HFA2		2,300,000	
HFA 3: Increase and sustain awareness creation, education and capacity building			
3.1 Information on hazards are accessible at all levels and to all actors	National Platform UNDP	300,000	
3.2 Information campaigns to promote a culture of prevention	National Platform CDP Technical Secretariat	200,000	
TOTAL HFA3		500,000	
HFA 4: Reduce underlying risk and vulnerability (and integrate DRR into sector planning and practices for example in water, agriculture, health, environment)			
4.1 Community based pilot activities to mitigate impact of extreme events in fragile areas	Technical Secretariat of the CDP Ministry of Youth and Youth Employment AGAIB	2,000,000	
4.2 Upgrading of building codes for climate/risk resilient infrastructure and buildings.	National Platform, CDP Technical Secretariat, ministry of Public works, Ministries of Education and Health,	300,000	
TOTAL HFA4		2,300,000	
HFA 5: Improve emergency preparedness and response through capacity strengthening			
5.1 Development of Guidelines for Incorporating DRR into the CDP and training	Technical Secretariat of the CDP UNDP AGAIB Civil society organizations	250,000	
5.2 Support to Emergency/contingency plans at all administrative levels and drills are taking place	Plan ORSEC National Platform	500,000	
TOTAL HFA5		750,000	
TOTAL GFDRR		8,100,000	

Annex: Hyogo framework – Togo – Update on actions (as of March 2009)

Hyogo priority		
1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation		
Indicator	Status	Constraints
1.1 National policy and legal framework for the mitigation of risks is in place. With clear decentralized responsibilities and capacity at different levels	Weak systematic commitment at the institutional/political level although some progress in recent times (March 2009 workshop)	Financial constraints
1.2 Sufficient resources are allocated to establish plans to reduce risks at all administrative levels	Limited progress (no budget line to prevent disasters)	Financial constraints
1.3 Community participation is ensured through decentralization of authority and of resources to local level	Institutional commitment is in place. Implementation is still incomplete	Financial constraints
1.4 Functioning multi-sectoral platform for risk reduction is in place	Institutional commitment in Place and legal framework in place. Some progress made during the recent workshop (March 2009)	Financial constraints to mobilize all stakeholders
2. Identify, assess, and monitor disaster risks – and enhance early warning		
Indicator	Status	Constraints
2.1 Risk assessment (national and local) based on data and information on hazards/vulnerabilities is available	Institutional commitment is in place. Implementation is still incomplete. With support from UNDP some studies will be launched on the assessment of risks at the national/local level	Lack of resources to prepare more realistic regional maps
2.2 Systems in place to asses, archive and disseminate information on hazards and vulnerabilities	Institutional commitment is in place. Implementation is still incomplete. "Journal L'environnement" is the newsletter on natural disasters	Strengthen the capacity of the technical secretariat of the National platform
2.3 Early warning systems are in place on the majority of natural hazards and are transmitted to communities	Institutional commitment but no system in place.	Financial constraints
2.4 Trans-national risks are taken into account by the national/local risk assessment strategy	Institutional commitment but no system/ action in place.	Financial constraints
3. Use knowledge, innovation, and education to build a culture of safety and resilience at all levels		
Indicator	Status	Constraints
3.1 Information on hazards are accessible at all levels and to all actors	Limited progress (waiting for a diagnostic)	Identification of risk areas and types
3.2 School curricula, textbooks and training include modules on risk reduction and concepts and best practices on reconstruction	Limited progress. Documentary on "prevention of disasters begins at school" currently being designed	Financial constraints
3.3 Research methods and technical capacity are in place to asses multiple risks (and cost analysis)	Limited progress	Strengthen the capacity of the technical secretariat of the National platform and of researchers
3.4 Information campaigns to promote a culture of prevention	Limited progress. Plans to promote the documentary and other programs with TV channels and other media	Financial constraints

(Cont.)

Hyogo priority		
4. Reduce the underlying risk factors		
Indicator	Status	Constraints
4.1 The reduction of risk of disasters is an integral part of policies and plans in the environment sector (planning, management of natural resources and adaptation to climate change)	Major progress include: parliamentary vote, National plan on the environment, National plan to adaptation, etc.)	Financial constraints to move forward, especially in the implementation of the National plan of adaptation
4.2 Policies and social plans are in place to reduce vulnerabilities of specific groups	Institutional commitment but system/ action limited.	Financial constraints to finance priority project as included in the PRSP
4.3 Policies and sector (economic) plans are in place to reduce vulnerabilities of specific groups	Institutional commitment but system/ action limited.	No statistical information
4.4 Planning and management of human settlements integrate risk reductions consideration and construction standards	Some progress with the creation of a special association of architects	No real policy in spatial/habitat planning
4.5 Risk reduction of disasters is part of the reconstruction/rehabilitation process	Institutional commitment but implementation is limited/incomplete	Financial constraints (to prepare TOR/ manuals)
4.6 Procedures are in place to assess the impact of risk reduction on all development projects, especially in infrastructures	Institutional commitment but implementation is limited/incomplete (there is a decree on type of projects to be monitored/assessed)	Financial constraints (especially to monitor the implementation of the decree)
5. Strengthen disaster preparedness for effective response at all levels		
Indicator	Status	Constraints
5.1 Policies, mechanisms and capacity are in place to manage risks	Institutional commitment but implementation is limited/incomplete	Operationalization of the National platform
5.2 Emergency/contingency plan are in place at all administrative levels and drills are taking place	Institutional commitment but implementation is limited/incomplete	Financial constraints
5.3 Financial emergency/contingency plan are in place to support emergency/reconstruction	Limited progress. Plan Orsec is in place, but no contingency financing for emergencies	Financial constraints
5.4 Procedures to exchange information on hazards are in place with the aim of conducting post-disaster analysis	Institutional commitment but implementation is limited/incomplete	Financial constraints

Source: Rapport national intermédiaire du suivi de la mise en œuvre du Cadre d'Action de Hyogo, Ministère de l'Environnement et des Ressources Forestières, Septembre 2008 and update by the Focal Point of the Ministère de l'Environnement et des Ressources Forestières (April 2009).



DISASTER RISK MANAGEMENT

East Asia and Pacific

Indonesia / Marshall Islands / Papua New Guinea / Solomon Islands / Vietnam

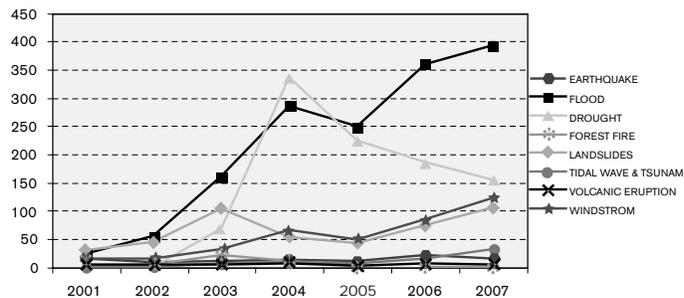
INDONESIA

In preparing this DRM Country Note, a series of consultations were carried out with the National Disaster Management Agency (BNPB) and with the National Development Planning Agency (BAPPENAS) to determine priority areas that could be supported if more funding are available. Upon identification of the scope for scaled up support, another consultation was carried out with international development partners working in Indonesia, and who also have major support programs for the country such as AusAID, JICA, the European Commission, DFID and UNDP. This consultative process is part of on-going partnership to build synergy, avoid duplication and increase leverage. The final proposal was also discussed by a visiting high official of the World Bank and the Minister/Head of the National Disaster Management Agency (BNPB) on 18 May 2009.

1. DISASTER RISK PROFILE

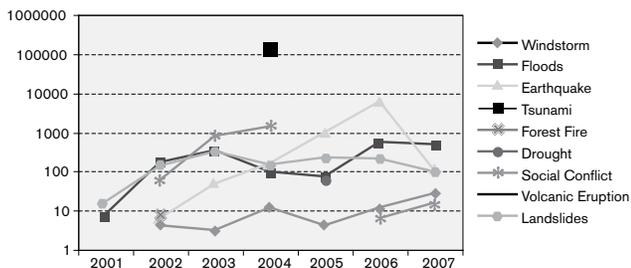
Indonesia ranks 12th among countries at relatively high mortality risks from multiple hazards. Indonesia is situated in one of the most active disaster hot spots where several types of disasters such as earthquake, tsunami, volcanic eruption, flood, landslide, drought and forest fires frequently occur. According to a global risk analysis by the World Bank¹, Indonesia is among the top 35 countries that have high mortality risks from multiple hazards with about 40 percent population living in areas at risk. For a country that has more than 230 million population, this percentage gives a very large nominal number of more than 90 million population potentially at risk creating a major humanitarian catastrophe should large disasters occur.

Disaster Occurrence in Indonesia



Source: DIB/BNPB

Mortality From Disaster in Indonesia



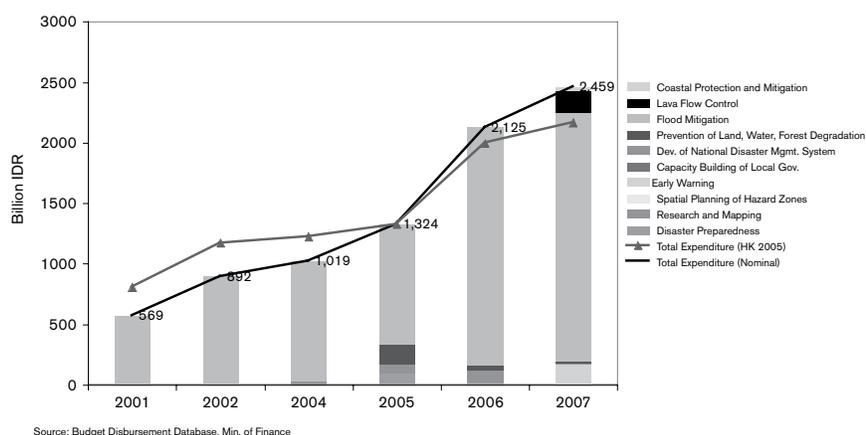
Source: DIB/BNPB

COUNTRIES AT RELATIVELY HIGH MORTALITY RISK FROM MULTIPLE HAZARDS¹ (Top 35 Based on Population)

1. Taiwan, China
2. El Salvador
3. Costa Rica
4. Dominica
5. Philippines
6. Antigua and Barbuda
7. Guatemala
9. Dominican Rep.
10. Jamaica
11. Nicaragua
12. INDONESIA
16. Bangladesh
17. Colombia
35. Panama

¹ See World Bank, *Natural Disaster Hotspots, A Global Risk Analysis* (Washington, DC: Disaster Risk Management Series, 2005), table 1.2

Government Expenditure on Disaster Response



Increasing frequency of disaster impacting public expenditures. According to the Government's disaster data², between 2001 and 2007 alone there have been more than 4,000 occurrences of disasters including floods (37%), droughts (24%), landslides (11%), and windstorm (9%). As the disasters damage public infrastructure and people's homes, mostly uninsured, they created an enormous burden on public expenditure to restore those facilities.

Hazard Profile

GEOLOGIC

Situated in the earthquake belt and pacific ring-of-fire Indonesia is highly vulnerable to earthquakes and volcanic eruptions. The areas most vulnerable to earthquakes are Sumatera, Java, Bali, Nusa Tenggara, Maluku, Sulawesi and Papua. Sumatera alone has suffered from over 15 large earthquakes in the past 100 years. Indonesia also has 129 active volcanoes, 70 of them are classified as dangerous. Between 2001 and 2007 alone, 26 volcanic eruptions were recorded mostly in Java. In 1815 the Tambora volcano on the northern coast of Sumbawa, West Nusa Tenggara Province erupted claiming more 92,000 lives, whereas on 1883 the Krakatoa eruption claimed more than 36,000 lives and created tsunamis as far away as South Africa. The islands of Java and Sumatra are also prone to landslides because of their topographic and unstable soil conditions.

HYDRO-METEOROLOGIC

High rainfall regime in the west and dry zone in some eastern provinces are are subject to recurring floods and droughts. Within the past century, floods have been the most frequent disaster for Indonesia. The floods often hit major population centers such as Jakarta (with population more than 13 million), Medan (more than 2 million), and Bandung (more than 4 million). The Government estimated that the 2007 flood that hit Jakarta created total damage and losses amounting to more than \$900 million³. According to the Ministry of Public Works, the annual flood in the Bengawan Solo watershed that occurred in 2007 cost the government more than \$200 million or equal to the total emergency allocation for all disasters for the entire year of 2008⁴.

CLIMATE VARIABILITY AND CHANGE

Deforestation and prolonged drought intensify the occurrence of forest fires. The wildland fire and smoke-haze

2 DiBi database (*Data and Information on Disaster in Indonesia*), National Disaster Management Agency (BNPB). <http://dibi.bnpb.go.id>

3 *Laporan Perkiraan Kerusakan dan Kerugian Pasca Bencana Banjir Awal Februari 2007 di Wilayah Jabodetabek*, National Development Planning Agency (BAPPENAS) 2007.

4 Source: Center for Strategic Assessment of the Ministry of Public Works, April 2009.

episodes in Indonesia during the 1980s and 1990s were the first documented influence of drought impact triggered by the El Niño-Southern Oscillation (ENSO). In East Kalimantan alone, nearly 3.5 million hectares of forests were affected by drought and fire. Nearly 0.8 million ha of primary rain forest was burned, but impacts were more widespread in logged-over and secondary forests (mainly in the vicinity of settlement areas)⁵. The climate anomaly brought by El Niño also induced the decrease in rainfall impacting food production by an average of 3.06 percent⁶.

Factors of Vulnerability

Population increase and urbanization. As in many other developing countries, economic growth in Indonesia has shown a strong correlation with urbanization, both in the sense of people moving from rural areas to the cities and in terms of the urbanizing of the rural settlements. By 2008, at least 50 percent of the population was living in the cities and urban areas were increasing at 4.4% per year, well beyond national population growth. This had placed more than 110 million people in around 60 cities mostly located in the coastal areas, exposing them to common hazards such as earthquakes, flooding and communicable diseases. The high population density in many of the larger cities also increased the vulnerability of the population in case of large-scale disasters.

Increased exposure due to poorly enforced zoning and poorly maintained infrastructures. The high rate of urbanization in Indonesia in the midst of limited capacity of the urban centers to provide adequate shelters and infrastructure has led to the emergence of many unplanned settlements. Poor quality and enforcement of land use zoning in turn led to many hazard prone locations being occupied by settlements, increasing the exposure of the population to disasters. The Ministry of Public Works estimated that a quarter of the population in the cities (or around 25 million people) are living in the slums and informal settlements⁷. The combination of the poor quality settlements and inadequate infrastructure has made Indonesia vulnerable, especially when larger scale hazard events occur.

Overall Risk Profile

More frequent events, increased exposure, lower coping capacity hence higher impacts. A combination between the uniqueness of Indonesia's geological setting and the complexity of its population settlements has generally led to increased disaster occurrence with a tendency for significant human impacts (e.g., loss of life as well as economic consequences). Although the natural events that cause hazard cannot be stopped, the severity of their consequences can be minimized or even avoided through better community preparedness and resilience. Overall, Indonesia's population is at higher risk due to increased exposure and weaker resilience.

The climate factor. Climate variability and change increase the level of risk to disaster for Indonesians. In addition to higher intensity of the meteorologically influenced events such as floods and droughts, climate has also influenced the food production pattern and outputs, bringing additional uncertainty in the event of disaster which could further exacerbate its impacts. While awareness of the importance of taking into consideration the impact of climate variability and change is increasing, more evidence-based response and adaptation measures need to be developed and explored.

⁵ Fire Situation in Indonesia. IFFN No. 26, January 2002, p. 37-45.

⁶ Fenomena Anomali Iklim El Niño dan La Niña: Kecenderungan Jangka Panjang dan Pengaruhnya Terhadap Produksi Pangan. Bambang Irawan. Forum Penelitian Agro Ekonomi, Vol. 24 No 1. Juli 2006: 28-45.

⁷ *Toward Developing Slum Free Cities 2025* (in Bahasa Indonesia). Djoko Kirmanto, Minister of Public Works. Keynote Speech delivered on the commemoration of World Habitat Day 2008. Bali 30 October 2008.

2. DISASTER RISK MANAGEMENT FRAMEWORK

A comprehensive legislative framework has been put in place, but implementation remains a major challenge. After the 2004 Indian Ocean Tsunami, Indonesia enacted a new Law on Disaster Management (Law 24/2007) that outlines the principles, division of labor, organization and implementation of the national disaster management system, including the role of international organizations. The Law has been further elaborated by the issuance of three key Government Regulations, one Presidential Regulation and numerous implementing guidelines. While the issuance of the legal framework is an important first step, more work needs to be carried out to ensure that the regulations are disseminated and implemented by the respective institutions and observed by the public.

A new National Disaster Management Agency has been created but only six out of 33 provinces have established provincial disaster management agencies. A major shift brought by the new Disaster Management Law is the establishment of a dedicated agency to deal with disaster, the National Disaster Management Agency (BNPB), where previously there was only an ad-hoc inter-ministerial council. BNPB is empowered with a strong mandate to coordinate line ministries on the entire cycle of disaster management from pre, during, and post disaster stages. While the Law clearly mandated the creation of disaster management agencies at the provincial (mandatory) and districts (depending on needs and capacity) levels, to-date only six out of 33 provinces and six out of more than 450 districts and municipalities have actually established their disaster management agency (BPBD). This necessitates further formulation of both the governance and the policy incentive for the provincial and local government to comply with the mandate of the Law.

The first three-year National Action Plan for Disaster Risk Reduction (NAP-DRR) is nearly concluded, and there is a need to develop a new action plan based on risk assessment. Indonesia was among the first few countries in Asia that formulated their national actions plan for disaster risk reduction (NAP-DRR), which is the first priority of the Hyogo Framework for Action (HFA). This first NAP-DRR covering the period of 2006-2009, which was formulated through multi-stakeholder processes, is nearly concluded. With the issuance of Government Regulation 21/2008 on the Implementation/Conduct of Disaster Management, the next NAP-DRR will have to refer to the National Disaster Management Plan (DM Plan) currently under formulation. The Government Regulation also stipulates that both the DM Plan and the NAP DRR would be based on risk analysis and be part of the broader development program. This new policy would require significant support in its follow up, both in terms of detailed institutional and technical procedures, and in terms of capacity for field implementation.

Government budget on DRM has quadrupled in amount, but comprehensive risk financing has not been put in place. The Government of Indonesia quadrupled its spending on disaster related activities between 2001 and 2007 as a response to two major disasters in Aceh (2004) and Java (2006). However, further analysis by BAPPENAS⁸ on sectoral budget allocations indicated that the amounts in the last three years from 2007 to 2009 actually decreased with the budget for 2009 back to one third of the spending in 2007, suggesting that most of the spending was for response and recovery. The analysis also noted that further tracking of sectoral allocation was still not possible to determine if DRR is fully mainstreamed in regular development programs. A new Government Regulation No 22/2008 on Funding and Management of Disaster Assistance has also stipulated three categories of funding namely: contingency fund, on-call budget, and social assistance fund through grant. However, in broader risk financing terms, other forms of financing such as risk insurance and contingency line of credit in the event of a large scale disaster are only recently being considered and are still under discussion.

⁸ "Planning and Budgeting for Disaster Management Plan in Indonesia". Dr. Suprayoga Hadi, presentation to UN/NGO/DONOR/Red Cross Convergence Workshop, February 2009.

Capacity building for local government and communities in disaster risk reduction requires major development investment. To fully transform the reactive mindset into one that reduces risk and prevents catastrophic impacts, systematic investment is required to build the capacity of local actors including governments, civil society and community organizations and the private sector. The current approach, which is still reactive in allocating resources for spending on disaster management, will have to be gradually shifted into investment for reducing risk and achieving sustainable development. This will require continuous improvement to build competent human resources and organizations to manage disaster risks.

Implementation of comprehensive disaster risk management measures requires both consensus and major rehabilitation works. Indonesia's efforts to build a national system for disaster risk management under Law 24/2007

have provided more room for concrete actions to reduce risks. Relevant laws on spatial planning, on environment as well as on natural resource management have provided the legal basis. But, detailed implementation still requires both more specific consensus and new innovation for rehabilitating the current pattern of development and human settlement to build physically and socially safer and more resilient communities.

3. ACTIVITIES UNDER HYOGO FRAMEWORK OF ACTION⁹

HFA Priority #1: Policy, Institutional Capacity and Consensus Building for Disaster Management

Focus on national institutional, legal and resource frameworks. Based on the first National Action Plan for Disaster Risk Reduction (NAP-DRR) covering the period of 2006-2009, Indonesia has put particular emphasis on the establishment of the proper legal, institutional and resource frameworks as part of building the national disaster management system. A new Law on Disaster Management (Law 24/2007) was recently enacted followed by the issuance of four key implementing regulations on the establishment of a new National Disaster Management Agency/BNPb (Presidential Regulation No 8/2008); on the implementation of disaster management (Government Regulation No. 21/2008); on Funding and Management of Disaster Assistance (Government Regulation No. 22/2008); and on the role of international institutions and international NGOs in disaster management (Government Regulation No. 23/2008).

Development of human resources in disaster management. Through the current NAP-DRR, the Government of Indonesia has also actively facilitated the participation of stakeholders to build the capacity of human resources in disaster management. The Evaluation Report of the NAP-DRR recorded that 26 government ministries/agencies, 14 donor agencies and international NGOs, 4 universities and 3 local governments were actively implementing training and capacity building programs. These include, among others, training of disaster management volunteers, disaster management information system for local governments, disaster victim identification, as well as the basics of disaster management.

Fostering consensus and participation of broad stakeholders. In addition to the engagement of stakeholders in capacity building, the Government of Indonesia is also actively promoting the involvement of local governments and communities in disaster management. In cooperation with the IFRC and the Indonesian Society for Disaster Management (MPBI), a framework and several symposia on community based disaster risk reduction and disaster management had been developed and carried out. There have also been active collaborations between UN agencies, international NGOs, and national stakeholders on various aspect of disaster management through a Convergence Group that has established a mechanism for regular consultation and exchange of information. A National Platform for Disaster Risk Reduction

⁹ Most of the activities summarized in this section are based on the published government report titled "Evaluation Report on the Implementation of National Action Plan for Disaster Risk Reduction for the 2007-2008". National Development Planning Agency (BAPPENAS) and UNDP, September 2008.

was also recently established comprising of representatives from the civil society, private sector, academia, and the government. The National Platform's first task would be to facilitate the formulation of the new National Action Plan for Disaster Risk Reduction for the period of 2010-2012.

HFA Priority #2: Disaster risk assessment and monitoring

Risk assessment at national and regional levels. Several key government ministries and agencies have continued to update and disseminate hazard and risk analyses within their sectoral purview. The Ministry of Home Affairs, for instance, has developed disaster risk maps for 11 provinces as the basis for governance (institutions, local by-laws, budget allocation) at the provincial and local levels. The Meteorological, Geophysical and Climatological Agency (BMKG) has developed and updated the map of potentially flooded and landslide-prone areas based on historical and forecasted data. The Ministry of Public Works has developed flood and landslide risk maps, particularly for major watersheds of economic and social importance. Other agencies such as volcanological survey and disaster mitigation center (VSI) and national mapping agency (BAKOSURTANAL) have also updated their risk maps. The National Agency for Disaster Management (BNPB) is currently also preparing a guideline for the local governments to conduct their disaster risk assessment (PARBA).

Improvement of early warning system. Since the 2004 Indian Ocean Tsunami, Indonesia has begun to more systematically develop an early warning system for tsunamis. Several agencies under the coordination of the Ministry for Research and Technology including BMKG, BAKOSURTANAL, and the Technology Agency (BPPT), with the assistance of Germany, have established a network of Tsunami Early Warning System (TEWS) initially in hazard prone areas facing the Indian Ocean, South China Sea, and the Southwestern Pacific Ocean. Several volcano monitoring systems and their associated hazard maps have also been installed and updated by the Volcanological Survey of Indonesia (VSI) for active volcanoes in Sumatra, Java and Sulawesi.

Capacity development in risk assessment and regional response. Capacity development in risk assessment and the required regional response also continue to be important activities under the HFA. The National Mapping Agency (BAKOSURTANAL) and the Ministry of Public Works continue to update national and regional base and thematic maps required for regional risk assessment and monitoring. Several international organizations such as the European Commission (through DIPECHO) and the IFRC have also provided support to building capacity in regional and local preparedness.

HFA Priority #3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

Information management and exchange. Management and exchange of DRM information have intensified, in particular following the 2004 Indian Ocean Tsunami. Among notable progress was the launch of Data and Information on Indonesian Disaster (DiBi) by BNPB providing online searchable data on past disasters. Fourteen ministries/national agencies, 3 international organizations and 2 universities have been reported as actively developing DRM information and/or promoting information exchange.

Education, training and research. Training and education on DRM have been focused on increasing preparedness toward more common disasters such as earthquakes, floods and landslides, tsunamis and volcanic eruptions. Seventeen stakeholder groups have been reported as active in this area including 8 from government ministries and agencies, 6 from the international community, 2 from universities, and 1 local government. Research on DRM is mostly focused on field surveys, risk assessment and area-based piloting of disaster management approach/model. A Consortium on

Disaster Education (CDE) consisting of members from national civil society organizations, international NGOs, the Red Cross and UN agencies has also been active in promoting DRR through its mainstreaming in education.

Public Awareness. Increasing awareness of the general public about the importance of reducing risks from disaster through prevention and preparedness has been an important focus for the last three years. Many pocketbooks, leaflets and video clips have been produced providing easily digested DRM information to the general public. Innovative media such as community radio have also been used in rural agricultural villages located near the active Merapi volcano in Central Java and in rural Aceh province providing the community with continuous situational update while conducting their livelihood on their agricultural lands.

HFA Priority #4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase resilience)

Sustainable natural resource and environmental management. Improved natural resource and environmental management is a key theme in addressing the underlying factors of flood, the most frequent disaster occurring in Indonesia. Key government ministries such as Public Works, Forestry, Environment, and Marine Affairs are actively advocating the importance of forest rehabilitation and the proper establishment and management of greenbelt areas buffering the hazard risk zones from the population.

Economic and social development. Poverty and the weak coping capacity of the community to respond to disaster is one of the major issues exacerbating the impacts of many recent disasters in Indonesia. In the last three years, efforts have been initiated to address food security, hospital preparedness, and piloting of safe school buildings. The Ministry of Marine Affairs has also piloted a micro-insurance for coastal communities as part of micro-credit scheme aimed at enhancing the economic resilience of the community in facing natural disasters such as tsunamis or weather-related events such as tidal waves and high seas.

Land use, spatial planning and zoning. Land use zoning, disaster resistance standards compliance, and enforcement are the main underlying factors for population exposure and risk to major disaster such as flood, earthquake and tsunami. The Ministry of Public Works, which has the mandate and capacity to manage this system, continues to promote the incorporation of disaster risk in the spatial plans (as mandated by Law 26/2007 on Spatial Planning), and local zoning regulations, as well as improving building standards and codes. As Indonesia is now highly decentralized, the enforcement of the zoning, standards and codes are in the hands of local governments. Central government agencies such as Public Works and Marine Affairs Ministries are providing technical guidance and assistance to local governments, while several NGOs and universities are developing pilots to showcase to the communities.

HFA Priority #5: Disaster preparedness, recovery and reconstruction at national, regional and local levels

Policy, institution, technical capacity and coordination in disaster response. With the enactment of the new Disaster Management Law (Law 24/2007), Indonesia has adopted a more comprehensive approach in the coordination of disaster response covering the stages of pre, during, and post disaster. National agencies such as BNPB, Ministries of Social Affairs, and Health, and the Indonesian Red Cross are actively updating contingency plans and providing guidelines and training on emergency response, logistic support system, and preparedness of health crisis centers.

Regional response through risk reduction and contingency planning. As Indonesia is geographically spread out, regional rapid response in remote areas is a major logistical challenge. The Ministries of Social Affairs and Health, and the

Indonesian Red Cross are also actively supporting the capacity building of regional government and logistical and health centers, and promoting networking among regional crisis and logistical centers.

Building volunteerism in disaster management. Indonesia has witnessed a rapid growth of voluntary organizations specializing in disaster management. In addition to the local disaster response volunteers (TAGANA) facilitated by the Ministry of Social Affairs, the Ministry of Health and Red Cross are actively supporting the formation of volunteer brigades by many organizations including faith-based charity organizations, Corporate Social Responsibility (CSR)-supported groups, and even political parties. While the growth trend remains positive, the focus is still limited to emergency response and less on risk reduction.

Lessons learned in rehabilitation and reconstruction from recent major disasters. Recent major disasters such as the Indian Ocean Tsunami and the Yogyakarta and Central Java earthquakes provided Indonesia with significant experience in recovery, rehabilitation and reconstruction as lessons for disaster risk reduction. The government through BAPPENAS has established a joint secretariat for planning and management of disaster response (P3B) which has been active in documenting and sharing development lessons. The implementation of major multi-donor funded initiatives such as the Multi-Donor Fund for Aceh and Nias (MDF) and the Java Reconstruction Fund (JRF) offer lessons in both donor coordination and collaborative approach among stakeholders, not to mention complex financial management. Overall, DRR still needs to be mainstreamed in the recovery process and rehabilitation and reconstruction practices, and to become the essence of successful recovery.

4. KEY DONOR ENGAGEMENTS

From recovery assistance to longer-term programmatic support. Following the 2004 Indian Ocean Tsunami and the 2006 Java earthquake, Indonesia received significant size of international assistance mostly for post-disaster reconstruction. But, as the recovery process reached completion, there have been continued support provided by the international community on longer-term capacity building in disaster risk reduction, both as new programs and as part of the recovery itself.

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
Australia Indonesia Facility for Disaster Reduction	Australian Agency for International Development (AusAID)	42 million 2009-2014	1, 2, 3, 4, 5
Regular annual programming which include support to DRR projects	Australian Agency for International Development (AusAID)	5 million/yr annually programmed	1, 2, 3, 4, 5
Institutional revitalization project for Flood Management; and Flash Flood Disaster Management	Japan International Cooperation Agency	- 2007-2010 2008-2011	5
Multi-disciplinary hazard reduction	Japan International Cooperation Agency	- 2009-2011	2, 3, 4, 5
Promoting Private Sector Role in Disaster Risk Reduction in Indonesia	US Agency for International Development (USAID)	300,000 2008-2010	3, 5
Safer Community through Disaster Risk Reduction (SCDRR)	UNDP (w /support from DFID and AusAID)	18 million 2007-2011	1, 2, 3, 4, 5

(Cont.)

10 Most of this funding is allocated mainly to rehabilitation and reconstruction activities. But, many of the activities include relevant DRR measures such as earthquake resistant structure, etc.

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
Mainstreaming DRR in Indonesia	World Bank (GFDRR)	1.25 million 2008-2010	1, 2, 3, 4, 5
Multi Donor Fund for Aceh and Nias Reconstruction ¹⁰	15 donors & managed by World Bank	692 million 2005-2012	5
Java Reconstruction Fund ¹⁰	7 donors & managed by World Bank	94.06 million 2006-2010	5

Building on the achievement of current GFDRR support. Indonesia has received support from GFDRR Track-II at a relatively modest size (\$1.25 million) relative to the size of the country and its disaster risks. The current funding has supported the Government in three core areas: 1) the preparation of the new National Action Plan for Disaster Risk Reduction, which will be more risk-based and will at the same time strengthen the newly formed National Platform as

a consultative forum; 2) capacity building of disaster management agencies in DRR, and 3) the preparation of a catastrophic risk insurance framework. In addition to the above core areas, the current funding also provides support to the internal mainstreaming of DRR within the World Bank projects. While the current activities are on-going and creating a strategic momentum for improving both the risk response planning, institutional capacity in DRR, and financing systems, further support needs to be provided to follow through the current achievements into more concrete actions by the relevant sectors and stakeholder groups.

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Key development issues to be addressed. Considering the risk profile of Indonesia where hazard occurrences are increasing while a large number of population become more exposed and vulnerable, development investment targeting different aspects of risk reduction is urgently required. Four key issues will be addressed in the proposed scaled-up GFDRR Track-II funded program, including: 1) the need to follow through the National Action Plan for DRR into key targeted sectoral and regional investments, 2) the need to further strengthen disaster management agencies at the central and local levels in building the appropriate risk analysis and risk-response systems, 3) the need to devise a more comprehensive risk financing strategy including to incentivise concrete risk reduction measures (e.g., insurance linked to the application of disaster resistant building standards), and 4) the need to showcase the importance of investing in 'no-regret' solutions for DRR and climate adaptation (e.g., improving the quality of urban drainage and sanitation to prevent flooding and water shortage).

Core areas for the scaled-up program. In response to the four key issues identified above, the proposed GFDRR scaled-up program will target the following areas of engagement: 1) Mainstreaming DRR in regular development and through post disaster recovery, 2) Capacity building of national and local DRM agencies including in risk assessment and risk-response, 3) Supporting the Government's effort to implement a comprehensive risk financing strategy linked to DRR actions, and 4) Linking DRR and climate adaptation initiatives through pilot investment projects.

Leveraging national programs and donor assistance. As a global and flexible facility, GFDRR is best positioned to leverage national programs and other donor assistance which exist in the form of larger programs. GFDRR can be used to complement the government and donor programs to build a more integrated approach to DRM in Indonesia. Through

its Steering Committee mechanism for the current Track-II funding, key donor partners such as UNDP, the European Commission, AusAID and JICA will continue to provide collective partnership under the leadership of the Government (BNPB and BAPPENAS) in directing the program.

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
I. Mainstreaming DRR in regular development and through post-disaster recovery			
Support for the mainstreaming of DRR in: (i) sectoral development programs; (ii) regional and local development programs; (iii) World Bank and donor financed development programs and projects	National Development Planning Agency (BAPPENAS), Ministry of Public Works, Local Governments, Civil Society, World Bank	3.2 million 2009-2012	1, 2, 3, 4, 5
Support to the capacity development of Government of Indonesia's efforts to mainstream DRR into rehabilitation and reconstruction framework	National Disaster Management Agency (BNPB), UNDP, World Bank	750,000 2009-2012	5
II. Capacity building of national and local DRM agencies, including in risk assessment and risk-response			
Support for the establishment and capacity building of national, provincial and local disaster management agencies, leveraging government and other donor programs	National Disaster Management Agency (BNPB), Ministry of Home Affairs, Local Governments	4 million 2009-2012	1, 2, 3, 4, 5
Technical Assistance for the development of national and regional risk and impact assessment frameworks, tools and methodologies	National Development Planning Agency (BAPPENAS), National Disaster Management Agency (BNPB), World Bank	750,000 2009-2012	2, 3
III. Support to comprehensive risk financing strategy linked to DRR actions			
Technical Assistance for the development and implementation of comprehensive risk financing framework for Indonesia	Ministry of Finance, National Development Planning Agency (BAPPENAS), World Bank	1.6 million 2010-2012	5
IV. Linking Disaster Risk Reduction and Climate Adaptation			
Support to national and local strategy for DRR and CCA linkages	National Council for Climate Change (DNPI), National Disaster Management Agency (BNPB)	250,000 2009-2011	1, 2, 3, 4, 5
Pilot initiatives and investment in climate adaptation and resilience in urban and rural communities to build alliance among the DRR and CCA constituents and programs	National Council for Climate Change (DNPI), National Disaster Management Agency (BNPB), Local Governments, Civil Society, World Bank	3.5 million 2009-2012	3, 4, 5
Support to implementation of disaster and climate proof building codes and standards and micro zoning	Ministry of Public Works, National Disaster Management Agency (BNPB), Local Governments, Civil Society, World Bank	1 million 2010-2012	3, 4, 5
Total Budget Requested:		US\$ 15.050 million	

MARSHALL ISLANDS

This Country Risk Profile was prepared in consultation with the National Disaster Management Office, The National Emergency Management and Coordination Office, the Ministry of Internal Affairs, the Ministry of Public Works, the Ministry of Finance the Environmental Protection Agency, the Marshall Islands National Weather Service, the Ministry of Resources and Development, the Office of Environmental Planning and Policy Coordination, the Marshall Islands Marine Resources Authority, the Pacific Islands Applied Geoscience Commission (SOPAC) and key donors in the region.

1. DISASTER RISK PROFILE

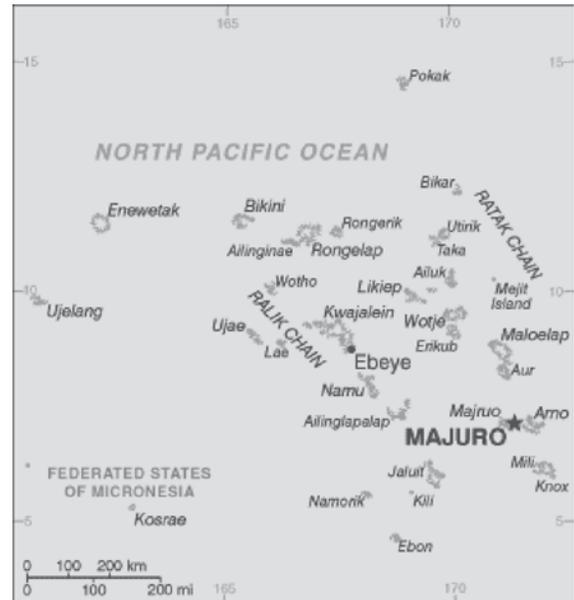
The Republic of the Marshall Islands (RMI) consist of 29 low lying atolls and five islands just west of the international date line and north of the equator. Its land area is roughly 70 sq miles compared with 700 sq miles of ocean surrounding the islands.

The major natural hazards facing the RMI are tropical storms, typhoons, storm surge and drought. Additional challenges/hazards include sea-level rise, coastal erosion, pollution of the marine environment, ecosystem degradation and food security. The hazard that poses the most threat to the RMI is sea-level rise. Its highest point is just 10 m above sea level.

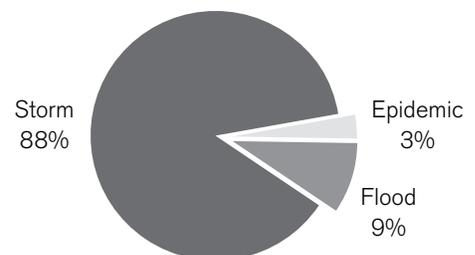
The key natural hazards – tropical storms and typhoons, high surf and drought – are all climate-related and expected to worsen with global warming. Moreover, the RMI faces physical, demographic and socio-economic conditions which exacerbate vulnerability to the above hazards including high population density, a substantial poverty rate, low elevation, limited fresh water resources and wide dispersal of the islands.

Major storms do not often affect the Marshall Islands. The last typhoons which caused substantial damage to the Islands were Typhoon Gay and Tropical Storm Axel in 1992. However the RMI is impacted by high wave action and ocean swells after hurricanes in the neighboring Pacific Islands. The last major disaster to hit the RMI was in late 2008. A storm surge/coastal flood affected 600 people.

According to a 2008 World Bank assessment, while the list of hazards facing the RMI is comparatively small, their potential for damage is significant as the islands two urban areas account for 60-70% of the population. In terms of the country as a whole, the greatest impact would be from direct typhoon hits on the urban centers of Majuro and Ebeye. The land has low elevation and is narrow; housing and most buildings are generally of poor construction, not well maintained and tightly packed; there are no established agreed means of evacuation or identified shelters to seek refuge and the airport would be unusable. Climate change is likely to increase the intensity, frequency, path and other characteristics of typhoons.



% People Affected by Disaster Type



The inhabitants of the Marshall Island rely on rainwater for 95% of their fresh water.

A state of emergency was declared in 2007 after a prolonged drought depleted fresh water supplies. In 2008 the storm surge and high tides caused widespread flooding in the capital city of Majuro and other urban centers, located at just one meter above sea level and the government declared a state of emergency.

Key Natural Hazards	Key Man-made or Human-induced Hazards
Tropical Storms and Typhoons	Fire
High Surf	Contamination of water supply
Drought	Outbreak of epidemic diseases
	Commercial transport accidents

Capital	Majuro (Delap)
Official Language	Marshalese, English
Independence	October 21, 1986 (from the United States)
Area	total: 181.3 km ² land: 181.3 km ² water: 0 km ²
Land Use	arable land: 11.11% permanent crops: 44.44% other: 44.45% (2005)
Government	constitutional government in free association with the US
Population	64,522 (July 2009 est.)
GDP	Per capita US \$3070 (2007)
HDI	not available
Terrain	low coral limestone and sand islands
Climate	tropical; hot and humid; wet season May to November; islands border typhoon b
Natural resources	coconut products, marine products, deep seabed mineral
Major products	copra cake, coconut oil, handicrafts, fish
Main development donors	United States

World Fact Book, World Bank Country Reports

2. DISASTER RISK MANAGEMENT FRAMEWORK

In 1987, RMI passed its National Disaster Management Plan. Seven years later, the enactment of the Disaster Assistance Act established a National Disaster Management Committee and a National Disaster Management Office (NDMO) located in the Office of the Chief Secretary. In 1994, the RMI also passed a Hazard Mitigation Plan, a National Disaster Manual, and an Airport Disaster Plan. A Drought Disaster Plan was passed in 1996, followed by the drafting of a revised National Disaster Management Plan in 1997. The most recent legislative activity in disaster risk management was the development of a Standard Hazard Mitigation Plan in 2005. The draft national action plan is linked to the RMI development policy.

The National Action Plan for Disaster Risk Management (NAP) aligns itself both with the regional policy framework (i.e. the Pacific Regional Framework for Action on DRR & DM) and the national policy framework. AUSAID - SOPAC has plans to support a NAP Disaster Facility to assist the RMI in establishing its DRM framework.

NAP GOALS AND OUTCOMES FOR THE RMI

Goal 1: Establish an enabling environment for improved DRM in the RMI

Outcome: Well-functioning Institutions and Systems for Disaster Risk Management

Goal 2: Mainstream DRM in planning, decision making and, budgetary processes at national and local levels

Outcome: DRM is mainstreamed in all relevant processes at all levels, and in all relevant sectors

Goal 3: Improve capacity for emergency preparedness and response at all levels

Outcome: Organizations and agencies at all levels are well prepared and resourced to respond to disasters

Goal 4: Build a strong and resilient DM early warning and emergency communication systems

Outcome: Effective early warning and communication between Majuro, Ebeye and the Outer Islands at all times

Goal 5: Access to safe and adequate clean water at all times

Outcome: Reduced vulnerability to water-related hazards and water-shortages resulting from hazards

Goal 6: Sustainable development of the coastal area

Outcome: Reduced vulnerability to coastal hazards

Goal 7: Reduce economic dependency of the Outer-Islands

Outcome: Improved Outer-Island resilience to hazards

Goal 8: Improve understanding of the linkages between zoning, building codes, and vulnerability to disasters

Outcome: Decision-makers and public more receptive to the need for adequate zoning and building codes in reducing vulnerability

Goal 9: Raise the awareness of DRM amongst the public

Outcome: Public are better informed of National and Outer Island DRM issues

Goal 10: NAP implementation and impact is monitored and reviewed on a regular basis

Outcome: The NAP is effectively implemented and kept up to date

Source: GFDRR Country Assessment Marshall Islands 2008

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority #1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

THE NATIONAL DRM AGENCY

The overall coordination of disaster management falls under the National Disaster Committee (NDC) and its operational arm, the National Emergency Management and Coordination Office (NEMCO). They have traditionally focused on post disaster response, not disaster prevention mitigation or CCA activities. The NDC is chaired by the Chief Secretary and the NEMCO falls under the Chief Secretary Office (CSO), reporting directly to the President.

In response to the growing importance and attention to DRR and the implementation of the National Action Plan for Disaster Risk Management (NAP), an implementation unit (NAPIU) will be established under the CSO. There is currently a lack of resources and funding for the NAP implementation unit.

While the NDC meets regularly, it is also responsible for other tasks outside the national disaster issues;

meetings cover a wider scope and include emergency relief coordination and planning efforts. Disaster risk management is regularly discussed by the sub-group of the NDC which is the DRM NAP Task Force. This group also meets regularly. The Task Force is chaired by the Deputy Secretary.

DRM LEGISLATION

In 1987, the RMI enacted the Disaster Assistance Act. Several laws such as the National Environmental Protection Act (1984), the Planning and Zoning Act (1987), and the Coast Conservation Act, 1988 all provide a good framework and require specific measures to be undertaken to prevent further environmental degradation.

DRM AT THE SUB-NATIONAL LEVEL

Local government has been engaged throughout the development of the NAP. The NAP requires that all Atoll Local Governments develop their own disaster risk management action plans.

DRM IN THE POVERTY REDUCTION STRATEGY

In terms of national development policy and priorities, the Government charted the *Vision 2018: The Strategic Development Plan Framework 2003–2018* which establishes the overall development priorities for the RMI and sets the first segment of the Government's Strategic Development Plan for the next 15 years. The Strategic Development Plan will consist of master plans which are mandated under the Vision 2018 focusing on major policy areas, and the Action Plans of Ministries and Statutory Agencies. Although Vision 2018 was drafted before the recent attention to DRR, it is felt within the RMI government that its goals remain broad and flexible enough to accommodate the emphasis on DRR without amendment.

The National Action Plan for Disaster Risk Management (NAP) aligns itself both with the regional policy framework (i.e. the Pacific Regional Framework for Action on DRR and DM) and the national policy framework (i.e. Vision 2018 and its Master and Action Plans).

INTERMINISTERIAL INVOLVEMENT IN DRM

The other agencies which have a role in DRM include:

- The Environmental Protection Agency (RMIEPA) – RMIEPA was created under the National Environmental Protection Act of 1984 and carries out multiple responsibilities including water quality monitoring, solid waste monitoring, public awareness and coastal management.
- The Office of Environmental Planning and Policy Coordination (OEPPC) was established to provide policy advice to the President and Cabinet; to ensure adequate attention is given to addressing the RMI's international commitments made through the international treaties; to ensure that activities arising from associated international conventions are linked to national priorities and to collaborate with other Government Partners/NGOs and communities in implementing environmental projects/programs.
- The Marshall Islands Marine Resources Authority (MIMRA). MIMRA is responsible for coordinating and regulating the exploration, exploitation and management of marine resources.
- The Ministry of Resources and Development is responsible for preparing much of the adaptation and response to the impacts of climate change as they arise.
- The Majuro Water and Sewer Company (MWSC) is responsible for the operation of the water supply, treatment and distribution systems.
- The National Disaster Management Committee (NDC) and is responsible for overall coordination of disaster relief operations.
- The National Emergency Management and Coordination Office (NEMCO) is the operational arm of the NDC. It is responsible for disaster response (not prevention); under the CSO.

- Marshall Islands National Weather Service is supported by the US National Oceanic Atmospheric Administration (NOAA) and provides weather, hydrologic, and climate forecasts and warnings for the Marshall Islands, its territories, adjacent waters and ocean areas.

CLIMATE CHANGE AND DISASTER RISK MANAGEMENT

The RMI adopted its Climate Change Strategic Plan in 2006. It was a short term strategic plan developed in line with the *Vision 2018* and based on group and regional discussions, public consultations and needs assessments conducted by OEPPC. This plan would lay the groundwork for establishing a longer-term climate change strategy for RMI. The strategic focus areas of this plan are:

- Institutional strengthening and capacity building
- Initial support to existing energy programs in the context of climate change
- Meet RMI's obligations under the United Nations Framework on Climate Change
- Clearinghouse mechanism
- Public awareness
- Link climate change to development through policy
- Building capacity in adaptation to climate change and develop a plan

HFA Priority #2: Identify, assess and monitor disaster risks and enhance early warning

NATIONAL, REGIONAL AND LOCAL SECTORAL RISK ASSESSMENTS

Factoring in climate change into RMI's risk mapping is an extremely high priority and urgent need given the country's low lying atolls. The Marshall Islands Resources Authority (MIMRA) has begun with marine resources mapping surveys which consider future climate change but is in need of both improved technology and human resource development.

EARLY WARNING SYSTEMS

Different agencies have roles in hazard monitoring and no one agency is responsible. The National Weather Service has an advanced warning system available for all the islands. The DRM NAP will consolidate forecasting responsibility to one agency. There is a relatively solid base of knowledge, data and tools for some sectors in the RMI particularly in terms of climate data. However there are some important gaps in mapping, monitoring and related activities. The NAP provides a framework for implementing risk reducing activities and risk assessment which would be founded on sufficient data and an understanding of the dynamics of the process. Therefore it is critical to develop an information management system wherein there is a system of organization, storage and sharing of data and information, including communication and sharing with outer islands.

FORECASTING

The RMI relies on the Meteorological Service Unit owned and supported by the US National Oceanic and Atmospheric Administration's (NOAA) National Weather Service and operated by RMI nationals contracted by NOAA. There are two tidal gauges (the longer established gauge provided by the University of Hawaii and the more recent Sea-Frame gauge, supported by Australia) which record sea-level data and are readily accessible. The record of temperature, precipitation, wind and pressure data are archived and available for time periods and forms which facilitate a range of risk and climate change reviews and assessments. These are housed at the U.S. National Climate Data Center. The data is used for three month climate and rainfall forecasts but could be further utilized for DRR/CCA activities.

Both the UNDP partnership in the Pacific Disaster Network and the SOPAC Pacific Disaster Network project will also strengthen technical skills for integrating an integrated hazards information system.

DATA SHARING

Developing an information management system should be a priority for the RMI. There is no centralized system for natural hazard information management and no method to facilitate the storage and sharing of basic and the RMI would benefit from a low-tech" starter system to facilitate simple information sharing with the goal of having all sector actors utilizing the same data base for all phases (conceptualization, planning, implementing, benchmarking, monitoring and follow up).

HFA Priority #3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

PUBLIC AWARENESS

Increased community awareness of natural hazards is needed. Even though community awareness raising of natural hazards is an activity which will be covered under SOPAC's programming. Preparatory activities of the NAP require extensive consultation with government officials, line agencies, mayors, the private sector and local communities. They were made aware of the government's commitment to the DRR and CCA principles as well as the opportunities and benefits of risk reduction. A continuance of this participatory approach would further reinforce the message.

INFORMATION MANAGEMENT AND EXCHANGE

Regional organizations such as SOPAC provide an important networking partnership that link the DRM NAP development and implementation processes with other organizations within and outside country. Much needed technical assistance is also provided by the network partners. As stated above, however, a centralized system is needed to store and share hazards data.

RESEARCH

RMI has two institutes studying hazards and vulnerabilities. The first is the School of the Pacific Rainfall Climate Experiment which is a collaborative field project involving schools (from elementary to university level) and local meteorological services from the Pacific Island Countries (PICs), atolls and the US Mainland. Its headquarters is at the University of Oklahoma. This program seeks to educate students on environmental issues and enhance the science programs in the participating schools. The students collect data that is used for climatological research and are part of the study of weather patterns in the Pacific.

The second program is the South Pacific Sea Level and Climate Monitoring project that is managed by the Flinders University of South Australia. Under this program, 11 SEA Level Fine Resolution Acoustic Measuring Equipment (SEAFRAME) stations were established in the Pacific Islands including one in the Marshall Islands. Data from these monitoring stations will provide the PICs access to data on climate variability and the impact of GHG and this will help RMI in planning and developing strategies and responses.

HFA Priority #4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience)

ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT

Development in the country has not taken into account current and future risks. With its fragile eco system

and dense population, safeguarding the RMI's natural resources, particularly its clean water supply is urgent. The RMI is poised to embark on a number of projects, especially as regards bolstering water supply systems in order to reduce the risks from drought. These include both individual and community water-harvesting projects. However, in general, these projects do not take climate variability and change explicitly into account.

The Integrated Water Management and Development Plan for Laura Groundwater Lens, Majuro will in part address this issue with \$500,000 in GEF funding and \$3,362,583 from other donors.

LAND USE PLANNING

At the national level, integration of disaster risk into land use planning provisions may be in place, but implementation falls short at the local level and unregulated coastal development poses a serious threat to the islands. For example, in order to avoid further coastal degradation and reduce risks, the Coastal Conservation Act of 1988 and the National Environmental Protection Act of 1984 provide the enabling provisions, but local governments who are responsible for enacting ordinances for land-use zoning requirements have not done so. As a stop-gap, the EIA regulations have been used on a select case-by-case bases. The Coastal Management National Framework, approved by RMIEPA but not yet endorsed by Cabinet, will hopefully provide a basis for filling the gap. In terms of fire risk, the lack of land-use planning and zoning has resulted in houses being built too close together in overly narrow streets, resulting in a major fire risk for parts of Majuro and Ebeye. The NAP seeks to mainstream DRM into the planning, decision making and budgetary processes across a broader sectoral arena at both national and local levels.

BUILDING CODES

Reviewing and revising draft building codes is essential for sustainable development in the islands. Each donor or entity is responsible for implementing its own building codes as, despite having been drafted over a decade ago, building codes have not been enacted. There is currently no control over design and location of buildings and high density, structurally-deficient buildings pose health and fire hazards, especially in areas of rapid urbanization.

HFA Priority #5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

RISK FINANCING

The Disaster Assistance Account was established under Disaster Assistance Act and is supervised and controlled by the Ministry of Finance. When there is a disaster, the amount utilized will be appropriated in the budget for the next financial year but the fund should maintain a continuous balance of \$200,000 at the beginning of each fiscal year. It is very difficult to get critical capital expenditures required for risk reduction activities explicitly targeted in the budget due to a lack of willingness, awareness and accountability as well as lack of available funds.

There is a stationary fund which is only drawn upon in the event of a disaster (not for prevention or preparedness). If disaster does not strike, the funds accumulate (at present, the balance is US \$2 million). The funds are appropriated in the Annual Appropriation Act for the following year based on the amount utilized in the current year. However, if the need arises for additional funding due to a disaster, the Chief Secretary in consultation with NDC will submit his/her request to the Ministry of Finance.

The government does not have mechanisms to compensate either for public or private assets damaged by a natural disaster. Compensation will be awarded only if the property was taken and used for coping with the disaster and only upon order by the Cabinet or NDC. All claims are filed with the Office of the Chief Secretary.

Under an amended agreement, the RMI will be able to request disaster assistance from USAID in a declared state of emergency, after utilizing the National Disaster Assistance Emergency Fund, (established by the amended Agreement as a first resource for disaster response), and requesting international assistance through the United Nations.

EMERGENCY MANAGEMENT

The National Emergency Management and Coordination Office (NEMCO) is in charge of emergency response in RMI and is headed by the Chief Secretary. The Emergencies Act 1979 outlines the steps for declaring a state of emergency but does not provide for an early warning protocol.

Under the Compact of Free Association (COFA), the RMI has access to the programs of the U.S. Department of Homeland Security/Federal Emergency Management Agency (FEMA). In the near future, USAID will expand its role in this arena and focus on training and capacity building in order for the RMI to take full responsibility for DRM.

REGIONAL APPROACHES AND PARTNERSHIPS

RMI works closely with the neighboring countries in the Pacific and is part of many regional partnerships/treaties. Vulnerability to extreme weather events affects not only the RMI but its neighboring countries; therefore it is beneficial to collaborate in responding to this common issue. One such initiative is the Micronesia Challenge wherein the participant countries aim to conserve 30 percent of marine resources and 20 percent of forest resources. The RMI has a mutual assistance agreement with the United States under the Compact of Free Association.

Moreover, RMI works with several key international development assistance partners in DRM, including: the United States, Republic of China, Japan, the EU, AusAID, SOPAC and the Asian Development Bank. RMI and the U.S. have a strong relationship of mutual assistance covered under the Compact of Free Association (COFA). In exchange for certain defense rights including the lease of 11 islands on Kwajalein Atoll, the U.S. provides guaranteed financial assistance through the Office of Insular Affairs. RMI participates in many of the TA activities under this Office and has access to many U.S. domestic programs including disaster preparedness, response and recovery program through the Department of Homeland Security (DHS)/Federal Emergency Management Agency (FEMA). RMI has several ongoing projects with EU/AusAID and SOPAC. In the future UNDP, UNICEF, IFRC and regional organizations as Secretariat of Pacific Community (SPC) may become involved.

4. KEY DONOR ENGAGEMENTS

One of the major donors in the RMI is the United States. The RMI has a mutual aid agreement with the US. In exchange for defense rights, the U.S. provides support for capital improvements and development assistance.

The Asian Development Bank (ADB, through its Regional Environment Technical Assistance Project, facilitated the preparation of the National Environment Management Strategy. Recently ADB prepared a Regional Technical Assistance Report on Regional Partnerships for Climate Change Adaptation and Disaster Preparedness. This TA was undertaken as part of ADB's contribution to a World Bank led initiative looking at the feasibility of a catastrophe insurance scheme for the Pacific.

The Pacific Regional Environment Programme (SPREP) conducted an in-depth study on the potential impact of expected climatic changes (primarily sea-level and temperature rise) in the Marshall Islands.

The Pacific Islands Applied Geoscience Commission (SOPAC) provides technical assistance to RMI through its (a) Ocean and Islands Programme for the Marshall Islands; (b) Community Risk Programme; and (c) Reducing Vulnerabilities of Pacific ACP States.

Through the Pacific Islands Climate Change Assistance Program (PICCAP), RMI prepared its First National Communication Report to the UNFCCC. PICCAP is funded by GEF and its main goal is to assist countries to build sustainable capacities to accomplish the required activities under the convention.

UNDP and GEF have also been RMI's partners in addressing climate change issues. The following programs were either implemented, funded, or overseen by UNDP Fiji MCO: (a) National Capacity Self Assessment (NCSA) (GEF-US \$225,000) provides tools/guidance in complying with their obligations to UNFCCC, UNCBD and UNCCD; (b) Second National Communications to UNFCCC: Stocktaking Exercise and Enabling Activity (US \$420,000) – provides assistance in preparing the SDN for submission to UNFCCC; (c) Action for the Development of Marshall Islands Renewable Energy (ADMIRE) (Budget US \$2,650,000; GEF US \$1,000,000) – aims to broaden the scope and utilization of renewable energy; (d) Coconut Bio-Fuel (UNDP-US \$30,000) – explores the use of coconut products as a source of electricity for rural communities; (e) Regional Energy Program for Poverty Reduction (UNDP, Bangkok – US \$2,782,500) – aims to contribute towards MDG targets through energy initiatives. In addition, UNDP PC provides funding to SOPAC for Mainstreaming Disaster Risk Management and Adaptation to Climate Change (ACC) into National Development Planning (Budget US \$500,000 for all PICs).

The World Bank, together with ADB and with funding provided by GFDRR and PFIII, are currently undertaking a Feasibility Study Catastrophic Risk Pool. They are also conducting Regional and Country Assessments as part of the TA for Sustainable Management through Reduced Risk from Disaster and Climate Variability in the Pacific Islands.

Existing Projects with Donors and International Financial Institutions	Funding Agency/ International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
Sustainable management through reduced risk from disasters and climate (Fiji, Kiribati, Marshall Islands, Papua New Guinea, Solomon Islands, Timor-Leste and Vanuatu)	World Bank	2008–present US \$1,900,000	2, 3, 4, 5
Pacific Catastrophe Risk Pool Feasibility Study	World Bank	2008–present US \$400,000	1, 2, 5
Regional Technical Assistance Report on Regional Partnerships for Climate Change Adaptation and Disaster Preparedness	ADB	Not available	1, 2, 4
Preparation of the National Environment Management Strategy (NEMS)	ADB	Not available	1
Ocean and Islands Programme for the Marshall Islands	The Pacific Islands Applied Geoscience Commission (SOPAC)	Not available	4
Reducing Vulnerabilities of Pacific ACP States (Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu, Cook Islands, Federated States of Micronesia, the Marshall Islands, Nauru, Niue and Palau)	The Pacific Islands Applied Geoscience Commission (SOPAC) /EU	2003–present	1, 2
Community Risk Programme	The Pacific Islands Applied Geoscience Commission (SOPAC)	2008–12	3, 4

(Cont.)

Existing Projects with Donors and International Financial Institutions	Funding Agency/ International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
<i>Pacific Islands Disaster Assistance Program (PDAP)</i> (The Cook Islands, Fiji, Kiribati, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu, Federated States of Micronesia and the Republic of the Marshall Islands)	USAID/OFDA	1995–present US \$4,001,75	5
<i>Pacific Islands Climate Change Assistance Program (PICCAP)</i> (The Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Samoa, Solomon Islands, Tuvalu and Vanuatu)	SPREP	1997–present	4
<i>EDF 9 B Envelope</i> – Upgrading monitoring and early warning systems	European Union	3.2 million euro	2
<i>Pacific Islands Climate Prediction Project</i> (The Cook Islands, Fiji, Kiribati, Niue, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu and Papua New Guinea)	AUSAID and the Australian bureau of Meteorology	2004–present US \$2.2 million	2
<i>South Pacific Sea Level and Climate Monitoring Project</i> (The Cook Islands, Federated States of Micronesia (FSM), Fiji, Kiribati, Marshall Islands, Nauru, Papua New Guinea (PNG), Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu)	AUSAID	1991–2010	
NAP Disaster Facility	AUSAID	2009–2011	1, 2, 3
Pacific Disaster Net	SOPAC, UNDP, UNOCHA, IFRC		3, 5
Project in Integrated Water Management	SOPAC-GEF	US \$500,000	4
Reducing Vulnerabilities of Public ACP States	SOPAC-EU	2003–present US \$2,797,329	

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Based on the GFDRR funded Country Assessment of the RMI, six priority areas were identified:

- Strengthening the capacity of National Emergency Management and Coordination Office (NEMCO);
- Developing an information management system;
- Enhancing community-based awareness, education and participation in risk-reduction and resilience-building;
- Climate-proofing new water supply developments;
- Reviewing and revising draft building codes; and
- Early warning response.

Two of these priority areas are already or likely to be supported by other donors or agencies – awareness raising slated to be taken up by SOPAC and early warning response has a host of interested donors coordinated by SOPAC.

The World Bank could support the remaining four priority areas as follows:

- **Strengthening the capacity of the National Emergency Management and Coordination Office (NEMCO)**, under which the NAP Implementation Unit (NAPIU) will operate. The support would be for Technical Assistance. The success of the NAP will depend heavily on the NAPIU, and this, in turn, depends heavily upon ensuring that NAPIU has strong capacity for technical advice, leadership and coordination. The NAP has been produced by an extensive, inclusive process of consultation, including local government, civil society and the private sector, which, as a result, has garnered significant in-country commitment. The institutional arrangements, placing the NAP within DRC/

NEMCO under the Chief Secretary's Office within the Office of the President, gives it strong positioning. Within three years, the preliminary implementation plan would be advanced and set the stage for implementation of the longer-term action plan.

- **Developing an information management system.** Such a system does not currently exist. The actions under the NAP (and other DRR and CCA actions) require cross-sectoral, cross-governmental (national to local) collaboration and integration of effort. And that requires a systematic system of organization, storage and sharing of data and information, including communication and sharing with outer islands. Technically, such a system could be established well within a three-year period, and, once established, would have long term benefits in facilitating integrated action across agencies and sectors. To be successfully implemented, the information system would have to be strongly championed by NEMCO.
- **Climate-proofing new water supply developments.** The RMI is poised to embark on a number of projects, especially as regards bolstering water supply systems in order to reduce the risks from drought. These include both individual and community water-harvesting projects. However, in general, these projects are not taking climate variability and change explicitly into account in terms of designing to acceptable levels of risk. Here is an excellent opportunity, with minimal additional support required, to maximize the synergy between DRR and CCA with actual on-the-ground risk-reducing measures. The climate-proofing measures would be “added value” to efforts that are current getting underway to enhance water supply systems. The time-frame for implementation is short, well within three years. The “on-the-ground” benefits, however, are long-term, and promote sustainable water resources in the face of future climate change.
- **Reviewing and revising draft building codes,** ensuring that DRR and CCA are incorporated explicitly. While RMI has had draft building codes for nearly two decades, they have never been enacted by local government. The government of RMI, as voiced by the NRC, the OEPPC and the EPPSO, stresses the paramount importance of establishing building codes. While there has been failure to enact draft codes in the past, it is felt that the circumstances are changing and are now more favorable for enactment, particularly if efforts at awareness raising and greater participation in DRR and CCA are pursued. The reviewing and revising of draft building codes is contained with the NAP as an action and is highlighted by the DRC as a priority. The required time-frame is short, within three years, but the benefits, if enacted, are long-term and sustainable.

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency/ International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
Facilitate Implementation of the NAP through providing TA support to the NAP Implementation Unit (NAPIU) <i>Priority Activities:</i> – Establish the NAPIU to lead the NAP implementation – Develop DRR/CCA policies and work with government ministries and local government to build an enabling environment for mainstreaming DRR/CCA in RMI.	CSO with NDC, NEMCO	US \$500,000 2009–2011	1, 2, 4
Establish Integrated Hazards Information System and Tools (with GIS capability) <i>Priority Activities:</i> – Provide TA support for the development of an integrated hazards information system including: – Develop and adopt a Hazards Information Policy; – Assess data needs and products for DRR/CCA – Identify long term storage requirements, analysis tools and mapping needs – Acquire appropriate computer hardware, software and high speed Internet connection – Support capacity building through populating the information system with available historical data and undertaking vulnerability mapping and risk modeling for CC and risk prediction	CSO with NAPIU, EPA, Met Services, MWSC, R&D, MIMRA, EPPSO, IA	2009–2011 US \$300,000	2
Climate-proofing water supply systems <i>Priority Activities:</i> – Identify and establish collaborative arrangements with donors, government agencies, private sectors, and communities involved in water supply – Develop and pilot a climate-proofing approach to a new water harvesting initiative, involving: 1. Assessing the system design with respect to risks of drought (present and future); 2. Consultation with water consumers and system designers concerning acceptable levels of risk; 3. Assessment of options for reducing the risks; – Build in-country capacity to implement the approach and tools; – Incorporate the climate-proofing approach and methods into the wider programme of water supply developments	EPPSO, with EPA, Weather Office, Min. of Internal Affairs, PWD	2009–2011 US \$500,000	4
Review, revise and promote building codes <i>Priority activities:</i> – Review the draft building codes and identify potential areas for improvement and strengthening with respect to risk reduction. – Develop preliminary set of options for revision covering range of hazards – Hold consultative workshops with local governments and communities in order to incorporate stakeholder views and preferences – Revise draft based on outcomes of consultation – Identify key proponents of building codes within government and promote government approval	CSO with NDC, NEMCO	2009–2011 US \$200,000	4
Total Budget Requested	US \$1.5 million		

6. BIBLIOGRAPHY

- ADB Regional Technical Assistance Report on Regional Partnerships for Climate Change Adaptation and Disaster Preparedness. 2008.* <http://www.adb.org/Documents/TARs/REG/41187-REG-TAR.pdf>.
- Bettencourt, Sofia, Richard Croad, Paul Freeman, John Hay, Roger Jones, Peter King, Padma Lal, Alan Mearns, Geoff Miller, Idah Pswarayi-Riddihough, Alf Simpson, Nakibae Teuatabo, Ulric Tritz, Maarten Van Aalst 'Not If, But When: Adapting to Natural Hazards in the Pacific Island Region' The World Bank. 2005.
- Climate Change Strategic Plan (2006), Office of Environmental Planning and Policy Coordination (OEPPC), Office of the President, Majuro.
- Coast Conservation Act 1988. Marshall Islands Consolidated Legislation. Accessed 3/26/09.* http://www.paclii.org/mh/legis/consol_act/cca1988217/.
- Community Risk Programme for the Marshall Islands. Pacific Islands Applied Geoscience Commission, SOPAC. Accessed 3/26/09.* <http://www.sopac.org/Community+Risk+Programme+for+The+Marshall+Islands>.
- Disaster Assistance Act 1987. Marshall Islands Consolidated Legislation. Accessed 3/26/09. http://www.paclii.org/mh/legis/consol_act/daa1987208/.
- Draft Country Assessment – Marshall Islands, World Bank, 2009.*
- Marshall Islands Interim national progress report on the implementation of the Hyogo Framework for Action 2008.* http://www.preventionweb.net/files/7500_MarshallIslands.pdf.
- Ocean and Islands Programme for the Marshall Islands. Pacific Islands Applied Geoscience Commission, SOPAC. Accessed 3/26/09.* <http://www.sopac.org/Ocean+and+Islands+Programme+for+The+Marshall+Islands>.
- Pacific Environment Information Network (PEIN) Country Profile Marshall Islands. Pacific Regional Environment Programme. Accessed 3/26/09.* http://www.sprep.org/publication/pein_marshall_islands.asp.
- PICCAP: National Activities, Coordination, Focal Point. The Republic of Marshall Islands Climate Change Website. Accessed 3/26/09.* <http://unfccc.int/resource/ccsites/marshall/activity/piccap.htm>.
- Rei, Muligatele Joe (2008): An Assessment of the Impact of Climate Change on Agriculture and Food Security in the Pacific: A Case Study in the Republic of the Marshall Islands. Food and Agriculture Organization.*
- Republic of the Marshall Islands – European Community EDF10 Country Strategy Paper and National Indicative Program (for the period 2008-2013). European Community, 2008.*
- SEAFRAME: National Activities, Coordination, Focal Point. The Republic of Marshall Islands Climate Change Website. Accessed 3/26/09.* <http://unfccc.int/resource/ccsites/marshall/activity/seaframe.htm>.
- SOPAC-EU Project: Reducing Vulnerabilities of Pacific ACP States. Pacific Islands Applied Geoscience Commission, SOPAC. Accessed 3/26/09.* <http://www.sopac.org/SOPAC-EU>.
- SPaRCE: National Activities, Coordination, Focal Point. The Republic of Marshall Islands Climate Change Website. Accessed 3/26/09.* <http://unfccc.int/resource/ccsites/marshall/activity/sparce.htm>.
- Strategic Development Plan Framework 20013-2018, Republic of the Marshall Islands.*
- Summary of Climate Change Projects Implemented/Funded/Overseen by UNDP. Pacific Regional Environment Programme (SPREP). Accessed 3/26/09.* http://www.sprep.org/publication/pein_marshall_islands.asp.

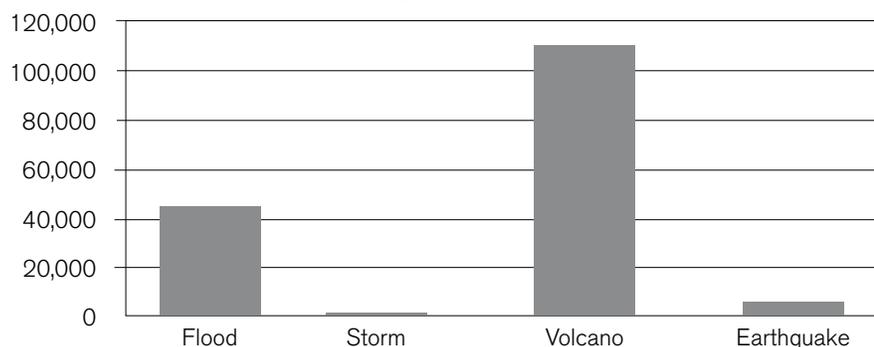
PAPUA NEW GUINEA

To prepare this Country DRM Note, consultations were undertaken with members of the World Bank Country Team, the National Disaster Committee, the Department of Mineral Policy and Geohazards Management, the National Weather Service, the Department of Environment and Conservation and other key donors in the region.

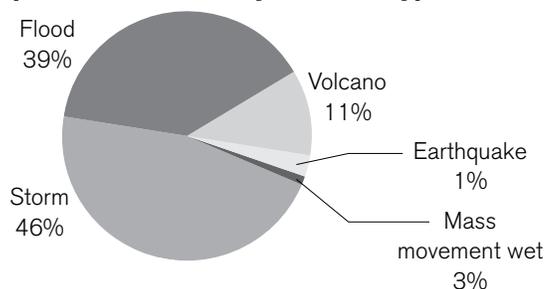
1. DISASTER RISK PROFILE

Papua New Guinea is prone to earthquakes, volcanic eruptions, tsunamis, cyclones, river and coastal flooding, landslides and drought. It is ranked 54th among countries most exposed to multiple hazards based on land area, according to the World Bank’s *Natural Disaster Hotspot* study.

Economic Damages by Disaster Type (1000s US\$)



% Population Affected by Disaster Type



Source: "EM-DAT: The OFDA/CRED International Disaster Database"

COUNTRIES MOST EXPOSED TO MULTIPLE HAZARDS (Top 60 based on land area with 2 or more hazards)

1. St. Kitts and Nevis
2. Macao, China
5. Taiwan, China
10. Guatemala
15. Somalia
18. Cayman Islands
20. Japan
25. Chile
28. Tajikistan
30. Madagascar
35. Mexico
40. Swaziland
45. Lesotho
50. Dominica
54. PAPUA NEW GUINEA
55. Jamaica
60. Armenia

Large parts of the country are extremely isolated. Most parts of the Highlands were not accessed by outsiders until the 1930s and many settlements are still inaccessible except by very difficult overland routes. The capital city is still not connected by road to most of the country and the range of communication, including radio, is extremely limited, increasing the inhabitants’ vulnerability.

MAJOR NATURAL HAZARDS

Like its neighboring Pacific states, Papua New Guinea is prone to natural-caused disasters including earthquakes, volcanic eruptions, tsunamis, cyclones, river flooding and coastal erosion, landslides, droughts and frost. It ranks in the top 6 countries with the highest percentage of population exposed to earthquake hazards and has the highest percentage of population exposed to severe volcanic risk. Given its topography, high seismicity and high annual rainfall, the country ranked highest in terms of landslide hazard profiles according to the World Bank Hotspot study.

RECENT DISASTERS

In 1994 the capital of East New Britain was rendered non-functional due to a twin-volcanic eruptions from Tavurvur and Vulcan mountains. As a result, they moved the capital to Kokopo including the airstrip and the resettlement scheme for the affected population. Between June 1997- February 1998 an El Nino influenced drought affected over 3,158,861 (70%) of the total population surveyed from the nation's total population of 4.5 million in that year. Most Papua New Guineans were immensely affected in the areas of food, water, education, economy, health and nutrition, agriculture and cultural practices. The National Disaster Centre's conservative estimate can put the total amount between PNGK81.0 million and PNGK85.0 million was used directly and indirectly for the drought, frost relief efforts by all concerned stakeholders. A total of eight disease outbreaks were reported but the National Department of Health does not have on deaths directly or associated with drought impact. In 1998, three 10 to 15 meter high tsunami waves devastated coastal villages in the Aitape-Sissano coastal area. In 2007, the island was hit by cyclone Gruba and in 2009, a landslide on a major highway paralyzed trade and transportation. Around 40 percent of PNG's population lives in poverty, that is, on less than **US \$1** a day, increasing their vulnerability to natural disasters.

Examples of cost of disasters in PNG (5 years – 1997–2002)

CALAMITIES	POPULATION AFFECTED		COST (PNGK)
	Total Affected	Killed	
Volcanic Activities (4)	46,358		4,058,870
Floods (22)	480,517		13,709,423
Landslides (22)	19,707	128	1,090,000
Sea Rise (1)	3,227		620,000
Famine (1)	2,000		200,000
Earthquakes (4)	221,285	2	18,674,000
Cyclone (1)	158,780		4,960,760
Drought & Frost	3,158,861	?	85,000,000
Disease Outbreak (2)	196	11	
Hailstorm (3)	2,259		250,000
Tsunami (1)	12,427	3,210	31,000,000
Chemical Spill (1)	750		46,000
Kerosene Explosion (1)	39	5	35,826
Total: (63)	4,106,406	3,356	K158,844,879

Source: PNG NDCen

Capital	Port Moresby
Languages	English, Tok Pisin, and Motu (official)
Independence	16 September 1975 (from the Australian-administered UN trusteeship)
Area	total: 462,840 sq km land: 452,860 sq km water: 9,980 sq km
Land Use	arable land: 0.49% permanent crops: 1.4% other: 98.11% (2005)
Government	constitutional parliamentary democracy and a Commonwealth realm
Population	6,057,263 (2009 est.)
GDP	\$2,200 (2008 est. – per capita)
HDI	149th
Terrain	mostly mountains with coastal lowlands and rolling foothills
Climate	tropical; northwest monsoon (December to March), southeast monsoon (May to October); slight seasonal temperature variation
Natural resources	gold, copper, silver, natural gas, timber, oil, fisheries
Main development partners	Australia, Japan, EC, New Zealand, the United States, The United Kingdom, the World Bank, UN agencies, ADB

The World Fact Book, World Bank Country Reports

2. DISASTER RISK MANAGEMENT FRAMEWORK

Papua New Guinea was among the first countries to adopt the Hyogo Framework for Action in November 2005, but has been unable to integrate the actions into its national development priorities. The Disaster Management Plan, in place since 1987, is considered outdated and not relevant to contemporary best practices. The current operational document for response management is the 2003 National and Provincial Disaster and Risk Management Handbook. The *Papua New Guinea Disaster Risk Reduction and Disaster Management National Framework for Action 2005–2015* is still in draft form and has not yet been adopted by the GoPNG. However various partners and stakeholders like UNDP (PNG) and the University of Papua New Guinea have been aligning their work plans and teachings based on this Framework.

The National Disaster Centre (NDC) within the Department of Provincial and Local Government Affairs was established by an Act of Parliament to coordinate rapid responses to the impacts of natural disasters. However, the NDC is not fully effective within the government and lacks sufficient budget, human resources and government backing. The NDC has embraced the whole of hazard approach through the principles of the totality of disaster management through Disaster Management Cycle where it spells out the importance of before disaster, during disaster and post disaster management. That was why PNG Mitigation Policy was established in later 2003.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

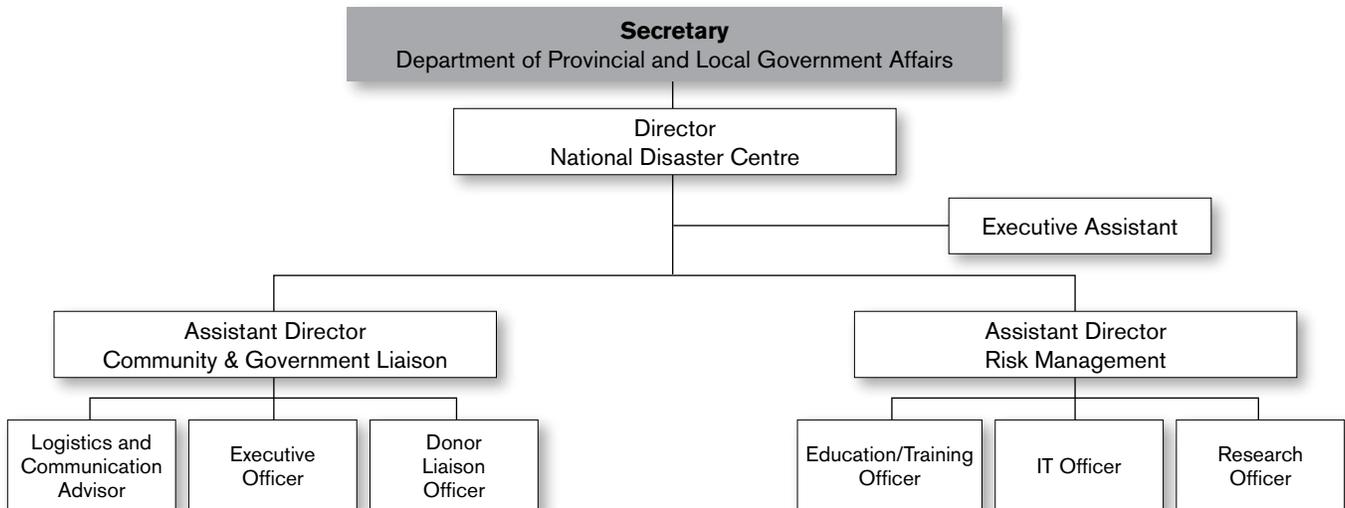
HFA Priority # 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

THE NATIONAL DRM AGENCY

The national agency responsible for DRM is the National Disaster Centre (NDC) within the Department of Provincial and Local Government Affairs. The NDC is the implementing arm of the National Disaster Committee. While the NDC is tasked with coordinating all disaster risk reduction activities, in reality the budget, human resources and government commitment to this center are insufficient to undertake risk reduction activities. Members of the

National Disaster Committee include the Commander of the Department of Defense and Police Commissioner and the department heads for Finance, Defense, Works and Supply Matters, Health, Foreign Affairs and Trade and Provincial and Local Governments.

Organization Structure of NDC



Source: ADRC

A parallel body called the Disaster Management Team has been established by donors and stakeholders and has recently provided disaster response coordination. The DMT is chaired by UNDP.

DRM LEGISLATION

The Disaster Management Plan has been in place since 1987 and is in need of updating. The current operational document for response management is the 2003 National and Provincial Disaster and Risk Management Handbook and the Draft Papua New Guinea Disaster Risk Reduction and Disaster Management National Framework for Action 2005–2015.

The National Disaster Management Act of 1984 (amended in 1987) is the country's DRM law and focuses only on preparedness and response arrangements during disasters. A National Disaster Mitigation Policy was prepared and approved by the National Executive Council in November in 2003 and launched in early 2004. The Policy would have created the National Environment and Disaster Mitigation Authority whose responsibilities would have included not only disaster management but environment and disaster mitigation as well.

DRM AT THE SUB-NATIONAL LEVEL

The draft National Framework for action cites a lack of capacity for disaster risk reduction at the provincial level. The draft Framework also mentions plans to integrate DRM into provincial level planning and budgeting and include disaster risk assessments into investment decisions at the community level. The NDM Act provides for the establishment of Provincial Disaster Committees which should be responsible for preparing emergency plans for the provinces and coordinate relief operations. UNDP has identified this and an opportunity for action in their future programming.

According to a World Bank draft assessment of DRM in Papua New Guinea, only four of the 19 provinces have active disaster management arrangements. While there is reasonable awareness among provinces, there is

an extreme shortfall in resources to implement disaster risk management activities at the sub-national level, and focus is solely on response rather than preparedness or mitigation. As well as a lack of budgetary resources, there is a lack of human resource capacity to create sub-national disaster action plans.

DRM IN THE POVERTY REDUCTION STRATEGY

Disaster Risk Reduction is not explicitly identified in the Government Medium Term Development Strategy (MTDS) 2005–2010 and there are no coordinated disaster risk reduction initiatives in current sector budgets. The MTDS noted that previous national strategies had failed due to political instability, weak institutional capacity and lack of ownership and commitment.

DISASTER RISK MANAGEMENT IN THE COUNTRY PARTNERSHIP STRATEGY

The World Bank Interim Strategy note for Papua New Guinea (2005) notes the country's vulnerability to natural hazards.

INTERMINISTERIAL INVOLVEMENT IN DRM

The other ministries and agencies which should play a role in DRM include:

- The Department of Mineral Policy and Geohazards Management which is responsible for seismology, volcanology and geotechnical issues
- The National Weather Service which operates observation networks and provides local forecasting
- The Water Resource Management Branch within the Department of Environment and Conservation which is responsible for water resources
- Members of the National Disaster Committee, who include the Commander of the Department of Defense and Police Commissioner and the Departmental heads for Finance, Defense, Works and Supply Matters, Health, Foreign Affairs and Trade; Provincial and Local Government.

There is reportedly weak coordination amongst agencies on disaster risk reduction and minimal sharing of information.

CLIMATE CHANGE AND DISASTER RISK MANAGEMENT

The agency responsible for climate change adaptation is the Greenhouse unit within the Department of Environment and Conservation. However, a Climate Change Office is in the process of being established and will directly report to the Prime Minister's Office.

HFA Priority # 2: Identify, assess and monitor disaster risks and enhance early warning

NATIONAL, REGIONAL AND LOCAL SECTORAL RISK ASSESSMENTS

While there is significant historical data available, there is a lack of national, regional and local sectoral risk assessment in Papua New Guinea. There is little government focus on risk and vulnerability assessment and tools for analysis and monitoring are not available. Papua New Guinea does however have some limited volcanic risk mapping according to their 2005 reporting on progress made towards commitments under the Hyogo Framework.

EARLY WARNING SYSTEMS AND FORECASTING

The newly-formed Department of Mineral Policy and Geohazards Management (DMPGM) addresses seismology (9 staff), volcanology (16 staff) and geotechnical issues (7 staff all vacant). The department inherits the policy and geohazard management functions from the previous Department of Mining following the formation of the Mineral Resource Authority (MRA) in early in 2008.

In the mid 80's there was a seismic network of 16 stations with both seismographs and accelerographs. The system has gradually run down and is now ineffective according to a recent World Bank assessment study. There is an EU funding proposal to install six to ten new seismographs to resurrect a monitoring and assessment capacity. Adding accelerographs to these proposed installations would provide capacity for identifying potential areas of high impact. The last major magnitude 8 earthquake was in the New Ireland region in 2000. Parts of New Britain, New Ireland and Bougainville demonstrate some of the highest seismic hazard potential in the world.

The Geotechnical unit covers landslides and slope stability, erosion (including coastal) and tsunamis. This unit is severely depleted but makes use of MRA staff for emergency situations. Landslide potential is high over large areas, given the combination of PNG's steep mountain ranges, volcanism, high seismicity and high annual rainfall. According to Geoscience Australia (2008), three of the world's largest landslides recorded in the last 120 year have occurred in PNG. In the Highlands area, intensified land use due to increasing population and increasing climate variability are adding to the problem.

The Papua New Guinea National Weather Service (NWS) sits within the Department of Transport. In recent years, its staffing has been decreased from 107 positions to 66. The Service operates three observation networks. There is a network of 14 synoptic weather stations with data continuously contributing to the regional and international weather systems (including the Pacific Islands Climate Prediction Project) through Melbourne. This network is very coarse and provides only limited detail for local forecasting. Responses are thus mainly reactive, rather than being based on predictive information. A rainfall network of 57 gauges is operated through volunteers providing monthly records of 24 hour rainfall. This network used to comprise of 1000 stations, but now its usefulness for monitoring rainfall trends across a country of highly complex terrain is seriously compromised. Finally there is a four station synoptic network including measuring sea level and temperature, as part of the Pacific Island Climate Prediction Programme. There is also a Manus Island SEAFRAME station for sea level and climate monitoring.

Overall, the NWS feels its monitoring network is falling below a credible level. Staff consider the existing data systems inadequate for detailed trend analyses. They say there is little ability to identify local climate change trends. Increasing climate variability (the threat of droughts and other extreme events) linked to the annual direction of the Southern oscillation is becoming a major concern for the service.

The Water Resource Management Branch (WRMB) sits within the Department for Environment and Conservation (DEC) and is responsible for the management of national water resources under the Environment Act 2000. The WRMB undertakes river monitoring and the allocation of ground water resources. The branch is not adequately equipped to carry out these functions.

The WRMB reported that over the past 10 years, river monitoring stations have been reduced from 130 stations to less than 10 and that the national network was effectively closed. In March 2008 only one station on the Ramu River was fully effective and two stations were to be reopened. Additionally, all four stations on the Laloki catchment were supposed to be reopened by mid 2008 and a new station is to be constructed on the Goldie River. Some four to six Representative Regional Stations will be required as part of the Pacific HYCOS project. A hydrological strengthening study undertaken in the late 1990's recommended a credible system of 72 stations was required nationally.

Although the historical record of hydrological monitoring in PNG is strong and goes back to the 1960's with an emphasis on hydro-power project investigation, data digitizing, database development and analysis and catchment mapping capability is deficient. WRMB reported that flood records have not been analyzed since 1997 and low flow records do not exist to contribute to understanding potential drought conditions.

HFA Priority # 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

EDUCATION AND TRAINING

There are courses on disaster risk reduction and hazard assessment at the University of Papua New Guinea, but these courses have not established strong links with the government. Other institutions such as the National Agriculture Research Institute and the National Fisheries Institute are undertaking climate related hazard work in food and water security.

AWARENESS RAISING

Fostering public awareness about natural hazards is the responsibility of the National Disaster Awareness and Preparedness Committee. The committee was formed in 1999, building on the lessons learned from the 1997/8 drought and the Aitape Tsunami in July 1998, to prepare provincial baseline data. However, meetings of the committee have apparently lapsed recently. A World Bank assessment of disaster risk reduction in Papua New Guinea found the overall level of awareness about natural hazards was high amongst the departments and provinces. However the study found there was a general sense that resources and skills available were inadequate to deal with natural disasters and little appreciation that they would impact a sector's activity or an individual's "job".

HFA Priority # 4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience)

ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT

The rapidly growing rural population is placing increased stress on land and water resources and increasing the population's exposure to hazards. However, the country has adopted the Environmental Act in 2000, which aims to regulate the environmental impact of development and protects national water resources.

LAND USE PLANNING

The Physical Planning Act (1989) administered by the Department of Lands provides a strong enabling tool for managing land use to reduce natural hazard risk. It is applicable to both alienated and customary land. In fact 97 percent of PNG land is customary with 3 percent alienated. The Physical Planning Act has been applied to just 2 percent of customary land which is subject to a government lease and on-lease for development purposes. Where land is subject to physical planning, it is a requirement that both environmental and hazard issues be addressed.

A recent World Bank Assessment noted that mainstreaming of risk reduction into development planning is not occurring. For example, while land use legislation requires consideration of hazards and environmental impacts, these inputs are not sought from the government hazard agencies or DEC in national or provincial land-use planning considerations.

The Department of Works advises that consultants to make their own interpretation of design parameters often without reference to local hazard information. The WRM branch of DEC noted they have not been approached by infrastructure consultants for hydrological data in the past two years. There are reports of new road developments being washed out by rainstorms or landslides – even donor funded projects which are specified to be risk and climate resilient. In the provinces it is reported that design manuals are not used.

HFA Priority # 5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

RISK FINANCING

The Disaster Management Act mandates that the Provincial Government will bear the cost of the first K15,000 (US \$5,400) for disaster relief and any amount over K15,000 and up to K100,000 (US \$36,220) will be split between the National and Provincial Governments. Any amounts above K100,000 shall be borne by the National Government. When reporting on progress made toward commitments under the Hyogo Framework in 2005, Papua Guinea noted that there was a budget available for disaster risk reduction activities. However, this budget is not readily available. Most Provinces have not readily taken the DRM in proactive way to prepare themselves for the onset of natural calamities because they still regard the DRM as the functions of the National Government. Once the draft DM Act is reviewed by end 2009, hopefully this should be corrected and provincial governments will take leading roles through planning and budgeting for any minor disaster in the province.

While disaster response appears to be under resourced given the potential economic losses which could be caused by natural disaster, disaster risk reduction activities have no standing budget at all. Papua New Guinea was one of the countries covered in the World Bank's Pacific Catastrophe Risk Financing Initiative Feasibility Study where they found the worst single year loss in Papua New Guinea was equivalent to 2.7 percent of the country's GDP.

EMERGENCY MANAGEMENT

The National Disaster Centre is in charge of emergency response in the country. According to a recent UNDP study, emergency response capacity is improving in Papua New Guinea and institutional restructuring is underway to improve the response time and coordination of the Emergency Services. Though there were initiatives to combine the National Disaster Service, the Fire Service and the Ambulance Service under one agency and to have it come under a proposed National Disaster and Emergency Authority which will sit under the Ministry of Defense, that initiative has been shelved pending the outcome of the improvement the current PNG disaster management protocols.. The protocol is now wit the Government to consider.

4. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency/ International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
<i>Pacific Catastrophe Risk Pool Feasibility Study</i> (The Cook Islands, Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu)	World Bank	2008–present US \$400,000	1, 2, 5
<i>Sustainable Management Through Reduced Risk from Disasters and Climate</i> (Fiji, Kiribati, Marshall Islands, Papua New Guinea, Solomon Islands, Timor-Leste, and Vanuatu)	World Bank	2008–present US \$1,9 million	2, 3, 4, 5
Support for DRM in PNG	AUSAID	2009–2012 US \$7.4 million	1, 2, 3, 4, 5
<i>Pacific Islands Disaster Assistance Program (PDAP)</i> (The Cook Islands, Fiji, Kiribati, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu, Federated States of Micronesia and the Republic of the Marshall Islands)	USAID/OFDA	1995–present US \$571,307	5
Department of Environmental Conservation (DEC) Capacity Building Project	UNDP	US \$300,000 2006-2012	1, 4
Disaster Risk Management	UNDP	2009	1, 2, 3, 4
EDF 9 B Envelope – Upgrading monitoring and early warning systems	European Union	3.2 million euro	2
<i>Pacific Islands Climate Prediction Project</i> (The Cook Islands, Fiji, Kiribati, Niue, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu and Papua New Guinea)	AUSAID and the Australian Bureau of Meteorology	2004–present AUS \$5.5 million	2
<i>South Pacific Sea Level and Climate Monitoring Project</i> (The Cook Islands, Federated States of Micronesia Fiji, Kiribati, Marshall Islands, Nauru, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu)	AUSAID	1991–2010	2, 5

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Due to the weak policy and institutional frameworks currently evident in Papua New Guinea, opportunities for investment have been restricted to those which:

- contribute to reducing actual risk
- contribute to building on existing in-country capacity
- are supported by, or contribute to, or inform sector risk reduction policy frameworks within country priority activities.
- Have a reasonably strong chance of receiving government commitment and partnership

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency/ International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
<p>Develop a Coordinated Hazard Policy and Integrated Spatial Hazard Risk Information and Mapping System for PNG (National Scale)</p> <p><i>Priority activities</i></p> <p>(1) Provide (Technical Adviser TA) support to hazard departments to:</p> <ul style="list-style-type: none"> • Establish a coordinated government policy on the collection and storage of hazard data, the development of vulnerability, risk and trend information and its presentation and sharing across sectors for planning and development purposes • Assess needs and develop an integrated spatial database with analysis tools and mapping capability • Identify requirements and acquire appropriate map and image bases for hazard mapping and land use management purposes for urban, rural, coastal and highland applications • Enter existing and historical datasets across all hazards and develop initial vulnerability and risk information • Enhance seismometer network installation (EU funded) with installation of accelerogram equipment. <p>Capacity Building on National Disaster Centre & Key agencies in the areas of:</p> <ul style="list-style-type: none"> • Finance Management • GIS and Remote Sensing Skills for Hazard Mapping and Risk Management (national scale) • DRR Trainings for provinces and communities <p>Conduct Hazard Maps, Digitizing and Spatial Information on Drought, Frost, Coastal Erosion Plus Awareness in view of Predicted Mega Drought in 2012 (local scale embedded into local planning and regulatory tools)</p> <ul style="list-style-type: none"> • Drought Vulnerability Map • Bush Fire Vulnerability Map • Water/River Cataachment Map • Food Security Information • Training • Awareness Information through media and stakeholders 	<p>Min of Mineral Policy and Geohazards Management with Geohazards Division, National Weather Service, Water Resource Management Branch, National Mapping Bureau, DL&PP, DEC, NDC</p> <p>NDC</p> <p>NARI, DAL, NDC, DEC, Geohazard Office, NMBureau, NS Actors</p>	<p>2009–2011 US \$550,000</p> <p>US \$550,000</p> <p>US \$1,500,000</p>	<p>2</p> <p>1, 5</p> <p>1, 5</p> <p>2, 3, 4, 5</p>
<p>Total budget request</p>		<p>US \$2,600,000</p>	

6. BIBLIOGRAPHY

AUSAID Country Brief Papua New Guinea 2009.

Bettencourt, Sofia, Richard Croad, Paul Freeman, John Hay, Roger Jones, Peter King, Padma Lal, Alan Mearns, Geoff Miller, Idah Pswarayi-Riddihough, Alf Simpson, Nakibae Teuatabo, Ulric Tritz, Maarten Van Aalst 'Not If, But When: Adapting to Natural Hazards in the Pacific Island Region' The World Bank. 2005.

Dilley, Max, Robert S. Chen, Uwe Deichmann, Arthur L. Lerner-Lam, and Margaret Arnold 'Natural Disaster Hotspots; A Global Risk Analysis' World Bank 2005.

EM-DAT: OFDA/CRED International Disaster Database, Catholic University of Louvain, Brussels, Belgium 2009.

Framework for Action 2005-2015: An Investment for Sustainable Development in the Pacific Island Countries Disaster Risk Reduction and Disaster Management; Building the Resilience of Nations and Communities to Disasters.

Hyogo Framework for Action 2005-2015: I S D R International Strategy for Disaster Reduction

Priorities and Action Agenda 2006-2015 Supplementary for Mainstreaming Disaster Risk Reduction and Disaster Management.

IBRD Interim Strategy Note for Papua New Guinea 2005.

Sikivou Moses. "What Do Pacific Developing Member Countries Want from Catastrophe Insurance," Pacific Islands Applied Geoscience Commission, National Catastrophe Risk Insurance Mechanisms for Asia and the Pacific, November 4-5, 2008, Tokyo, Japan.

Papua New Guinea Disaster Management Act 1984.

Papua New Guinea Environmental Planning Act 1978.

Papua New Guinea Australia Development Cooperation Strategy 2006-2010.

UNDP. Human Development Index. 2007.

UNDP. Gaps and Opportunities for DRM Programming in Papua New Guinea 2009.

UNISDR. Living with Risk: A Global Review of Disaster Reduction Initiatives 2002.

UNISDR. Accessed 3/20/09 < <http://www.unisdr.org/eng/mdgs-drr/national-reports/Papua-New-Guinea-report.pdf>>.

The World Bank (Draft) Pacific Catastrophe Risk Financing Initiative 2009.

The World Fact Book 2009.

The World Bank Draft Country Assessment Report Papua New Guinea.

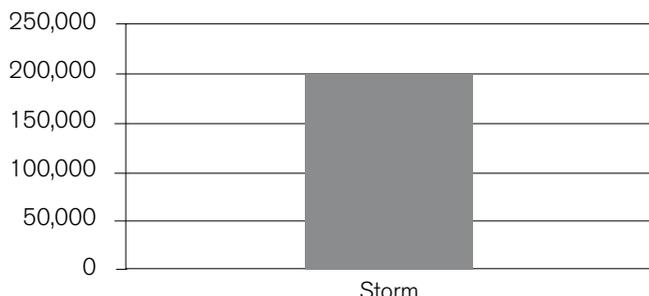
SOLOMON ISLANDS

To prepare the Country DRM Note, consultations were undertaken with members of the World Bank’s Pacific team and the Director of the NDMO, and meetings were held with Ministry of Home Affairs, Ministry of Environment, Conservation and Meteorology, Ministry of Mines and Energy, Ministry of Planning and Aide Coordination, Ministry of Finance, Ministry of Works and Infrastructure, European Commission, ADB, AusAID, NZAID, UNDP, SOPAC, Red Cross.

The matrix of priority areas and actions for DRM and estimated budget allocations were discussed and cleared with the NDMO Director in May 2009 after consultation within Government and with key donors and partners. There is strong support and ownership and endorsement by NDMO for the matrix of priority areas and actions.

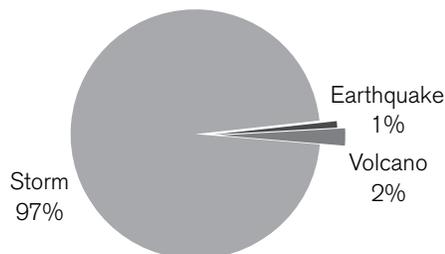


Economic Damages by Disaster Type (1000s US\$)



Source: EM-DAT: The OFDA/CRED International Disaster Database.

% Population Affected by Disaster Type



Source: EM-DAT: The OFDA/CRED International Disaster Database.

1. DISASTER RISK PROFILE

The Solomon Islands rank among 20 countries with the highest economic risk exposure to two or more hazards. With over 992 islands stretching over 1,500 kilometers, this group of mountainous islands with some low lying coral atolls has just over half a million people.

The Solomon Islands lie East of Papua New Guinea and north of Vanuatu. At its furthest reach, the Santa Cruz Islands are north of Vanuatu and some 200 kilometers from the next closest island in the Solomon Islands chain.

The Islands are exposed to a wide range of geological, hydrological and climatic hazards, including tropical cyclones, volcanic eruptions, earthquakes, tsunamis, landslides, floods and droughts. Over the past 30 years there have been six major natural disasters: two earthquakes – one with an associated tsunami – and four tropical cyclones, directly impacting over 100,000 people with over 100 deaths.

The last disaster was the earthquake and tsunami that occurred on 2 April 2007 centered on the Western Province and Choiseul Provinces. It killed 52 people and damaged or destroyed some 6,000 homes and other

buildings including schools and hospitals. The cost of reconstruction was estimated at around US \$100 million or 80 percent of the 2006 national recurrent budget.

Heavy rain from 29 January to 2 February 2009 caused extensive flooding in the western and eastern parts of Guadalcanal, impacting a total population of 52,000, displacing an estimated 2,000 people and costing around US \$3m.

Capital	Honiara
Provinces	Nine provinces: Guadalcanal, Central, Western, Ysabel, Malaita, Makira, Temotu, Choiseul, and Rennell and Bellona.
Official Language	English
Independence	July 7 1978 (from UK)
Area	<i>total:</i> 28,450 km ² <i>land:</i> 27,540 km ² <i>water:</i> 910 km ² <i>coastline:</i> 5313 km
Land Use	<i>arable land:</i> 0.62% <i>permanent crops:</i> 2.04% <i>other:</i> 97.34% (2005)
Government	Parliamentary Democracy
Population	595,613
GDP	GDP (December 2007): US \$270 million
HDI	129 out of 177
Terrain	mostly rugged mountains with some low coral atolls
Climate	tropical monsoons; few extremes of temperature and weather
Natural resources	fish, forests, gold, bauxite, phosphates, lead, zinc and nickel
Major products	copra, marine products, and timber. Subsistence activities dominate the lives of 80 percent of Solomon Islanders.
Main development donors	Australia, New Zealand, the EU, Japan, and the Republic of China (Taiwan)

World Fact Book, World Bank Country Reports.

2. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

THE NATIONAL DRM AGENCY

The National Disaster Council has the primary responsibility for disaster risk management in the Solomon Islands. Established by the National Disaster Council Act (1989) and the National Disaster Plan (1987), it is supported by the National Disaster Management Office (NDMO) under the Ministry of Home Affairs. The NDC is currently reviewing the institutional framework for DRM as they plan to develop a National Action Plan for DRM and Disaster Risk Reduction.

A cross-section of ministries participates in the National Disaster Council: the Police Commissioner, the Permanent Secretary of the Ministry of Home Affairs, the Ministry of Foreign Affairs, the Ministry of Infrastructure and Development, the Ministry of Finance and Treasury, the Ministry of Communications and Civil Aviation, the Ministry of Health and Medical Services, and the Ministry of Provincial Government. Other ministries and agencies can be co-opted based on the nature of the emergency.

Disaster Risk Reduction needs to be owned by all government agencies rather than a single ministry. The NDMO has limited ability to coordinate across ministries due to its location in the Ministry of Home Affairs. The Chairman of the NDC does not report to the Prime Minister but to the Minister of Home Affairs. The proposal for the new National Disaster Risk Management Plan and Act foresees that the NDC falls directly under the Prime Minister's office, with the Chairman reporting to the Prime Minister.

The country's disaster risk management framework is currently under review and a new proposal should be presented to Parliament by November 2009. This new plan and legislation addresses both CCA and DRM and provides for a broader NDC membership including the Prime Minister's Office, the Ministry of Development Planning and Aid Coordination; the Ministry of the Environment, Conservation and Meteorology; The Ministry of Mines and Energy; the Ministry of Agriculture and Livestock and the Ministry of Women Youth and Children.

The new proposal will establish four NDC Committees: Committees on (1) Disaster Management (lead by the NDMO), (2) Hazards (lead by the Ministry of Environment, Conservation and Meteorology), (3) Recovery & Rehabilitation (lead by the Ministry of Development Planning and Aid Coordination), and (4) Risk Reduction (led by the Ministry of Lands, Housing and Survey).

LEGISLATIVE FRAMEWORK

The current legislation does not address risk reduction. The National Disaster Council Act provides the current institutional framework for Disaster Management (DM). The Act legally supports the creation of a National Disaster Plan. It also spells out the use of special powers in times of disasters should the need arise. Upon Parliament's approval of the National Disaster Risk Management Plan, a National DRM Act will be drafted. The Solomon Islands does not have sub-national DRM strategies or plans.

A review of the current Act and other potentially relevant legislation took place in 2006. Based on the findings, the proposed National DRM Plan (and Act) will address current shortcomings such as moving the NDC to the Prime Minister's Office, strengthening the institutional structures and ensuring a more coordinated joint government effort.

The NDC meets quarterly and in response to disasters. In the future, the four proposed Committees should meet regularly to address their area of responsibility and report to the quarterly NDC meetings.

DRM AT THE SUB-NATIONAL LEVEL

The provincial disaster committees are tasked with disaster awareness, preparedness, management and response activities. In the event of a natural disaster, they are responsible for ex-post response. However, there are no provincial disaster plans currently in place and arrangements are minimal and lacking accountability.

INTERMINISTERIAL INVOLVEMENT IN DRM

Several key ministries participate in disaster risk management. As mentioned above, the Ministry of Home Affairs has the primary role for disaster management in the area of preparedness and response; the Meteorological Division (Ministry of Environment, Conservation and Meteorology) provides climate data; the Geohazards Unit of the Ministry of Mines and Energy is responsible for data and information on geological hazards; the Water Resources Division of the Ministry of Mines and Energy provides stream flow data; the Ministry of Agriculture and Livestock is responsible for pest control and the Ministry of Health and Medical Service has the responsibility for pandemics and is involved in disaster response.

However, effective mechanisms for cross-sector collaboration and cooperation are absent and linkage between national, provincial and community governance systems are weak. Sector ministries are uncertain of

their roles both before and after disasters and avoid accountability. Structures beyond provincial government are non-existent except for arrangements for distributing relief. The revised disaster risk management framework will address all of these shortcomings with increased focus and accountability through the creation of the four Committees and improved coordination and clarity of roles through explicit structures at the national, provincial and local levels. To be effective, these institutional structures will need sustained support for implementation over three years and beyond.

CLIMATE CHANGE AND DRM

The Ministry of Environment, Conservation and Meteorology's Climate Change Division is responsible for climate change adaptation (CCA). Cross sector coordination is through the National Advisory Committee on Climate Change – currently known as the TeCOM (Technical Committee on Climate Change). A policy framework for CCA is yet to be developed and linkages across government are weak. It is intended that CCA will come within the widened overview and scope of the new NDC. Currently MECM is only a co-opt member of the NDC. A larger role is foreseen under the new framework and the MECM will take the lead of the Hazards Committee.

The National Adaptation Programmes of Action (NAPA) was developed in November 2008 and lays out the following priority adaptation activities: (1) managing the impacts of, and enhancing resilience to, climate change and sea-level rise in agriculture and food security, water supply and sanitation, human settlements, human health and education, awareness and information; (2) climate change adaptation on low-lying and artificially built-up islands in Malaita and Temotu provinces; (3) waste management; (4) coastal protection; (5) fisheries and marine resources; (6) infrastructure development; and (7) tourism.

HFA Priority # 2: Identify, assess, and monitor disaster risks—and enhance early warning

NATIONAL, REGIONAL, LOCAL AND SECTOR RISK ASSESSMENTS

Hazard maps are unavailable at a sufficient resolution for purposes of disaster risk reduction and climate change and adaptation activities. Flood hazard maps exist for northern Guadalcanal, albeit at a somewhat coarse scale. National volcanic and landslide hazard maps are not available. While some data exists, a detailed seismic mapping would require analyses and additional data. However, there is a lack of capacity and tools to carry out data analyses, hazard mapping and vulnerability and risk assessments.

The existing risk maps do not factor future climate projections and there are no comprehensive community-level risk assessments or mapping.

The existing observation networks for hazard monitoring are degrading and are inadequate to support ongoing understanding of the local hazard or changes due to climate change or to support local early warning arrangements.

EARLY WARNING

There are various technical agencies charged with collecting hazard information. Data and information on geological hazards is produced by the Geohazards Unit (MME), climate data by the Meteorological Division (Ministry of Environment, Conservation and Meteorology - MECM), and stream flow data by the Water Resources Division (Ministry of Mines and Energy (MME) – all on a national level). The Ministry of Agriculture and Livestock (MSL) monitors pests, and the Ministry of Health and Medical Services (MHMS) pandemics. MHMS is a member of the NDC, the others are co-opted members. The proposed new framework foresees full membership for all the above ministries, and NDC committee leadership for MECM on hazards.

Forecasting is linked to the Australian Bureau of Meteorology and Pacific Regional Meteorological Center

in Fiji, which provide the primary source of data. For example, in case of a cyclone, the Meteorological Division receives information from overseas weather sources in Nadi (Fiji), Brisbane (Australia) and Honolulu (Hawaii/USA) (for Tsunami information, which is however of limited use for locally generated tsunamis). The Meteorology division informs the Chairman of the NDC, the Commissioner of Police, the Chief of Marine, the Controller of Aviation and the Chairman of the relevant Provincial Disaster Committees and Solomon Island Broadcasting Corporation.

NDMO is responsible for the activation of emergency management arrangements, coordinating the National Disaster Operations and issuing of public safety messages/evacuation orders through radio and television. Issuing of cyclone warnings to the public takes place only after the approval of the NDC. The National Emergency Operation Center contacts the Provincial Disaster Committee, while NDMO directly contacts affected communities.

A wide range of communications systems are available for disaster information dissemination from the more sophisticated to community-based methods High frequency (HF) radio transceiver units; VHF transceiver units; Telephone (urban); facsimile (urban); Internet and email service; Satellite telephone; EMWIN (for warnings to the Met Service and NDMO), Broadcasting (SIBC; Television broadcasting service) and PFNET rural e-mail services. Apart from ENWIN these services do not have 24 hour operation. All have limited outreach to rural and remote communities. There are severe limitations in the ability to get early warnings and information to large parts of the rural community which makes up 85 percent of the population. This is also true for livelihood and development information. The lack of an effective communication network through the approximately 10,000 small rural villages is a major constraint to effective DRM and risk reduction – as it is also to effective rural development activities across the livelihood and welfare sectors.

HFA Priority # 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

EDUCATION AND TRAINING

The National Disaster Council runs an annual Disaster and Risk Awareness Campaign through the NDMO with input from the Meteorological Service, the geohazards and hydrology units of the Ministry of Mines and Energy, the Ministries of Health and Education, the Police, Search and Rescue and a number of involved NGOs. The program targets schools, villages and the business sector and addresses hazard information, preparedness and warning arrangements. However, there is a lack of funding to support this activity.

To be effective, programs need to occur in the villages with an annual follow-up. The resources and local arrangements required are significant to address the around 10,000 villages of the Solomon Islands. In addition, materials and content need to be developed. Core frameworks need to be developed within which to coordinate NGO and civil society programs.

DRM is not currently integrated into school curricula. The only education programs with a DRM component is in School of Nursing, which includes a three-day introduction into DRM for its third year students.

HFA Priority # 4: Reduction of the underlying risk factors

MAINSTREAMING DRR INTEGRATION INTO LAND USE, ZONING, BUILDING CODES, LOCATION AND CONSTRUCTION OF PUBLIC INFRASTRUCTURE

Disaster risk management is not yet integrated into the Solomon Islands' planning and budgeting processes. There is no mechanism for the mainstreaming of DRM into national and sector policies, plans, legislation and regulations. If DRM is incorporated in the land law, it is not enforced and land use. Zoning, building codes, location and construction of public infrastructure do not take hazards into account.

While recognizing public assets are extremely vulnerable to adverse natural events, key ministries (i.e. transport, planning, water resources, etc) have not mainstreamed disaster risk reduction measures into their plans and new investments. DRM is not mainstreamed into major sector investments (e.g., education, water, environment, infrastructure, health sectors). The World Bank does not have school, hospital or roads building projects in the Solomon Islands but disaster risk considerations are incorporated into other new projects such as rural development.

The revised scope and committee structure for the proposed NDC reporting to the Cabinet will provide the mechanism to address these issues but ongoing support for planning, capacity development and implementation at the sector level will be necessary to achieve sustainable progress on the ground.

PRIVATE SECTOR INVOLVEMENT IN DRM

The private sector is involved in response by providing and delivering relief in disaster affected areas. However, problems with regards to payment mechanisms are a major constraint. There are no public-private partnerships, nor is there a forum for regular consultation with the private sector on DRM. Irregular private sector engagement takes place, for example, at the 2007 Post-Tsunami workshop. The private sector was also consulted on the proposal for the new framework for DRM and provisions for financial management and engagement mechanisms with the private sector (as well as for other partners) will be included.

RISK FINANCING FRAMEWORK

The NDMO has a limited annual budget allocation for both ex-ante and ex-post activities. Financing for disaster risk management allocation in 2009 was (1) SBD 800,000 (US \$99,400) for awareness, education and risk reduction and (2) SBD 2 million (US \$248,600) for response activities.

If unused, response activity funds cannot be carried over. In case of emergency, the SBD 2 million are paid into the National Disaster Council Fund, which also includes donations, contributions or income from sales of property. Funds in the NDC Fund that are not required for immediate use do not lapse but are to be invested in securities – with the exception of the annual appropriation of SBD 2 million. There is also a contingency warrant to request funds in cases of emergency.

There is no government insurance scheme in place for public assets and, common amongst many countries, the government has no obligation to cover losses to private property. A World Bank Pacific Islands Catastrophe risk financing initiative that would cover losses to public and private assets in the Pacific Islands countries is under consideration but should await the implementation of the new DRM framework and possibly the completion of some rigorous assessment of national and strategic assets.

HFA Priority # 5: Strengthen disaster preparedness for effective response at all levels.

EMERGENCY MANAGEMENT

The National Emergency Operations Center (NEOC), which falls within the functions of the National Disaster Council, is in charge of the country's emergency response. Immediate response is coordinated with the Police Department but the current National Disaster Plan makes coordination across other agencies difficult. Systems for assessment, planning and financial management are limited.

The Police and Fire Department includes search and rescue teams but equipment is limited. The presence of the Regional Assistance Mission to the Solomon Islands (RAMSI) provides another response capability.

Response capacity is often dependent on international support but poor systems make coordination of this support difficult and lead to loss of confidence in Government arrangements. The new DRM arrangements are intended to improve this with explicit structures and accountabilities across government agencies.

SIMULATION EXERCISES

Disaster simulation exercises are done as part of annual training sessions with Provincial Disaster Committees. The Solomon Islands participates in the Pacific-wide Tsunami Exercise. A nation-wide disaster simulation exercise is planned for October/November 2009 to test the new framework as part of the proposal for a new DRM plan.

REGIONAL LINKAGES

In part due to its own limited capacity and resources, the Solomon Islands are linked in with a number of regional facilities. The Meteorological Division receives information from overseas weather sources in Fiji, Australia and Hawaii. Tide gauges throughout the region give tide measures, pressure, wind speed and direction and sea surface and are all linked to the Australian National Tidal Facility in Adelaide, which was established as part of the South Pacific Sea Level and Climate Monitoring Project.

DAMAGE AND LOSS ASSESSMENT

In the past damage and loss assessments have been slow and if not inaccurate then often conflicting, hampering relief and particularly recovery activities. With nine new Provincial Disaster, Officers assessments teams will be formed and trained as part of the new arrangements. This is a significant commitment by the Government and on-going support will be needed.

3. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency/ International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
<i>Pacific Catastrophe Risk Pool Feasibility Study</i> (The Cook Islands, Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu)	World Bank	2008–present US \$400,000	1, 2, 5
<i>Sustainable management through reduced risk from disasters and climate</i> (Fiji, Kiribati, Marshall Islands, Papua New Guinea, Solomon Islands, Timor-Leste and Vanuatu)	World Bank	2008–present US \$1,900,000	2, 3, 4, 5
Strengthening the National Disaster Management Office	AUSAID through the NDMO	2005–2010 AUS \$2,500,000	1, 2, 3, 4,
Strengthening disaster management facilities in the provinces	The European Union/provincial level partners	Not available	1, 2, 3, 4
Community level disaster risk reduction and disaster preparedness workshop	JICA/provincial level partners	Not available	2, 3, 4
Disaster Risk Management Advisory Support and Rehabilitation of Damaged infrastructure	ADB	Not available	
<i>Pacific Islands Climate Change Assistance Program (PICCAP)</i> (The Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Samoa, Solomon Islands, Tuvalu and Vanuatu)	SPREP	1997–present	4
<i>Pacific Islands Disaster Assistance Program (PDAP):</i> (The Cook Islands, Fiji, Kiribati, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu, Federated States of Micronesia and the Republic of the Marshall Islands)	USAID/OFDA	1995–present US \$4,001,756	5

(Cont.)

Existing Projects with Donors and International Financial Institutions	Funding Agency/ International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
<i>Pacific Islands Climate Prediction Project</i> (Cook Islands, Fiji, Kiribati, Niue, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu and Papua New Guinea)	AUSAID and the Australian Bureau of Meteorology	2004– present AUS \$5.5 million	2
<i>South Pacific Sea Level and Climate Monitoring Project</i> (The Cook Islands, Federated States of Micronesia (FSM), Fiji, Kiribati, Marshall Islands, Nauru, Papua New Guinea (PNG), Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu)	AUSAID	1991– 2010	2, 5
Environmental sustainability mainstreamed into regional and national policies and planning frameworks (Federated States of Micronesia, Fiji, Kiribati, Nauru, Palau, Marshall Islands, Solomon Islands, Tonga, Tuvalu and Vanuatu)	UNDP	2008–2012 US \$16,831,000	
<i>South Pacific Sea Level and Climate Monitoring Project</i> (The Cook Islands, Federated States of Micronesia Fiji, Kiribati, Marshall Islands, Nauru, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu)	AUSAID	1991–2010	2, 5

4. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

As the islands currently lack a disaster risk management strategy and implementation plan, a key activity would be providing technical assistance to the development of a framework for disaster risk management and developing facilities whereby this framework can be funded. Both country specific and PIC initiatives must be considered to (i) strengthen institutional capacity for strategic planning and coordination (ii) integrate disaster risk reduction into all development planning and (iii) lead towards the next phase of a comprehensive risk finance strategy.

Indicative Program for GFDRR Funding (Projects and engagement areas being considered for GFDRR funding)	Implementing Agency/ International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
<p>A. Support the integration of DRM, including DRR and CCA, in Solomon Is Government institutions, policies and plans</p> <p><i>Priority Activities:</i></p> <p>1. Support the implementation of the DRM/CCA Institutional Framework through the National Disaster Council (NDC). This could include: support to NDC Committees and Operational Clusters at the national, provincial and local levels; development of policies and arrangements for integrating DRM/CCA into national, sector and provincial planning and budget processes</p> <p>2. Strengthen DRR/CCA planning and budgeting capacity of sector specific institutions and develop DRR/CCA plans within key ministries (Ministries of Agriculture, Infrastructure, Lands, Women Youth and Children, Health, Education, Environment, Rural Development)</p>	<p>Prime Minister's Office National Disaster Council (NDC) Ministry of Development Planning and Aid Coordination Ministry of Finance and Treasury NDC Ministries NDMO Sector Ministries</p> <p>International Partners: AUSAID 2009 AUS \$600,000 Potential for cooperation and coordination with donor and NGO community programs in DRR and CCA</p>	<p>2009–2011</p> <p>2009 US \$100,000</p> <p>2010 US \$200,000</p> <p>2011 US \$200,000</p>	1, 2, 3, 4, 5

(Cont.)

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency/ International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
<p>B. Implement DRR activities and pilot investments in priority sectors and at community level</p> <p><i>Priority activities:</i></p> <p>1. Implementation of priority DRR activities in selected key sectors. Possible activities could include: improving end-to-end early warning arrangements; developing and disseminating risk maps, undertaking provincial and community level DRM programs in conjunction with NGO and local community groups, encouraging the private sector in DRR activities and promoting the sustainable use and management of ecosystems – including through better regulation of land-use and development activities to reduce risk and vulnerabilities.</p> <p>This activity and the selection of pilot interventions will depend on the progress under Activity A and will be coordinated with other donors and partner institutions.</p> <p>2. Support the development and implementation of a wireless broadband communication network across the nine provinces to support disaster risk management arrangements and early warning systems.</p> <p>Such a network could also support hazard observation monitoring networks and rural development, livelihood and welfare sector programs. The network could comprise up to seven satellite receiving stations, microwave spine systems with local village networks on a village ownership business model and be installed in association with technical co-sponsors.</p> <p>Activities would include: addressing the feasibility of the technical and business model solutions; implementing a satellite receiving network with microwave spine system in three stages; and progressively establishing local networks through villages on a local ownership business model.</p>	<p>National Disaster Council (NDC) Ministry of Development Planning and Aid Coordination Ministry of Finance and Treasury Ministry of Communication and Aviation Ministry of Environment, Conservation and Meteorology Ministry of Rural Development NDMO Utility agencies NGO's Private sector</p> <p>International Partners: New Zealand based technical co-sponsor UNDP EU</p>	<p>2009–2011</p> <p>2010 US \$300,000</p> <p>2011 US \$600,000</p> <p>2009 US \$100,000</p> <p>2010 US \$500,000</p> <p>2011 US \$100,000</p>	<p>1, 2, 3, 4, 5</p>

(Cont.)

Indicative Program for GFDRR Funding (Projects and engagement areas being considered for GFDRR funding)	Implementing Agency/ International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
<p>C. Strengthen institutional arrangements for integrated hazard management, including developing an integrated hazard information system and progressively upgrading the hazard observation networks.</p> <p><i>Priority activities:</i></p> <ol style="list-style-type: none"> 1. Develop a hazards strategic plan and undertake capacity development within the hazards group including but not limited to: mapping of key hazards, development of an integrated all-hazards information system with risk and vulnerability tools, undertaking risk and vulnerability assessments for priority and identified sector clients 2. Establish minimum requirements for the Solomon Islands observation networks (particularly for the meteorological and hydrological monitoring) and progressively upgrade in conjunction with other regional programs 	<p>NDC Committees for Hazards and Risk Reduction Ministry of Environment, Conservation and Meteorology Ministry of Mines and Energy Ministry of Lands, Housing and Survey NDMO</p> <p>International Partners: UNDP EU Regional HYCOS and Meteorological review programs Melanesian Volcanic Network initiative.</p>	<p>2009–2011</p> <p>2009 US \$100,000</p> <p>2010 US \$200,000</p> <p>2011 US \$200,000</p>	<p>1, 2, 3, 4</p>
<p>D. Develop the Guadalcanal Flood Plain Management regime and warning system and associated DM Arrangements</p> <p><i>Priority activities</i></p> <ol style="list-style-type: none"> 1. Define a hazard monitoring regime and floodplain management plan 2. Install a hydrological network and warning system 3. Develop local disaster management arrangements 	<p>NDC – Risk Reduction Committee Ministry of Mines and Energy – Hydrological Unit Ministry of Environment, Conservation and Meteorology Ministry of Lands, Housing and Survey NDMO</p> <p>International Partners: ADB EU</p>	<p>2009–2011</p> <p>2009 US \$100,000</p> <p>2010 US \$500,000</p> <p>2011 US \$100,000</p>	<p>2, 3, 4</p>
<p>Total Budget Requested</p>		<p>US \$3.3 million</p>	

4. BIBLIOGRAPHY

- ADB, 2009. Aide Memoire of Joint Reconnaissance Mission of Flood Damage, 9-13 March 2009.
- ADB Solomon Islands 2008 Fact Sheet.
- The CIA World Factbook 2009.
- Hyogo Framework for Action 2005-2015: I S D R International Strategy for Disaster Reduction.
- Bettencourt, Sofia, Richard Croad, Paul Freeman, John Hay, Roger Jones, Peter King, Padma Lal, Alan Mearns, Geoff Miller, Idah Pswarayi-Riddihough, Alf Simpson, Nakibae Teuatabo, Ulric Tritz, Maarten Van Aalst 2005 'Not If, But When: Adapting to Natural Hazards in the Pacific island Region' The World Bank.
- Manilofia, Rex, 2006. Disaster Communications in the Solomon Islands. ITU/ESCAP Disaster Communications Workshop, 12–15 December 2006, Bangkok, Thailand.
- UNDP 'Human Development Index' 2007.
- The World Bank 2008 Pacific Catastrophe Risk Financing Initiative.
- The World Bank, 2008. GFDRR Solomon Islands Country Assessment.
- The World Bank 2007 Country Summary.
- Max Dille, Robert S. Chen, Uwe Deichmann, Arthur L. Lerner-Lam,4 and Margaret Arnold 'Natural Disaster Hotspots; A Global Risk Analysis' World Bank 2005.

VIETNAM

The country DRM note was prepared in consultation with Vietnam’s Committee for Storm and Flood Control- Disaster Management Unit (CCFSC-DMU), the Ministry of Natural Resources and the Environment, the Ministry of Finance, the United Nations Development Program and other key development partners.



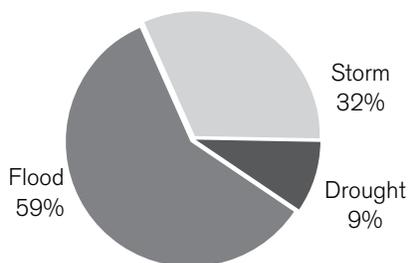
1. DISASTER RISK PROFILE

Located in the tropical monsoon area in South East Asia, Vietnam is one of the most hazard-prone areas in the Asia Pacific Region.

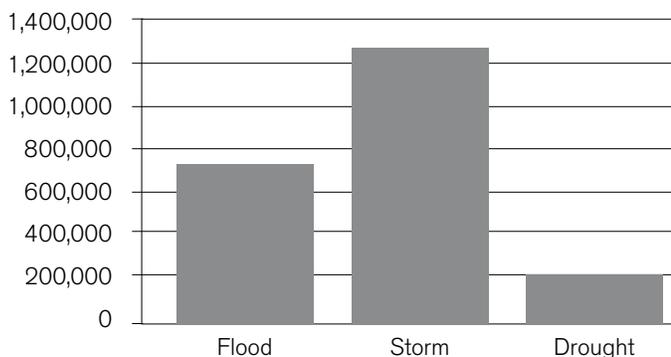
Because of its topography, Vietnam is susceptible to typhoons, floods, droughts, sea water intrusion, landslides, forest fires and occasional earthquakes of which typhoons and floods are the most frequent and most devastating hazards. The storm season lasts from May to December with storms hitting the northern part of the country in May through June and moving gradually south from July to December.

Given the massive concentration of its population along the coastline and in the low lying deltas, disasters take a heavy toll in lost lives and damaged livelihoods. The encroachment of economic activity and development into marginally suitable areas such as floodplains, costal swamps, drainage channels or other natural buffers only adds to the vulnerability of the population.

% People Affected by Disaster Type



Economic Damages by Disaster Type (1000s US\$)



Source: EM-DAT: The OFDA/CRED International Disaster Database.

COUNTRIES AT RELATIVELY HIGH MORTALITY RISK FROM MULTIPLE HAZARDS (Top 96 based on population with 2 or more hazards)	
1.	Bangladesh
2.	Nepal
4.	Burundi
5.	Haiti
7.	Malawi
10.	Guatemala
15.	Antigua and Barbuda
17.	Nicaragua
19.	Cuba
20.	Niger
22.	VIETNAM
25.	Chile
26.	Ecuador
30.	Burkina Faso
32.	Venezuela

Household survey data from 2006 confirms the continued reduction of poverty in Vietnam, with the fraction of households living below the poverty line attaining 16 percent (Vietnam Development Report 2008). Most of the poor live in rural areas and while rural poverty rates are declining, urban poverty rates appear to have stagnated. Natural disasters continually threaten the progress that has been made.

Every year, natural disasters cause an average of 750 deaths, and result in annual economic losses equivalent to 1.5 percent of GDP. However, damage and loss data is chronically underreported, so real totals may be much higher. As most of the population is living in low-lying river basins and coastal areas, more than 70 percent of the population is estimated to be exposed to risks from multiple natural hazards.

A 2007 assessment of the World Bank listed Vietnam as one of the five worst affected countries by climate change, as a large proportion of the population, infrastructure and economic production including irrigated agriculture, is located in coastal lowlands and deltas. It appears that a one-meter rise in the sea level would affect 39 of the 64 provinces in six of the eight economic regions of Vietnam. About 20 percent of the communes could be wholly or partially inundated, with the Mekong River Delta being the most seriously affected area. By one estimate, a one-meter rise in sea level would affect approximately 5 percent of Vietnam's land area, 11 percent of the population, and 7 percent of the agriculture input.

Relative Disaster Frequency

High	Medium	Low
Flood	Hail rain/tornado	Earthquake
Typhoon	Drought	Accident (technology)
Inundation	Landslide	Frost
	Flash flood	Damaging cold
	Fire	Deforestation

Capital	Hanoi
Official Language	Vietnamese
Independence	2 September 1945 (from France)
Area	Total: 329,560 sq km Land: 325,360 sq km Water: 4,200 sq km
Land Use	Arable land: 20.14% Permanent crops: 6.93% Other: 72.93%
Government	Communist state
Population	86,967,524 (July 2009 est.)
GDP	US \$90.88 billion (2008 est.)
HDI	105 th out of 177 countries (HD Report 2007/2008)
Terrain	Low, flat delta in south and north; central highlands; hilly, mountainous in far north and northwest
Climate	Tropical in the south; monsoonal in the north with hot, rainy season and warm, dry season
Natural resources	Phosphates, coal, manganese, chromate, offshore oil and gas deposits, forests, hydropower
Major products	<i>Agriculture products:</i> paddy rice, coffee, rubber, cotton, tea, pepper, soybean, cashews, sugar cane, peanuts, bananas, poultry, fish, seafood. <i>Industries:</i> food processing, garments, shoes, machine-building, mining, coal, steel, cement, chemical fertilizer, glass, tires, oil, paper

EXPOSURE AND VULNERABILITY

An estimated 80–90 percent of the population is affected by typhoons according to the Ministry of Agriculture's Central Committee for Flood and Storm Control. This includes both communities living along the long coastline and those living in the upland areas who are vulnerable to subsequent flashfloods resulting from the typhoons' heavy rains.

River plain flooding is extensive and prolonged throughout the wet season in the large deltas. Most of Vietnam's 2,360 rivers are short and steep, so that heavy rainfall in their basins produces intense, short duration floods. Sizeable portions of the country and especially the Central Highlands and Central Coast are subject to heavy rainfall. Three consecutive years of flooding in the Mekong Delta claimed the lives of over 1,000 people, mainly children.

An average of six to eight typhoons or tropical storms of varying intensity strike Vietnam each year with more frequent occurrences in the northern and central coastal region earlier in the season. In 1997, Typhoon Linda killed over 3,000 people along the southern coast.

RECENT DISASTERS

Vietnam – Major Hazardous Events of the Decade (1999-2008)

Year	Event	No. of people dead	No. of people injured	No. of people missing	Economic loss (VND billion)	Areas affected
2008	Storm Kammuri	133	91	34	1,939.733	9 North and Central provinces
2007	Storm Lekima	88	180	8	3,215.508	17 North and Central provinces
2006	Storm Xangsane	72	532	4	10,401.624	15 Central and Southern provinces in
2005	Storm No. 7	68	28		3,509.150	12 North and Central provinces
2004	Storm No. 2	23	22		298.199	5 Central provinces
2003	Rains and floods	65	33		432.471	9 Central provinces
2002	Flooding	171			456.831	The Mekong River Delta
2001	Flooding	393			1,535.910	The Mekong River Delta
2000	Flash Floods (July)	28	27	2	43.917	5 Northern provinces
1999	Floods	595	275	29	3,773.799	10 Central provinces

Source: CCFSC's Website, Historical Disaster Database, <http://www.ccfsc.org.vn/ndm%2Dp/?module=800&sid=NDMP&mnid=67>

2. DISASTER RISK MANAGEMENT FRAMEWORK

Vietnam's primary DRM framework, the National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020, was approved by the government in November 2007. The strategy lays out Vietnam's primary disaster risk management objectives, focusing largely on water related disasters. The Ministry of Agriculture and Rural Development estimated they will require a budget of US \$18 billion; around US \$13 billion for structural measures i.e. building reservoirs, dams and dykes and US \$5 billion for non-structural measures. This figure does not include funds needed by other ministries and provinces to implement disaster risk reduction action plans.

The main objectives of the National Strategy are: The integration of disaster risk management into socio-economic development plans at the national and levels with a focus on disaster response; ensuring sustainable disaster recovery which integrates disaster risk management; planning five different regional disaster risk management strategies for the five geographical regions of the country; combining structural and non-structural measures in disaster risk management and dividing implementation responsibilities and timing for risk reduction among a range of ministries.

Traditionally, Vietnam has focused on preparedness and response with a strong emphasis on structural measures such as dykes and seawalls. Mitigation activities are slowly entering the development agenda but the revised strategy still puts disaster preparedness and forecasting as its foremost objectives.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

THE NATIONAL DRM AGENCY

Vietnam's national disaster risk management agency, the Committee for Flood and Storm Control, is chaired by the Minister of MARD. Established by decree 1990, it formulates all flood and typhoon related policies and mitigation measures, with the Office of Government, the Ministry of Agriculture and the Ministry of Defense as its key members. Its secretariat is provided by the Department of Dyke Management and Flood Control (DDMFC) of MARD.

The CCFSC tends to convene primarily in response to natural disasters although Vietnam is making the shift from a largely reactive to an increasingly proactive approach to disaster risk management. While the CCFSC is responsible for a broad range of disaster risk reduction activities, its ability to focus on and coordinate response among a wider range of ministries is limited due to its position within MARD.

DRM LEGISLATION

Vietnam does not have a DRM law. The National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020 is the key document underpinning all disaster risk reduction policy and strategy. There are ongoing discussions about drafting a disaster risk management law and this is planned as an activity in MARD's new action plan and in the newly-launched UNDP program on disaster risk reduction.

Disaster risk management policy is addressed in several additional Vietnamese laws and decrees.

- The Law on Water Resources promulgated in May 1998 governs water usage and the prevention of water related disasters¹
- The Ordinance on Flood and Storm Control promulgated in March 1993 amended and revised in August 2000 formally created the existing institutional structure²
- the Law on Dyke promulgated in November 2006 regulates the planning of flood prevention and response in flood prone areas¹
- The Environment Protection Law (1998) governs the use of natural resources as a means to prevent natural disasters.

¹ Available at <http://dwrn.gov.vn/en/uploads/Laws/files/8-1998-OHIO.pdf>

² www.cafs.org.vn/ndmp/images/download/Phap%201enh%20PCLN%SDBS%202000.pdf

GOVERNMENT



Source: CCFSC

Other legislative instruments which incorporate disaster risk management elements are

- The Law on Forest Development and Protection³
- The 2003 Law on Fisheries⁴
- The Ordinance on Irrigation Structures Utilization and Protection⁵
- The Ordinance on Hydro-meteorological Structures Protection⁶

LEGISLATIVE AND ORGANIZATIONAL GAPS

Legislation related to natural disasters is prolific—in spite of the lack of an explicit DRM law—but enforcement is erratic. Much of the existing legislation lacks clear institutional arrangements for enforcement and the current organizational structures, mandates, annual budget earmarks and working agenda focus largely on disaster response rather than prevention. There is no professional and specialized cadre of staff who focus on disaster management. Instead, it is managed in an 'as-needed' basis, part-time, by staff of the agriculture and rural development sector, mainly under the irrigation and dyke management sub-sectors. Some of these gaps have been addressed in the on-going World Bank Financed Natural Disaster Risk Mitigation project and the new UNDP/One UN program.

3 Available only in Vietnamese at http://www.nea.gov.vn/luat/toanvan/Luat_BVPT_Rung.html

4 Available only in Vietnamese at http://www.fistenet.gov.vn/Luat_TS2.asp

5 <http://www.vncold.vn/Web/Content.aspx?distid=415>

6 <http://www.kttvqg.gov.vn/Default.aspx?tabid=12>

DRM AT THE SUB-NATIONAL LEVEL

Line ministries, provinces and districts are responsible for disaster risk management planning, creating both vertical and horizontal reporting structures. The Ordinance on Flood and Storm Control mandates the creation of provincial and other sub-national disaster risk management strategies and plans and has subordinate provincial and district Committees for Flood and Storm Control.

All 64 provinces and cities of Vietnam are tasked with developing their own action plans to implement the National Strategy up to 2020. As of March 2009, approximately 90 percent of the provinces had created and approved their own action plans for incorporation into the National Action Plan. While actual implementation and funding for these action plans varies widely from province to province, the sheer number of provinces which have undertaken the first steps in this exercise is commendable.

Disaster risk management activities are coordinated across ministries at the national level though the work of the CCFSC, however at the provincial and lower level, reporting is both vertical and horizontal, through line ministries and local committees for Storm and Flood Control. For example, while a wide range of ministries belong to and participate in the Central Committee for Flood and Storm Control, at the provincial level, the provincial Department of Construction would report upwards to the national Ministry of Construction in parallel to the Provincial Committees for Storm and Flood Control.

DRM IN THE POVERTY REDUCTION STRATEGY

Disaster risk management is integrated into Vietnam's Poverty Reduction Strategy and Country Development Plans, although implementation remains uneven. Within Vietnam's Socio-Economic Development Plan 2006-2010, the Government of Vietnam has stipulated it will halve the number of poor people falling back into poverty due to natural disasters by 2010 as one of its primary indicators⁷. This is a good first start, but there is room for increased integration of risk reduction into all levels of development planning.

DISASTER RISK MANAGEMENT IN THE COUNTRY PARTNERSHIP STRATEGY

The Vietnam Country Partnership Strategy 2007-2011 contains the following disaster risk reduction benchmarks: "Strategy and action plan for DRM approval; (1) Targeted communities and populations reporting improved early warning for storms and floods; (2) Flood forecasting with 80 percent preciseness on the Red River 48 hours in advance, in the Mekong River 3-5 days in advance, and (3) Feasibility of agricultural flood-index based insurance tested for scale-up."

INTERMINISTERIAL INVOLVEMENT IN DRM

A wide range of government agencies and ministries are involved in disaster risk management. The *National Committee for Search and Rescue* (NCSR) is responsible for search, rescue and emergency relief during and after disasters; *The Fatherland Front and Red Cross Society* are charged with receiving and distributing emergency relief donations; *The Ministry of Natural Resources and Environment* (MONRE) and *Geophysics Institute of Vietnam Academy of Science and Technology* are charged with disaster warning and forecasting; the *Voice of Viet Nam* (VOV) and *Vietnam Television* (VTV) are responsible for disseminating disaster warning and forecast to the public; *The Ministry of Finance* (MOF) is responsible for allocating and releasing emergency response funds and other recourses in order to meet post-

disaster needs; *The Ministry of Health* (MOH) is responsible for post-disaster environment health needs; *The Ministry of Transportation* (MOT) is responsible for traffic safety and rehabilitation during and after disasters; *The Ministry of Post and Telecommunication* is responsible for rehabilitating communication systems ex-poste; *The Ministry of Labour,*

⁷ Reporting on progress made on this indicator was not available as of April 2009.

Invalids and Social Affairs (MOLISA) is charged with setting disaster compensation policies; *The Ministry of Industry* is responsible for managing reservoirs in and hydro power plants; *The Ministry of Foreign Affairs* is responsible for disaster related international cooperation issues. The above is not an exhaustive list, but all are members of the CCFSC.

CLIMATE CHANGE AND DISASTER RISK MANAGEMENT

The Government of Vietnam approved its National Target Program (NTP) to respond to climate change in December 2008. The National Target Program Steering Committee is led by the Ministry of Natural Resources and the Environment, with the participation of key ministries such as the Ministries of Agriculture, Transportation, and Construction. Its strategic objectives are to assess climate change impacts on sectors and regions, to develop feasible action plans to effectively respond to climate change in the short and long term and to join the international community's efforts in protecting the climate system.

HFA Priority # 2: Identify, assess and monitor disaster risks and enhance early warning

NATIONAL, REGIONAL AND LOCAL SECTORAL RISK ASSESSMENTS

While limited national hazard mapping exists with a primary focus on water related events, there is little if any comprehensive risk mapping in Vietnam. Where hazard data exists, there is often insufficient exposure data.

Historically, the hazard mapping data that exists is held by different agencies and where detailed maps exist, considered sensitive by the government and not widely disseminated. There are three larger scale hazard mapping projects but two of these projects (tsunami and drought mapping) have experienced considerable delays.

For example, where detailed flood maps exist at the provincial level, they are often not factored into new development plans. No institution, including the Central Committee for Flood and Storm Control, has the mandate to ensure risk maps are taken into consideration.

Donor and NGO projects have sponsored ad hoc provincial and community level risk assessments. An OFDA/UNDP 2003 mapping project created high resolution risk maps for eight provinces in central Vietnam. However limited field survey data produced risk maps that were subsequently never used by most participating provinces and the map distribution was extremely limited. Community level risk mapping has been undertaken in some other projects, but data quality is not sufficiently detailed to be of use for national level risk maps.

In particular regions, there is a high level of awareness about Vietnam's exposure to natural hazards at both the national, provincial and commune level when related to annual river based flooding rather than floods associated with tropical cyclones. Communities living along the low lying Mekong Delta areas have experienced floods for generations, and the government has developed a program of "living with floods."

At some point in the future, the government should strongly consider an integrated national disaster and hazards data and mapping system as a first step to obtaining reliable data on the scale of economic activities at risk from natural hazards. Currently MONRE's Institute of Hydro-met and Environment has three hazard mapping projects underway.

Project	Budget (US\$)	Timeframe
Flash flood risk mapping at district level and 1:200,000 scale for selected mountainous provinces	US \$1.02 million	2006–2009
Tsunami risk mapping for coastal areas	US \$384,000	2006–2008 (not completed)
Drought hazard mapping for the Highlands and Southern Central provinces	US \$395,000	2006–2008 (not completed)

INDICATORS ON DISASTER RISK MANAGEMENT

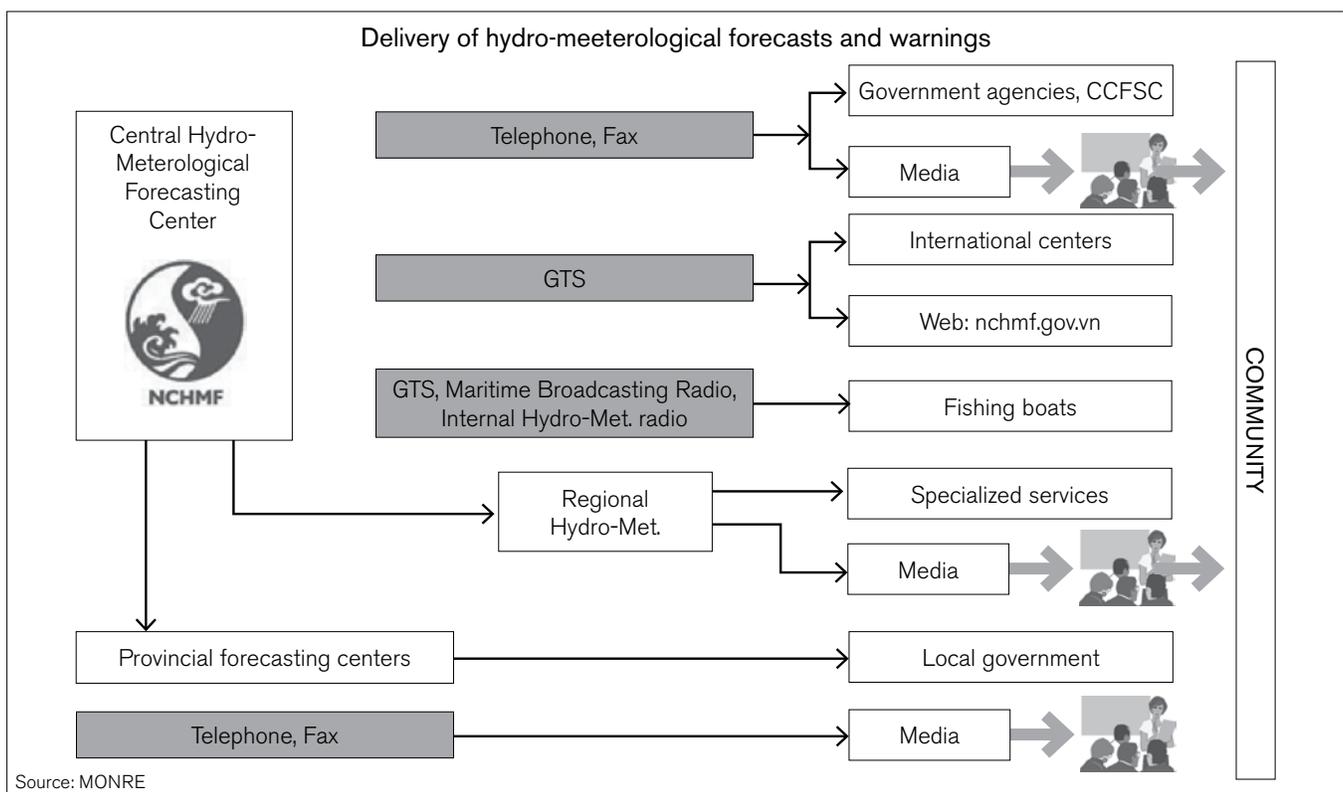
There is a shortage of data, tools and capacity to quantify natural hazard risks and to interpret them in a manner which allows risk reduction to be integrated explicitly into development planning and decision-making. Vietnam lacks a system of disaster risk and vulnerability indicators at national and sub-national scales that will enable decision-makers to assess the impact of disasters on social, economic and environmental conditions and disseminate the results to decision makers, the public and populations at risk.

EARLY WARNING SYSTEMS

Disaster risk management coordination is strongest, in Vietnam, for hydromet disasters. When storms approach over the South China Sea, they are monitored by the Geophysics Institute and the Central Hydro-metrological Center, which produce forecast bulletins every two hours on the approaching event. The bulletins are immediately and simultaneously sent to Vietnam Television/ Voice of Vietnam and the Maritime Broadcasting System for broadcasting nation-wide, to the Department of Dike Management and Flood Control, which is the Standing Office of the Central Committee for Flood and Storm Control and uploaded on the Center's website for external reference. The DDMFC, based on information received from the National Hydro-meteorological Center, convenes meetings of the CCFSC.

Depending on the severity of the disaster, the CCFSC will be chaired by the Minister of MARD or the Deputy Prime Minister/Prime Minister. Its other core members, the National Committee for Search and Rescue, MOT, MOH, VTV, VOV and others participate based on the scale and requirements of the event.

When a storm is incoming or following a natural disaster, the CCFSC convenes once a day, or more frequently if necessary. It prepares directive telegraphs which are dispatched to relevant ministries and localities affected by the disaster, asking for appropriate actions i.e. population evacuation, return of fishing boats, securing critical assets, etc. These directives are also broadcast through VTV and VOV nation-wide.



MONRE is the state agency charged with hazard monitoring through its Department of Hydro-meteorology and Climate Change. The tasks of weather forecasting (mainly hydrological and metrological phenomena) observations and issuing early warning sits with the National Center of Hydro-meteorology which has networks at the regional and provincial levels. The National Center of Hydro-meteorology is a member of CCFSC, responsible for providing early warning and forecasts for the CCFSC's action.

FORECASTING

Vietnam has nine regional hydro-meteorological forecasting centers, 54 provincial hydro-meteorological forecasting centers, and the following observation station networks:

Description	Quantity
Surface meteorological stations	174
Rain gauge sites	764
Hydrological stations	248
Marine meteorological stations	18
Radio stations	5
Weather radar stations	6
Wind-gauge by theodolite	8
Ozone and UV stations	3
Weather radars	6
Radiation	13

Insufficient coverage and distribution of the observation centers as well as outdated equipment is cited by the national hydro- meteorology centers as an impediment to accurate forecasting. It is not only a problem of equipment. Were more modern equipment in place, it would still need to be accompanied by a comprehensive human resource development program.

DATA SHARING

Vietnam has linkages to numerous regional and international climate forecasting centers including. It has been a member of the WMO since 1955 and is participating in the Regional Association II (Asia). Vietnam also participates in the UNESCAP/WMO Typhoon Committee (member since 1979, TC chair: 2006-2007), the ASEAN SCMG (member since 1995), the Mekong River Commission (member since 1957; signed the Agreement on the cooperation for the sustainable development of the Mekong River Basin in 1995), the North-West Pacific Tsunami Advisory Center (NWPTA), Japan, the Pacific Tsunami Warning Center (PTWC).

Vietnam has a number of bilateral forecasting agreements, including agreements with: China: (since 1993): exchange of weather forecast expertise, instrumentation in calibration, communication using PCVSAT, research, training; the United States: (since 2001) for technology transfer (NWSRFS, ETA models), training: Asia Pacific Desk, AMS annual meetings, training courses in Vietnam and US; Australia: (since 2002) for technology transfer, training; Lao PDR for technology transfer: providing Data receiving, processing and plotting systems; 6 meteorological and hydrological stations to DMH, training; Cambodia; Japan (GAME, SOWER/Pacific, MAHASRI); ADPC (Multi-hazard early warning system, application of climate information and prediction) and APEC (APEC Climate Center).

COMMUNICATIONS

Vietnam's communications system is relatively developed and functional before and after disasters. Vietnam has telephone and fax hotlines which connects the meteorological service with the CCFSC, the NCSAR, and the

VOV/VTV in the event of emergencies. The CCFSC is also connected via phone and fax with the Standing Offices for Flood and Storm Control which is often housed in the Department of Agriculture in the provinces. They also make use of village/neighborhood speaker systems to broadcast warnings at the community level.

HFA Priority # 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

EDUCATION AND TRAINING

Increasing community awareness about disaster risk reduction is undertaken primarily through donor-funded projects rather than through the Government of Vietnam, although the two work in close cooperation.

Vietnam runs natural disaster awareness raising pieces on its state-run television and radio stations and NGOs sponsor community events on disaster risk management.

Scaling up its Community-based Disaster Risk Management program is a main priority for Vietnam in the next decade. As a part of their CBDRM programs, they plan to train all staff at central, provincial and commune level on disaster risk management, establish disaster risk management centers at the province level and engage in a large-scale community awareness raising programs. Support for this activity is being requested from a wide range of donors.

The National Strategy for DRM up to 2020 has a component on integrating disaster risk reduction into school curricula. While not yet on the curricula, it is acknowledged as an important area with several NGOs already working on pilot programs.

INFORMATION MANAGEMENT AND EXCHANGE

Vietnam has several academic research institutions designated to studying different hazards. The Institute of Hydro-Meteorology studies flood and storms, the Institute of Geography focuses on geo-hazards and the Institute of Geophysics is in charge of studying and providing warnings for earthquakes and tsunamis.

HFA Priority # 4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience)

ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT

Mangrove forests, which have traditionally provided a barrier against flooding and seawater intrusion, have steadily been decreasing in acreage as Vietnam's population expands. However, the government has been making a concerted effort at mangrove reforestation and has passed appropriate legislation (such as the Law on Forest Protection) to reforest vulnerable areas and encourage the sustainable use and management of ecosystems. They have also offered advice and financial assistance to communities who use adaptive special plants in flood-prone areas.

LAND USE PLANNING

Land use planning incorporates some risk reduction policies but exposure to natural hazards is inconsistently taken into consideration. For example, while new developments must factor in earthquake and other hazards, a site's location in an area prone to flash flooding will not necessarily preclude major development. Increasing provincial level awareness about factoring natural disasters into land use planning is a priority for sustainable development.

Vietnam's building codes factor in certain natural hazards (for example, typhoons, earthquakes, sea level rise, wind loading) but their enforcement varies widely from province to province. While construction codes are stringent about earthquake resilience, flood resistance for buildings is more loosely enforced. In the highly storm and

flood prone provinces of Quang Nam, for example, approval is contingent on considering the impact of a wide range of natural hazards. In other equally hazard-prone provinces, this is not compulsory. Instead, it is frequently dependant on the level of awareness of the particular province, investor or developers and their interest in safeguarding their development. Pre-construction environmental impact assessments sometimes consider flooding as a factor. The existing building codes mainly apply for major public works. There is almost no enforcement of the building codes in construction of private housing.

SOCIAL AND ECONOMIC DEVELOPMENT PRACTICE

Households living in disaster prone areas have been active in diversifying their income sources so as to reduce risk (Vietnam Development Report 2008). By correlating daily rainfall data from 172 weather stations with household survey data, it appears that farmers in higher rainfall areas facing more volatile conditions areas diversifying their labor inputs more to safeguard their assets against risk (i.e. not relying on only crops but on crops and livestock). But they do not self-insure by accumulating livestock or holding assets. The Vietnam Development Report also suggests that farmers in these disaster prone areas have fewer diversification options, perhaps because they do not have good access to land or credit.

HFA Priority # 5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

RISK FINANCING

Most budgetary allocations in Vietnam are intended for response. Three percent of both the central and province level budgets are allocated for response contingent funds. These funds cannot be carried over from year to year and are in principal, supposed to be returned to the state budget. They are rarely used for mitigation activities, though frequently spent each year. There is an annual budget line at central and province level for both the relocation of people living in high risk areas and for the maintenance of the dyke systems.

Under the Ordinance on Flood and Storm Control, the Vietnamese Government is responsible for losses to public assets caused by natural disasters. There is also limited compensation for private assets, housing and livestock (but, as in most countries, insufficient to cover the entire loss). Vietnam does not have a disaster insurance scheme in place. Currently, MOF and MARD are considering a pilot agricultural insurance scheme which will be submitted to the Government by end of June 2009. The World Bank is also undertaking an initial study on risk transfer instruments currently in place in Vietnam.

When a disaster is declared, provinces use their contingency fund and may later ask the state for reimbursement if damage is in excess of the provincial contingent fund. They are also reliant on funds from line ministries. Funds are usually transferred from state to provincial treasuries for expenditure at the local level.

There is no comprehensive data available for total disaster relief expenditure nor origin of these funds. Post disaster funding is a complex web of state and provincial budgeting, line ministry reallocations, donors' funds outside the annual line items, private companies and individuals who donate through the mass organizations such as the Fatherland Front. The CCFSC tries to track funding data on its website.

DAMAGE AND LOSS ASSESSMENTS

Following a natural disaster, key ministries (usually the Ministries of Agriculture, Transportation and Health) send missions to the worst affected areas to investigate the situation and direct their respective sectors on appropriate response and recovery actions. The DDMFC receives and consolidates damage data from local

levels on a daily basis following a natural disaster. The consolidated data is sent to the CCFSC/Prime Minister for the Government's decision on the level of support provided to the affected areas. Following the initial disaster and damage reports, the Ministry of Finance allocates budget support from the State Treasury to provincial Treasuries in accordance to the Government's decision.

The broader socio-economic impacts of disasters are acknowledged by the government. Nevertheless the Government's damage and loss assessments can be inconsistent across sectors and provinces and total loss figures difficult to substantiate. Damage reported by communes – for instance to housing – may be in excess of government assistance allowances and so revised downwards to match available funds. Available norms for valuing damages – as in many countries – do not take loss into consideration and may significantly underestimate the total impact of natural hazards. Nevertheless, the government does send out teams from central ministries to assess damage in major sectors as well as rely on commune and provincial damage estimates.

EMERGENCY MANAGEMENT

Vietnam has a central, provincial, district and commune level emergency response plans for storms and floods which are reviewed and updated annually. Vietnam is particularly strong at pre-storm evacuations and has moved up to half a million people from the coastline within the space of a few hours.

Search and Rescue is embedded in the Ministry of Defense and its garrisons around the country. Responsibility falls under the National Committee for Search and Rescue located in and led by Ministry of Defense and composed of a number of relevant ministries such as the ministries of transportation, health, agriculture and rural development.

The National Committee for Search and Rescue has three 'Centers of Sea Search and Rescue', three 'Centers for Oil Spill Response' and a number of emergency units at military airports. The government is interested in improving its search and rescue capacity, particularly in terms of training and equipment. At present, following a natural disaster, locally based army garrisons are mobilized, often young soldiers with no professional skills for search and rescue. As a part of its effort to strengthen key technical capacity across the sector, Vietnam would like to focus on improving the capacity of its search and rescue cadre.

4. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency/ International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
<i>Natural Disaster Risk Mitigation Program</i> involves prevention and mitigation investments, community based disaster risk management, post-disaster reconstruction support and institutional strengthening	World Bank, Netherlands, Japan and AusAID	US \$110 million	1, 2, 3, 4, 5
<i>Hazard Risk Management Institutional Development Advocacy and Capacity Building Program</i> provides technical assistance for capacity building in risk finance, CBDRM, urban drainage designs, climate resilient cities, and integration of DRM into poverty reduction activity.(* see chart below for additional details)	GFDRR	US \$914,000	1, 3, 4, 5
<i>Emergency Rehabilitation of Calamity Damage Project</i> for a rapid resumption of livelihoods and reduction of vulnerability to natural disasters in the affected areas (primarily infrastructure repair)	ADB	US \$76 million	4, 5

(Cont.)

Existing Projects with Donors and International Financial Institutions	Funding Agency/ International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
<p><i>Strengthening Institutional Capacity for Disaster Risk Management in Vietnam, including Climate Change related disasters</i> program provides institutional capacity building TA for DRM and climate change related issues in Vietnam</p> <ul style="list-style-type: none"> - Supporting evidence-based national and local Disaster Risk Management legislation, strategies and policies and plans developed, approved and integrated in socio-economic and sectoral strategies and plans - Strengthening Institutional systems and processes to enhance coordinated and integrated DRR actions and adaptation to global climate change, at national and provincial level - Strengthening national and local capacities to minimize the adverse social, economic and environmental impacts of climate-related disasters 	UNDP/One UN	US \$4.5 million	1,2, 3, 4, 5
Program for Hydrometeorological Risk Mitigation in Asian Cities (PROMISE): (Chittagong, Bangladesh; Hyderabad, Pakistan; Dagupan City, the Philippines; Kalutara, Sri Lanka; and Da Nang, Vietnam, Semarang in Indonesia)	USAID/OFDA	2005–present US \$1,855,286	1, 2, 3, 4
<i>Asia Flood Network (AFN)</i> : (Cambodia, China, Laos, Thailand, and Vietnam in the Mekong river basin and Bangladesh, India, Nepal, and Pakistan in the Ganges-Brahmaputra-Megna)	USAID/OFDA	US \$2,579,927	2, 3
<i>Drought Preparedness in Southeast Asia</i> : (Cambodia, East Timor, and Vietnam)	USAID/OFDA	US \$1,200,000	2, 3
<i>Project for Building Disaster Resilient Societies in Central Region of Vietnam</i> supports storm and flood mitigation infrastructure works in the three central provinces of Quang Ngai, Thua Thien Hue and Quang Nam	JICA	US \$4.5 million	1, 2, 3, 4, 5
<i>Joint Advocacy Network Initiative (JANI – formerly Dani)</i> program works to improve the effectiveness of Community-based Disaster Risk Management (CBDRM) in Vietnam	ECHO	1998–present Euro 6 million	1, 2, 3, 5
<i>Capacity Building for Mitigation and Adaptation of Geodisasters Related to Environment and Energy Development in Vietnam</i> project aims to building capacities for Vietnamese experts in the areas of geodisaster adaptation and mitigation	Norway	US \$2.2 million	2,3, 4, 5
Community Based Disaster management in the Mekong Delta/ Mountainous areas	Oxfam UK/ Hong Kong		2, 3, 4
Mangrove Plantation, disaster preparedness and climate change	Vietnam Red Cross		2, 3, 4

Ongoing GFDRR Activities (Current GFDRR Portfolio)	Budget (years covered)	HFA Activity Area(s)
Study on existing transfer activities	165k	HFA Priority #4: Reduction of the underlying risk factors
Study on drainage system for coastal cities	154k	HFA Priority #4: Reduction of the underlying risk factors
Climate resilient cities, pilot in Hanoi, Can Tho and Dong Hoi	320k	HFA Priority #4: Reduction of the underlying risk factors
Documentaries to promote CBDRM	65k	HFA Priority #3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels
DRM integration into the Bank's poverty reduction project	110k	HFA Priority #4: Reduction of the underlying risk factors
Capacity support to DRR and CCA	68k	

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

By putting forth the National Strategy and the National Action Plan, the Government has shown a strong interest in moving forward with the DRM agenda. Vietnam currently has a US \$110 million IDA program. Although DRM is a priority for the government, lessons learned from this activity show there is extremely weak capacity for client implementation so Bank execution is proposed for much of the next round of GFDRR grants. Moreover, there is a strong need to integrate DRM into many of Vietnam's new investment projects. The Government has proposed integrating DRM into its socio-economic planning and, in partnership, the World Bank Hanoi would like to integrate DRM into its upcoming and existing projects.

The areas proposed have been identified in consultation with national local authorities and reflect HFA priorities. They will build on activities started in the first round of GFDRR programming (such as expanding support for CBDRM and undertaking a more broad reaching risk finance strategy) and will contribute to the development of the future lending program in Vietnam.

Indicative Program for GFDRR Funding (Projects and engagement areas being considered for GFDRR funding)	Implementing Agency/ International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
<p>I Integration of Disaster Risk Reduction into Pipeline World Bank projects in Vietnam</p> <p><i>Priority activities:</i></p> <ol style="list-style-type: none"> 1. Identification of pipeline projects suitable for DRM integration 2. Mainstreaming disaster reduction activities (structural improvement and non structural activities such as assessments and awareness raising etc) and into upcoming projects such as roads, schools, hospitals, the Northern Mountains program etc. during the preparation phase 3. Developing guidelines for a detailed disaster risk assessment checklist for future Vietnam projects 4. Integration of DRR into upcoming and existing CAA Activities 4. Preparation of the next IDA lending program for Disaster Risk Reduction in Vietnam projected for FY 2012 	WBOH	2009–2011 US \$2 million	1, 2, 3, 4, 5
<p>II Risk Financing Options - Supporting the Development of Vietnam's Strategy</p> <p><i>Priority activities:</i></p> <ol style="list-style-type: none"> 1. Identification and assessment of catastrophe risks (e.g. wind, earthquake, flood) 2. Collection of relevant existing hazard, vulnerability and exposure data 3. Support development of a catastrophe risk finance model for Vietnam that would allow for risk transfer and risk sharing mechanisms 4. Support development of draft legislation and regulations that would allow implementation if such a scheme in Vietnam. 5. Explore development of supplemental multi-hazard risk maps 6. Strengthen Ministry of Finance and National Planning capacity for understanding and bringing a focus to this issue 7. Establishment of an umbrella contingent component for the Bank's investment projects that can be mobilized for disaster recovery 	WBOH Ministry of Finance, Ministry of Agriculture and Rural Development	2009–2011 US \$3 million	1, 2, 3, 4, 5

(Cont.)

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency/ International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
III Support Vietnam's NAP Implementation <i>Priority activities may include:</i> <ol style="list-style-type: none"> 1. In close coordination with other donors, provide TA for the preparation of the National Action Plan to implement the National Strategy on DRM 2. Support sub national DRM structures, in coordination with UNDP, including both establishment of centers and staff capacity building 3. Update and developing risk maps and related information in conjunction with activity II 4. Support Vietnam's planned national DRM training and awareness raising activities 5. Improving development and enforcement of building codes which incorporate disaster risk reduction measures 	WBOH Central Committee for flood and Storm Control, MONRE, Provincial authorities	2009–2011 US \$6 million	1, 2, 3, 4, 5
IV Strengthen the hydrological and meteorological capability for Vietnam <i>Priority activities:</i> <ol style="list-style-type: none"> 1. Review the meteorological and hydrological observational networks, data collection, processing and information dissemination systems 2. Based on identified gaps and establish requirements for effective meteorological and hydrological monitoring, forecasting and end-to-end warning system and service delivery, at the same time addressing hazard management and climate change needs 3. Review and develop institutional arrangements to support a sustainable level of service 4. Implement institutional and sustainable service arrangements. 5. Design and implement systems support purchase of and tools to support regular meteorological and hydrological monitoring, forecasting, end-to-end warning and effective service delivery 6. Enhance the climate database and operational systems for effective climate change monitoring, prediction and evaluation. 7. Identify skills gap and assist with training and capacity building 	MONRE, Department of Hydro-meteorology and Climate Change, National Center of Hydro-meteorology	2009–2011 US \$3.9 million	2
Support to program monitoring, evaluation and oversight	WBOH	3 years US \$100,000	
Total Budget Requested:	US \$15,000,000		

6. BIBLIOGRAPHY

Biden, Lolita ADPC Disaster Management in Southeast Asia, 2003.

Dilley, M. R.Chen, U. Deichmann, A.Lerner-Lam, and M. Arnold. 2005. Natural Disaster Hotspots; A Global Risk Analysis, Washington DC: World Bank.

EM-DAT: OFDA/CRED International Disaster Database, Catholic University of Louvain, Brussels, Belgium. Accessed 3/15/09: www.emdat.net

Hyogo Framework for Action 2005-2015: I S D R International Strategy for Disaster Reduction.

Priorities and Action Agenda 2006-2015 Supplementary for Mainstreaming Disaster Risk Reduction and Disaster Management.

Accessed 8/13/09. www.unisdr.org/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf

National Report on Disaster Reduction in Vietnam for the World Conference on Disaster Reduction 2004.

UNDP/Government of Vietnam Project Outline Strengthening institutional capacity for Disaster Risk Management in Vietnam, including Climate Change related disasters 2009.

USAID/OFDA Asia and Pacific Disaster Preparedness programs 2008. Accessed 8/13/09. http://www.usaid.gov/our_work/humanitarian_assistance/disaster_assistance/countries/papua/template/fs_sr/asia_cy_fs01_09-30-2008.pdf

Vietnam's National Strategy for Disaster Prevention, Response and Mitigation up to 2020. Accessed 8/13/09. <http://www.ccfsc.org.vn/ndm%2Dp/images/download/National%20Strategy-E.pdf>

Vietnam's Ministry of Agriculture and Rural Development Action Plan to implement the National Strategy up to 2020. Accessed 3/13/09. <http://www.ccfsc.org.vn/ndm%2Dp/?module=102&nid=979&sid=NDMP>

Vietnam's Natural Disaster Mitigation Partnership report on Review Ministerial and Provincial Action Plans for the Implementation of the National Strategy on Natural Disaster Prevention, Response and Mitigation to 2020, Accessed 2/14/09. <http://www.ccfsc.org.vn/upload/File/Provincial%20Action%20Plan%20Report%20E.pdf>

Vietnam's Natural Disaster Mitigation Partnership study report on DM integration into socio-economic development planning, 2008. Accessed 4/14/09. http://www.ccfsc.org.vn/ndm%2Dp/images/download/DM%20integration%20report_Final%20version.pdf

Vietnam's Action Plan of MONRAE to implement the National Strategy on DRM up to 2020.

Vietnam's Introduction presentation of National Center for Hydro-meteorology.

Vietnam's National Target Program to respond to Climate Change: Accessed 9/12/09. <http://www.ngocentre.org.vn/files/docs/NTP%20English.pdf>

Vietnam's Law on Water Resources promulgated in May 1998. Accessed 8/11/09. <http://dwrm.gov.vn/en/uploads/Laws/files/8-1998-QH10.pdf>

Vietnam's Ordinance on Flood and Storm Control promulgated in March 1993, amended and revised in August 2000. Accessed 08/11/09. <http://www.ccfsc.org.vn/ndm-p/images/download/Phap%20lenh%20PCLB%20SDBS%202000.pdf>

Vietnam's Law on Dyke promulgated in November 2006: regulating the planning of flood prevention and response on rivers being protected by dykes, the planning of dyke systems, the investment on dyke construction, upgrading, and maintenance and the management, protection and utilization of dykes and structures attached to dykes: www.ccfsc.org.vn/ndm-p

Vietnam's Law on Forest Development and Protection. Accessed 8/11/09. http://www.nea.gov.vn/luat/toanvan/Luat_BVPT_Rung.html

Vietnam's Law on Fisheries issued in 2003. Accessed 8/11/09. http://www.fistenet.gov.vn/Luat_TS/Luat_TS2.asp

Vietnam's Ordinance on Irrigation Structures Utilization and Protection. Accessed 2/20/09. <http://www.vncold.vn/Web/Content.aspx?distid=415>

World Bank Impact of Sea Level Rise on Developing Counties 2007.



DISASTER RISK MANAGEMENT

Europe and Central Asia

Kyrgyz Republic

KYRGYZ REPUBLIC

To prepare the Kyrgyz Republic Country DRM Note, the team built upon a technical assistance project supported by GFDRR. This project, –An Action Plan for Improving Weather and Climate Service Delivery in High-Risk, Low-Income Countries in Central Asia–, involved support from the Kyrgyz Hydrometeorological service, which facilitated the work of technical missions in Bishkek and Naryn oblast. The Country Note benefitted from ongoing collaboration with the entities of the sectoral ministries and agencies of the Kyrgyz Republic; in particular, the Ministry of Emergency Situations, the Ministry of Agriculture, Water Resources and Manufacturing industry, the Ministry of Transport and Communications, and the Ministry of Industry and Energy. In advancing the Kyrgyz Republic’s hydromet services, the project team benefitted from constructive dialogue with representatives of stakeholders during a consultation workshop in Bishkek (December 16, 2008). The World Bank’s Bishkek office provided support for these consultations and representatives of donor organizations such as the Swiss Cooperation Office actively participated and supported the underlying technical assistance work.

1. DISASTER RISK PROFILE

The geography and topography of the Kyrgyz Republic makes it a **highly hazard prone country**. These include hydro-meteorological, geological, geo-physical, and biological hazards. Natural hazards include earthquakes, land and mudslides, avalanches, squalls, downpours, icing, frosts, droughts, breakthrough of glacial lakes, floods, rise of sub-soil waters, epidemics, pests, crop diseases and river erosion. Heavy snowfall in winter leads to spring floods which often cause serious downstream damage. Some hazards, e.g. floods and landslides, are seasonal and occur annually; others, e.g. earthquakes, are rarer events but potentially highly destructive. The country is classified as the most seismically dangerous territory in Central Asia and 3,000 to 5,000 earthquakes are registered annually. Devastating seismic catastrophes occur every 5-10 years. On average, natural disasters cause approximately \$30- 35 million of damage and losses annually.

Meteorological Hazards. Kyrgyzstan is located in the center of the largest Eurasian continent, away from significant water bodies, and close to deserts, which defines the drought-prone continental climate of the country. On average, 3-4 extreme meteorological hazards (drastic changes of weather, frosts, heavy precipitation) occur annually covering the majority of the country, there are about 7-10 high-impact mudflows and avalanches, and seasonal river floods happen every year. Destructive mudflows and floods, and large avalanches occur once in several years. Major weather-related risks to agriculture include droughts (especially associated with low water flow in the rivers), late spring and early fall frosts, winter thaws (risks for winter grain cereals), and hailstorms. Floods and mudflows generated by snow-thaw and rainstorms destroy residential houses, dams, other irrigation facilities, roads, bridges and agricultural crops. Over the last few decades the entire Central Asian region (including the Kyrgyz Republic) has experienced an increase in hydro-meteorological disasters. This trend is likely to continue as the consequences of climate change - particularly increases in temperature - will likely increase the frequency and severity of floods and droughts. Climate change may also cause a higher prevalence of infectious diseases. **Approximately half of Kyrgyzstan’s GDP is weather and climate sensitive** and would benefit from more reliable hydrometeorological and climate information to improve day-to-day operations and planning. **Current economic losses are estimated to vary between 1.0 - 1.5% of GDP.** Agriculture is the leading sector of the economy and most vulnerable to extreme weather, especially droughts and frosts. Other sectors at risk include transport and communication, construction, energy production and distribution, including domestic heating, health and mining.



Seismic Events. As per the Global Seismic Hazard Assessment Program (GSHAP), **most of Kyrgyzstan lies in a region with very high seismic hazard** (see map below). When fully operational, the national system of seismic monitoring registered from 2,000 to 5,000 earthquakes each year. Among them, 5 to 10 per year are considered strong (felt, but no major damage), while a destructive earthquake (causing infrastructural damage) takes place every 3 to 5 years, and a catastrophic one (causing infrastructural damage and death) every 35 years, on average. During the 20th century more than 500 earthquakes were registered in Kyrgyzstan with a magnitude greater than 5 on the Richter scale. Seismologists also warn of the possibility that strong earthquakes with magnitudes of eight on the Richter scale could strike the capital Bishkek. The most recent destructive catastrophic earthquake (Magnitude 6.6 on the Richter scale) hit the southeast of the Kyrgyz Republic on 5 October 2008. The village of Nura was the most severely damaged, with 74 people killed, including 43 children; 157 people were injured. An estimated 90% of the village infrastructure was destroyed and more than 850 people left homeless.

Landslides. Extensive areas of the Kyrgyz Republic are characterized by the presence of very large landslide hazards. There are about **5,000 potentially active landslide sites**, about 3,500 of which are in the southern part of the country. Stability of most landslides is satisfactory in dry conditions. Landslides are typically activated due to temporary development of significant ground water pressures along the slip planes, with actual mass displacement sometimes initiated within minutes or hours of activation. Such conditions are likely to occur following significant rainstorms and snowmelt. Furthermore, seismic forces large enough to displace landslides may develop during strong motion earthquakes that are rather common in Kyrgyzstan. None of the major landslide areas that threaten villages are equipped with monitoring and warning instrumentation, leaving their populations vulnerable to landslide hazards. Every year landslides cause damage to buildings, roads, power lines, and water supply, heating supply, and sewerage systems, as well as the death of tens of people. On average, about 700 houses are damaged or destroyed per year. The last major landslide disaster occurred on April 20, 2003 when a landslide near Uzgen in Osh Oblast killed 38 people, while 84 families lost their houses.

Uranium Mine Tailings, Rock Dumps and Landslide Hazards. With independence, the Kyrgyz Republic inherited a legacy of environmental damage caused by many years of output-focused mining development, with little regard to

either economic viability or environmental impact. There are five significant locations in the country with old mine tailings and waste rock dumps. A particularly dangerous location is Mailuu-Suu – an impoverished town of about 23,000 people, including about 6,000 in surrounding villages - near the Uzbekistan border upstream of the densely populated and highly productive Ferghana Valley. There was active uranium mining in Mailuu-Suu from 1946 until 1968, leaving behind 23 radioactive tailings and 13 waste rock dumps. The tailings were constructed conveniently near the mill plants and are mostly within the flood plain of the Mailuu-Suu River, which is a tributary of the Syr-Darya. The total tailings volume is about 1.96 million m³. The total waste dump volume is 0.8 million m³.

2. DISASTER RISK MANAGEMENT FRAMEWORK

Institutional Setup for Disaster Hazard Management and Emergency Response. The Ministry of Emergency Situations (MES) is responsible for disaster hazard management and emergency response. MES has established departments responsible for preparedness, mitigation, response, and recovery. There is the understanding within government and MES for the need to focus on hazard mitigation efforts designed to reduce the loss of life and injuries, and the economic and social impacts of future events. A detailed set of risk maps has been developed and potential disasters have been classified. The outline of a declaration process was developed to define when each successive level of government becomes involved if a disaster event occurs. Government is, however, anxious to improve the practical effectiveness of its emergency management and response efforts, and there are a number of critical issues that must be addressed and resolved in order to successfully build on the current foundation. Since Independence in 1991, the technical capacity of MES has been reduced considerably and it currently does not have adequate and modern operational procedures in place, or sufficient levels of resources allocated to carry out its mandates. Emergency intervention criteria have not been developed in detail, and there is no well-defined system of functions and responsibilities between the various departments in MES and regional and local administrations to allow for quick and effective intervention in case of emergencies. Also, staff has not received necessary training to adequately respond to emergencies, and most local communities have not been involved in disaster response training thus far.

Legislation and Strategies. Several pieces of relevant legislation have been approved in the Kyrgyz Republic. Some of the important ones are the Law on Tailings and Waste Rock Dumps, the Law on Radiation Safety of the Population of the Kyrgyz Republic, the Law of the Kyrgyz Republic on Protection of the Population and Territories from Natural and Man-Caused Emergency Situations, and the Law of the Kyrgyz Republic on Civil Defense. The legislation is generally acceptable, as it defines authorities, roles and responsibilities at all levels of government and in the private sector. Current issues relate to a lack of regulations to support the primary legislation and the lack of coordination, technology, and resources to implement necessary measures. The Kyrgyz Government sees the National Strategy for Sustainable Human Development, adopted in May 1997, as the appropriate framework for risk management of disaster hazards with the broad objective to reduce the vulnerability of the population and the economy to hazardous processes. In this respect, five specific goals have been set: (i) to provide timely warning to the public of the threat of natural and manmade disasters; (ii) to reduce and mitigate human and material losses from disasters; (iii) to establish a single monitoring system to ensure safety of the population; (iv) to improve disaster preparedness by training the population; and (v) to improve rescue preparedness against disasters. *The Kyrgyz Government recently developed a draft National Emergency Response and Management Plan (NERMP) that will, when approved, serve as a much better structured and funded Government framework for disaster management.*

Status of Hydrometeorological Services. An extensive technical review (financed by GFDRR in 2008-2009) of observational networks and other hydrometeorological infrastructure of the Kyrgyzhydromet has shown that the current condition of the hydrometeorological service fails to meet the needs of the government and the weather and climate-sensitive social and economic sectors for hydrometeorological services, and fails to fulfill the country's international and

regional obligations for weather and climate information including those under the World Meteorological Organization's Global Observation Network. In particular, (i) there is a persistent downward trend in the quantity and quality of measurements at most stations of the ground-based meteorological network, (ii) the condition of the hydrological observational network is unsatisfactory resulting in insufficient quality of the runoff forecast; (iii) the snow survey network is almost destroyed; (iv) no aerological observations are performed which, given the lack of temperature and wind sounding data from Tajikistan and Turkmenistan, significantly affects the quality of weather forecasts, as well as the results of global and regional meteorological model calculations for the Central Asian Region; (v) there is a lack of appropriate communication between stations and monitoring sites of the observational (meteorological and hydrological) network, data collection center, and regional and district-level users; and (vi) the means of forecasting and production of information products, possibly except automated technologies of runoff forecasting in the Syr-Darya River basin, developed with Swiss assistance, fail to meet modern requirements for hydrometeorological services provided to public authorities, the economy and communities. *There is an urgent need for hydromet modernization to reduce the risks to human life and potential damage to Kyrgyzstan's economy as a result of weather and climate events.*

Reducing the financial vulnerability of homeowners and SMEs to natural hazards. Despite major loss potentials from natural disasters, the level of catastrophe insurance penetration in Kyrgyzstan is much too low to mitigate the adverse financial consequences of future natural disasters on the economy, central government and households budgets. In addition, the lack of adequate risk management and risk underwriting skills in the local insurance industry severely impairs the ability of insurers to pay claims in case of catastrophic events. In this context, the Government needs to develop mechanisms for risk transfer and sharing through public-private partnerships, engagement of the insurance industry and consider setting up a catastrophe insurance pool. Unfortunately, the analysis of the insurance markets in the Kyrgyz Republic suggests that the creation of a stand-alone individual country catastrophe insurance pool is unlikely to be economically and technically feasible. The Kyrgyz Republic would thus benefit from the creation of a regional catastrophe insurance pool that would act as a regional aggregator of catastrophe risk and help governments access the global reinsurance market on better pricing terms. The risk pooling arrangement for the Central Asian countries can be modeled after the regional catastrophe insurance facility for Southeastern and Central Europe which is currently being developed by the World Bank, the UN ISDR and the Regional Cooperation Council for SEE countries. The relatively large size of the Kazakhstan economy and the more advanced state of development of its insurance market may also provide for the development of a regional catastrophe insurance scheme on the basis of a national Kazakh catastrophe insurance program. *Such a program could be then extended to the Kyrgyz Republic and other countries of the region.*

Systemic Issues. Under the overall disaster risk management (DRM) approach, risk identification, risk reduction and mitigation, capacity building, risk transfer and emergency preparedness need to be examined for a more effective overall response. In this regard *multi-hazard risk assessments need to be carried out on a priority basis and effective early warning systems need to be developed and strengthened.* The institutional arrangements from the national level down to the community level need to be operationalized and corresponding capacity needs to be built. This needs to be complemented by introducing disaster risk reduction curricula in various national institutions along with general public awareness-raising. A *National Emergency Response and Management Plan* was recently prepared under the WB-funded Disaster Hazard Mitigation Project. The Plan changes the way emergency response should be implemented. What is needed now is for government to consider the Plan and decree to put it in action. *If this is not done, emergency response and management will remain ad hoc.* In most disasters sub-standard construction techniques cause substantial fatalities, therefore the Government should review existing building codes and strengthen enforcement. Learning from the recent Nura earthquake, it is recommended to integrate DRR into sector policy, planning and implementation during the reconstruction phase. The Government should also develop a methodology and system for common post-disaster damage, loss and needs assessment so that a better coordinated and rapid needs assessment could be carried out in case of any future disaster.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Policy, institutional capacity and consensus building for disaster risk management.

A range of activities have been carried out in the frame of the Disaster Hazard Mitigation Project (DHMP) such as a review of the current functions of MES and its regional administrative agencies involved in disaster management and response, development of a draft of the NERMP, development of a manual with guidelines for emergency management, and development of training programs for civil servants (including simulating an earthquake and a dam breach) and the population. The Emergency Response Centers, both in Bishkek and Osh, were fully equipped with computer and video equipment, which serves as an important place to manage the emergencies not just during disaster events but also for regular transfer of monitoring data from rayons to the GIS center that will be the part of the ERC. *The next step for the Government would be approving the NERMP at earliest convenience, together with an action plan for its implementation, for which support for institutional development would be needed.*

HFA Priority # 2: Disaster risk assessment and monitoring.

Under the DHMP some activities have been completed including supply of the laboratory equipment to assess basic parameters in water as pH, electric conductivity, oxidation reduction potential and temperature and automated monitoring and sampling unit with data transmission radio telemetry transceiver units. A regional seismic network utilizing digital data acquisition and telemetry will be developed to provide a means of detecting and locating earthquakes in real time enabling the immediate notification of MES about a potential risk or immediate damage. The MES ERC has a GIS center that collects data on potential risk areas, especially related to landslides. Books and atlases were prepared by MES. Every year, field inspections of dangerous landslide areas are conducted, however, assessments and monitoring of other potential disasters, e.g. floods is much less structured due to continued weak capacity of Kyrgyzhydromet.

HFA # 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels. Several training programs were carried out for state employees and selected villagers under DHMP. Much more is needed, which would be done after the acceptance of the NERMP. At the moment, DRM is very much an ad hoc activity by responding to a disaster, with little focus on prevention and preparedness.

HFA # 4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience. There is little budget available to make structural improvements to reduce the risk of disasters, e.g. by flood protection embankments and landslide stabilization.

HFA # 5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels. A manual on essential principles of comprehensive emergency management was elaborated and presented to the ministry. It includes the integrated approaches to emergency management, local planning, communications and involvement of NGOs and UN in emergency management processes. Again, the NERMP would put some structure in this.

4. KEY DONOR ENGAGEMENTS

The Kyrgyz Republic receives support for hazard risk management (HRM) from the ADB, the European Union, Swiss Agency for Development and Cooperation (SDC), the UNDP, and the World Bank.

Existing Projects with Donors and International Financial Institutions	Funding Agency International Partners	Allocated Budget and Period(US\$)	HFA Activity Area(s)
Country Programs			
Reducing Vulnerability of the Poor to Natural Disasters, to improve the capacity of the national and local authorities for reducing the vulnerability of the poor to frequently occurring natural disasters.	ADB (Japan Grant)	1,000,000 2004-	1
Water Management and Disaster Risk Reduction, which includes awareness training on integrated DRM, grants for disaster reduction, and an earthquake safety project.	Swiss Development Corporation (SDC)	N.A. 2007-2011	3
DRM programme that focuses on preparing for, mitigating and responding to natural disasters, particularly in the south of the country.	UNDP	N.A. 2008-2010	1, 4, 5
Investigation and Analysis of Natural Hazard Impacts on Linear Infrastructure in South Kyrgyzstan.	World Bank (GFDRR)	50,000 2008-2009	2
Improving Weather, Climate and Hydrological Services Delivery in Kyrgyz Rep. (TA project).	World Bank (GFDRR)	75,000 2008-2009	1, 2, 5
Disaster Hazard Mitigation Project (DHMP) to: (i) remediate abandoned uranium mine tailings in the Mailuu-Suu area; (ii) improve the effectiveness of emergency management and response by national, sub-national authorities and local communities; (iii) reduce loss of life and property in key landslide areas.	World Bank (IDA Grant \$6.9m), Japan/PHRD, GoKR	11,760,000 2004-2010	1, 2, 4
Regional Programs			
Central Asia Regional Disaster Preparedness Programme, under the 5 th DIPECHO Action Plan for Central Asia (July 08) to enable local communities and institutions to better prepare for, mitigate and respond adequately to natural disasters.	Directorate General EC Humanitarian Office (DG ECHO)	€325,000 for all Central Asia; 2008-	
Central Asia Regional Disaster Management Initiative, including (i) disaster mitigation, preparedness and response; (ii) disaster financing and risk transfer; and (iii) hydromet modernization.	UNISDR, WMO, CAREC/ADB, World Bank, GFDRR, bilaterals.	155,000 (GFDRR track 1) in 2008-2009	

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

As noted earlier, the Kyrgyz republic faces a variety of natural hazards – earthquakes, floods, hail, landslides, mudflows, drought, erosion and desertification. Over the past few decades, these natural hazards have caused extensive damage, and will continue to negatively impact the Kyrgyz Republic unless proactive measures are taken to mitigate and prepare for these hazards.

- (i) Building upon GFDRR-funded country and regional studies (to be completed by June 2009), **modernize Kyrgyzhydromet services under a regional framework**, to reduce the risks to human life and to the economy as a result of weather and climate events;
- (ii) Building upon the WB-financed DRM project (closing in 2010) and other donor activities, and to complement ongoing/planned SWAPs in health and education sectors, **strengthen overall capacity to prepare and respond**

to disasters, with a focus on the mitigation of a potential major earthquake in the capital Bishkek and/or another large city; and

- (iii) Support further assessment and studies to develop of a risk financing framework for the Kyrgyz Republic, including a **regional catastrophe insurance pool** that would benefit the Kyrgyz Republic and other Central Asia countries.

Component I: Reducing the risks to human life and to the economy as a result of weather and climate events

Modernization of National Meteorological and Hydrological Services (NMHS) is primarily aimed at reducing the risks to human life and potential damage to Kyrgyzstan's economy as a result of weather and climate events. It is also intended to fulfill of the country's regional and international obligations, first and foremost, the assessment and management of regional water resources, the improvement of cooperation between the NMHS and final users of hydro-meteorological data and information products, and the maintenance of the NMHS capacity by improving its institutional, staff and financial sustainability.

Under the GFDRR-funded study, three modernization options were considered. The moderate cost option was preferred. It is a high impact program designed to achieve many of the objectives of the large scale option, but with less investment in automation of the observing network and implementation of information technologies. Specifically it would allow Kyrgyzhydromet to:

- Achieve the key objective of the modernization, i.e. reduce the risk to life and damage to the economy caused by weather and climate-related events through higher accuracy and longer lead time warnings provided to relevant emergency agencies;
 - Fulfill regional and international obligations of Kyrgyzstan through improved quality and reliability of meteorological and hydrological (water discharge/runoff) measurements;
 - Provide reliable hydrometeorological data and forecasts to users;
 - Achieve a level of Kyrgyzhydromet close to "satisfactory" in terms of technology; and
 - Retain Kyrgyzhydromet capacity by enhancing its institutional, staff and financial sustainability.
- ✓ **GFDRR would co-finance the "moderate cost" option, together with contributions from Government and other donors, possible including IDA. Because Kyrgyzhydromet is critically dependent on the strengthening of the regional hydromet framework for its investments, operations, data sharing and training, GFDRR would also support regional level activities that benefit the Kyrgyz Republic. Estimated GFDRR financing USD 7.5 million, complementing support from Government and other donors.**

Component II: Improving overall capacity to prepare and respond to disasters, and overcome a major earthquake.

There is a need to consolidate and continue enhancing the institutional and technical capacity for disaster management and emergency response supported by the Government and various donors, ensuring a common approach and strengthening critical partnerships and platforms. This would be achieved through the implementation of the National Emergency Response and Management Plan (NERMP).

At the same time there should be more focus on critical gaps: (i) making public facilities such as schools, hospitals and large residential buildings more earthquake resistant, (ii) develop risk assessment methodologies for commercial, industrial and residential buildings and (iii) enhance enforcement of building codes.

In particular, a seismic risk mitigation assessment should be carried out for critical public facilities in large cities such as Bishkek and Osh, to reduce the risk of future earthquake damage to priority public facilities such as hospitals, clinics, schools, administrative buildings and infrastructure. The assessment should also review coordination mechanisms with local, regional, international and non-governmental partners, equipment and training needs, and the establishment of a functioning operations center (at local and regional levels). The result of this assessment would be incorporated in ongoing and planned SWAPs in the Health and Education sector, financed by the World Bank and several other donors. Depending on the availability of funding, GFDRR might co-finance the implementation of priority retrofitting/reconstruction of selected public facilities on a pilot basis.

In addition, innovative approaches should be supported to better enforce building codes and compliance with land use plans, notably (i) supporting public awareness of the importance of compliance with building codes and land use plans, (ii) studies to support the enhancement of guidelines and regulations aiming at better enforcement of building codes and land use plans, (iii) initiating voluntary certification of engineering professionals, and (iv) supporting selected district municipalities in enforcement of building codes and land use plans through initiatives streamlining issuance of building permits and introducing transparency measures in issuance of building and settlement permits.

- ✓ ***GFDRR would support the implementation of the National Emergency Response and Management Plan (NERMP) to prepare and respond to disasters, focusing on the mitigation of a potential major earthquake in the country's largest cities such as Bishkek and Osh, through a seismic risk mitigation assessment and the design of a retrofitting program of critical public facilities. In addition, GFDRR would support regional level activities that benefit the Kyrgyz Republic in this area, through the proposed regional Disaster Preparedness and Response Center¹. Estimated GFDRR financing needs: USD 1.5 million.***

Component III: Reducing the financial vulnerability of homeowners and SMEs to natural hazards

Despite major loss potentials from natural disasters, there is an almost non-existent level of catastrophe insurance coverage among homeowners and SMEs in the Kyrgyz Republic. In this context, the Government needs to develop mechanisms for risk transfer and sharing through public-private partnerships, engagement of the insurance industry and reduce financial exposure through a combination of internal resources and catastrophic insurance facilities. Unfortunately, the analysis of the insurance markets in the Kyrgyz Republic suggests that the creation of a stand-alone individual country catastrophe insurance pool is unlikely to be economically and technically feasible.

The Kyrgyz Republic would thus benefit from the creation of a regional catastrophe insurance pool that would act as a regional aggregator of catastrophe risk and help governments access the global reinsurance market on better pricing terms. The risk pooling arrangement for the Central Asian countries can be modeled after the regional catastrophe insurance facility for Southeastern and Central Europe– the SECE CRIF – which is currently being developed by the World Bank, the UN ISDR and the Regional Cooperation Council for SEE countries. A relatively large size of the Kazakhstan economy and the more advanced state of development of its insurance market may also provide for the development of a regional catastrophe insurance scheme on the basis of a national Kazakh catastrophe insurance program. Such a program can be then extended to the Kyrgyz Republic and other countries of the region.

¹ The principal objectives of the Center would include: (i) further development of national systems of disaster prevention and response, (ii) emergency planning, coordinated management of regional services and resources, (iii) development of effective information-communication systems for collecting, processing and analyzing information in real time, (iv) creation of uniform information-sharing space, (v) involvement in international monitoring systems and networks, including assessment of the seismic hazard in the region, and (vi) cooperation with foreign partners, arrangement of international seminars, trainings, workshops and conferences.

√ **GFDRR would support further assessment and studies to develop of a risk financing framework for the Kyrgyz Republic, including a regional catastrophe insurance pool that would benefit the Kyrgyz Republic and other Central Asia countries. Estimated financing needs including regional component: USD 1 million.**

Indicative Program for GFDRR Funding (Projects and engagement areas being considered for GFDRR funding)	Potential Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s) ¹
Component I: Hydromet Services Modernization <ul style="list-style-type: none"> Develop the technical design of the hydromet monitoring and telecommunication system Improve the system of hydromet monitoring to provide timely warnings of extreme and hazardous weather events and to manage water resources: (i) restoration and technical upgrading of the meteorological observational network, (ii) resume temperature-wind atmosphere sounding, (iii) renew key observation sites of the hydrological network, and equip operating posts with the required additional instruments and devices, (iv) restore snow avalanche observation network, (v) establish quality control of hydromet data and products, (vi) strengthen IT base Institutional strengthening and capacity building, to enhance service delivery, staff training and professional upgrading 	Govt. , WMO, IFAS, Switzerland, Germany, Finland, UNISDR, World Bank	7,500,000 2009-2012	1, 2, 3, 4, 5
Component II: Capacity building for DRM and seismic risk mitigation <ul style="list-style-type: none"> Institutional development and technical capacity to support the implementation of the NERMP2 Carry out seismic risk mitigation assessment for Bishkek and Osh, including design of priority retrofitting and reconstruction of selected public facilities (schools, hospitals), to prepare for future implementation under separate donor/counterpart funding Enforce building codes and compliance with land use plans Support to regional DRR center 	Govt., CAREC/ ADB, UNISDR, UNDP, JICA, UNOCHA (for regional center), World Bank	1,500,000 2009-2011	1, 2, 5
Component III: Disaster risk financing and transfer Develop a risk financing framework for the Kyrgyz Republic, including a regional catastrophe insurance pool that would benefit the Kyrgyz Republic and other Central Asia countries	Govt., CAREC/ ADB, GFDRR, World Bank	1,000,000 2009-2010	4, 5
Total Budget Requested:		US\$ 10 million	
<p>¹Calendar year.</p> <p>1 GFDRR support through the NERMP would complement and help consolidate other donors' support. A more precise scope of GFDRR support under this component would be discussed and agreed at an upcoming workshop coinciding with the formal approval of NERMP. GFDRR support could include capacity building initiatives on all levels, national and decentralized in oblasts and communities and development of civil society participation.</p>			

Expected Benefits of GFDRR Support:

GFDRR support would provide the following systemic benefits:

- **Consolidate and leverage donor support for greater impact**, benefiting from the catalytic role GFDRR can play in bringing together key stakeholders
- **Mainstream disaster risk management within sector programs and projects**, such as the Health and Education SWAps supported by several donors, the Bishkek/Osh urban project
- Enable Kyrgyz Republic to **benefit more from activities carried out at the regional level**, through its increased participation in a regional hydromet center, regional DRR center, and a potential regional CAT insurance pool.

More specifically, GFDRR support would:

- Help the Kyrgyz Republic fulfill its regional and international obligations, first and foremost, the assessment and management of regional water resources, the improvement of cooperation between the NMHS and final users of hydrometeorological data and information products, and the maintenance of the NMHS capacity by improving its institutional, staff and financial sustainability.
- Help operationalize the National Emergency Response and Management Plan (NERMP) through institutional and technical capacity development, and in particular help the vulnerable better prepare for future disasters notably earthquakes.
- Lay the technical and institutional foundation for a potential regional catastrophe insurance pool to benefits Kyrgyzstan's economy, businesses and households through risk pooling, resulting in diversification of risks and reduced insurance premiums.



DISASTER RISK MANAGEMENT

Latin America & Caribbean

Haiti / Panama

HAITI

This DRM Country Note updates the April 2009 version. The Note was prepared following consultations with members of the World Bank's Haiti DRM Country team and the task team leaders overseeing projects in Haiti. The programmatic DRM approach proposed within this document has been presented to the World Bank's development partners. Following discussion with the Government of Haiti, a workshop was organized in mid September 2010 to further discuss the strategic vision of the National Disaster Risk Management System and the subsequent program to support the realization of this vision. The Note will be updated following the conclusion of this exercise.

Table 1. Most destructive natural hazards in Haiti since the 18th century.

Hazards	No. Events	%	Fatalities	%	Affected	%
Hydrometeorological	97	69.29	19,262	7.53	5,363,876	45.60
Droughts	20	14.29	-	-	2,668,000	22.68
Earthquakes and tsunamis	13	9.29	235,952	92.22	3,721,730	31.64
Landslides and torrential debris flows	10	7.14	635	0.25	10,509	0.09
TOTAL	140	100.00	255,849	100.00	11,764,115	100.00

Sources: Observatoire du Petit Séminaire Saint-Martial (1701-1963; in Mora 1986); Haitian Red Cross (1968-1985); OPDES (1983-1997); DPC (2000-2010); CRED (2002-2008).

Period lacking or without complete/reliable information: 15th to 19th centuries; September 1997 to October 2000; October 2002 to April 2003.

Risk Profile on Haiti – Human Exposure

Hazard type	Population exposed	Percentage of population
Cyclone	246,272	2.1%
Drought	997,929	8.5%
Flood	75,554	0.6%
Landslide	8,438	0.07%
Earthquake	13,950	0.12%
Tsunami	0	0%

Source: 2009 Global Assessment Report

Disaster Statistics on Haiti

Disaster	Date	Affected (number of people)
Earthquake*	2010	3,700,000
Storm	1994	1,587,000
Storm	1980	1,165,000
Drought	1992	1,000,000
Storm	1988	870,000

Source: OFDA/CRED International Disaster Database
Data version: v11.08 * Including tsunami
Data displayed does not imply national endorsement.

COUNTRIES AT RELATIVELY HIGH MORTALITY RISK FROM MULTIPLE HAZARDS (Top 96 based on population with 2 or more hazards)¹

1. Bangladesh
2. Nepal
3. Dominican Republic
4. Burundi
5. HAITI
10. Guatemala
13. Trinidad and Tobago
20. Niger
37. Peru
54. St. Vincent and the Grenadines
55. Mexico
57. St. Kitts and Nevis
61. Belize
63. United States
78. Bolivia
96. Thailand

¹ Dilley et al. (2005). Table 1.2.

1. DISASTER RISK PROFILE

Haiti ranks as one of the countries with the highest exposure to multiple natural hazards, according to the World Bank's Natural Disaster Hotspot study.¹ Haiti has been heavily exposed to natural hazards, and suffered the associated losses, throughout its recorded history (Table 1). With 96% of its population living at risk, Haiti has the highest vulnerability rating in terms of cyclones² among the region's small island states (12.9 on a scale of 13).³ The effects of cyclones include wind damage, flooding, landslides, torrential debris flows, and coastal surges. In addition to the hydrometeorological hazards, Haiti is also located in a seismically active zone, intersected by several major tectonic faults. The country's high population density (up to 40,000 per km² in Port-au-Prince) coupled with the large number of informal structures, and weak public and private infrastructure, render the country and its population particularly vulnerable.

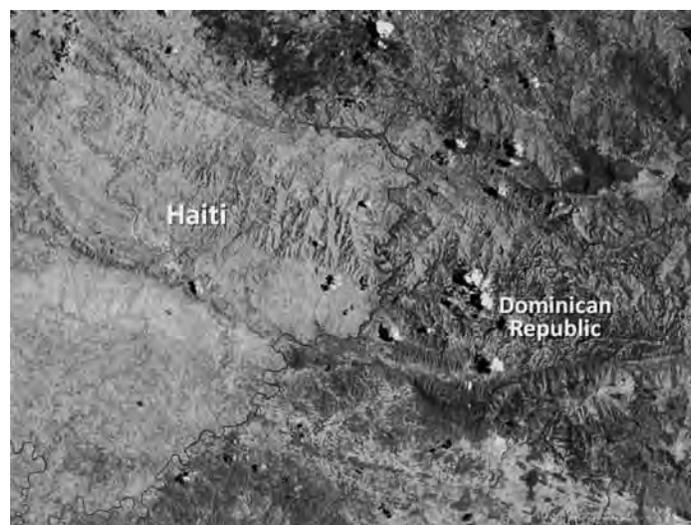
Severe environmental degradation (Figure 1), and the presence of settlements in low-lying areas and floodplains are key contributing factors towards the country's vulnerability. Further contributing factors include high levels of poverty, weak public infrastructure, weak environmental and risk governance, a history of ineffective governments, and serious fiscal problems.

Economic losses from adverse natural events are increasing in Haiti. As assets are created and concentrated, losses from adverse natural events are increasing.

This was demonstrated in August and September of 2008 with the passage of Tropical Storm Fay and Hurricanes Gustav, Hanna and Ike (herein referred to as "FGHI") during a three-week period, resulting in damage and losses equivalent to 15% of the country's GDP. FGHI represented one of the largest disasters in Haiti's recent history, second only to the January 12, 2010 earthquake. The 7.0 earthquake resulted in more than 222,570 deaths, 300,572 injuries, 2.3 million displaced and an estimated US\$7.8 billion in damage and losses, slightly more than Haiti's GDP in 2009.⁵

The implications of climate variability and change on the intensity and frequency of adverse natural events underscore the importance of a proactive approach to disaster risk management (DRM). According to the report of the Climate Investment Fund's Pilot Program for Climate Resilience (PPCR) Expert Group, Haiti is one of the 10 global climate-change hotspots.⁶ The inability or failure of the government to address its vulnerability and to support the reduction of risk has drastically undermined the rate of development and growth, and the overall poverty reduction efforts.

Figure 1. Difference in vegetation cover between Haiti (left) and the Dominican Republic (right). The border in this area is drained by the Artibonite River.⁴



2 Includes tropical depressions, storms and hurricanes.

3 UNDP (2004).

4 NASA (2010).

5 Government of Haiti (2010a).

6 PPCR (2009).

Major Natural Hazards

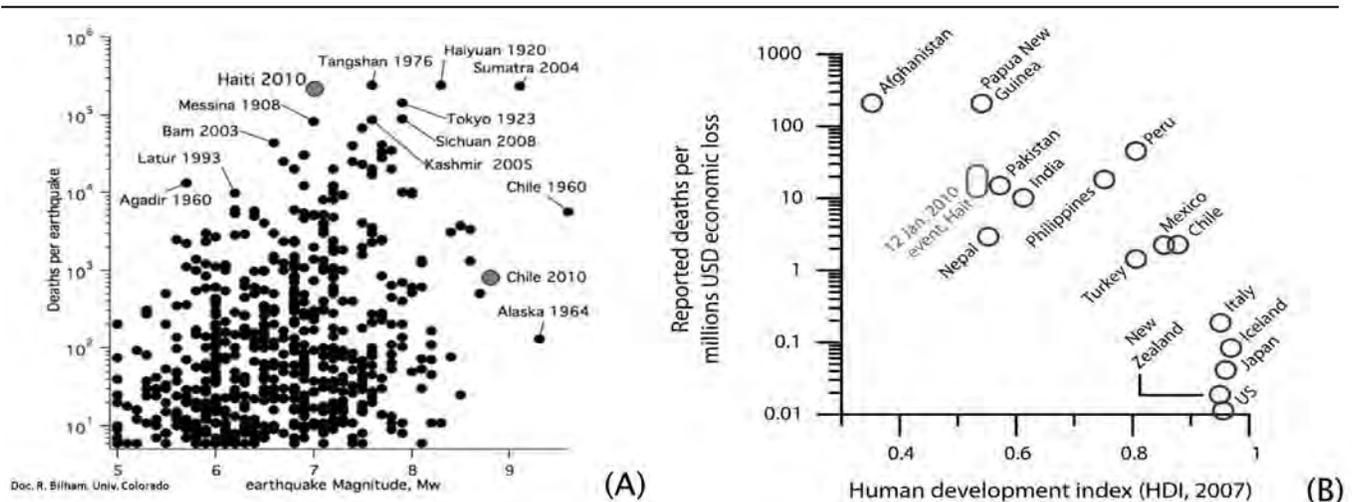
A multiple-hazard assessment (NATHAT) performed in Haiti after the January 12, 2010 earthquake identified the spatial, temporal and relative intensity of the most severe natural hazards.⁷ The assessment is preliminary and subject to further review and improvement as the quantity and quality of available data improves. The multi-hazard perspective has been designed to serve as the platform for the ensuing risk assessments; orient the vision for integrated risk management; serve as a tool to understand and communicate risk; serve to assist political and managerial decision-making for development investments; and serve to assist with land use planning, risk reduction and transfer, financial protection, and emergency and disaster management.

The most intense natural hazards are seismic and hydrometeorological (Table 1). Seismic hazards are associated with the interaction of the Caribbean and North American tectonic plates. Hydrometeorological hazards are related to the precipitation caused by northern polar fronts, tropical cyclones and waves, the Inter-Tropical Convergence Zone, and convective-orographic activity. El Niño/ENSO episodes have tended to delay the arrival of the rainy season, create drought conditions, and increase the number and intensity of cyclones, some of which could approach and hit Hispaniola. Other secondary hazards impacting Haiti include landslides, torrential debris flows, soil liquefaction and tsunamis.

Exposure and Vulnerability

The collapse of several buildings prior to the earthquake, and the stunning impact of the January 12, 2010 earthquake serve as a sharp reminder of the weak and unregulated public construction sector and the potential implications involved. This resulted in the disproportionate number of deaths and injuries and amount of damage, given the magnitude (Figure 2). Unless enforceable national building norms are created, Haiti, particularly

Figure 2. The ratio of deaths.



The ratio of deaths: (A) In relation to the magnitude of the earthquake (Bilham 2010). The January 12, 2010 earthquake resulted in the highest number of deaths for the given 7.0 magnitude. More fatalities only occurred in instances of higher magnitude. (B) Deaths per economic losses, inversely related to socio-economic development level. Circles show direct, tangible earthquake losses (1950–2009) for some countries commonly affected by earthquakes (blue) as well as recently estimated losses from the January 2010 Haiti earthquake (red) (Roberts et al. 2010).

⁷ Understanding Risk (2010). See also Government of Haiti (2010b).

Port-au-Prince due to its adverse soil conditions, will suffer equivalent or worse damage in future, inevitably larger, seismic events.

Haiti suffers from severe environmental degradation, as evidenced by only 2% forest coverage and the overall degradation of the country's land and watersheds (Figure 1). In past decades, water catchment areas have suffered an accelerated process of expansion of the agricultural frontier and deforestation to satisfy local food, energy and other income-generating demands. Most of the forested lands have been converted to agricultural and livestock use, or simply deforested for charcoal production, without replanting. This has provoked reductions in infiltration capacity and led to extensive erosion and loss of nutrients and biomass. This, combined with intense demand pressure in urban areas, further reduces the availability of potable water from surface and underground sources.

These pressures, exacerbated by Haiti's mountainous topography, changing climatic environment, environmental degradation and the movement of small land title holders to increasingly fragile upland soils, have resulted in extensive deforestation, accelerating erosion, depleting fertility, and silting of waterways, lakes, reservoirs and shorelines. This, in turn, diminishes the agrarian bearing capacity of the land and contributes to a downward socio-economic and environmental spiral.

With 77% of the Haitian population living on less than US\$2 a day and 52% living on less than US\$1 a day, extreme poverty represents a significant social vulnerability. This translates into precarious living conditions for the majority of the population, drastically decreasing their coping abilities and resilience to the impact of adverse natural events, further enhancing the vicious circle of poverty, environmental degradation, rapid urbanization and vulnerability. Currently, more than 60% of Haiti's 9.8 million inhabitants live in urban areas. The high population density (average up to 35,400/km² in Haiti, and higher in Port-au-Prince) coupled with unregulated construction, weak social and economic public infrastructure, lack of land-use planning, and unstable governance, further aggravates the extensive social vulnerability.

Additionally, Haiti suffers from significant governance issues that further increase its vulnerability to natural hazards. Haiti's long history of political instability has greatly weakened its institutions and governance mechanisms (Haiti has the lowest index of corruption perception⁸) which contribute to, inter alia, serious fiscal, regulatory and planning issues. The lack of political stability has a significant impact on the continuity and effectiveness of the National Disaster Risk Management System (Système National de Gestion des Risques et des Désastres, SNGRD), in particular its risk management components. Often the Government of Haiti (GoH) is not afforded the time to develop strategic policies, programs and ensuing coordination, monitoring and evaluation tools, to successfully implement an effective DRM program. Rather, the GoH chooses short-term reactive actions to cope with disasters rather than develop longer-term strategies and programs to address their causes.

Recent Disasters and Tendencies

Recent disasters in Haiti confirm an increasing level of vulnerability facing its hard-won development gains. During the 20th century, Haiti experienced 97 internationally recognized disasters of hydrometeorological nature. Approximately 80% of the disasters happened after 1954 and 40% occurred in the 1990s alone. This trend is expected to continue due to climate change, continued concentration of assets and expected seismic activity. In the last few years alone, a number of particularly significant disasters affected Haiti. In 2004, Tropical Storm Jeanne affected over 315,000 people; in 2008, FGH1 affected more than 865,000 people; and in 2010, the January 12 earthquake directly affected more than 1.5 million people. The impact of the disaster on the national economy in terms of damage

⁸ Transparency International (2006) classifies Haiti as 163rd among 163 countries.

and losses for Tropical Storm Jeanne (2004) was evaluated at 7% of the GDP⁹, 15 % of GDP for FGHI (2008)¹⁰, and 120% of GDP for the January 12 earthquake (2010).¹¹

Climate change may also have adverse impacts in Haiti, classified as one of the 10 global climate change hotspots.¹² With a possible increase in the frequency and severity of storms and a decrease in average rainfall associated with climate change, the potential impact on populations and livelihoods will require a comprehensive and integrated approach towards the management of hazards associated with changing global and regional weather patterns.

2. DISASTER RISK MANAGEMENT FRAMEWORK

The January 12th earthquake has led the GoH, with support from its technical and financial partners, to undertake a broad reconsideration of the country's National Disaster Risk Management System (System National de Gestion des Risques et des Désastres - SNGRD). The broad consultative process held for the Post-Disaster Needs Assessment (PDNA) in conjunction with the elaboration of the GoH's Action Plan for National Recovery and Development of Haiti have contributed to the development of the proposed revision of the system. These documents, presented by the GoH during the UN Donor Conference in New York in March 2010, emphasize the need to (i) strengthen the operational capacities for disaster response; (ii) set up a permanent structure for crisis management; and (iii) continue work on risk prevention. The period leading to the upcoming presidential and senatorial elections, and subsequent political transition, offers an opportunity to discuss different institutional and policy options for each of these priorities. This process will form the foundation for a legislative framework which, for the first time, will clearly define roles and responsibilities of all stakeholders.

Haiti's SNGRD was signed into effect in 2001 by 10 key line ministers and the President of the Haitian Red Cross. The SNGRD has achieved significant results in disaster preparedness and response since its inception. While the 2004 hurricane season resulted in 5,000 casualties over 300,000 affected people, FGHI resulted in less than 800 casualties over 865,000 affected people. Strong collaboration between the key members of the SNGRD and its technical and financial partners (TFP)¹³ was critical to improving the speed and efficiency of the response capacity. It is to be stressed that the crisis following the January 12, 2010 earthquake was beyond the capacity of the SNGRD due to its unexpected catastrophic nature.

Haiti's hard-won development gains are often jeopardized by adverse natural events. To ensure a rapid and effective transition from the emergency response phase to the subsequent recovery and reconstruction phases following the January 12, 2010 earthquake, it is important to begin integrating DRM activities and to set the foundation for a successful recovery process and reducing vulnerability throughout the reconstruction phase. This process ensures that DRM will be mainstreamed as a core component of sustainable poverty reduction and economic growth strategy.

While efforts to further strengthen the SNGRD's preparedness and response capacities continue, there is a greater need to focus on protecting investments as well as livelihoods, to facilitate the transition from a "living at risk" to "living with risk" approach. DRM has been included as a key cross-cutting priority in the Government of Haiti's (GoH) Poverty Reduction Strategy Paper (PRSP: 2008-2011) and

9 ECLAC (2005).

10 Post-Disaster Needs Assessment (PDNA). 2008. UN, World Bank, European Commission.

11 Government of Haiti (2010c).

12 PPCR (2009).

13 Including International Financial Institutions (IFIs), bilateral donors, NGOs and the private sector.

as a principle pillar of the United Nations Development Assistance Framework (UNDAF: 2009-2011), as well as the World Bank's Country Assistance Strategy (CAS: 2009-2011). More recently, the Post-Earthquake Disaster Needs Assessment 2010 and the Action Plan for National Recovery and Development of Haiti present DRM as a cross-cutting priority for both the public and private sectors and present it as an opportunity to promote (i) decentralization; (ii) a stronger civil society; and (iii) an innovative private sector. Overall, this demonstrates a growing consensus within the GoH and amongst its TFPs of the importance of integrating DRM as a critical component of a successful poverty reduction and economic growth.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK FOR ACTION

HFA Priority # 1: Policy, institutional capacity and consensus building for disaster risk management

Haiti's National Disaster Risk Management System (SNGRD) was signed into effect in 2001 by 10 key line ministers and the President of the Haitian Red Cross. The National Disaster Risk Management Plan (PNGRD) provides the operational framework for the SNGRD and identifies the specific roles and responsibilities of the participating institutions. The system is headed by the National Disaster Risk Management Council (CNGRD), which is led by the Prime Minister¹⁴ and composed of the signatory Ministers of the SNGRD and the President of the Haitian Red Cross. At a more operational level, the Directorate of Civil Protection (DPC) and the Permanent Secretariat for Disaster Risk Management (SPGRD) are responsible for the implementation of the PNGRD. Established in 1997, the DPC is the institution most involved in the implementation of the PNGRD, yet as a line ministry Directorate, it does not have the mandate or the technical capacity to design national or sectoral DRM strategies for adoption and implementation by the government and its key line ministries. The SPGRD, led by the Director General of the Ministry of Interior and Collective Territories (MICT)¹⁵, is composed of technical representatives for the signatory Ministries of the SNGRD and the Red Cross and is divided into two branches: a disaster management branch consisting of the Emergency Operation Center; and a risk management branch, composed of thematic and sectoral committees.

While the PNGRD emphasizes a proactive approach vis-à-vis risk reduction and mitigation rather than disaster management, its implementation so far has focused on the latter. The PNGRD identifies the following three axes of intervention: i) risk management at the central level, ii) disaster management at the central level, and iii) disaster and risk management at the local level. The SNGRD has historically focused on disaster preparedness and response with the objective of reducing fatalities associated with adverse natural events. Most of the existing DRM programs evolve around the DPC and SPGRD, but there has recently been an increase in sector integrated DRM projects and activities. Efforts made in 2009 to reinforce and update the national policies for Emergency Response and Risk Management were interrupted by the January 12, 2010 earthquake.

The SNGRD has prioritized the engagement of local communities and the strengthening of their capacities in an effort to decentralize their operations and bolster the system's capacities. The SNGRD has established an extensive network of Departmental Disaster Risk Management Committees (Comité Départementaux de Protection Civile, CDPC) present at the departmental level (all 10 departments) and municipal level (more than 110 of the existing 165 municipalities). Under the leadership of relevant senior government officials (the delegate of the President at the departmental level and the mayor at the municipal level), the CDPCs are composed of the representatives of government, civil society and international technical partners. Trained initially to focus on disaster management activities (preparedness

¹⁴ Leadership delegated to the Minister of the Interior and Collective Territories (MICT).

¹⁵ Leadership delegated to the Director of the Directorate of Civil Protection.

and response), the CDPCs are acquiring the tools and capacities to assume greater responsibility in the development of their respective DRM strategies and execution of local risk reduction activities.

Currently, most line ministries do not have the legal mandate, strategic framework or technical capacity to effectively fulfill their DRM role and responsibilities as defined within the PNGRD. Although the PNGRD was signed in 2001 by 10 ministries and the Red Cross, the MICT is the only institution with a clear DRM mandate. The existing insufficient legal framework makes it difficult to allocate financial resources and limits the involvement of the signatory ministries at the institutional level. As a result, the SNGRD has come to rely mostly on multi-sectoral coordination committees without the necessary corresponding institutional involvement.

At the highest level, the GoH has yet to assume full ownership over the SNGRD. The apex political body of the SNGRD, the CNGRD has never officially met and the SPGRD, headed by the DPC, is in the difficult position of attempting to 'chair' the system and streamline cooperation and coordination among international actors. This task has become ever more challenging since the January 12, 2010 earthquake on account of a significant increase in international actors.

While the support to a central coordination body remains a priority, the need to re-think format and level of political engagement for this structure is imperative. As outlined by the Action Plan for National Recovery and Development of Haiti, a National Council for Civil Protection will be established, responsible for defining a new vulnerability reduction strategy and a more general crisis response strategy, for both natural and man-made crises. In support of this council, legal frameworks and decrees have been proposed to render the SNGRD more operational and raise the status of the DPC to the level of General Directorate. While no effort has been spared to modernize the risk management structure, its effectiveness and the required political will has yet to take root.

HFA Priority #2: Disaster risk assessment and monitoring

Over the last 8 years, the SNGRD has made some improvements in data collection for risk assessments. Although there is currently no updated national, departmental or sectoral comprehensive risk assessment, there exist a number of initiatives, namely: i) Oxfam elaborated in 2002 the first national natural hazard and disaster vulnerability maps, ii) the National Center for Geospatial Information has developed two pilot local flood maps, and iii) the Ministry of Planning and External Cooperation (MPCE) and several line ministries are interested in developing sectoral risk assessments to better inform their strategic investment program decisions. At the local level, risk assessment has improved over the last five years. The close collaboration between the DPC and its technical and financial partners (TFPs)¹⁶ has allowed for each CDPC to develop a rudimentary risk map based on available data.

Following the January 12, 2010 earthquake, the GoH requested funding from the World Bank for a multiple-hazard assessment (NATHAT). The study was funded by the World Bank-hosted Global Facility for Disaster Reduction and Recovery (GFDRR) and carried out with the collaboration of UNESCO, the Inter-American Development Bank, and several Haitian institutions and professionals. The study was designed to:

- Conduct an inventory of natural hazards across the country;
- Provide an assessment of imminent hazards and vulnerability of disaster victims in light of the approaching rain season and potential of another severe earthquake;

¹⁶ Including International Financial Institutions (IFIs), bilateral donors, NGOs and the private sector.

- Summarize recommendations for a medium- and long-term strategy to improve risk management;
- Formulate an action plan and offer recommendations for the reconstruction phase.

The analysis and outcomes were intended to inform a varied target audience (decision-makers, general population, international community, scientists and engineers). In view of the quantity, quality of data collected and the time available, the work was prioritized along the following lines:

- In the very short term, during humanitarian and rehabilitation work, determine the hazards at temporary transitional camp sites (nearly 1.2 million people);
- Considering the likelihood of another major earthquake striking Haiti in the future, examine the possible magnitude, intensity, acceleration, and secondary effects (aftershocks, soil liquefaction, landslides and tsunami);
- Evaluate the hydrometeorological hazards (tropical cyclones and waves, El Niño/ENSO, polar thrusts) and their secondary effects (heavy rainfall, floods, windstorms, surge, drought, torrential debris flows, landslides).

Haiti relies on limited natural-hazard-specific data collection and monitoring capacity and there is currently no structured national observatory or early warning (alert-alarm) system. The systems that are currently operational fail to provide the coverage and data-sharing required. Haiti's National Meteorological Center (NMC) relies on two weather-monitoring stations and a network of volunteer observers around the country to provide the data necessary to supplement the United States' National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) forecasts. With 13 unique microclimates, Haiti's capacity to accurately forecast the local weather conditions and provide timely early warning is limited. Although several institutions and organizations have local rainfall monitoring capacity, a formal network to gather, share and action the data does not exist, thereby undermining the ability of the NMC to fulfill its mandate. Similar situations exist for other major hazards including seismic activity, landslides, liquefaction and tsunamis, where the combination of a lack of equipment, formal networks, databases, and limited institutional capacities constitute a challenge.

The SNGRD has successfully managed to reduce mortality rates associated with hydrometeorological events from thousands to hundreds as a result of better diffusion of warning messages and increased local awareness. The current flood and hurricane warning system depends heavily on the regional data provided by the NWS's Hurricane Center in Miami and from local observers. More work is needed to improve the forecasting capacities and further decentralize the monitoring capacity. Several pilot activities have been executed on flood early warning systems (FEWS) financed by USAID and UNDP, a national program covering the installation of FEWS across 13 priority watersheds funded by the Inter-American Development Bank and a simulation exercise carried out by the SPGRD. The United States Geological Survey is providing assistance for the installation of seismic stations on the main active tectonic faults.

While analyses, studies and data collection mechanisms exist, there are no established updating and integration mechanisms. Due to the tightly coupled relationship between Haiti's different vulnerability factors, it is essential to create a work dynamic among the ongoing observatory initiatives (poverty, environment, food security, etc.) under one platform that can be used as the basis for formulating a comprehensive risk assessment. The implementation of such an initiative will require considerable funding, technical assistance, networking and partnership building. With required resources not yet mobilized and the drive for quick and visible interventions, this may take some more time.

13 Including International Financial Institutions (IFIs), bilateral donors, NGOs and the private sector.

14 Leadership delegated to the Minister of the Interior and Collective Territories (MICT).

15 Leadership delegated to the Director of the Directorate of Civil Protection.

HFA Priority #3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

The SNGRD has benefited from significant increases in financial and technical support from the GoH's TFPs, for the purposes of, *inter alia*, institutional strengthening activities. The technical expertise mobilized in support of the institutional strengthening agenda has resulted in improved procedures and products and the development of new tools as well. To ensure that the acquired knowledge and tools are institutionalized, thus contributing to long-term impact of the outputs, the implementation of a knowledge management system is essential. While there is an ongoing initiative to set up a disaster management database (following the guidelines of the Regional Center for Disaster Information) with support from UNDP, more resources are required to establish a dynamic knowledge and information management system for the promotion of a culture of vulnerability reduction.

Through the CDPC network and efficient partnerships with the media, the SNGRD has made progress in raising the public's awareness on DRM. The SNGRD has targeted national, departmental and local government officials, the general public and the vulnerable groups (women, elderly and children) with specific messages for preparedness and response. The SNGRD also disseminates general DRM information through the media on various occasions. The thematic committee working on public awareness and education is developing a more structured public communication strategy and plans for raising awareness in schools. In addition, the thematic committee is supporting the development of a DRM module for integration into the national curriculum. Also, the World Bank is supporting an additional initiative focused on the production of diverse risk communication tools based upon the results of the NATHAT analysis, addressed to the general public (in Kréyole Ayisien, and accessible in French), to the decision makers (in French) and to the international donor community (in French and English).

The development of human capital with the necessary strategic and technical expertise remains a major challenge. In order to capitalize on the improved institutional capacities and effective outreach programs, additional human capital with DRM expertise is needed to successfully promote the introduction of safety and resilience into the culture. This is also critical to protect against the potential loss of knowledge and expertise through the anticipated turnover of the limited staff working within the SNGRD. Through an academic partnership between the University of Florida and the University of Quisqueya Haiti, 20 people completed a DRM Masters program during the 1990s. Unfortunately this partnership no longer exists, although recent efforts to reestablish new university-level graduate and postgraduate programs partnership are underway.

HFA Priority #4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience)

The PRSP represents a significant opportunity for the integration of DRM into the national development process, with the objective being to transition from “living at risk” to “living with risk”. Following FGHI in 2008, the GoH revised the PRSP to place a much greater emphasis on the integration of DRM into the national and sectoral strategies and investment programs as a means of securing its investments.

The integration of DRM at the strategic level translates into more effective operations at the sectoral level. In addition to the Ministry of Planning and External Cooperation (MPCE) and the Ministry of the Environment (MDE), numerous line ministries are interested in strengthening their respective DRM capacities as evidenced by emerging ministerial rhetoric. The GoH's TFPs have taken notice and are beginning to support the GoH's shift in strategy by allocating significant portions of post-disaster recovery and reconstruction assistance towards mitigation and DRM capacity-building activities. While the World Bank is working with select line ministries through its existing portfolio

to mainstream DRM¹⁷, it has launched an advocacy campaign - in support of the SNGRD - to further orient pipeline investments of the GoH's TFPs.

Risk management at the departmental level has increased, yet departments require additional technical and financial support to successfully address the high level of vulnerability. Departmental and local governments are acutely aware of the risk they face, yet struggle to implement a comprehensive DRM program due to limited technical and financial resources. The World Bank, the EC and the UNDP currently finance local risk management activities (using a community-driven approach) and capacity-building activities at the departmental level. However, additional resources are required to ensure the integration of DRM in local governance activities, i.e. through land use planning, local development plans, etc.

The next step on the risk management agenda is a multi-layered approach to strengthen both the institutional capacities at national, sectoral and local levels and to increase the volume of investments and projects taking into account DRM factors. For the institutional component, the objectives are to i) establish a central strategic and coordination capacity within the ministries of Planning and Economy, ii) build up the sectoral DRM capacities of line ministries and support investment securing activities, and iii) strengthen local governments for the integration of DRM in their plans and the execution of risk management activities through the sectors. For this, the World Bank is working in close collaboration with the most relevant TFPs, including UNDP, EC, IADB, and USAID.

HFA Priority #5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

The SNGRD has achieved significant results in the areas of disaster preparedness and response, effectively reducing the mortality rate. Although the mortality associated with the impact of natural hazards remains high, significant advances were made based upon a strategy encompassing the areas of working towards i) strengthened local capacities, ii) increased early warning capacity and effective public awareness campaigns, iii) development of partnerships with key actors, iv) establishment or strengthening of the PNGRD coordination mechanisms, and v) development and operationalization of technical tools for disaster preparedness and response. It is clear that all stakeholders involved must undertake additional and sustainable measures to support this capacity-building.

In the wake of the January 12, 2010 earthquake, the local structures of the SNGRD played a critical, though relatively unknown, role in search-and-rescue operations as well as in the management of IDP camps and food distribution, among other things.

At the local level, the establishment of the CDPCs has been effective in the development of local knowledge and capacity. With close to 4,000 people involved through the departmental and local CDPCs, the true operational capacity of the SNGRD is at the decentralized level. The CDPCs bring local actors together to plan for the hurricane season and coordinate and conduct disaster response operations with support from the SNGRD's TFPs.

The SNGRD is working on improving its flood warning system capacity. The number of evacuated people (6,000 in 2006; 33,000 in 2007; and 122,000 in 2008) is an indicator of the improved structuring and dissemination of warning messages and the public responsiveness to the warnings. The establishment of warning protocols and their application by the majority of institutions involved in the SNGRD has also contributed to a faster and more efficient mobilization for response operations.

¹⁷ Emergency Recovery and Disaster Management Project, Emergency Bridge Reconstruction and Vulnerability Reduction Project, Emergency School Reconstruction Project.

The recent creation of municipal evacuation plans (including the related communication strategy) and shelters in 31 municipalities at high risk of floods throughout the country (an IADB-supported initiative) is a stepping stone in this direction. Next steps include scaling this initiative up throughout the entire country, expanding it to several types of hazards, and creating and improving observation and surveillance capacities.

To increase its span of work, the SNGRD has established or strengthened a number of coordination mechanisms as defined in the PNGRD. To support the DPC and the SPGRD, the two central institutions in charge of DRM activities, the SNGRD has strengthened the thematic committees (early warning system, public awareness and education, environment, shelter management) and plans to establish several more. These committees are composed of all institutions involved and other partners working on a specific theme for strategy development, activity planning and coordination. The committees often need technical assistance, as most of the expertise is not available. The SNGRD has also put in place and improved the Emergency Operation Centers (EOCs), with one at the central level and several at the departmental and municipal level, enabling faster and more efficient initial disaster response.

Strengthening the operational capacities for disaster preparedness and response remains the key priority for the SNGRD. Specifically, this will include:

1. **Streamlining operational emergency procedures and technical tools procedures for disaster preparedness and response at national, departmental and municipal levels.** For instance, the SNGRD devises annual hurricane preparedness strategies (contingency planning, simulation exercises, communication campaigns, etc.) as well as post-cyclone-season evaluation activities. However, these activities need to be further institutionalized and developed at the local level.
2. **Completing construction and adequate equipment of Emergency Operation Centers at the departmental and municipal level.** This needs to be completed with the allocation of small operational budget for DRM Committees at the departmental and municipal level to allow mobilization of their members.
3. **Creating a body of professional first responders to include fire brigades, police, and medical doctors.** This will be complemented by a reorganization of the civil protection volunteer sector to allow broader mobilization of human resources in response to disasters.
4. **Strengthening technical capacities and professionalization of NDRMS members** through (internal and external) training, study visits and exchanges with foreign DRM institutions, etc.
5. **Strengthening government's training delivery capacity** through the standardization of training modules, creation of a pool of nationally recognized instructors, and introduction of a training certification process.

One of the greatest challenges facing the SNGRD is to facilitate a rapid and smooth transition from recovery to development following disasters. Typically, emergency response operations begin immediately following a disaster. However, as evident by the results of the GoH and their TFPs' response to Jeanne in 2004 and the current efforts after the January 12, 2010 earthquake, failure to identify and launch recovery activities designed to bring the affected communities back to a self-sustainable situation through social and economic activities can prove a hindrance for the reconstruction effort. Furthermore, the reconstruction suffers from the lack of land use planning and normative tools and often fails to reduce the underlying risk factors. The next steps would be to strengthen the recovery-planning capacities through institutional support and work at strategic and technical levels to raise awareness for such needs and their critical role to ensure proper return from crisis management to development. It is clear that only with adequate risk knowledge and risk information tools would this be a reachable goal. The World Bank is currently working on developing such tools and on the design and implementation of an institutional framework to acquire, stock and share data and information on risk.

Additional Observations

The GoH has successfully introduced DRM as a condition for sustainable development and is working to build consensus among its institutions and partners. The consensus represented within the respective strategic documents is of particular importance because the international community has financed more than 60% of the investment prior to the earthquake, only to be multiplied given current circumstances.

More work lies ahead to ensure that DRM priorities identified in the national development plans are integrated within sectoral agendas. There is currently no ministry or any other agency or entity integrating DRM into their respective strategies, although there is now a strong political will to act on the extreme level of vulnerability. Key coordination ministries such as the MPCE, MICT and MEF and several line ministries have expressed interest. Funding from the GFDRR is available to provide technical assistance to the MPCE and comes in addition to World Bank financed emergency reconstruction projects. Now that the MPCE has an operational DRM cell (Cellule de Réduction de la Vulnérabilité, CRV), the next stage will focus on building the necessary institutional capacity (both strategic and technical) and fostering consensus among the actors involved in each specific sector. Among the TFPs, there is a clear adjustment of overall strategy among the most influential actors (G10) and there are more organizations integrating DRM in their assistance plans. In addition to the World Bank and the UN system, USAID is planning for greater investment in DRM over the coming years: USAID in the form of technical assistance to the Ministry of Agriculture, Rural Development and Natural Resources (MADRNR) and the Ministry of the Environment (MDE in the context of national risk reduction through a watershed rehabilitation program.

4. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s) ¹⁸
Emergency Reconstruction and Disaster Management Project	World Bank (IDA), UNDP, European Commission	19.4 million 2005-2011	1, 2, 3, 4, 5
SNGRD Development Program	UNDP, USAID, European Commission	4 million 2009-2011	1, 2, 3, 5
National Early Warning System Program	IADB, UNDP, World Bank	6 million 2006-2010	2, 3, 5
Haiti Integrated Growth through Hurricane Emergency Recovery	USAID, UNDP, IADB, World Bank	96 million 2009-2011	1, 3, 5
Emergency Bridge Reconstruction and Vulnerability Reduction Project	World Bank (IDA), IADB, UNDP	20 million 2009-2012	1, 2, 4
Emergency School Reconstruction Project	World Bank (IDA), Canadian International Development Agency, IADB	5 million 2009-2013	1, 3, 4
Haiti Transportation and Territorial Development Project	World Bank, European Commission, Agence Française de Développement, IADB, Canadian International Development Agency	16 million 2007-2012	5
Hurricane Noel Reconstruction Project	European Commission	3.9 million 2009-2011	4, 5
Technical Assistance to Support the Creation of the DRR Unit at the Ministry of Planning and External Cooperation (MPCE)	World Bank (GFDRR), Ministry of Planning and External Cooperation (MPCE)	1.9 million 2009-2011	1, 2, 4
Haiti Institutions and Infrastructure Emergency Recovery Project	World Bank	65 million 2010-2013	5

Continues

¹⁸ HFA Priority Action Areas: 1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2. Identify, assess, and monitor disaster risks—and enhance early warning; 3. Use knowledge, innovation, and education to build a culture of safety and resilience at all levels; 4. Reduce the underlying risk factors; 5. Strengthen disaster preparedness for effective response at all levels.

Continuation

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s) ¹⁸
Support to National Institutions for Haiti Earthquake Recovery	World Bank (GFDRR)	1.1 million 2010-2012	1, 3, 5
Haiti Structural Assessment Program	World Bank (GFDRR), Ministry of Public Works, Transport and Communications	1.3 million 2010-2012	1, 3, 4, 5
Haiti Multi-Hazard Assessment	World Bank (GFDRR)	0.9 million 2010-2012	2, 3, 4, 5
Strengthening Crisis Management Capacities (communication; equipment; training)	European Commission Instrument for Stability	19.2 million 2010-2012	1, 3, 5
Strengthening Disaster Preparedness at National and Departmental Level, including community level and IDP camps	European Commission/ECHO, UNDP, IFRC, THW, other NGOs	7.6 million 2010-2012	3, 5
DIPECHO/Disaster Preparedness Program	European Commission/ECHO, UNDP, IFRC, NGOs	8.3 million ¹⁹ 2011-2012	3, 5

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Given Haiti's risk profile and its existing framework for disaster risk management, the key priority in Haiti is to reduce the level of extreme vulnerability through a comprehensive risk management approach targeting all phases (risk knowledge and communication, recovery, reconstruction, prevention, and mitigation). Strategic actions are needed in the following areas to enhance disaster risk management in Haiti: (i) strengthen institutional capacity for strategic planning and coordination at central and local levels, (ii) mainstream DRM in specific sectors, and (iii) develop a comprehensive risk identification, assessment and monitoring capacity.

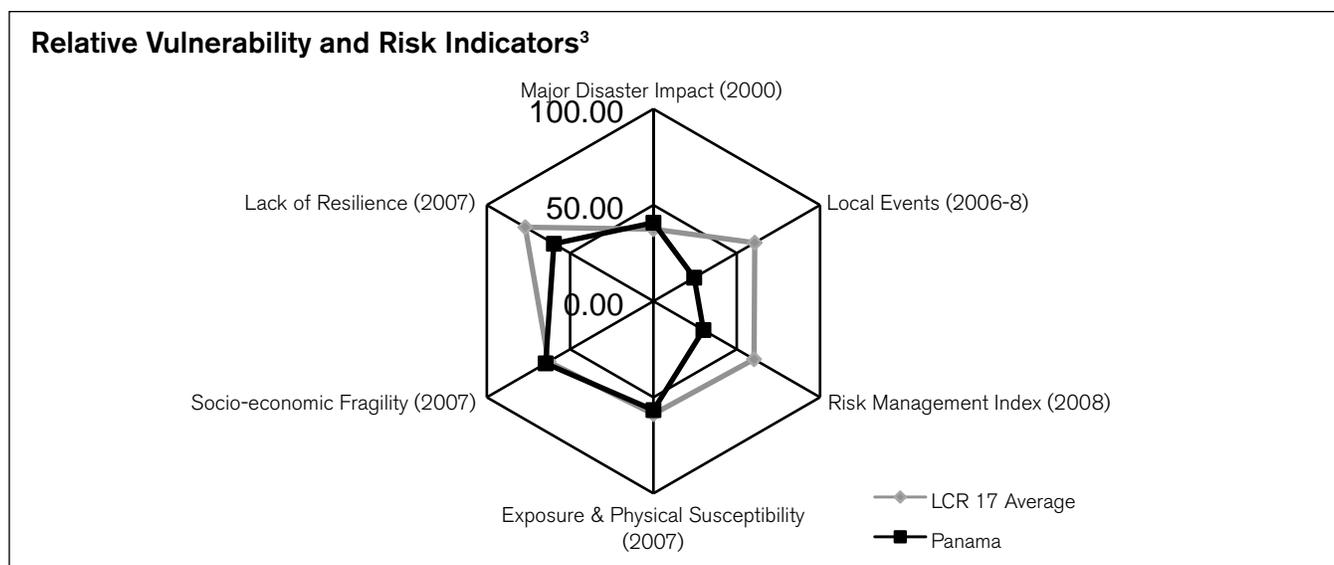
The following activities have been identified in consultation with local authorities and their technical and financial partners and reflect HFA priority action areas. These actions support Haiti's disaster risk management program.

Indicative Program for GFDRR Funding (Projects and engagement areas being considered for GFDRR funding)	Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
Technical Assistance to support institutional capacity building for mainstreaming of DRR	Prime Minister's Office (CIAT), Ministry of Planning and External Cooperation, Ministry of Interior/World Bank	1.2 million 2011-2013	1, 2, 4
Development of local DRM expertise through pilot DRM activities within priority sectors*	Ministry of Planning and External Cooperation, Ministry of Interior/World Bank	2.8 million 2011-2013	1, 2, 4
Building Risk Identification, Assessment and Monitoring Capacity*	Prime Minister's Office (CIAT), Ministry of Planning and External Cooperation, Ministry of Interior/World Bank, UNDP, IADB, USAID, European Commission	2.9 million 2011-2013	2
Social Infrastructure Structural Assessment and Construction Norms	Ministry of Public Health/World Bank, PAHO	1.5 million 2010-2011	2, 4
Initial Budget Proposal:		US\$7.9 million	

* The local DRM pilot activities and the risk identification, assessment and monitoring capacities will focus on the same priority sectors to complete the institutional strengthening efforts previously identified for programs for GFDRR financing: Agriculture, Public Work, Social Affairs, Education, and Environment.

¹⁹ Forecast.

There is now a strong political will and a window of opportunity to act on the extreme level of vulnerability; key coordination ministries such as the MPCE, MICT and MEF and several line ministries have expressed interest in taking the lead. This initial step aims to build capacities at the central planning level, with a DRM-specific cell within the MPCE. Initial funding from the GFDRR is available to provide technical assistance to the MPCE. Based on the lessons learned and the resources expected to be assigned to this first DRM cell, the second step will focus on the priority sectors with a dual approach: institutional strengthening at the central level and DRM pilot activities at the local level. The pilot activities will focus on designated vulnerable communities, which will receive technical assistance for DRM mainstreaming in local development plans. Based on these initial two steps, the next phase will focus on expanding the scope of work to other line ministries (such as Commerce and Trade, Health, Tourism, Culture, etc.) and increasing the geographic coverage of efforts to reduce the vulnerability in the most exposed communities. A request for additional financing will be elaborated for this next phase. It is expected that the experience and the reduction of natural hazards' impact on the development process will be the base for mainstreaming DRM within the legal mandates of national institutions and will provide additional capacity for further work.



Major Natural Hazards

Due to its geographical location and geotectonic characteristics, Panama is exposed to a variety of natural hazards, including hydrometeorological and geophysical hazards. The Isthmus of Panama is only 60 to 90 km wide between the Caribbean Sea and the Pacific Ocean, with a mountain divide well known for its slope instability, intense rainfall and active tectonics.

Panama is characterized by very intense and long lasting rainfalls, windstorms, floods, droughts, wildfires, earthquakes, landslides, tropical cyclones, tsunamis and ENSO⁴/El Niño-La Niña episodes. Natural Disaster Data from Panama published on the Prevention website⁵ indicates that the country experienced 32 natural disaster events between 1983-2008, with total economic damages estimated at US\$86 million, with a total of 249 people killed by these events.

The country is located over a segment of the Caribbean tectonic plate, namely the Panama Deformed Belt (also known as the Panama micro-plate), at the border of the Cocos and Nazca Plates, with influence from the nearby South American Plate. This is one of the most important seismogenic sources in the region as part of the Circum-Pacific Belt.

Earthquakes have continued to strike Panama. In 2003 a magnitude 6.0 earthquake struck Panama near the Costa Rican border; the event was followed by more than 60 aftershocks (of magnitude higher than 4.0) during the following few weeks. Soil liquefaction occurrences were widespread, creating more damage to the infrastructure and at least three

³ Relative Vulnerability and risk Indicators are adapted from IADB-IDEA-ERN (2009). Values are normalized on scale of 0 – 100 and presented against the average for 17 LCR countries. Major disaster Impact taken from disaster deficit Index: the ratio of economic losses which a country could suffer during a Maximum Considered event and its economic resilience. Local events taken from Local disaster Index: the propensity of a country to experience recurrent, small-scale disasters and their cumulative impact on local development. risk Management Index is presented as the negative (i.e. 0 = optimal, 100 = incipient) of IADB's risk Management Index: measures a country's risk management capability in (i) risk identification, (ii) risk reduction, (iii) disaster management, and (iv) financial protection. resilience, Fragility and exposure are taken from the component indices of Prevalent Vulnerability Index. Date for local event data depends on information available for each country. Data, and the respective LCR 17 average, from 2000 is used for Dominican Republic, El Salvador, Guatemala, Jamaica and Nicaragua. Data, and the respective LCR 17 average, from 2006-08 is used for Bolivia, Colombia, Costa Rica, Ecuador, Panama and Peru. All LCR 17 averages are calculated based on available data.

⁴ El Niño-Southern Oscillation; commonly referred to as simply El Niño, a global coupled ocean-atmosphere phenomenon.

⁵ Prevention Web (2010b).

fatalities.⁶ Tremors of magnitude 4.0 or less are common in Panama, particularly near the borders with Costa Rica and Colombia. According to local experts from the University of Panama's Geosciences Institute, there is a considerable amount of active geologic faults in Panama, and at some point a powerful earthquake is going to happen. The seismic history of Panama shows that there have been many earthquakes greater than 7.0 on the Richter scale throughout recorded history.

Volcanism and tsunamis are also present in Panama with a volcanic range stretching from the border with Costa Rica to the East, dividing the country into two main North-South watersheds (Caribbean and Pacific). The Chiriquí volcano, also known as Barú, is the highest mountain peak of the country, reaching 3,475m.⁷ The latest eruptions of the Barú and La Yeguada Volcanoes were recorded around 1550 and 1620, respectively. Tsunamis have been recorded as affecting both Panama's Caribbean and Pacific shores with up to 5m surge wave height.

Exposure and Vulnerability

The most important recent disasters in Panama have resulted from vulnerability to floods, landslides, earthquakes, windstorms, wildfires and storm. A high proportion of the low-income population in Panama lives in areas most exposed to natural hazards and resides in poorly designed and inadequately built structures. The poor enforcement of national and local land use regulations, the uncertainty about compliance with building codes, rapid demographic growth and unplanned urban and industrial expansion are responsible for most of the current and significant increases in vulnerability. Panama City's skyline is growing steadily and concerns are widespread about adherence to construction codes.

In light of its significant economic growth, the Government of Panama must be proactive to ensure the country reduces its long-term exposure to hazards. The integration of disaster risk management is essential in large infrastructure investments such as the ongoing US\$5.25 billion Panama Canal Expansion project, the planned construction of the Panama subway, and other road and urban development projects. In 2004, the cluster of operational and economic activities linked to the Panama Canal operations - locally known as the Canal Economic Sector (Sector Económico del Canal, SEC) - generated direct and indirect contributions totaling 25% of the revenues received by the National Treasury.⁸ In 2009, the Panama Canal Authority's direct transfers to the National Treasury represented about 3.4 percent of Panama's GDP and about 12.5 percent of its fiscal revenues⁹, and a permanent 0.6 to 0.8 percentage-point boost to real GDP growth upon conclusion of the canal expansion project is projected. Special attention in Panama is required to protect these assets by reducing the country's increased vulnerability.

Global climate change models¹⁰ have predicted that Panama will undergo several climatic shifts such as increases in temperatures, droughts, higher-intensity rainfalls and storms, and rising sea level. It is known that ENSO events have already severely impacted water availability and canal operations. It is also known that inter-annual climate variability of either the Pacific (i.e. ENSO) or the Atlantic (i.e. North Atlantic subtropical highs) causes a significant amount of the total variance in rainfall in the Caribbean and throughout Central America.¹¹ There are geological, geomorphologic, and hydrometeorological studies, developed or sponsored by the Panama Canal Authority, that can be interpreted as studies on natural hazards exclusively for the Panama Canal watershed.

6 Damage caused by the 2005 earthquake: <http://www.igc.up.ac.pa/info.jpg>.

7 *Instituto de Geociencias* (2010).

8 Panama Canal Authority (2006).

9 World Bank (2010).

10 Hadley Centre Coupled Model, Version 2 (HADCM2), as reported in Mulligan (2003). Same modeling data as used by the Intergovernmental Panel on Climate Change (IPCC).

11 Giannini et al. (2002).

As is the case in most Central American countries, cities in Panama have grown steadily and have thereby heightened vulnerability due to the increased concentration of the population, infrastructure and production of goods and services. Although the country has a comprehensive anti-seismic building code (based on the State of California's construction code), its implementation in new buildings and towers is uncertain, and provisions for retrofitting existing buildings are not efficiently enforced.

2. DISASTER RISK MANAGEMENT FRAMEWORK

Panama has improved its legal and institutional framework for disaster risk management (DRM). The authority for Panama's DRM National Platform stems from Law No. 7, Resolution 28 which created the National Civil Protection System (*Sistema Nacional de Protección Civil*, SINAPROC) in 2005. SINAPROC is responsible for coordinating DRM in Panama as the highest-ranking authority in the event of a natural catastrophe or man-made emergency. SINAPROC is also charged with executing the actions, regulations and directives towards the removal or reduction of the impacts of disasters on human lives, goods and society.

The Government of Panama is making important efforts in the Strategic Plan 2010-2014 (GPSP) toward mainstreaming environmental protection in the sectoral planning processes. The GPSP recognizes that current efforts to promote sustainable land use have been incomplete, with poor planning, and without effective enforcement of zoning regulations. It also highlights the need for protecting the country's natural resource base as a fundamental ingredient for maintaining the growth performance of key economic sectors, including the operation of the Panama Canal and tapping the very high potential of the country's tourism industry to induce economic growth and generate employment.

Panama has adopted the recommendations and priority actions of the "Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters" as part of the Government of Panama's efforts to improve its DRM capacity. Panama is an active participant in regional and international DRM forums, including the Central American Coordination Center for the Prevention of Natural Disasters (CEPREDENAC) and the United Nations International Strategy for Disaster Reduction (UN ISDR). The Government of Panama established and maintains an active CEPREDENAC's National Commission. In addition, as part of its increasingly proactive DRM agenda, the Government of Panama signed the Central American Policy for Comprehensive Disaster Risk Management, adopted at the 35th Central American Integration System (SICA)'s Ordinary Meeting of Heads of State and Government, held in Panama in June 2010.

As the leading DRM authority in Panama, SINAPROC maintains responsibility for the development and implementation of the National Emergencies Plan and the country's Risk Management Plan. The National Emergencies Plan defines roles, responsibilities and general procedures for institutional preparedness and response, establish an inventory of resources, coordinate operational activities, and assessments in order to safeguard life, protect property, and restore normalcy as soon as possible after the occurrence of a hazardous event. The Risk Management Plan guides risk reduction activities, emergency preparedness, and disaster recovery efforts. These measures are intended to improve safety against various risks while greatly reducing the economic impacts and social consequences of disasters.

The Government of Panama acknowledges that there is still a need to further strengthen existing DRM institutions and policies. Actions explored by the Government to improve disaster risk management in Panama include: (i) strengthening the National Civil Protection System (SINAPROC)'s institutional capacity, (ii) reducing

vulnerability in urban areas, (iii) developing the country's risk assessment and monitoring capacity, (iv) developing risk reduction strategies for emergency response and diversified risk management instruments, and (v) strengthening the environmental institutions.

The National Environment Authority (ANAM) and the Canal Watershed Inter-Institutional Committee have integrated DRM and climate change in their national agendas. This is in recognition of the fact that each year during the rainy season, from May to November, floods and landslides are the most destructive natural disasters in the country, affecting people and communities, agricultural productivity, the road system and housing. In addition, the Panama Canal Watershed is particularly vulnerable to wildfires and the canal itself is vulnerable to earthquakes that can cause floods, damages to dams, and loss of life and property. Contingency measures have been developed to retrofit infrastructure, train staff, acquire necessary equipment and enhance inter-institutional coordination.

Panama has nationwide networks of volcanological and meteorological monitoring stations and has implemented regional and local flood early warning systems. The country also has a national emergency toll-free phone number: “*335”. By calling the “*335” number flooding, landslides, earthquakes, high winds, falling trees, falling ceilings, missing persons along rivers or beaches, infrastructure collapses, and fires, among other incidents, can be reported. Since February 2009, the Unified Emergency Management System (*Sistema Único de Manejo de Emergencias*, SUME), or 911, began operations in Panama. The 911 emergency number is available for common EMS emergencies. These numbers are integrated with modern ICTs¹² that allow efficient delegation of authority and responsibilities to the appropriate responders. Government agencies involved in emergency response are working on educational campaigns to ensure that the population understands the importance of such emergency services and uses them responsibly.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

SINAPROC is in charge of planning, scientific research, direction, supervision, assessment, information, education, organization, public policy implementation and all other DRM actions in Panama. The execution of the National DRM Plan, including proactive initiatives and coordination with all national and international entities, is also within SINAPROC's responsibilities. Emergency management and disaster response are prescribed in Articles 6, 7 and 8 of Law No. 7 of 2005.

Emergencies are managed by the Center for Emergency Operations (COE¹³). This entity was created in 2000 with funding from the Southern Command of the United States Army. Equipped with the latest ICT, GIS and Remote Sensing technology and managed by civil servants, the COE has a command-and-control structure, with clearly defined hierarchical authorities and responsibilities. Alerts, supervision and command-control operatives are executed during emergency situations for both natural and man-made hazards.

CEPRENAC's National Commission is comprised of a multisectoral and multidisciplinary set of governmental and non-governmental entities involved in DRM. Led by SINAPROC, the Commission is playing an increasingly important role in mainstreaming DRM activities in the country.

¹² Information and Communication Technologies.

¹³ http://www.sinaproc.gob.pa/index.php?option=com_content&view=article&id=80&Itemid=56.

The Government of Panama signed the Central American Policy for Comprehensive Disaster Risk Management, adopted at the 35th Central American Integration System (SICA)'s Ordinary Meeting of Heads of State and Government, held in Panama in June 2010.

Panama's progress towards achieving the goals of the Hyogo Framework for Action¹⁴ includes the following:

HFA Priority # #1: Policy, institutional capacity and consensus building for disaster risk management

As part of the Government's efforts to mainstream disaster risk reduction and to implement its risk reduction strategy the following actions have been implemented:

- A National DRM Policy (*Política Nacional de Gestión del Riesgo*, PNGR) was drafted, under the guidance of SINAPROC, with participation of a multidisciplinary team of governmental and non-governmental stakeholders. This draft is yet to be approved by the Government of Panama. However, the leadership role played by SINAPROC during its preparation ensures that the Government's DRM goals and perspective are incorporated in the proposal.
- SINAPROC, working closely with relevant DRM stakeholders, who were also involved in the drafting of the PNGR, has begun the consultation process for the preparation of the National Risk Management Plan, as mandated by Executive Decree No. 177 of April 30, 2008, which regulates Law No. 7 of 2005.
- The Ministry of Economy and Finance has recently created a new unit within the Directorate of Investments, Concessions and State Risks, responsible for integrating natural disaster risks as a variable in the planning process for infrastructure investments.
- As part of its regional binding commitments, through Executive Decree No. 402 of November 12, 2002, the Government of Panama created the National Commission of CEPREDENAC (CEPREDENAC-PANAMA). The Commission was delegated the responsibility for coordinating CEPREDENAC's activities in Panama. The Commission is comprised of a representative of SINAPROC, who presides; along with representatives of the Ministries of Foreign Affairs, Economy and Finance, Education, Public Works, Health, Housing, and Agricultural Development; a representative of the National Environment Authority (ANAM); a representative of the Social Security Administration (*Caja del Seguro Social*, CSS); representatives of the Civil Engineering Department and the Institute of Geological Sciences of the University of Panama; and a representative of the governmental Electricity Transmission Company (*Empresa de Transmisión Eléctrica S.A.*, ETESA). This commission remained inactive until 2005 when it was re-launched, as part of the restructuring of SINAPROC, under the mandate of Law 7. Since then, the commission, with the leadership of SINAPROC, has become the country's National DRM Platform, and is involved in mainstreaming the country's legal and institutional DRM framework, as well as preparing the country's progress reports towards the achievement of the Hyogo Framework for Action's DRM goals. The incorporation in 2006 of the Panama Canal Authority as a member of the National DRM Platform represents an important recognition of the platform's increasing role in promoting DRM in Panama.
- The Government of Panama signed the Central American Policy for Comprehensive Disaster Risk Management in June 2010. This agreement, signed by all the Central American Presidents, positions DRM as one of five pillars for sustainable development in the region, and commits its signatories to integrate DRM in their countries' national development plans.

¹⁴ Speech made by the Ambassador Deputy Representative of the Permanent Mission of Panama to the United Nations in Geneva before the first meeting of the Global Platform for Disaster Risk Reduction. June 2007. Geneva. http://www.preventionweb.net/files/2271_PanamaStatementGP07.pdf.

Important efforts have also been made to mainstream DRM into the development of sectoral policies.

Panama has developed several environmental policies that address DRM in an attempt to foster sustainable environmental development, such as the national policies for water, climate change, cleaner production, environmental monitoring, and environmental information, among others. The National Environment Authority is playing an increasingly proactive role in promoting the enforcement of these policies into the urban and rural planning processes. In addition, the Ministry of Health has developed and implemented a proactive program for risk reduction within its health facilities.

HFA Priority # 2: Disaster risk assessment and monitoring

Earthquakes in Panama are monitored by two seismological networks: the Western Earthquake Observatory (OSOP¹⁵) and the National Seismological Network (RSN¹⁶). Earthquake hazard has been probabilistically assessed in Panama through the RESIS II Project (NORSAR 2008). Volcanic hazards have only been preliminarily assessed in the western region, near the Barú volcano.¹⁷ The Institute of Geological Sciences of the University of Panama is the leading agency responsible for monitoring seismological events in Panama. The Government of Panama has adopted the seismic code of California as the standard for construction in the country.

The Hydrometeorological Management Office of the Electric Transmission Company (GH-ETESA¹⁸) acts as the national climatologic, meteorological and hydrological monitoring service in Panama. Hydrometeorological hazards are also assessed at this bureau with coordination links to SINAPROC and COE.

The Government of Panama reported the following accomplishments and outcomes within HFA Priority #2¹⁴:

- The disaster inventory database was updated and improved.
- Flood-prone and landslide-prone areas were identified in the district of San Miguelito: Villa Greece and 8 communities of the Bocas del Toro province.
- Several early warning systems for floods were implemented in vulnerable communities prone to floods from the Mamoni, Cabra, and Chico rivers.
- Monitoring tools were customized for the Cabra, Tocumen and Tatar rivers and hazard maps of floods were developed to support decision-making in vulnerable districts. Additional hazard maps were created for rainfall, temperature, runoff patterns, and volcanic risk to benefit communities and enhance DRM activities.

Progress has been made to develop structural and non-structural risk assessment and risk reduction programs pertaining to health infrastructure. The Ministry of Health has developed protocols to ensure that health facilities exposed to natural or human hazards are retrofitted to withstand the impact of a disaster and remain in operation after the event, to assist victims in the aftermath of such an event. This requires the timely reduction of the vulnerability of the infrastructure, in addition to preparedness for providing a timely and effective response. National risk assessments of hospitals and health centers have been supported through the Social Security Fund and 95% of related staff have been trained in risk management.

¹⁵ <http://www.osop.com.pa/index.html>.

¹⁶ <http://www.igc.up.ac.pa/>.

¹⁷ Instituto de Geociencias (2010).

¹⁸ <http://www.hidromet.com.pa/sp/InicioFrm.htm>.

Monitoring systems and related networks have been advanced in Panama. The University of Panama's Geosciences Institute has a real-time data-gathering system with 20 seismological stations that continuously monitor seismic activity at national and local levels. Also, twelve research projects were implemented to develop monitoring networks of urban hazards throughout Panama.

Inspections have been conducted by the National Civil Protection System in prevention and mitigation activities, developing changes in home-building processes, erosion control in urban development, and integrated watershed management, towards reducing the impact of flooding in the most vulnerable areas of the country.

The hydrometeorological network was implemented and expanded through the Electric Power Company to monitor climatic conditions and support DRM initiatives across the country. Long-term, weekly and daily weather forecasts have also been prepared. These forecasts are provided to the Ministry of Agrarian Development to support decision-making and are shared with the Ministry of Health, the Smithsonian Institution, the National Civil Protection System, the National Environment Authority, and international organizations.

HFA Priority # 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

The National Secretariat for Science, Technology and Innovation (SENACYT) is charged with fostering all research, development, training and education efforts related to natural hazards, risk, and DRM in Panama.

The Government of Panama reported the following accomplishments and outcomes within HFA Priority #3¹⁴:

- An initiative was proposed to develop a National Strategic Education Plan for Risk Management and Sustainable Development in order to mainstream a culture of prevention that strengthens the Panamanians' way of life and advances sustainable development.
- The inter-agency coordination between the Social Investment Fund, the General Accounting Office, the Tommy Guardia Institute, and SINAPROC was strengthened to facilitate the management and sharing of scientific and technical DRM information.
- SINAPROC organizes public education campaigns to mainstream Disaster Risk Prevention through printed media, and radio and TV broadcasting.
- SINAPROC's Academy of Civil Protection (a technical body created by Law 7 of 2005) serves as a national and regional training center for professional first responders by providing specialized courses in risk reduction and emergency response.

The National Civil Protection System and the Ministry of Education have begun incorporating risk management and disaster topics in the programs and curricula of early childhood education, primary, middle and high schools, and the first DRM manual has been released for teachers at primary levels. The National Civil Protection System and the University of Panama's Faculty of Education initiated coordination activities towards developing qualified DRM personnel to strengthen the Operative Plan for the School Safety Program.

Community outreach on environmental concepts, information and actions was carried out through the World Meteorological Day celebrations and other activities. For instance, a training project between the Electric Power Transmission Company and the Ministry of Education called "Rain, Source of Life" sought to develop awareness of the natural environment among fifth- and sixth-graders, facilitating the training of teachers. Also, a contest was developed

for children as a tool to raise awareness about disasters, the environment and how to protect their environment, sponsored by the Electric Transmission Company (ETESA) and the Ministry of Education.

The Technological University of Panama has integrated DRM topics by delivering programs on safe housing construction, quality control of construction materials, and seismic instrumentation for high-rise buildings.

HFA Priority # 4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience)

The Government of Panama reported the following accomplishments and outcomes within HFA Priority #4¹⁴:

- Climate change scenarios were adapted for the Santa Maria River Watershed to facilitate the identification and implementation of adaptation measures.
- The “Strengthening of Forest Fire Prevention and Control Management” program was developed in the Soberania and Camino de Cruces National Parks.

In the context of community capacity development for disaster risk prevention and mitigation, the National Civil Protection System has strengthened local capacity for DRM and emergency response capabilities in several communities. Local DRM Civil Protection Committees have been established in twenty-nine vulnerable communities. Communal Civil Protection bases have also been created to foster effective DRM practices and response in the event of a disaster or emergency in areas identified as high risk. These areas include the province of Panama, Western Panama and the countryside, Chiriquí, Bocas del Toro, Colón, Herrera and Los Santos.

HFA Priority # 5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

The Government of Panama reported the following accomplishments and outcomes within HFA Priority #5¹⁴:

- Based on a regional plan, the Ministry of Public Works developed a risk reduction master plan, and Emergency Operation Centers were established in the Provinces of Chiriquí and Coclé.
- Panama implemented the first early warning system in Central America that integrates voice and text messaging for communities at risk. This service, known as Line *335, is toll-free for landline and mobile phones for all users requesting information about disaster-related emergencies. This information is accessible 24 hours a day, 365 days a year.
- Since February 2009, the Unified Emergency Management System (Sistema Único de Manejo de Emergencias, SUME), 911, began operations in Panama. The 911 emergency number is available for common EMS emergencies.
- Six technical cooperation agreements on the topics of disaster risk reduction, preparedness, and emergency response have been signed with governmental agencies and international organizations (e.g. the Southern Command of the United States, Water Center for the Humid Tropics of Latin America and the Caribbean, Japan's International Cooperation Agency and the United Nations Development Program).
- Significant effort was made to improve emergency response capabilities at the local level by training water rescue personnel, providing courses on the Incident Command System, and piloting a project to promote procedures for standard search and rescue and pre-hospital care.

Panama will benefit from building on these initial efforts to ensure local governments are accountable for the implementation of critical DRM activities, such as the design and enforcement of building codes and establishment of an adequate regulatory framework for the zoning of urban and industrial developments.

It is expected that Panama will continue mainstreaming the concepts of risk reduction into the national planning process while promoting further integration of DRM into development plans. It is also expected that improving strategic risk management planning in relevant sectors such as health, environment, education, agriculture, public works and investments, housing, and human settlements, will continue.

4. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget (US\$)	HFA Activity Area(s)
Integration of Climate Change Adaptation and Mitigation Measures for the Natural Resources Management in Two Priority Watersheds in Panama	FAO, PAHO/OMS, UNDP, UNEP, WHO, UNDP, UNEP	4,000,000 2008-2011	2, 3, 4
Development of disaster risk management capacity at the local level	Japan International Cooperation Agency	300,000 2008-2011	2, 4
Strengthening of CEPREDENAC and National Commissions for disaster vulnerability reduction in Central America	Spanish International Cooperation Agency	130,000 2005-2009	1
Earthquake Risk Reduction In Guatemala, El Salvador and Nicaragua with regional cooperation support to Honduras, Costa Rica and Panama (RESIS II)	Norway	2.4 million 2007-2010	2
Regional Program of Environment in Central America (PREMACA)	Danish Cooperation (DANIDA)	675,112 2005-2010	2, 4
Program for the Reduction of Vulnerability and Environmental Degradation Panama (PREVDA)	European Commission	3.34 million 2007-2011	2, 3
Support to advance a Regional Plan for Disaster Reduction (PRRD)	Norway, Spanish International Cooperation Agency	400,000 2006-2011	1
Mesoamerican coordination system for territorial information	IADB	800,000 2009-2011	2
Strengthening of Information and Communication for CEPREDENAC and National Commissions	World Bank (Institutional Development Fund)	446,000 2007-2009	1, 2

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Given Panama's disaster risk profile and its existing framework for disaster risk management, the key priority in Panama is to mainstream disaster risk reduction at the sectoral level. Strategic actions are needed in the following areas to enhance disaster risk management in Panama: (i) strengthen institutional capacity of members of the national platform for DRM, under SINAPROC's leadership; (ii) reduce vulnerability in urban areas; and (iii) develop a comprehensive risk assessment and monitoring capacity.

GFDRR has included Panama in its list of priority countries. The most immediate activity approved for Panama is the incorporation of a comprehensive risk assessment platform by joining efforts with other countries in the region that are actively involved with the Central American Probabilistic Risk Assessment (CAPRA).¹⁹ CAPRA is expected to improve the country's capacity to prepare for and respond to natural disasters.

The following activities have been identified in consultation with local authorities and international donor agencies. These actions support Panama's disaster risk management program and reflect the HFA priority action areas.

1. It is important to continue supporting and enhancing SINAPROC's technical capacity and leadership role in risk prevention and mitigation.
2. The development of an Emergency Fund – with an effective mechanism to ensure its proper capitalization - is needed.
3. It is important to develop strategies for mainstreaming DRM, as a cross-cutting theme, into the budgeting and planning processes of all Ministries and other governmental institutions (e.g. ensuring that new hospitals and educational buildings are built away from flood-prone areas and according to the seismic code. Old buildings should be retrofitted to withstand the impact of earthquakes).
4. The Ministry of Public Works should incorporate disaster risk reduction and mitigation measures in its infrastructure construction and maintenance activities.
5. Mainstreaming DRM among local municipalities is critical. In the particular case of Panama City and its surrounding areas (the Panama City Metropolitan Area), the construction boom and fast-growing population are exerting serious pressures on the land and the quality of water resources. Even though there is a Metropolitan Territorial Zoning Plan and many other land use regulations, unplanned urban development and new infrastructure projects are increasing the conditions of vulnerability in the Panama City metropolitan region.

Finally, the Government of Panama has developed a substantial regulatory framework to guide urban development in the Metropolitan Areas of Panama City and Colón. The main objective has been to ensure the sustainability of the Panama Canal operations. Most of the Panamanian population lives in or around the Panama Canal Watershed, and migration from rural areas continues. The pressure on land and (planned and unplanned) new urban development projects is threatening the environmental health of the watershed, affecting water resources, and forest areas – which in turn is affecting the quality of the water for human consumption. The proposed targeted sectors are based on the Government of Panama and WB assessments of activities with the highest positive impact in disaster risk reduction.

¹⁹ <http://ecapra.org>.

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
Support for the development of a Risk Assessment Platform for Panama	SINAPROC, Universities, Minister of Finance	914,000 2009-2011	1, 2, 3
Support capacity building and integrate risk reduction into national planning systems to mitigate urban risk	SINAPROC, Municipality of Panama, Other Municipalities, UNDP	2.2 million 2009-2012	1, 2, 4
Technical assistance to mainstream disaster risk management in the water and transport sectors	Ministry of Health, Ministry of Transport, SINAPROC	600,000 2009-2011	1, 2, 4
Support to mainstream disaster risk management in other priority sectors	Minister of Finance, SINAPROC	980,000 2009-2012	1, 2, 3, 4, 5
Technical assistance to raise public awareness and proactively engage the private sector in disaster risk reduction activities	SINAPROC, Private Sector Entities	500,000 2009-2011	1, 3, 4
Total Budget Requested:		US\$ 5.194 million	

In addition to the above-mentioned activities, there is ongoing dialogue with national and local officials to identify disaster risk management measures that consider climate change as part of adaptation strategies in Panama.



DISASTER RISK MANAGEMENT

Middle East & North Africa

Djibouti / Republic of Yemen

DJIBOUTI

The Djibouti Disaster Risk Management (DRM) program is the result of active collaboration between the World Bank and five leading Djibouti DRM agencies. The following are the national agencies engaged: (i) the Djibouti Center for Study and Research (CERD); (ii) the Executive Secretariat for DRM (SEGRC); (iii) the Ministry of the Habitat, Urbanism, Environment, and Land Management (MHUEAT); (iv) the Meteorology Division of the Airport; and (v) the University of Djibouti.

1. DISASTER RISK PROFILE

Djibouti is a resource scarce country. Measuring 23,000 sq km, it is located at the juncture of the Red and the Aden Sea, which serves as a vital regional and international trans-shipment port. According to 2003 national statistics, the country's population is estimated at 734,000 people, 85 percent of which live in urban coastal areas¹ and roughly 65 percent in Djibouti-ville, the capital city. In 2008 Djibouti's real GDP grew by 5.9 percent, driven mainly by foreign direct investments (FDI) in construction and maritime services. According to the World Bank, Djibouti's strong externally financed public investment and the growing diversification of maritime services will allow Djibouti to decrease its dependence on Ethiopian trade and will support real GDP growth of about 5 percent in 2009.

Figure 1. Map of Djibouti



Djibouti is vulnerable to a range of natural hazards: i) extended dry multi-annual droughts that result in water scarcity for agriculture and domestic uses; ii) frequent intense flash floods with a variable but approximate recurrence of 7 years; iii) frequent earthquakes ranging in magnitude between 4 and 5 on the Richter scale iv) volcanism originating along the Afar rift area; and v) fires fueled by droughts and exacerbated by precarious construction materials.

Data from recent disasters (Table 2) demonstrates that Djibouti's economic growth and sustainable development have been heavily affected by natural disasters. According to the World Bank Natural Disaster Hot Spots Study², Djibouti is characterized by a relatively high economic risk from multiple natural disasters. Approximately 33 percent of its population lives in areas of high risk³, and 35.3 percent of the economy is vulnerable to natural disasters.

- 1 The majority of Djiboutian population is located near the coast, and is particularly at risk from sea level rise and flash floods (as seen in 1927, 1989, 1994, and lately in 2004).
- 2 World Bank, Natural Disaster Hotspots: A Global Risk Analysis. 2005.
- 3 According to UNDP, the drought of 1999 affected more than 150,000 nomadic herdsmen, and the scarcity of rainfalls resulted in the loss of 30 percent of the cattle.

Djibouti's disaster risk vulnerability is worsened by scarce water resources management, insufficient land use planning, non-systematic building codes enforcement, as well as by the country's limited capacity to prevent and respond effectively when a natural disaster occur. Furthermore, at present the country is experiencing a water crisis due to the pressure placed on its renewable freshwater resources by population growth, as well as by climate change. With less than 400 m³/yr/per capita (in 2005), the country is classified as water scarce (according to World Health Organization definition of <1000 m³/yr/per capita) (Table 1).

Table 1. Country snapshots

Index	Djibouti	Morocco	Yemen
Population (1000)	793	31,478	20,975
Growth rate (%)	2.1	1.5	1.1
Water per capita (m ³ /yr)	378	921	195
GDP agriculture (%)	4	16	13
Rural water access (%)	59	56	65

Source: United Nations Statistic Division (2005)

Droughts have been exacerbated by two consecutive failed rainy seasons, which resulted in the insufficient replenishment of water catchments. According to the Emergency Events Database (EM DAT), 2008 drought damage and loss affected roughly 50 percent of the population. As the drought worsened food prices for staples reached record levels, worsening the situation for poorer households. Poor urban households can currently buy only 68 percent of their daily minimum food requirements⁴. According to the Food Security and Nutrition Working Group, 284,000 people (41 percent of total population) are food insecure or at risk of food insecurity due to droughts.

A recent World Bank study indicates that annual economic losses resulting from the April 2004's flash floods at Oued d'Ambouli, exceeded DJF 1.8 billion (approximately US\$ 11.1 million), caused 230 fatalities and severely affected about 20,000 households. The flash floods caused grave damage to services, roads, bridges, health facilities, and schools.

Table 2. Main Natural Disasters in Djibouti 1970 – 2007

Natural Disaster	Year	Total Dead	Number of Affected People	Damage US\$ million
Flood	1977		91,000	
Flood	1978		106,000	2,500
Drought	1980	0	145,000	
Flood	1981	25	102,000	
Drought	1984	0	80,000	
Drought	1988	0	30,000	
Flood	1989	10	15,0300	
Flood	1993	0	20,000	1,100
Flood	1994	145	120,000	
Epidemic	1994	10	239	2,119
Wind storm	1995	0	775	
Drought	1996	0	100,000	
Epidemic	1997	50	2,424	

(Cont.)

4 World Bank, Djibouti Economic Monitoring Report, Social and Economic Development Group MNA. April 2008.

Natural Disaster	Year	Total Dead	Number of Affected People	Damage US\$ million
Epidemic	1998	43	2,000	
Drought	1999	0	100,000	
Drought	2000	0	150,000	
Epidemic	2000	4	419	
Flood	2001	0	95,000	
Flood	2004	230	115,000	1,600
Drought	2005	0	42,750	NA
Drought	2007	0	150,000	NA
Drought	2008	0	284,000	NA

Source: UNDP, Disasters for LDCs (2004); GFDRR (2009)

2. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Institutional Capacity and Consensus Building for Disaster Risk Reduction

Djibouti's main DRM strategy objectives includes the following pillars: (a) increase national leadership and commitment to the sustainability of DRR through the implementation of the HFA; (b) enhance collaboration and coordination among national stakeholders in order to increase DRR knowledge and understanding; (c) increase national commitment to protect disaster vulnerable households; and (d) serve as national focal point in the United Nations International Strategy for Disaster Reduction (ISDR) system, and strengthen links with its secretariat.

Table 3. Djibouti's DRM Legal and Policy Framework

Date	DRM Legislations/Documents
Oct-06	National Action Program for Climate Change Adaptation; Ministère de l'Habitat, de l'Urbanisme, de l'Environnement et de l'Aménagement du Territoire, UNEP, GEF, UNFCCC
Jul-06	Decree No. 2006-0192/PR/MID. Institutional framework for disaster and risk management
Mar-06	Exécution of the National Strategy for DRM; Ministère de l'Intérieur et de la Décentralisation
Jun-05	Coastal Environmental Profile of the Republic of Djibouti; Ministère de l'Habitat, de l'Urbanisme, de l'Environnement et de l'Aménagement du Territoire
Feb-05	Prescription No. 2005-0147/PR. Creation of the Post-Flooding Rehabilitation Program Steering Committee
Aug-04	Prescription No. 2004-0579/PR/MID. Creation of a Technical Committee to prepare and elaborate a national strategy for disaster and risk management
Jun-04	Law No. 58/AN/04/5 ^{eme} L. Creation and status definition of the Civil Protection Bureau
Dec-01	Republic of Djibouti First National Communication to the UNFCCC; Ministère de l'Habitat, de l'Urbanisme, de l'Environnement et de l'Aménagement du Territoire
Jul-01	Study of Vulnerability and Adaptation to Climate Change; Ministère de l'Habitat, de l'Urbanisme, de l'Environnement et de l'Aménagement du Territoire
Dec-00	National Environmental Plan; Ministère de l'Habitat, de l'Urbanisme, de l'Environnement et de l'Aménagement du Territoire

Source: World Bank 2009

DRM is a priority of the Government of Djibouti, and is an integral part of the processes of development planning and poverty reduction. However, disaster prevention, mitigation and preparedness are new to the country and need to be further strengthened. The institutional structure for DRR and DRM is headed by the National Committee,

presided by the First Minister responsible for: (i) policies and strategies formulation; (ii) international aid mobilization, and (iii) integrating DRM activities with poverty reduction.

In 2006 Djibouti's Government established the Executive Secretariat for Risk and Disaster Management (SEGRC). SEGRC advises the National Committee on natural disaster technical matters, coordinates prevention, mitigation, and response activities. Moreover SEGRC controls the crisis center, promotes and coordinate the preparation of sectoral and regional plans for risk and disaster management. Although SEGRC capacity is limited (it consists of three staff members), a plan for its expansion is envisaged, increasing staff members to 6 by the end of 2009.

The National Inspectorate for Civil Protection has been operational since 1970. In 2004 a new law has been approved in order to expand and better define the Civil Protection core DRR competencies. The Civil Protection has two main functions: (a) fire risk management and prevention; and (b) emergencies operational management. The Inspector manages all relief operations either from the command post of the Civil Defense Inspectorate or, in most cases, from the field. The Government of Djibouti has been enhancing the Civil Protection capacity and is currently establishing regional Civil Defense offices.

Djibouti's main think tank is the National Center for Scientific Study and Research (CERD). CERD is a multidisciplinary scientific research development institute which provides policy makers and citizen's access to training, workshops and knowledge on: (i) environmental studies; (ii) social sciences; (iii) international strategic studies; (iv) cartography and geography; and (v) information technologies. CERD has led the first phase of GFDRR technical assistance, and would be one of the key partners in the development of the second phase.

In terms of DRM Institutional Capacity and Consensus Building for DRR, several multilateral organizations are engaged in strengthening DRM capacity in Djibouti. These organizations are: USAID, UNEP, UNDP, UNICEF, and the EC. In addition, the MNA DRM Team is currently seeking to establish regional partnership with IGAD in order to foster disaster preparedness.

HFA Priority # 2: Disaster Risk Assessment and Monitoring

Djibouti has not regularly assessed the country's exposure to natural disaster risk, nor to climate variability. In spite of the country technical sectoral expertise (meteorology, seismology, hydrogeology, geology, and geography) Djibouti lacks risk assessment and evaluation capacity. There have been limited attempts to assess risk in probabilistic and financial terms, and there are no local, national and regional hazard risk maps available. Policy makers have therefore limited access to risk evaluation tools.

The MNA DRM Team has carried out preliminary activities to develop a comprehensive risk assessment system for the country, in partnership with CERD and the MHUEAT and in close coordination with SEGRC. The activities developed are: (i) establishment of detailed TORs for the system; and (ii) undertaking of a detailed inventory of vulnerability data existing in Djibouti.

In 2006 MHUEAT in partnership with GEF, and the United Nations Intergovernmental Panel on Climate Change (UNIPCCC) led the preparation of a national action program for adaptation to climate change: The National Adaptation Program of Action (NAPA)⁵. The key objectives of this report were: (i) establish a climate adaptation framework; and (ii) improve the government effectiveness to tackle climate variability challenges.

Following April 2004 devastating flood that stroke Djibouti-City, the Government applied for USAID funding to establish a flash flood early warning system. In January of 2009 the Government of Djibouti began the installation

5 UNEP, GEF, et al. National Adaptation Program of Action. 2006

of a surveillance system in the *Ambouli River Basin*, and several Government officials are currently undertaking training at CERD prior to the system becoming operational in the fall of 2009. SEGRC needs to develop alert and shelter protocols, as well as set up a simulation system in order for the surveillance system to be upgraded to an early warning system. SEGRC is also working with USAID for the establishment of an additional early warning system for the region of Oued d' Amis.

In 2001 Djibouti developed its first disaster vulnerability, as well as climate change adaptation study on the vulnerability and adaptation to climate change impact.

HFA Priority # 3: Reduce the underlying risk factors

DRR awareness dissemination is limited, and does not comprise university curricula, school training, or text books for primary or secondary education. The SEGRC, with funding from the IDA-financed Flood Emergency Rehabilitation Project, developed some activities to raise awareness, notably training of technical staff from various government agencies, creation and training of regional disaster prevention committees, and launching of general awareness radio emissions. Nevertheless these efforts have been limited in scope and have lacked a framing long-term strategy. The dissemination of disaster and environmental information, best practice and lessons learned in Djibouti has a long way to go. There is a lack of information and knowledge regarding: the country's natural resources; potential natural disaster and environmental impacts. Furthermore, there is no systematic DRR training provided to decision makers, neither is risk knowledge disseminated to vulnerable rural and coastal communities.

HFA Priority # 4: Reduction of the underlying risk factors

Disaster response has improved considerably as a result of combined national and international efforts, as well as because of Djibouti increased financial allocation to disaster planning and emergency response. Nonetheless, DRR is not systematically incorporated into the design and implementation of emergency, response, recovery and rehabilitation processes of the national policy framework. Consequently, risk reduction policies struggle to find due consideration and justification, needed to encourage investment in prevention.

Although some efforts to introduce building codes standards have taken place, law enforcement is limited. DRR elements are not systematically included in land use development plans; additionally technical construction standards are not always elaborated and implemented.

With regard to climate change adaptation, in February 2009 the World Bank, with support from the Bank Netherlands Partnership Program (BNPP), issued a report on climate change risks and adaptation options for the Republic of Djibouti⁶. This report aims to identify Djibouti most climate change vulnerable sectors, and to outline potential priority adaptation measures that could help develop national capacity to understand and adapt to climate change impacts.

HFA Priority # 5: Strengthen disaster preparedness and response at all levels

There are currently limited disaster preparedness and risk transfer activities. However the Government is planning to increase funding for the development of the following activities: (i) creation of a contingency fund; (ii) elaboration of emergency planning at all levels and; and (iii) enhancement of emergency and crisis related institutional capacities.

⁶ Wilby, R. Climate Change Risk and Adaptation Options for the Republic of Djibouti. February 2009

3. INTEGRATION OF DISASTER RISK MANAGEMENT IN DEVELOPMENT STRATEGIES

To address its social and economic challenges, in January 2007 the Government of Djibouti launched the “Initiative Nationale pour le Développement Social (INDS)”, replacing the Poverty Reduction Strategy Paper (PRSP). The INDS will promote access to basic social services and improve the quality and effectiveness of delivery. In terms of DRR, INDS aims to streamline DRR in priority sectors by strengthening DRM institutional capacity, risk mitigation and preparedness.

The current Country Assistance Strategy (CAS) for the Republic of Djibouti (FY 2009-2012) recognizes natural disasters as one of the main causes of poverty. Djibouti CAS proposes to tackle disaster vulnerability by integrating DRR into sectoral activities, increasing investment in the water sector in order to retain water for agriculture, to prevent floods, and to recharge water aquifers. This is very relevant given that most disasters in Djibouti are of water born nature.

UNDAF 2008-2012 emphasized Djibouti’s risks exposure to natural disaster and proposes to strengthen national institutions responsible for poverty reduction, with a special focus on DRR, and epidemics. More concretely UNDAF envisaged a framework for a better management of natural resources. This framework will include the establishment of: (i) an integrated environmental safeguarding strategy; (ii) a framework for fighting desertification; (iii) an early warning system; and (iv) and the active involvement of rural communities in the prevention and management of natural disaster activities.

4. KEY DONOR ENGAGEMENTS

Table 4. Key Donors and International Financial Institutions Engagement

Ongoing Projects	UN, Donor, IFI Cooperation	Indicative Budget (US\$)	HFA Activity Area(s)
Developed Countries Fund (LDCF) project grant	Global Environment Facility (GEF)	10,500,000	HFA 2-4-5
Flood Emergency Rehabilitation Project: Establish SEGRC	World Bank	6,500,000	HFA 5
Preparatory activities and methodology to develop a comprehensive system for risk assessment	Global Facility for Disaster Reduction and Recovery (GFDRR)	70,000	HFA 1-2
Climate modeling and risk management (Multi country project)	GFDRR	43,900	HFA 1-5
Urban Poverty Reduction Program	World Bank	3,000,000	HFA 1
DRM Strategy	United Nations Development Program (UNDP)	50,000	HFA 1
Drought Prevention Water Management	European Commission (EC)	769,000	HFA 1-2-3
Ensure that a national multi-sector platform for DRR is operational	World Bank, UNDP, UNEP, EC	800,000	HFA 1-2-4
National Adaptation Program of Action (NAPA)	MHUE, UNEP, GEF	200,000	HFA 2-3-4
Climate Change Risks and Adaptation Options for the Republic of Djibouti (Final Report)	World Bank, BNPP	60,000	HFA1-2-3-4

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Although Djibouti has made considerable progress in DRR, significant challenges remain unaddressed. Understanding of natural hazards remains limited, and natural disasters are predominantly dealt in an ex-post manner. The following strategic actions are necessary in order to streamline DRR: (i) increase technical capacity, awareness and equipment of national DRM institutions; and (ii) mainstream DRR in priority sectors. Given the limited capacity in the country, the task team proposes that the second phase of the technical assistance be focused on improving risk assessment and monitoring capacity, targeting the following organizations: CERD, SEGRC, the University of Djibouti, MHUEAT, and the METEO.

The task team proposes country execution for this activity in order to ensure the highest transfer of DRM capacity to Djibouti agencies. However, in order to ensure effective project implementation, key national agencies seek to establish an implementation unit which will be housed in CERD and will be responsible for activity coordination, financial and administrative management. By working with the five identified institutions through a structured technical assistance, we will gain further coordination and we will provide support to data analysis, which is indispensable for developing prevention activities.

MNA DRM team will seek GFDRR financial assistance to continue strengthening Djibouti risk assessment and monitoring capacity. The second phase of GFDRR Track II activity aims to develop Djibouti's comprehensive system for risk assessment. This activity will further strengthen CERD, SEGRC and MHUEAT DRM capacity, and reinforce stakeholders understanding of the country's exposure to natural disasters and its social, economic, environmental and physical vulnerabilities. The TORs for the Comprehensive Risk Assessment activity in Djibouti are inspired by The Central American Probabilistic Risk Assessment (CAPRA). CAPRA seeks to develop appropriate standards and methodologies for probabilistic risk evaluation, and incorporates state of the art models into a geographic information platform.

Strengthen SEGRC DRM capacity. SEGRC has limited staff, consisting of three staff members: the executive secretary and two administrative assistants. Under the second phase of GFDRR work, the task team plans to strengthen SEGRC DRR capacity by developing an activation and crisis management protocol, as well as broadening the development of disaster simulations at national and community levels.

In terms of climate change adaptation, MNA DRM team aims to strengthen MHUEAT, as well as National and Local Government capacity to understand and adapt to climate change. The climate adaptation activities options under consideration seek to build on existing efforts such as the NAPA, and the 2008 World Bank Climate Change Risk Adaptation Options for the Republic of Djibouti. This activity will consist of a coastal climate adaptation pilot project, which will seek to reduce the adverse effects of climate change through raising climate risk awareness, and by increasing the understanding of available climate adaptation options.

Broaden DRR training programs for country stakeholders through the involvement of the University of Djibouti, public schools, and key national think tanks. This activity aims to develop DRR training modules and a master's degree for students as well as specialized training for teachers. This component will ensure that university curricula, education material and relevant trainings include DRR and recovery concepts and practices. By incorporating disaster risk-related issues into existing university curricula, the DRR team contributes to continuous learning and sustainability of the program, as well as reinforces DRR knowledge in the country.

Enhance the Division of Meteorology knowledge of meteorological risks, and quality of data access in order to strengthen the METEO climatic risk analysis. This will be obtained by establishing between 7 and 15 automatic weather stations throughout the seven climatic regions of Djibouti and by providing specialized training to staff.

Djibouti is looking to engage in the GFDRR South-South Cooperation Program. South-South Cooperation will expand partnership with disaster-prone countries facing similar challenges, by tapping into technical know-how, sharing experiences and lessons learned of governments, institutions, and NGOs, leading to efficient solutions to challenging disaster risk and climate change problems.

Table 5. Planned DRM Activities

Indicative Program for GFDRR Funding <i>(engagement areas being considered for GFDRR funding)</i>	Implementing Agency	Indicative Budget Year (US\$)	HFA Activity Area(s)
Development of a comprehensive risk assessment platform (CARAD), within CERD and provide technical assistance and equipment to use and maintain the platform	CERD	1,000,000 2009-2012	HFA 1-2-3
Establish an implementation unit to facilitate project implementation	CERD	60,000 2019-2011	HFA 1-2-4
Strengthening institutional DRM and DRR capacities of national organizations	SEGRC, METEO, University of Djibouti, MHUEAT, WB	1,538,000 2009-2012	HFA 1-2-3
Elaboration and activation of alert and shelter protocols, and development of a simulation program	SEGRC, Regional DRM Committees	300,000 2010-2011	HFA 1-3-5
Develop a climate adaptation pilot in the northern coast of Djibouti	MHUEAT	350,000 2009-2011	HFA 3-4
Develop DRM module training and master for professional and students	University of Djibouti, University of Montpellier, WB	480,000 2009-2012	HFA 1-3
Total indicative budget requested			US\$3,728,000

REPUBLIC OF YEMEN

The Yemen Country Note is based on vigorous consultations undertaken with various governmental agencies, the UN agencies, and the World Bank country office staff to understand the current organizational structure for managing disasters in Yemen and identify possible areas of support for strengthening Disaster Risk Management (DRM). Major governmental agencies consulted include the ministries of Planning and International Cooperation, Oil and Minerals, Communications and Information Technology, Transport, Public Works and Highways, Civil Defense, Water and Environment, Agriculture and Irrigation, Health, and Local Administration. The findings of the consultations were presented to a cabinet level meeting, held on April 23rd 2009, chaired by the Deputy Prime Minister, Ministry of Planning and International Cooperation. During the meeting, the Government of Yemen provided guidance and identified priority areas of interventions for DRM.

1. DISASTER RISK PROFILE

The Republic of Yemen, covering an area of nearly 528,000 km² on the Arabian Peninsula near the Horn of Africa, is home to a population of about 22 million that is growing at over 3 percent per annum. Yemen's urban population, currently about 27 percent of the total, has a much faster growth rate than the overall population growth rate, and is growing at about 5 percent per annum. The country's topography of rugged mountains, highlands, deserts, and coastal plains, coupled with arid weather conditions, render Yemen highly susceptible to desertification and floods, and make it a disaster prone country that has experienced at least one disaster per year over the last two decades.

Floods are the most recurrent natural disaster in Yemen, followed by landslides and earthquakes. The most recent major floods occurred in 1996, 2000, and 2008. While regular flooding has traditionally been beneficial for agricultural practices in Yemen, when flooding occurs in areas that are densely populated, there are significant economic damages that occur due to loss of lives, damage to livelihoods, property and infrastructure. With an estimated per capita GDP of US \$870 and therefore limited financial resources, Yemen can ill afford the losses it currently sustains from recurrent disasters. Table 1 provides an overview of the natural disasters reported in Yemen over the last 28 years, while Table 2 provides estimates of loss from the ten most major disasters over the last twenty years.

Table 1. Natural disasters reported from 1980-2008¹

No of events	27
No of people killed	908
No of people affected	1,064,592
Economic Damage (US\$ X 1,000)	2,849,500
Economic Damage per year (US\$ X 1,000)	101,767

Table 2. Top 10 natural disasters reported (1988-2008)²

Disaster	Date	Affected	Killed	Cost (US\$ X 1000)
Flood	2008	700,000	73	1,638,000
Earthquake	1991	40,039	70	10,000
Flood	1991	30,000	65	1,500
Flood	1993	21,500	50	NA
Flood	1999	19,750	36	NA
Flood	1996	5,000	33	NA
Flood	1998	3,000	32	NA
Flood	2006	2,000	31	NA
Flood	2007	2,000	28	NA
Drought	1988	NA	NA	NA

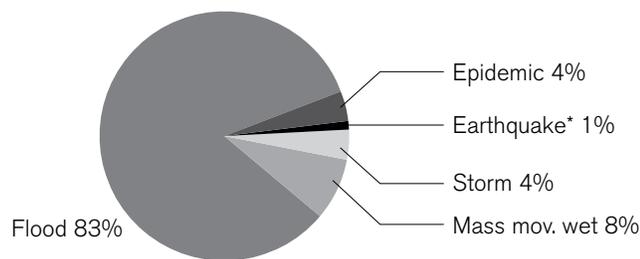
¹ Provention Web and WB DLNA: October 2008 Tropical Storms and Floods, Republic of Yemen 2009.

² Ibid.

Floods are the major natural disaster in Yemen

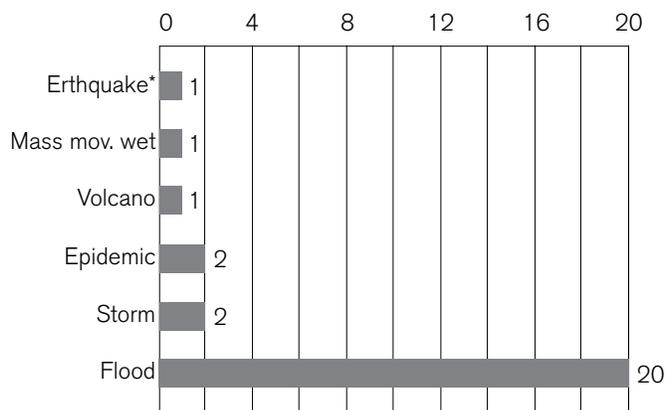
Loss of human life has been the greatest from floods and the economic damage from the 2008 flood was very severe (Figures 1 and 2). Floods occur almost every year in Yemen with major floods reported in 1991, 1993, 1996, 1999, 2000, 2006, and 2008. The 2008 flood affected two governorates in Yemen, which received 90 mm of rainfall in 30 hours, almost eighteen times greater than the normal rainfall of 5mm to 6mm. The rain fell over a catchment area of 2 million hectares, and the nearly 2 billion cubic meters of water caused severe flash floods in the valley, with water surges exceeding 10 meters in some areas.

Figure 1. Percentage of reported people killed by disaster type



Source: WB DLNA: October 2008 Tropical Storms and Floods, Hadramout and Al Mahra, Republic of Yemen

Figure 2. Natural disaster occurrences reported



The last flood was caused by a level-three tropical storm that affected the two eastern Governorates of Al-Mahara and Hadramout³. 73 people were killed, over 25,000 people were displaced, and about half the population in these

Governorates lost their livelihood. Consequently, the poverty rate in these two Governorates is expected to increase from 28 to 51 percent, and the national poverty rate is expected to go up by 1.1 percent. The overall damage and loss assessment from this flood was estimated to be about US\$1,638 million, or about 2.8% of Yemen’s GDP⁴.

Spatial distribution of floods, earthquakes, and landslides in Yemen

Floods: The areas that are at risk from flooding are largely the densely populated areas of western Yemen, that include governorates of Sada’a, Sana’a, Dhamar, Ibb, Taiz, Lahz, Mareb, and Abyan (Figures 3 and 4)⁵. In central and eastern

Figure 3. Population Density

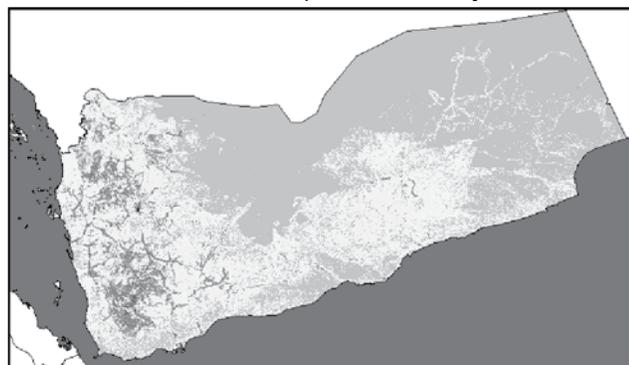


Figure 4. Flood Hazard



3 Yemen is divided into 19 governorates

4 Source: WB DLNA: October 2008 Tropical Storms and Floods, Hadramout and Al Mahra, Republic of Yemen

5 Preliminary risk maps from WHO e-atlas of disaster risk for Eastern Mediterranean Region, 2008; population density map from LandScan™ Global Population Database (2006). Oak Ridge National Laboratory. Available at <http://www.ornl.gov/landscan/>.

Yemen, the Hadramout Valley and the southern coastline of Yemen are also at risk from flooding. Floods in Yemen mostly result from high-intensity rainfall, and sometimes from coastal storm surges and tsunamis.

Earthquakes: Yemen is located in the seismically active zone between the Arabian and African tectonic plates. The western and southern portions of Yemen (Figure 5)⁶ around the rifts of the Red Sea and Gulf of Aden, are at risk from earthquakes. This is where the Arabian and African plates are pulling apart.

Landslides: Unstable geological conditions, including the development of extensive cracks due to natural aging and extreme weather conditions, exist in several mountainous regions of Yemen such as Al-Dhafeer Al Gayah and Al-Semah. In such regions, heavy rains, storms, earthquakes, or volcanic eruptions, as well as mining and inappropriately sited

infrastructure, can combine to trigger landslides. Since the terrain of Yemen is mostly mountainous, the entire country is at risk of landslides (Figure 6)⁷.

Figure 5. Seismic Hazard

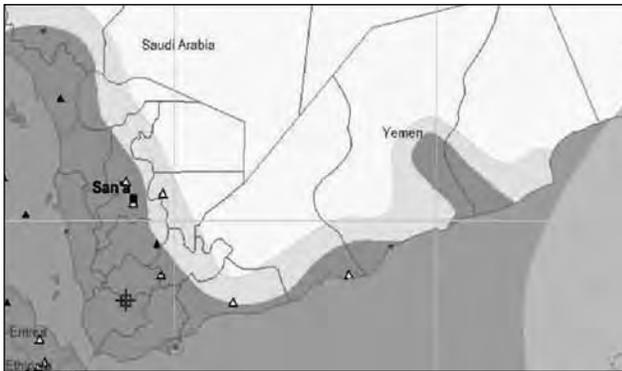
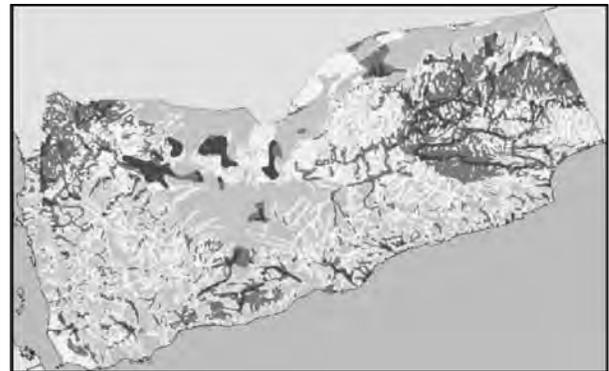


Figure 6. Landslide Hazard



Three main factors that exacerbate Yemen's vulnerability to natural disasters

Climate change is expected to increase exposure to drought and flash floods, leading to a trend: While there is no international consensus on the impact of climate change on precipitation levels in Yemen, Global Climate Models (GCM) predict a three to four degree centigrade increase in mean temperatures⁸ by the 21st century. Climate change induced impacts may include a rise in sea levels, and increased exposure to droughts and flash floods in the country.

Depletion of water resources: The availability of water in Yemen stands at 150 cubic meters per capita, and is well below the threshold of 1000 cubic meters per capita established by the United Nations for classifying countries as water scarce countries. In fact, the availability of water in Yemen is much lower than the average figure for the Middle East and North Africa Region, which is about 1250 cubic meter per capita. This limited availability of water is further exacerbated by three factors: (i) seasonal and temporal changes in the pattern of rainfall that Yemen receives; (ii) both expansion of the area under cultivation as well as water intensive agricultural production; and (iii) higher ground water extraction and reduced ground aquifer recharge as a result of increased urbanization which in turn has resulted in an expansion in built-up areas. The depletion of water resources is increasing aridity, which could lead to reduced economic prospects in the future, thereby making Yemen more vulnerable to natural disasters.

⁶ Source: <http://mrnathan.munichre.com>.

⁷ Preliminary risk maps WHO e-atlas of disaster risk for Eastern Mediterranean Region, 2008

⁸ Values are for changes in mean temperature between 20th century (1961-1990) to 21st century (2070-2099) as projected by nine climate-change models and reviewed by IPCC Third Assessment Report (2001).

Ineffective urban planning and development in hazard prone areas: Ineffective and weak land-use planning coupled with a lack of building codes not specific to withstanding the impacts of natural disasters, has exposed both urban and rural households in Yemen to greater risk of losses. Much of the expansion of built-up areas in Yemen's cities is taking place in unplanned settlements, located predominantly in environmentally sensitive zones where land values tend to be low, e.g. low lying flood prone areas, steep hillsides, etc. Development in such zones often blocks existing natural drainage channels, rendering them much more prone to damage when these areas get flooded due to inadequate drainage. In rural areas too, as observed in the Hadramout valley, traditional mud structures *on the edge* of river beds are starting to give way to concrete structures often built *inside* river beds, which impede the natural flow of water. Such man-made obstructions obstruct to the natural flow of rain water, which can lead to floods and increase Yemen's vulnerability to disasters.

Moving from a reactive to a preventive approach to disaster management in Yemen

Yemen's approach to managing disasters is currently reactive, focused on post disaster relief and recovery activities. Post disaster relief activities consist of emergency relief, and recovery & reconstruction programs. Such programs involve the army, international relief agencies, various branches of technical ministries, and utility agencies at Governorate level. Recovery and reconstruction activities are currently financed through specialized Recovery and Reconstruction Funds (e.g. the recently established Fund for Recovery and Reconstruction in Hadramout and Al Mahara). The branches of line ministries, other specialized agencies such as the Public Works Program, the Social Fund, and the Social Welfare Fund contribute to recovery and reconstruction activities in keeping with their specific institutional mandates and implementation capabilities.

The concept of disaster risk management (DRM) is new to the country. As a result of a current focus on post-disaster relief, Yemen has relied largely on central government agencies to mobilize for relief activities. Going forward, however, as Yemen's commitment to proactive risk management is translated into re-mapping of administrative responsibilities of central agencies and the forging of essential partnerships horizontally between and amongst central agencies, there will be a need to establish effective vertical linkages between central and sub-national levels of government that penetrate effectively down to the level of communities.

Donors have begun supporting the rationalization and clarification of roles and responsibilities for various central agencies that are either already contributing to, or have the capability to contribute to the design and development of a cohesive, coordinated, and efficient program for proactive risk management. While efforts to improve and enhance the horizontal linkages between central level agencies is an excellent start, there is a long way to go before there is an established disaster risk management program with a specific focus on (i) the prevention of disaster, (ii) the mitigation of the impacts of a disaster, and (iii) and the preparedness needed to deal with disasters when they occur. The planning and execution of such a program will require functional linkages, both horizontally and vertically, between national and sub-national government agencies, local communities, international development agencies, as well as non-governmental organizations.

2. PROGRESS TOWARDS HYOGO FRAMEWORK FOR ACTION

Yemen is a signatory to the Hyogo Framework for Action⁹ and in keeping with the five priority areas for action, Yemen has committed to:

1. Ensuring that the reduction of risks from disasters is a national and a local priority with a strong institutional basis for implementation;
2. Identification, assessment, and monitoring of risks from disasters, and enhancing its early warning system;
3. Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels.
4. Reduction in the factors that make Yemen more vulnerable to disasters; and
5. Strengthening disaster preparedness for effective responses at all levels.

The next section describes the state of progress that Yemen has made in the above mentioned five Hyogo Framework priority action areas, along with the gaps and possible next steps.

HFA Priority # 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

Yemen has accorded high priority to disaster risk reduction, and has established two focal agencies to take the lead in this area. These are:

- (i) The *National Disaster Management Unit* (NDMU), housed within the Civil Defense General Directorate (CDGD) under the Ministry of Interior (MoI); and
- (ii) The *Directorate of Environmental Emergencies and Disasters* (DEE) under the Ministry of Water and Environment (MWE), established in 2004 through a ministerial decree.

The Unit in the Civil Defense Directorate has the mandate to focus on disaster management and response in Yemen, while the Department of Environmental Emergencies under the Ministry of Water is responsible for reporting on progress in Yemen on the five priority areas of action outlined in the Hyogo Framework for Action, to the UN International Strategy for Disaster Risk Reduction (UNISDR) – UNISDR being the agency that is responsible for monitoring progress on the Hyogo Framework. Although the DEE has represented Yemen at several international forums, it has limited resources. The Unit in the Civil Defense Directorate, on the other hand, is better resourced as it has been responsible for providing emergency relief after disasters.

Yemen has established an institutional basis for implementation of actions related to disaster risk reduction. There is a legal foundation for the creation of an organizational structure for managing the risks from disasters, and Yemen has designated its Ministry of Interior to lead the structure. The 1997 Civil Defense Law defines the responsibilities of the Civil Defense General Directorate with respect to for disaster management¹⁰. Subsequently, the Executive Bylaw and the Republican Decree (N°386) became the basis for the Supreme Council of Civil Defense. The Council is responsible for providing policy direction, approving plans for disaster preparedness and response, and defining the tasks and responsibilities of each ministry/agency, actors and stakeholders before and during any

9 The Hyogo Framework for Action (HFA) 2005-2015: *Building the Resilience of Nations and Communities to Disasters* was developed during 2005 World Conference on Disaster reduction in Kobe, Japan. The HFA aims to substantially reduce disaster losses, in lives and in the social, economic and environmental assets of communities and countries by effectively integrating, in a coherent manner, disaster risk considerations into sustainable development policies, planning, programming, and financing at all levels of government.

10 Protecting the population from natural and general disasters and securing methods of safety and communication during peace and war (source Law N° (24) of 1997 on Civil Defense).

emergency. It is chaired by the Minister of Interior, and includes key ministries as members¹¹. However, when the floods occurred in 2008, the Supreme Council was chaired by the Prime Minister himself on two occasions.

There is progress on the identification, assessment, and monitoring of risks from disasters, and the establishment of an early warning system is in its infancy. The UN agencies and the Government of Norway have provided support to initiate disaster risk management related activities in Yemen. They supported the Disaster Preparedness, Management and Recovery project in 2003, which established under the Civil Defense General Directorate the National Disaster Management Unit. However, the Unit needs technical, and financial strengthening, in addition to an improved internal re-organization that enables it to develop the necessary vertical mechanisms for coordination with sub-national entities and communities (which will also need strengthening). In order to develop an effective, comprehensive and integrated disaster risk management system, the Civil Defense General Directorate was accorded the status of an authority, with greater managerial and financial autonomy. However, it still functions as a ministerial department, and its budget is approved by the Ministry of Interior. The National Disaster Management Unit has a National Disaster Management Team that consists of focal staff from various ministries. It developed a National Disaster Management Plan in 2006. This Plan, in addition to proposed initiatives for capacity building, GIS mapping, and rescue operations, includes

a checklist of activities to be undertaken in the event of a disaster, as well as a list of key contacts. This Plan is awaiting approval by Yemen's Cabinet.

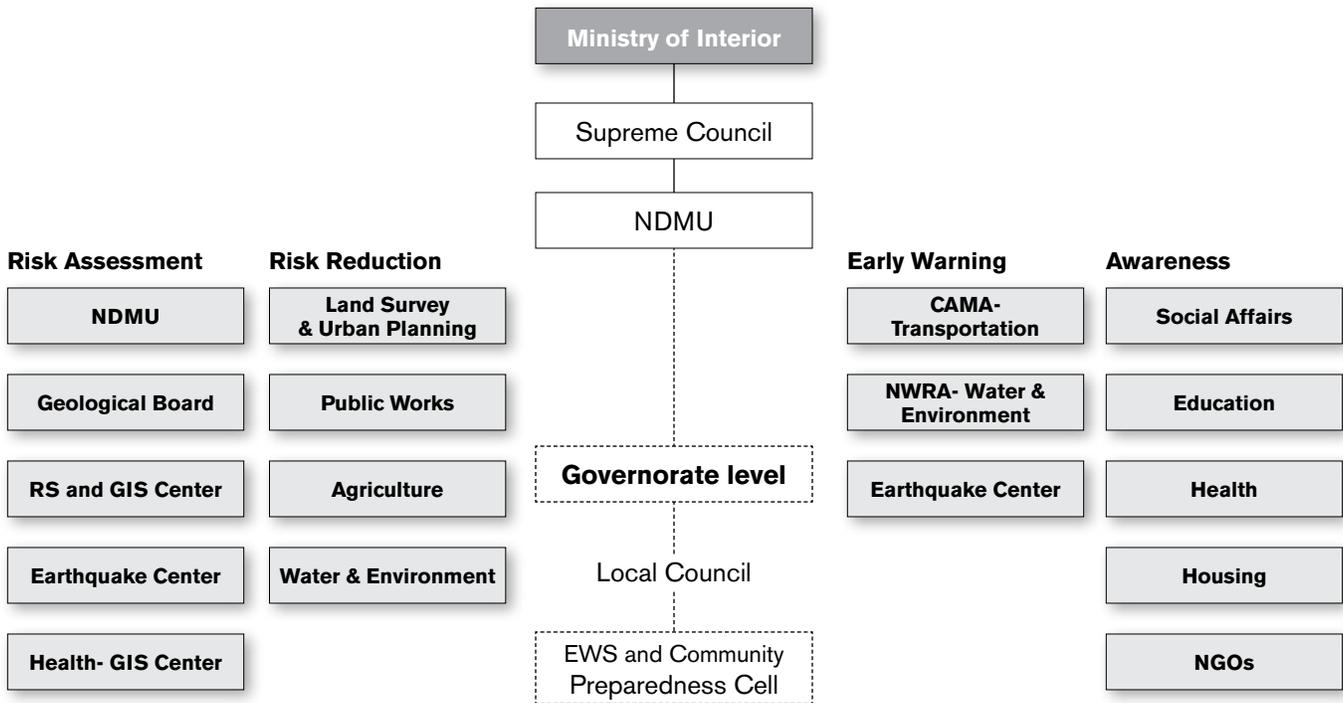
There is a need to further strengthen the organizational structure for managing the risks from disasters, streamline agency functions, and improve functional coordination and information sharing for an early warning system. Other prominent agencies that play an important role in disaster risk management are the Public Works Program, the Geological Survey and Mineral Resources Board, the National Water Resources Agency, and the Vulnerability Assessment Mapping Unit under Ministry of Health. These agencies are active in risk assessment, early warning, and post disaster reconstruction & recovery according to their specific institutional mandate and implementation capabilities. Figure 7 provides an institutional map of agencies that are active within the different categories of activities that together constitute a comprehensive disaster risk management program, and their relationship with the National Disaster Management Unit.

Yemen has to make rapid progress towards making disaster risk management a priority at the local level. Sub national governments, their agencies, and local communities need to be integral to the planning and execution of disaster risk management activities, so that there is more ownership which can lead to more effective implementation. There is already progress towards decentralization in Yemen, and Yemen's decentralization policy¹² has mandated local governments with disaster risk management and reduction. The legal foundation for developing and implementing disaster risk management programs at the local level already exists.

11 The ministries currently and proposed to be represented are: Public Health and Population, Electricity and Energy, Commerce and Industry, Communications and Information Technology, Transport, Finance, Oil and Minerals, Education, Justice, Public Works and Highways, Deputy General Staff for Training Affairs and the Chairman of Civil Defense Authority, Planning and International Cooperation, High Education and Scientific Research, Foreign Affairs, Local Administration, Information, Youth and Sport as well as the Chairman of the NGO Yemeni Red Crescent and Chairman of Federation of Commerce and Industry

12 The Local Authorities Law No. 4 of 2000

Figure 7. Organizational Map of Government agencies for disaster risk management in Yemen



HFA Priority # 2: Identify, assess, and monitor disaster risks, and enhance early warning systems

Implementation of initiatives that identify disaster risks is well underway, although a formal early warning system does not so far exist. A National Probabilistic Risk Assessment of Yemen, as well as detailed risk assessment for the Governorate/s of Hadramout & Al-Mahara governorate, and Sana'a are underway¹³. These studies will provide a risk atlas for various kinds of hazards in early 2010, and be the basis for planning and execution of various initiatives for disaster risk management in the country. The atlas will enable informed political debate on difficult choices that Yemen may have to make for both planning and retrofitting sectoral infrastructure in various spatial locations, and help the country develop a strategy that can be supported by donors, including possibly through additional IDA operations.

The identification of risks and their mapping is underway in Yemen. Several agencies are preparing digital risk maps of Yemen (Table 3). There is, however, no mechanism to either ensure compatibility between the data formats being developed by the agencies, or to avoid duplication of functions for optimizing the use of resources. There is also no institutionalized mechanism that links these agencies which are the critical suppliers of critical data, with the sub-national agencies and communities that are the users of this data. Unless such coordination and integrative mechanisms are in place, the design and implementation of disaster risk management activities will be ineffective and yield sub-optimal results.

13 \$700,000 study under TF #091825 and TF#091190

Table 3: Agencies active in risk mapping

Agencies	Relation to Risk Assessment	Comments
<i>Geological Survey Board Ministry of Oil and Minerals</i>	Landslide and earthquake risk mapping	Good infrastructure, over 15 years experience. Need consistent budget and capacity building
Remote Sensing and GIS Center Min. Telecommunications	National depository of base maps for Yemen and satellite imagery	Good infrastructure, 4 years experience
GIS cell in NDMU Ministry of Interior	Preparing maps of hospitals and emergency shelters	Location within NDMU, just started working with UNDP staff
Health Sector Mapping, Ministry of Health	Health vulnerability assessment maps	Good infrastructure, developing health facility maps with WHO guidance and support

Establishing a formalized early warning system in Yemen will require functional linkages between agencies as well as substantial support to procure modern technology. A number of agencies are involved in collecting weather, seismic, and hydrological data useful for early warning system. These include the National Seismological Observatory Center, the Civil Aviation and Meteorology Authority, the Maritime Affairs Authority, the Desert Locust Monitoring and Control Center, the General Directorate of Animal Resources, Yemen Red Crescent, UN agencies, and local/international organizations. The National Water Resources Agency is developing a proposal for early warning system at river basin levels both for warning communities about hazards, as well as for optimal management of flood control structures.

The Government of Yemen has allocated funds for the development of a formal early warning system. Although there is no formal early warning system at the national or local level, the Government has allocated US\$7.5 million to the Civil Defense General Directorate for the development of emergency control rooms in fifteen governorates. An emergency room, possibly for an early warning system and rescue operations, has become partially operational in Aden. A control room established in Sana'a is not yet operational due to financial and technical constraints. There are plans to establish emergency rooms in Mukalla, Taiz, and Hodeida.

An initiative to strengthen the capacity of the National Disaster Management Unit to enable it to deliver early warnings to coastal communities and enhance their preparedness is underway. This initiative, known as the Disaster Preparedness, Management, and Recovery Project is being supported by the UNDP. An initial assessment report from this project highlights a list of priority actions and priority intervention locations which are Al-Mahara, Hadramout, Aden, Shabwa, Abyan, Lahz, Taiz, Hodeidah, and Hajja. It also lists the key players that need to be involved in these areas. The project has supported community awareness programs in two pilot areas - Al Mahara and Socotra Island. The National Disaster Management Unit may partner with Oman to share early warnings about tsunamis with coastal communities.

HFA Priority # 3: Use knowledge, innovation, and education to build a culture of safety and resilience at all levels

The Government of Yemen is extremely receptive to integrating knowledge and innovation into its disaster management program. The recently completed 2008 Damage and Loss Needs Assessment was well received by the Cabinet of Yemen and is being widely disseminated within the country. Similarly, the Government of Yemen is seeking to collaborate actively with Gulf Cooperation Countries in developing a regional mechanism in areas related to disaster mitigation like early warning systems and post-disaster response.

Initial educational efforts to start building a culture of resilience is underway in Yemen. A national strategy for awareness, targeting school children specifically and the public more generally, is being developed by the National Disaster Management Unit. The literature that is being developed for the awareness campaign includes advice on ‘what to do during emergency’. Also included are interactive games for children.

Much progress remains to be made on building a culture of resilience at all levels. So far there exist no formal institutions or programs that can deliver training on adapting to climate change at a scale that is needed to build resilience at all levels. The National Disaster Management Unit is trying to include the concept of disaster risk management as well as the importance of environmental protection in reducing risks from disasters, in the curriculum of schools. The Ministry of Water and Environment, the Ministry of Health, and the Ministry of Social Welfare are also developing communication material that can effectively reach out to the larger public and inform on the appropriate response needed during a disaster or an emergency. With multiple agencies developing communication strategies and tools, efforts are needed to ensure adequate coordination and avoid duplication so that there is optimum impact on building a culture of resilience at all levels.

HFA Priority # 4: Reduce the underlying risk factors

Sectoral ministries are working towards reducing the risks posed by the three main factors that exacerbate Yemen’s vulnerability to natural disasters: (i) climate change, (ii) depletion of water resources, and (iii) ineffective land use planning that are contributing to development in hazard prone areas. Table 4 maps the various national and sub-national entities that have a crucial role in limiting risks from the three underlying factors. There is a need to develop clear guidelines for mainstreaming disaster risk reduction into the sectoral planning and investment cycles of these ministries. Discussions amongst policy makers are underway to include in the institutional mandates of these agencies, an explicit focus on reducing the risks from disasters, so that appropriate initiatives can be mainstreamed and supported. These agencies have already embarked on some steps to reduce the risks from disasters, for example, the incorporation of flood plain protection in strategic land use planning, the development of appropriate building codes, and environmental impact assessment procedures.

Table 4. Agencies active in risk reduction

Agency	Relation to Risk Reduction	Comments
Governorates/Director of Districts	Implementation and Enforcement	With decentralization, the role of these agencies is crucial for the development of strategic land-use planning and their enforcement.
General Authority on Land Survey and Urban Planning	Master Plans in accordance with flood plain location	Has advisory role, need actual implementation at local level
Ministry of Public Works	Building codes, permits, design and construction	Needs greater implementation at local level
Ministry of Agriculture and Irrigation	Flood protection works, Dikes/ Dams	Ministry would like to focus in the areas of desertification and locust storms
Ministry of Water and Environment	Environmental Impact Assessment (EIA)	By law all infrastructure projects should follow EIA to ensure no alteration in hazard prone areas

Implementation of specific measures that impact the underlying risk factors will not be possible without significant ownership of necessary actions at the community level. At present disaster risk reduction efforts in Yemen are far from being coherently organized vertically. Without decentralization, there will be little empowerment of sub national levels of government and their communities to develop an effective and balanced program to reduce

risks. Effective disaster risk management strategies will be difficult to develop, and the implementation of policies and programs developed centrally will be difficult and inefficient.

HFA Priority # 5: Strengthen disaster preparedness for effective response at all levels

Disaster preparedness for effective response at all levels has not as yet received attention in Yemen, as the planning focus has been on disaster relief and recovery operations. Although there is no institutional mechanism to ensure adequate preparedness levels for natural disasters and an emergency response to them, as stated earlier, the National Disaster Management Unit in the Ministry of Interior has developed a National Disaster Management Plan. This plan spells out in detail, the role of key line ministries before, during, and in the post disaster emergency phase. It provides checklists for essential activities to be executed in the different phases of a disaster, as well as a list of essential contacts. This plan, however, is yet to be approved by Yemen's cabinet.

In the absence of attention to the pre-disaster planning, the only central government practice that exists is for an area to be declared a "Disaster Affected Area" before resources can be mobilized. In the event of a disaster, the President of Yemen declares the affected areas as "Disaster Affected Areas". Only after this declaration can relief funds be allocated, with relief efforts coordinated through a high level inter-ministerial committee. Such a committee was organized under the Prime Minister's Office after 2008 floods to coordinate national and international relief efforts. This committee coordinates the efforts of the army, international relief agencies, the branches of technical ministries, and utility agencies at governorate level, which are the main actors during the disaster relief phase of disaster operations.

Immediate recovery and reconstruction activities, i.e. post emergency relief, are coordinated at the governorate level by branches of line ministries (chief being Ministry of Public Works) and local NGOs. Long-term recovery and reconstruction activities are mostly coordinated by specialized Recovery and Reconstruction Funds (e.g. recently established Fund for Recovery and Reconstruction in Hadramout and Al Mahara). There is a need to develop and adopt early warning protocols and preparedness plans at regional and local levels.

3. KEY DONOR ENGAGEMENTS

Since 1990s the World Bank (WB) has supported more than seven operations (approx. US\$ 200m), largely focused on post-disaster reconstruction, in addition to flood reducing activities under other operations. The most significant projects are the Taiz and Sailah (Sana'a) flood management projects that have dramatically transformed the cities and reduced the risks associated with floods. In 2008, in response to floods in Hadramout and Al-Mahara Governorates in Yemen, the Bank completed a Damage, Losses and Needs Assessment (DLNA), established the Yemen Recovery and Reconstruction Fund (YRRF), and got approval of the Yemen Flood Protection and Emergency Reconstruction project (US\$ 41 million). To enable a shift from an existing reactive approach towards a preventive approach for the management of disasters, the Bank is supporting three activities focused on mapping disaster risks at the national level as well as for Al-Mahara & Hadramout, and Sana'a. GFDRR has provided about US\$ 1.2 million in support for various activities in Yemen since 2007. Almost two decades of sustained Bank support for post-disaster reconstruction has resulted in the emergence of a strong and trusting partnership between the Government of Yemen and the Bank, and there exists today a high level of awareness on the importance of pre-disaster planning amongst policy-makers.

Yemen's Third Socio-Economic Development Plan (2006-2010) explicitly recognizes the need to reduce risks from natural disasters and focuses on mainstreaming risk reduction from natural disasters in development. The current Country Assistance Strategy (CAS) for the period 2009-2013 therefore includes the "management of natural resource scarcity

and natural disaster risk” as an explicit CAS goal. IDA has provided substantial support over the last three decades, for post-disaster and pre-disaster investments in drainage and flood protection or flood reduction, building resilience for climate change particularly in rural areas, water resource protection to tackle one of the three underlying risk factors¹⁴.

The World Bank has been involved in lending operations in the area of flood protection in Yemen through the Taiz Municipal Development and Flood Protection Project (TMDFP) since 2002. More recently, in March 2009 the World Bank approved an IDA Grant for \$35 million for the reconstruction and rehabilitation of selected key infrastructure damaged by October 2008 floods. On the request of the Government of Yemen, the World Bank under TMDFP is also preparing packages for financing priority infrastructure works in the governorate of IBB.

Table 5. Donor Support for disaster related activities in Yemen: on-going and closed

Projects	Implementing Agency	Budget and Timeline (US\$)	HFA Activity Area(s)
1. UNDP: Disaster Preparedness, Management and Recovery Project	Civil Defense General Directorate/ UNDP/ Government of Norway	1,469,372 (GOY - 700,000 & GO Norway - 28,812) 2003 - extended to 2008	1, 3, 5
2. WB/GFDRR – Strengthening Yemen National System for Disaster Risk Reduction and Recovery (Disaster Risk Reduction Institutional Mainstreaming Strategy and Priority Intervention Areas in Sana’a, National Probabilistic Risk Assessment Study including Al Mahara and Hadramout)	Ministry of Planning and International Cooperation	1,200,000 2007- ongoing (\$700,000 currently committed)	1, 2, 4
3. WB/GFDRR – Comprehensive Damage and Loss Needs Assessment	Ministry of Planning and International Cooperation	199,000 2008-2009	5

4. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

The World Bank participated in a cabinet level meeting to discuss the way forward for Yemen to move from a reactive approach to disasters to a more pro-active approach that enables the reduction of risks posed by natural disasters. This proposal is based on guidance provided by the cabinet level meeting chaired by the Deputy Prime Minister, Ministry of Planning and International Cooperation. The Government of Yemen has established the following principles to guide the development of a comprehensive program for reducing the risks from disaster:

- No new institution will be created. Rather, to embed mainstreaming into regular government work, the focus of donor support will be to support existing institutions to improve their organizational structures and operations.
- Donor support should focus on strengthening coordination mechanisms both before and during disaster
- The existing National Disaster Management Unit should remain small and efficient, so that it is able to attract and retain highly qualified staff within its budget.
- Donor support for developing local level initiatives to help communities better plan, prepare and respond to disasters before, during and after a major event, is welcome.

¹⁴ (Annex on this should be developed and attached with inputs provided by all Country Team members to bring sectoral colleagues into the picture and start to build ownership)

- Sequencing of activities, as well as their spatial location, will be determined by targeting those governorates as priority, that are at severe risk of experiencing floods and landslides, which appear to be the following based on the analysis available to date: Abyan Aden, Al Mahara, Hadramout, Hajja, Hodeidah, Ibb, Lahz, Shabwa, and Taiz.

Based on the above, Yemen's profile of risk from natural disasters, as well as a rapid assessment of the existing institutional organization of government agencies active in the area of disaster risk reduction, this proposal for support over five years (2009-2014), has two strategic objectives:

- strengthen Yemen's institutional capacity for planning, coordinating, implementing, and monitoring disaster risk assessment and risk reduction activities from the national to the community level, and
- jump-start the implementation of a national civil works program for reducing the risks from floods.

Table 6 provides an overview of the *proposed activities* that are expected to be supported by this proposal, the focal agency that will be responsible for their execution, estimated costs, and finally the which of the five priority action areas of the Hyogo Framework for Action, the proposed activities can be mapped to.

Table 6. Proposed GFDRR DRM Program

Proposed activities	Focal Agency	Budget US\$ m
I). Strengthening institutional capacity for planning, coordination, monitoring, and reporting at both central and local levels (Hyogo Framework for Action Priority Areas 1, 3, 4 and 5)		
1. Development of legal framework 2. Technical capacity assessments of key central agencies 3. Technical capacity assessments of key sub-national agencies in five Governorates 4. Analysis, consensus building and implementation of an action plan for any re-mapping of inter-agency functional links, inter-ministerial coordination, monitoring and reporting. The action plan will include actions that enhance horizontal and vertical organizational links to improve the preparedness and response to disasters. 5. Development of focused training and communication tools, dissemination, as well as the design and delivery of courses targeting government and non-government audiences. 6. Development of an inter agency, data portal that integrates data both horizontally and vertically, and enables real time information sharing by multiple users.	NDMU	0.8m
II). Design and execution of a National Awareness Campaign (Hyogo Framework for Action Priority Areas 1 and 3)		
7. Design and execution of a national communications program and implementation of a communications and public participation program at the community level in five Governorates. 8. Design and execution of the delivery of key messages to school going children, stratified by region. 9. Program targeting political leaders & civil society 10. Design and Execution of an internal inter-agency communications strategy for disaster risk and preparedness (with eventual links to enabling strategic electronic communications linked to the data portal) amongst them, as well as the delivery of cohesive messages to an external audience. 11. Design and delivery of a communications program targeted to political leaders and civil society stakeholders.	NDMU/ MoE/ MWE	0.3m
III). Development of a risk assessment forum (Hyogo Framework for Action Priority Areas 1, 2 and 3)		
12. Institutionalization of a structured forums at central and governorate levels (e.g. annual national disaster risk awareness events) 13. Technical national and international forums/ exchange programs for knowledge sharing 14. Development, management and mainstreaming of the use of risk maps linked to the data portal 15. Satellite/ aerial imagery of hazard prone areas Scaling up of current risk assessment studies	NDMU/ GSMRB	0.8m

(Cont.)

Table 6. Proposed GFDRR DRM Program

Proposed activities	Focal Agency	Budget US\$ m
IV. Design and establishment of a National Early Warning System (Hyogo Framework for Action Priority Area 2)		
16. Review and analysis of existing elements of the system (human as well as technical resource needs).	NDMU	1.0m
17. Procurement of goods and training for central and sub-national agencies.		
V. EWS and community preparedness (Hyogo Framework for Action Priority Areas 1, 3, 4 and 5)		
18. Targeted action plans designed specifically for the communities at risk, as identified by the risk assessments underway, will be executed for at risk communities in Hadramout, Al Mahara, Ibb, and Taiz Governorates.	Min. of Loc Admin. with local partners	1.2m
19. A specific action plan will be developed and executed for the at-risk communities in Sana'a		
VI. Jumpstarting national civil works program (Hyogo Framework for Action Priority Areas 4 and 5)		
20. Financing of priority investments to protect at-risk areas from floods in Ibb.	Min. of Public Works / NDMU	5.5m
TOTAL		10.56m

(Note: NDMU- National Disaster Management Unit, MoE- Ministry of Education, MWE- Ministry of Water and Environment, GSMRB- Geological Survey and Mineral Resources Board)

Preconditions essential for results from this program for disaster risk management

For a successful implementation and maintenance of the proposed program, the following preconditions are required:

- Adequate yearly budget allocations should be made for salaries and operating costs of agencies involved in disaster risk assessment, prevention and preparedness activities.
- Staff of the involved government agencies should meet proper qualification criteria and be motivated by proper compensation, a stimulating work environment and a career growth plan.
- Institutions and people responsible for disaster risk prevention and preparedness should be held accountable for any possible failure, as failure in DRM can have catastrophic consequences.



DISASTER RISK MANAGEMENT

South Asia

Nepal

NEPAL

To prepare the Country DRM Note, consultations were undertaken with members of the World Bank's Nepal Country team. Meetings were held with the Ministry of Home Affairs (MoHA) and other key ministries and departments involved in Nepal's disaster management system including Ministry of Water Resources, Ministry of Finance, Ministry of Local Development, Ministry of Public Works, the Department of Water-Induced Disaster, Ministry of Environment, Science and Technology, Ministry of Education, Ministry of Health, the Department of Hydrology and Meteorology, and the Kathmandu Fire Brigade. Additionally, meetings were held with selected NGOs, including the National Society of Earthquake Technology, Nepal and the Nepal Centre for Disaster Management. The World Bank Kathmandu office convened a roundtable meeting of a broad segment of the Donor Community—ADB, FAO, UN OCHA, European Union, and the Nepal Red Cross Society.

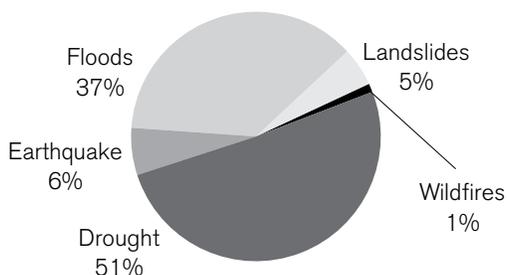
There is strong support and ownership for the matrix of priority areas and actions from the MoHA and other key ministries and departments engaged in disaster management.

1. DISASTER RISK PROFILE

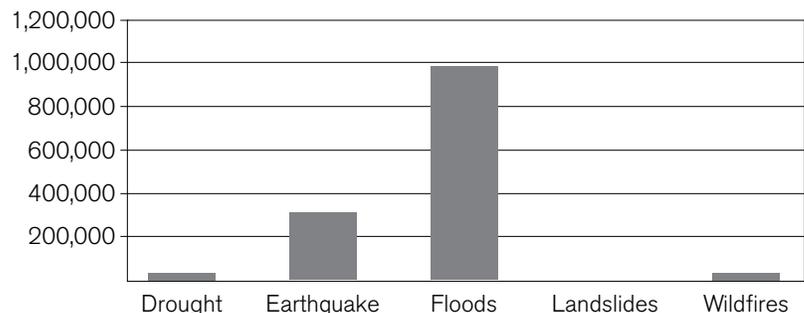
Nepal is a landlocked country lying between India and China. It is divided into three ecological zones, the "Terai" low-lying plains and marshy area in the south, the "Hills" in the middle and the "Mountains" in the north. Nepal's landscape is predominantly composed of hills and mountains covering about 83 % of the total area of the country.

Nepal faces several types of natural disasters every year, the most prominent being floods including glacial lake outburst flooding (GLOFs), drought, landslides, wildfires and earthquakes. Nepal ranks 11th in the world in terms of vulnerability to earthquakes and 30th in terms of flood risks.¹ A combination of rough topography, steep slopes, active seismic zone and intense impact of monsoon rains makes Nepal extremely vulnerable to disaster impacts.

% Population Affected (1900-2007)



Damage in USD '000 (1900-2007)²



There are more than 6,000 rivers and streams in Nepal. On reaching the plains, these fast-flowing rivers often overflow causing widespread flooding across the Terai region as well as flooding areas in India further downstream. Another potential hazard is Glacial lake Outburst Flooding (GLOF). In Nepal, a total of 159 glacial lakes have been found in the

¹ UNDP, A Global Report: Reducing Disaster Risk, 2004

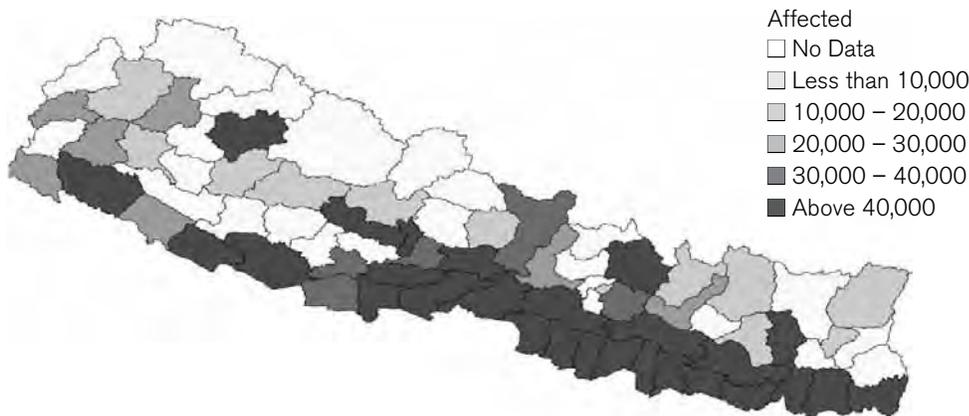
² EM-DAT: OFDA/CRED International Disaster Database, Catholic University of Louvain, Brussels, Belgium, www.emdat.net (disclaimer from EM-DAT regarding the reliability of the economic damage data)

Koshi basin and 229 in the Tibetan Arun basin. Of these, 24 have been identified as potentially dangerous and could trigger a GLOF event. In the period from 1935-1991, Nepal has experienced 14 GLOF events.³ Seismic records for Nepal date back to 1255. In 1934, Nepal experienced a major earthquake which claimed more than 8,500 lives. There followed other earthquakes in 1980 and 1988 further highlighting the extreme vulnerability that Nepal faces regarding earthquakes.⁴

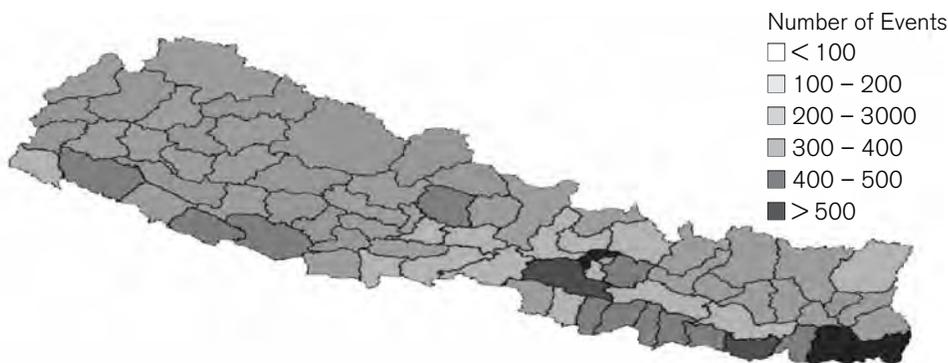
Exposure and Vulnerability

Out of 21 cities around the world that lie in similar seismic hazard zones, Kathmandu city is at the highest risk in terms of impact on people. Studies conducted⁵ indicate that the next big earthquake is estimated to cause at least 40,000 deaths, 95,000 injuries and would leave approximately 600,000 – 900,000 people homeless in Kathmandu. Haphazard urban growth, poor construction quality and non-enforcement of building codes further add to the vulnerability faced by the people regarding earthquake risk.

People affected by disasters per District (1971-2007)



Frequency of Disaster Events by District (1971-2007)



3 ICIMOD, Impact of Climate Change on Himalayan Glaciers and Glacial lakes, 2007

4 NSET, Global Assessment of Risk: Nepal Country Report, 2008

5 Nepal's hazard profile, Sumesh Kumar Bhattarai, The Kathmandu Valley Earthquake Risk Management Action Plan, National Society for Earthquake Technology [NSET]-Nepal and GeoHazards International, 1999

Nepal has a population of over 27 million people, of which 84 % live in rural areas. Almost 31% of the population is below the poverty line and Nepal ranks at 142⁶ in the Human Development Index country ranking, the lowest in South Asia. Poverty and a large reliance on agriculture for livelihoods increase the vulnerability of rural communities in getting impacted by disasters and in being able to recover socially and economically from disaster events.

As effects of climate change become more pronounced through increased seasonal variability, extreme weather events and glacial melt, Nepal is amongst those countries that will be most severely affected by the impacts of climate change.

2. DISASTER RISK MANAGEMENT FRAMEWORK

The current institutional framework of the Government of Nepal is more oriented towards disaster response and relief. The government organization responsible for disaster management is the Disaster Management section within the Ministry of Home Affairs. The Ministry collaborates with Nepal Police and the Royal Nepalese Army. Through Chief District Officers, the Ministry has a network throughout the country that extends to the district level. Although the Ministry of Home Affairs holds the overall responsibility of emergency preparedness and disaster management, it is still primarily concerned with the provision and distribution of emergency relief to disaster victims.

The Central Disaster Relief Committee (CDRC) is the apex body of the disaster response system in Nepal. The Central Disaster Relief Committee is headed by the Minister of Home Affairs, consists of the Minister of Health, the Minister of Physical Planning & Works, Secretaries of other ministries, representatives from the Royal Nepalese Army and the Nepal Police, the Director Generals from the Department of Mines & Geology and from the Department of Hydrology & Meteorology, as well as representatives from the Social Welfare Council, the Nepal Red Cross Society and the Nepal Scouts. Following a disaster, the CDRC meets as required to address the needs of the affected population. The committee controls a Central Disaster Relief Fund (CDRF), which is occasionally supplemented by the Prime Minister's fund.

At the district level, the District Disaster Relief Committee (DDRC) is the nodal body for coordinating relief efforts. The District Disaster Relief Committee is chaired by the Chief District Officer, consists of representatives from public sector organizations such as the District Health Office and the Nepal Red Cross Society. The Natural Calamity (Relief) Act, 1982 also accommodates the provision for the establishment of regional and local disaster relief committees as required.⁷

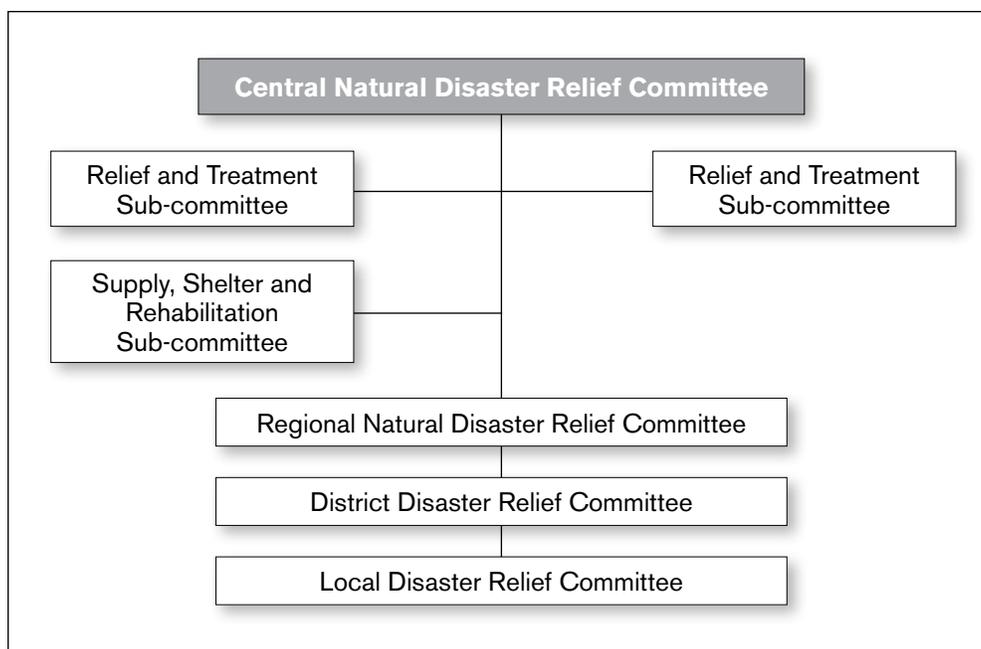
3. PROGRESS TOWARDS HYOGO FRAMEWORK FOR ACTION

HFA Priority # 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

The Natural Disaster Relief Act enacted in 1982 (though having been revised twice) is primarily focused on post disaster relief and recovery. The Ministry of Home Affairs (MoHA) has recently taken up revision of the 1982 Disaster Relief Act towards formulation of a Disaster Management Act. The MoHA has also initiated the development of a National Strategy for Disaster Risk Management covering all aspects of DRM. However the strategy is still not approved by the final authorities in the government and thus still remains a conceptual document.

⁶ Human Development Report, Human Development Index, Nepal ranked 142 out of 177

⁷ NSET, National Strategy for Disaster Risk Management in Nepal, 2008; www.drrgon.gov.np



The Government of Nepal allocates 2.5 billion Nepal rupees (US\$ 36 million, which is approximately 1.5 percent of the total annual budget) every year in the annual budget for disaster management. There is also a provision of Prime Minister Relief Fund and Central Disaster Assistance Fund for Disaster Management. However these are primarily for relief and rescue activities. Resources for disaster risk reduction are not allocated on a priority basis.

The Local Self-Governance Act (1999) has given the authority and responsibility to the local government authorities (District Development Committees (DDC), Municipalities and Village Development Committees (VDC)) to design and implement DRR activities at the local level. However, there is no systematic and assured mechanism of resource allocation to the local authorities from the center.

The Ministry of Home Affairs has already initiated a process to establish a multi-sectoral national platform with representatives from concerned government agencies, UN agencies, donors, INGOs, NGOs, media, academic institutions, private sector and CBOs.

HFA Priority # 2: Identify, assess, and monitor disaster risks – and enhance early warning

There has been some effort in hazard mapping by UNHABITAT and Department of Mines and Geology in 1993. There is no national level multi-hazard risk assessment covering regularly occurring disasters. However, there is a historical record of disaster occurrence and their impact for 37 years available in Nepal. This database based on the “DesInventar” system is managed by NSET and UNDP. International organizations such as International Centre for Integrated Mountain Development (ICIMOD) have initiated a process to assess the socio-economic impacts of GLOFs and flash floods through case studies.

The Government of Nepal has also established a seismic monitoring system within the Dept. of mines and geology. Few localized single hazard-oriented early warning systems managed by Department of Hydrology and Meteorology and some I/NGOs are in existence in a few places. However, there is no early warning system in place for major hazards with outreach to disaster-prone communities.

National and local level risk assessment is still a new phenomenon in the country. The need for regional cooperation and especially real-time data sharing has been recognized by most stakeholders in different forums. With the support from UNISDR, the Government of Nepal is undertaking the disaster-poverty interface study.

HFA Priority # 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

The Department of Water Induced Disaster Prevention, Nepal Red Cross Society and other I/NGOs have been collecting and disseminating national level information. However, as of now there is no designated and fully functional central and district-level data clearing house. Similarly, there is no established mechanism to share such available information.

The current school curricula have a limited amount of information on disaster management. In 2008, the secondary level of education curriculum has recently incorporated the disaster management component with the support of WWF and other institutions. Several I/NGOs have been supporting the MoE to incorporate DRR in to school curricula, teachers training on DRR, awareness building classes, publication of various IEC (Information, Education and Communication) materials on DRR.

Science based disaster risk reduction/ management is a new phenomenon in Nepal. Organizations such as The World Bank, Asian Development Bank and ICIMOD have initiated empirical research on cost-benefit analysis and mitigation practices in Nepal. The World Bank is carrying out four different studies⁸ in the area of risk reduction in the country. With support from UNISDR, Nepal is undertaking a national level study on the relationship between poverty and disaster. Nepal is practicing some internationally accepted and practiced tools for retrofitting of buildings and vulnerability assessment.

HFA Priority # 4: Reduction of the underlying risk factors

The existing natural resources management Acts and Acts related to climate change does not include disaster management as an integral part of it. However, the National Disaster Management Plan developed in 1993 and endorsed by the Government in 1996 emphasized that the need to bring the natural resources management, climate change and development together with disaster management. It is anticipated that the forth coming National Strategy for Disaster Risk Management will bring synergy to integrate natural resources management (NRM) and climate change along with sustainable disaster management.

The Ministry of Health with technical and financial support from WHO and NSET has initiated the non-structural vulnerability assessment of hospitals. However, this initiative has covered only few hospitals. The Ministry of Agriculture has been involved in vulnerability reduction activities such as drought risk reduction, food security, etc. Insurance in the agriculture sector is still under developed.

Implementation and monitoring of Land-use is extremely weak. Building Codes have been made compulsory in municipal areas. The National Shelter Policy, 1996 and the National Urban Policy 2007 have incorporated disaster risk reduction to some extent. However there is a serious lack of enforcement of the codes. Unplanned urbanization and construction of unsafe houses can be clearly seen in the Katmandu Valley. The absence of land-use planning and management of human settlement in the valley has increased the vulnerability of people to earthquakes by many folds.

As of now there is no systematic Disaster Impact Assessment carried out in any major development projects, even in most of the key infrastructure projects. However, there is a strong recommendation in the proposed National Strategy for Disaster Risk Management in making Disaster Impact Assessment a practice.

8 1)Study of glacial lakes for potential GLOFs with ICIMOD, 2) a study on school earthquake safety with NSET, 3) Hazard risk assessment of Nepal and 4) Emergency response system in Nepal.

HFA Priority # 5: Strengthen disaster preparedness for effective response at all levels

The Disaster Management Act (1982) focuses primarily on post disaster activities. The proposed new DRM act and the strategy encompass all elements of disaster management, long term and sustainable disaster risk reduction and linking disaster with development. The proposed Act and the strategy also strongly emphasize the establishment of a national framework for disaster risk management that includes establishment of autonomous DRM authorities from the central level (NADRM as an apex body) through all levels. Institutional commitment is required for the effective implementation of the plans and policy.

Few districts of Nepal had developed District Disaster Management Plans (DDMP) based on GIS information during the early 2000s. However, due to lack of coordination and technical capacity these plans were not fully implemented and monitored. On an ad hoc basis, several organizations organize lessons learnt sessions after the occurrence of any disaster in the country. There is no any concrete and well established forum for sharing such knowledge and experiences.

4. KEY DONOR ENGAGEMENTS

Some of the ongoing DRM initiatives are supported by multilateral assistance. These initiatives are listed below:

UNDP: In relation to disaster risk management, UNDP Nepal is actively assisting in the development of a legal and institutional framework on disaster risk management; incorporating DRM into national development planning and assisting through emergency grants for flood and landslide response projects.

UNICEF: Mainly engaged in preparedness and risk assessment in the water & sanitation and emergency health & nutrition sectors.

FAO: Engaged in food security and the livelihoods sector, especially post-disaster.

UN OCHA: Engaged in disaster preparedness, response preparedness and emergency coordination.

WHO: engaged in DRM in the health sector through its Emergency and Humanitarian Action (EHA) Programme. WHO Nepal has been an active partner in the health sector emergency planning and preparedness activities. WHO along with NSET is leading the Safe Hospitals campaign in Nepal.

DIPECO: Supporting different organizations of whom, Practical Action, an I/NGO, has developed community based early warning systems that can be managed by local communities and have long-term sustainability as a key consideration in their design and operation.

NSET: Focusing on Earthquake Risk Management. NSET is substantively engaged in the area of Earthquake Engineering & Research, School Earthquake Safety Program, Urban & Community Based Disaster Risk Management Preparedness & Emergency Response, Program for Enhancement of Emergency Response.

Action Aid: Working on hazards and vulnerability reduction through community awareness and capacity building programs. They have been active in developing school curriculums with disaster risk management elements.

Oxfam: Mainly engaged in humanitarian response post-disaster.

Nepal Red Cross Society (NRCS): NRCS is the largest humanitarian organization in Nepal with a nationwide network of volunteers. Main focus is on disaster risk reduction as well as response (relief) and recovery.

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Ongoing GFDRR Funded Activities

Ongoing GFDRR funded activities	Partnerships	Budget	HFA priority area(s)
Disaster Risk management Program, Nepal TA and analytical work on GLOFs, earthquake safety and emergency response capacity amongst others	MoHA, NSET, ICIMOD	\$ 914,000	HFA Priority 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation
Nepal: Agricultural Insurance Feasibility Study	Insurance Board, MoHA, Min. of Agriculture	\$159,400	HFA Priority 4: Reduction of the underlying risk factors

Indicative New Program Areas and Projects for GFDRR Funding

INSTITUTIONAL STRENGTHENING AND BUILDING TECHNICAL EXPERTISE

The Ministry of Home Affairs needs a lot of support towards building technical expertise of staff involved in DRM activities. Needs range from foundational training in Incident Command, Emergency Operations systems, Resource Management, Search and Rescue, Building Code Enforcement, Fire Management, and Structural Retrofitting. Training programs organized in-house and in foreign institutions will allow knowledge sharing and capacity strengthening of some key personnel.

FLOOD MANAGEMENT PROJECT - RAPTI RIVER BASIN

Given the annual flooding issues faced by Nepal, the project will focus on a pilot river basin towards developing a comprehensive flood management project. The project will focus on the hardware aspect of installation of better equipment towards collection of real-time precipitation data and assisting the ability of climate scientists in the Department of Hydrology and Meteorology towards improved 3-5 day weather forecasts. The project will also focus on the softer aspects of awareness, mobilization, preparedness and risk reduction for floods and other disasters for targeted communities living in the Rapti basin. The project will develop a pilot flood early warning system to focus on effective and efficient information dissemination down to the community level.

ENHANCING EMERGENCY RESPONSE CAPACITY

Majority of Nepal's population is rural while more than 80% of the country is hilly and mountainous. A disaster emergency at times makes it very difficult to access the affected areas from Kathmandu, the capital, where most of the resources are located. This entails a strong network of emergency search and rescue and relief supplies to be strategically located across the country. This also entails developing a strong logistical and distribution system in case of a calamity. The project will support the MoHA and the Nepal Red Cross Society in strengthening the emergency relief supplies network through strategically located warehouses across the country.

Deployment of a more robust emergency communications network, or construction of a national emergency operations center, will prove effective if there is an enhanced understanding of Incident Management and Emergency Operations processes and procedures. The UNDP has been working towards establishment of an Emergency Operations Centre. The proposed funding will complement activities planned by the UNDP in helping strengthen communication linkages between the center and districts.

ENHANCING WEATHER FORECAST FOR DISASTER PREPAREDNESS

Extreme weather events and severe weather conditions often wreak havoc and impact peoples' livelihoods across Nepal.

Presently, the Nepal Department of Hydrology and Meteorology has limited capabilities in making weather forecasts beyond 24 hours with acceptable accuracy. Improving the capacity of the department in being able to make reliable 1-5 day weather forecasts would greatly enhance the capacity of the MoHA and the district level government officials in being better prepared against extreme events. Advanced information dissemination to communities can also greatly benefit their coping strategies against disaster impacts. The project will undertake a study to identify existing gaps and needs within the Department of Hydrology and Meteorology and will provide technical assistance through a partner international climate forecast organization in building the technical expertise of Nepal's climate scientists. In addition, this component includes the purchase of equipment.

SCHOOL AND HOSPITAL EMERGENCY PLANNING AND SAFETY INITIATIVE

The Department of Education (DoE) expressed the need for development of a comprehensive plan covering all aspects of safe schools, including capacity building towards retro-fitting including training of masons, training of technical personnel, development of safe schools guidelines and creating community awareness. The DoE also needs support in the elaboration of a National Action Plan on Safe Schools.

The WHO in collaboration with the Ministry of Health has developed a project towards Strengthening Initiatives for Safe Health Facilities in Nepal. The project will focus on assessing the safety of primary health care centers; develop checklists similar to the existing Safe Hospital Checklist and pilot test in one health care center in each health region. The Safe Hospital Checklist will be applied in all public hospitals. Safety improvement plans will be developed for health facilities. The project will also support the development of a GIS to facilitate the use and application of space-based technologies and related services for DRM activities in the health sector, including the national safe hospitals program. In addition, this component would include structural strengthening measures of selected health facilities.

Indicative new program areas and projects for GFDRR funding	Partnerships	Indicative Budget or GFDRR funding	HFA priority area(s)
Institutional Strengthening and Building Technical Expertise <ul style="list-style-type: none"> – DRM skill training for MoHA staff – Damage & needs assessment methodology training – Specialized training for Incident Command, emergency operation system, Building Code enforcement, Resource management, Fire Management, Search & Rescue 	MoHA, UNDP, relevant national & international training institutions	\$ 750,000 (3 years)	HFA Priority 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation HFA Priority 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels
Flood Management Project – Rapti River Basin <ul style="list-style-type: none"> – Real-time collection of precipitation data – Improved and reliable 1-5 day weather forecast capability – Community preparedness and pilot flood early warning system 	Dept. of Hydrology & Meteorology, other relevant international organizations	\$ 1,250,000 (3 years)	HFA Priority 2: Identify, assess, monitor disaster risks, enhance early warning HFA Priority 5: Strengthen disaster preparedness for effective response

(Cont.)

Indicative new program areas and projects for GFDRR funding	Partnerships	Indicative Budget or GFDRR funding	HFA priority area(s)
Enhancing Emergency Response Capacity <ul style="list-style-type: none"> – Strengthening network of emergency relief supplies and distribution system across the country – Support development of emergency communications system and an Emergency Operations Centre 	MoHA, UNDP, Nepal Red Cross Society	\$ 3,500,000 (3 years)	HFA Priority 2: Identify, assess, monitor disaster risks, enhance early warning HFA Priority 5: Strengthen disaster preparedness for effective response
Enhancing Weather Forecast for Disaster Preparedness <ul style="list-style-type: none"> – Technical assistance for building expertise of Nepal's climate scientists towards development of reliable 1-5 day forecasts – Purchase of equipment 	Dept. of Hydro & Met, WMO, relevant international climate institution,	\$ 2,500,000 (3 years)	HFA Priority 2: Identify, assess, monitor disaster risks, enhance early warning HFA Priority 3: Use of knowledge, innovation, and education
School & Hospital Emergency Planning and Safety Initiative <ul style="list-style-type: none"> – Developing a comprehensive safe schools program and piloting specific activities – Strengthening initiatives for Safe Health Facilities in Nepal 	Department of Education, NSET, Ministry of Health, WHO	\$ 2,400,000 (3 years)	HFA Priority 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels
TOTAL		\$ 10,400,000	



DISASTER RISK MANAGEMENT

East Asia and Pacific

Cambodia / Lao PDR / Vanuatu

CAMBODIA



To prepare the Country DRM Note, consultations were undertaken with the National Committee for Disaster Management (NCDM) and members of the World Bank's Country team. Working closely with NCDM, consultations were held with Ministry of Interior; Ministry of Agriculture, Forestry and Fisheries; Ministry of Health; Ministry of Public Works and Transport; Department of Hydrology and River Works (Ministry of Water Resources and Meteorology); Ministry of Education, Youth and Sports; Cambodia National Mekong River Commission; Mekong River Commission; Climate Change Office (Ministry of Environment); UNDP's decentralization project (in Svay Rieng Province); World Food Program; Action Aid; Oxfam-Great Britain and Asian Disaster Preparedness Center. Together with Asian Disaster Preparedness Center, flood prone areas were visited and consultations held with the Svay Rieng Provincial Committee for Disaster Management and Svay Chrum District Committee for Disaster Management, and line departments representing the committees. The findings were presented to NCDM and the guiding principles for engagement in the country were agreed upon.

1. DISASTER RISK PROFILE

Cambodia today presents an environment that is favorable, but a bit of urgency, to support its disaster risk management initiatives: Efforts made by the country in recent years to manage its natural disasters provide a strong foundation for taking concerted steps towards reducing vulnerability of its people and economy from natural disasters. Post-conflict Cambodia has made good improvements in its socio-economic conditions: by managing its disaster risks more effectively, there is opportunity to improve further the living standards and preserve the development gains.

Table 1. Top 5 Natural Disasters in Cambodia for the Period 1980-2009/5 (sorted by numbers of total affected population)

Disaster	Date	No Total Affected	Damage (000 US\$)
Drought	June 1994	5000000	100000
Flood	July 2000	3448053	160000
Flood	August 2001	1669182	15000
Flood	August 2002	1470000	100
Flood	June 1996	1300000	1500

Source: "EM-DAT: The OFDA/CRED International Disaster Database; www.em-dat.net-Université Catholique de Louvain – Brussels – Belgium

The year 2009 marks a milestone year for Disaster Risk Management in Cambodia The Strategic National Action Plan for Disaster Risk Reduction (2008-2015) which sets out clear priorities was launched by the Government in March. The

country has been freshly assessed of its disaster preparedness response capacity by UNDAC. Moreover it is the 15th year of the establishment of the National Committee for Disaster Management, the apex body for coordinating disaster risk management activities in Cambodia. NCDM and its provincial and district units are making efforts to transform themselves from their traditional disaster managers to disaster risk managers. Thanks to years of effort by numerous local, national, regional and international organizations, the concept of Disaster Risk Management (contra disaster management) is trickling down from national to the local level, and there is an appreciable amount of understanding of ideas and concepts surrounding Disaster Risk Management in the country.

The field of Disaster Risk Management in Cambodia is also crisscrossed by a host of actors: The field appears uncoordinated and external support fragmented; it remains saturated with reports containing good recommendations that wait to be implemented; and interventions that are yet to make sustainable impact.

2. DISASTER RISK MANAGEMENT FRAMEWORK

The major natural disasters Cambodia faces are floods and droughts: The southwest monsoon begins around mid May and lasts until end October and brings over three quarters of the country's annual rainfall. As a result floods along the Mekong River, the Tonle Sap Lake and the tributaries are recurrent and often convert into major disasters. Mekong river floods affect the provinces of Kandal, Kampong Cham, Kratie, Prey Veng, Stung Treng, Svay Rieng and Takeo. Flash floods in tributaries around the Tonle Sap Lake affect several other provinces as well. Delays or early ending of the Monsoon rains and erratic (volume and period) rainfall have contributed to agricultural droughts.

A large segment of the population lives in the flood plains of the Mekong and Tonle Sap watersheds: Natural disasters have had significant impact on the country's people and economy. For example, floods accounted for 70% of rice production losses between 1998 and 2002, while drought accounted for 20%. Cambodia is one of the countries which at relatively high economic risk from multiple hazards. About one tenth of the total area of the country is estimated to be at risk from two or more hazards. Moreover 31.3% of the population and 34.5% of GDP are estimated to be at areas of risk from two or more hazards (Dilley et al. World Bank 2005).

Urban vulnerabilities are accumulating: As the population in the Mekong floodplain of Cambodia continues to increase mainly due to rural-urban migration, and as major cities such as Phnom Penh and Siem Reap urbanize rapidly with—often without adequate land use planning—newer vulnerabilities continue to accumulate. Lack of building codes that respond to country context and their weak enforcement, as well as lack of proper drainage in urban centers have increased the vulnerabilities of urban dwellers.

Increasing rural vulnerability: On the rural front, where about four fifths of the population (and 90% of the poor) resides, livelihoods—agriculture, fisheries and forestry—are subject to increasingly more frequent floods and drought. Deforestation and subsequent soil erosion; inadequate irrigation systems and water conservation measures to protect against drought; have all contributed to increase rural people's vulnerability to natural disasters.

3. PROGRESS TOWARDS HYOGO FRAMEWORK FOR ACTION

HFA Priority # 1: Ensure that disaster risk reduction is a national and local priority with a strong institutional basis for implementation

STRATEGIC NATIONAL ACTION PLAN FOR DISASTER RISK REDUCTION IN CAMBODIA 2008-2013

The Strategic National Action Plan for Disaster Risk Reduction in Cambodia 2008-2013 (herein after SNAP-DRR) was launched in March 2009. Prepared by NCDM and Ministry of Planning (MoP), this strategy has been formulated to serve as the “road map” for development and strengthening of institutions, mechanisms and capacities of disaster management committees at all levels, enable them to effectively and efficiently implement disaster risk reduction in the country.

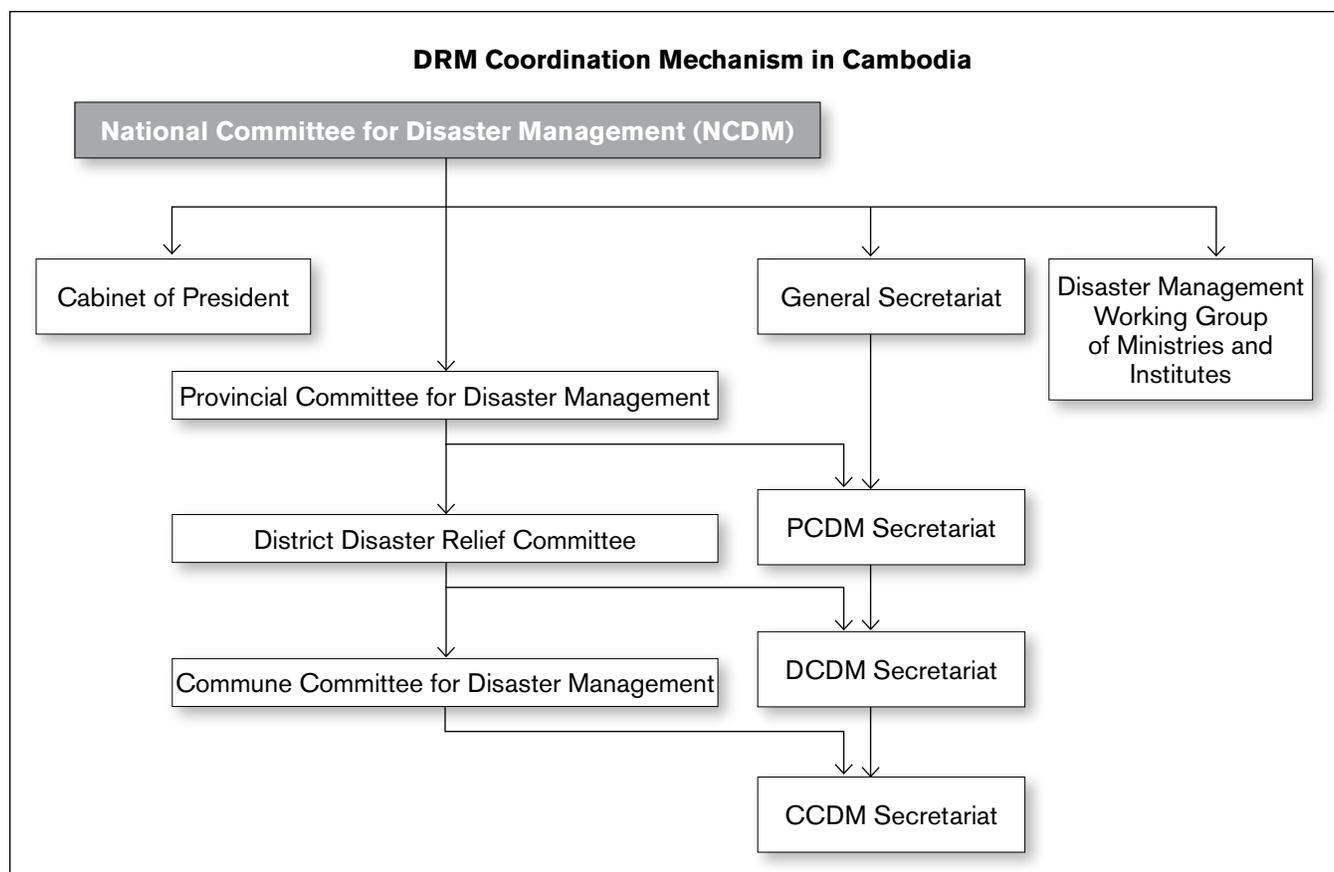
The SNAP-DRR identifies six key DRR components and outlines DRR priorities in four levels-critical, first, second and third level. The six components follow the HFA and are: (1) Ensure that DRR is a national and a local priority; (2) Strengthen sub-national and community based disaster risk management; (3) Identify, assess and monitor hazard risks and enhance early warning; (4) use knowledge innovation and education to build a culture of safety and resilience; (5) mainstreaming DRR into policies and programs for relevant government ministries and (6) Strengthen disaster preparedness for effective response at all levels.

The critical priorities which correspond to HFA 1 seek to ensure that DRR forms an integral part of the government’s development agenda. Specific activities under this priority include formulation of national disaster risk management policy and legislation, creation and strengthening of national DRR coordination mechanism; integration of DRR into the national development planning.

First level priorities set out by the SNAP-DRR are strengthening sub national and community disaster risk management capacities; mainstreaming DRR into policies and programs of relevant government ministries mainly the Ministry of Land management, Urban Planning and Construction (MOLLMUPC); Ministry of Agriculture, Forestry and Fisheries (MOAFF), Ministry of Education, Youth and Sports (MOEYS), Ministry of Environment (MOE); Ministry of Health (MOH) and Ministry of Rural Development (MORD); and strengthening disaster preparedness for effective response at all levels.

Second Level priorities include DRR projects that enhance component 2 and component 6; DRR projects related to component 3 that require greater technical expertise and specialization; and DRR projects aimed at raising public awareness corresponding to Component 4. The last level of priorities are those deemed “not feasible” within a short span of time such as establishment of a disaster fund, risk financing instruments, and establishing partnership with local and international scientific institutions.

- National, Provincial and District Disaster Management Committees (NCDM, PCDM, DCDM): The National Committee for Disaster Management (NCDM) was established as the lead coordinating agency in 1995 by Sub-decree 35ANKR-BK signed by the Prime Minister (amended in 1999 under Presidential Decree 1566, Sub decree 54ANKR-BK). Chaired by the Prime Minister, its members are 22 government ministries and agencies such Economics and Finance, Agriculture, Forestry and Fisheries; Water Resources and Meteorology; Rural Development, Health, Defense, Police, etc. NCDM is replicated at lower levels--each province also has a PCDM and each district a DCDM which are chaired respectively by provincial governors and district chiefs; and the committee members are government line ministries and agencies. The NCDM is responsible for managing disaster risk data and providing reporting on disasters, securing resources for emergency response, DRM capacity building and human resource development in DRM, coordinating the implementation of disaster management policies and



information sharing on DRM.

- Emergency Management Policy and National Disaster Management Bill: The NCDM is finalizing a national Emergency Management Policy and National Disaster Management Bill that will provide a strong basis for coordinated and effective disaster risk management in the country. Both these documents are awaiting approval from the Council of Ministers.
- The country's National Poverty Reduction Strategy (NPRS) identifies natural disasters—floods and droughts—as critical factors in increasing the vulnerability of rural poor and placing a disproportionate burden of coping with the effects of disasters on women.
- The National Strategic Development Plan (NSDP) for 2006 -2010 incorporates issues of disaster risks in sectors such as social welfare, water resource management and agriculture and rural development, including the protection of rural areas from floods and droughts, community based disaster preparedness and risk reduction and vulnerability reduction for the poor.

HFA Priority # 2: Identify, assess and monitor disaster risks and enhance early warning

- Cambodia has limited scientific information of its risks. Available information is not regularly developed, updated, and disseminated and also remains fragmented amongst national authorities and partner agencies. Ministry of Water Resource and Meteorology (MoWRAM) through Department of Hydrology and River Work (DHRW) and Department of Meteorology is responsible for establishing, maintaining and disseminating weather and flood forecast and early warning systems. Human resources and equipments appear as major constraints for risk

assessment and monitoring. **Several of the Early warning systems** are not well functioning; systems face problems such as poor dissemination mechanism of forecast and early warning to the end-users at community levels; poor maintenance.

- Some progress in risk assessment and monitoring and EWS can be found in the works of the Mekong River Commission which is developing flood and drought vulnerability indices for Lower Mekong basin. The MRC has also produced some flood maps for flood-prone provinces. Mekong River Commission has flood forecasting and early warning for the river flood plains which is complemented by community-based flood EWS projects of Cambodian Red Cross. Further, local risk assessments through Vulnerability and Capacity Assessment undertaken by NGOs such as Oxfam, Care and ActionAid. Also, in 2003, the NCDM and the UN World Food Program (WFP) developed risk maps of 500 of the most at risk communities. Of these 260 prone to floods and 293 prone to drought. This represents about one third of the total number of communes in the country.

HFA Priority # 3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels

- Several NGOs involved in managing disaster (risks) have created a Disaster Risk Reduction Forum with support from DIPECHO.
- With assistance from DIPECHO and ADPC Ministry of Education Youth and Sports has piloted mainstreaming of disaster risk reduction measures into education sector. The work includes mainly developing and integrating DRR into school curriculum.
- NCDM has formulated a national disaster risk communication strategy.
- Several NGOs have conducted local public awareness campaigns as part of community based projects.

HFA Priority # 4: Reduce the underlying risk factors

- Numerous small scale (ponds, culverts, safety boats, etc) flood and drought mitigation projects implemented by NGOs and MoWRAM has developed flood protection structures in few provinces.
- MRC implementing long term Flood Mitigation and Management Programme (FMMP) for lower Mekong basin No risk financing strategy and extremely limited insurance penetration
- Tonle Sap Basin Authority created for sustainable use of lake ecosystem with ADB support Limited efforts to address DRR across sectors
- MRC is in the process of producing flood proofing guidelines. However in general there is lack of national building codes, standards and technical specifications that response to Cambodian disaster contexts and lack of enforcement
- Comprehensive norms and standards not established for integration of disaster risk reduction measures into post disaster recovery and rehabilitation processes
- National Adaptation Program of Action to Climate Change (NAPA): Approved by the government in 2006, the NAPA presents 16 priority adaptation activities in key sectors such as agriculture, water resources and coastal zone management. Do far a very few projects proposed in NAPA have been taken up. SNAP/DRR presents mainstreaming of DRR into the NAPA as a first order priority under Mainstreaming DRR into policies and Programs of Ministry of Environment. Both SNAP/DRR and the NAPA seek to address community vulnerability to hazards.

HFA Priority # 5: Strengthen disaster preparedness for effective response at all levels

- There is a national working group on disaster coordination, response and recovery chaired by NCDM. Also, as mentioned under HFA 1, the draft of the National Emergency Management Policy has been formulated by NCDM. However there is still lack of a Standard Operating Procedure for national and local emergency response.
- Svae Rieng and Takeo Provinces have formulated Flood preparedness Plans while the provinces of Prey Veng, Kandal and Kratie are being supported under Flood Emergency Management Strengthening (FEMS) program of ADPC/ADB.
- United Nations Disaster Management Team, IFRC, Oxfam and Care have well established regional response mechanisms in place.

4. KEY DONOR ENGAGEMENTS

REGIONAL INITIATIVES

1. The ARPDM (ASEAN Regional Program on Disaster Management (2004-2010) and subsequent AADMER (ASEAN Agreement on Disaster Management and Emergency Response) signed by member states in 2005, Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations (SASOP)
2. The Regional Consultative Committee on Disaster Management (RCC) RCC Program on Mainstreaming Disaster Risk Reduction into Development (MDRD) Phase I (2004-2007) and Phase II (2008-2012)
3. ASEAN, UNISDR and WB 5 year Memorandum of Cooperation (2009-2014)
4. Forthcoming Memorandum of Understanding between Asian Disaster Preparedness Center (ADPC), and World Bank, sets forth the framework for a collaborative alliance between the two organizations.
5. Mekong River Commission: Created as an intergovernmental body by the countries of the Mekong Basin, MRC is supporting member countries in the following five areas: Flood Management and Mitigation programme, including Establishment of Regional Flood Management and Mitigation Centre (RFMMC); Structural Measures and Flood Proofing; Enhancing Cooperation in Trans-boundary Flood Issues; Flood Emergency Management Strengthening; and Land Management.
6. Asian Disaster Preparedness Centre: The Asian Disaster Preparedness Center (ADPC) is a regional non profit resource center based in Bangkok, with substantial experience in implementing disaster risk management projects in countries of the region including Cambodia. Some of the projects which it helped implement in Cambodia are Capacity Building for Integrated Disaster Management in Cambodia (UNDP support), Community Based Flood Mitigation and Preparedness 1995-2004 (under the Asian Urban Disaster Mitigation Program), Flood Emergency Management Strengthening 2004-2007 (with MRC and GTZ) and mainstreaming DRR in the education Sector (with NCDM, ECHO, UNDP and MoEYS).

DONORS/IFIS

- AusAID: Reducing the vulnerability of the poor to natural disasters is one of the three themes for Australia's engagement in development cooperation with Cambodia. Australia has been a
- DIPECHO: Ongoing funded projects include Promoting and Strengthening Disaster Resilient in Cambodia DIPECHO Partners include several NGOs including Action Aid, Lutheran World Federation (LWF-Cambodia), Cambodian Red Cross, Danish Red Cross, Netherlands Save the Earth, etc. DIPECHO South East Asia Action Plan (Subject to availability of funds) will support DIPECHO projects beginning April 2010 and will have a duration of maximum 15 months.

- ADB - Community Based Disaster Risk Reduction Strategy for Flood and Drought (2007 – 2012) Implemented with ADPC, in partnership with MoWRAM. Promoting community level action and developing CBDRM plans.
- UNDP: UNDP is engaged in supporting the NCDM and Mekong River Commission as well as in developing climate forecasts and applications, and flood mapping and early warning initiatives
- World Bank: The GFDRR/WB is preparing a Technical Assistance to ensure better coordination and implementation of SNAP-DRR, to integrate disaster risk reduction into national development planning, implement the national CBDRR strategy and develop guidelines for integration of DRR into local development plans, initiate the mainstreaming DRR into policies and programs of two ministries, support the development of provincial multi hazard DRR plans and implement partnerships in at least two new provinces, strengthening the Management of NCDM. Similarly past World bank engagement under the completed Flood Emergency Rehabilitation Project (FERP) repaired and rehabilitated infrastructure damaged by floods in 2000, and provided TA to help build capacity to more effectively manage and mitigate future water disasters
- GTZ: Providing major support to MRC; GTZ-MRC-ADPC Flood Emergency Management Strengthening (FEMS)
- WFP: Food aid through Food For Work program targeted towards poorest communities; damage and needs assessment (DANA) guidelines and tools for NCDM developed
- UNESCAP: Partnership for Disaster Reduction in Southeast Asia (PDR-SEA) (Phase I, II, III & IV)

NGOs

- LWF, CWF, Concern Worldwide, Care International, World Vision, ZOA, Action Aid, CRC, Oxfam GB, Oxfam America, Oxfam Australia, DCA, Save the Earth and other local NGOs etc.

Guiding Principles for GFDRR/WB interventions

The main objective of the GFDRR/WB support will be to safeguard livelihoods of rural poor against floods and drought risks and help address persistent poverty and maintain sustainable economic development. Following will be the guiding principles for WB engagement in DRM in Cambodia for 2010-2012:

- *Disaster types*: Focusing on flood and drought risk management which is directly linked to the rural poverty;
- *Promoting national strategies*: Advancing priorities as set out in the SNAP-DRR and the DRR components of the National Adaptation Plan of Action (NAPA);
- *People and livelihood focus*: Taking a people centered approach to safeguard their livelihoods from disaster;
- *Partnerships*: NCDM will be the coordinating partner at the national level and line ministries will be focal points; PCDM/DCDM will be partners at implementation level. Where possible we will rely on respective comparative advantages;
- *Multi-sector approach*: Engaging the provinces in implementing the DRR on the ground to enable a multi-sector approach (education, transport, agriculture, water resources and health) to mainstream the DRR into the sector policy and plan; build a cadre of disaster risk reduction champions across sectors;
- *Focus on poor provinces*: Focusing on provinces which are relatively poor and with less donor support;
- *Regional consideration*: Engaging Vietnam and MRC to address the flood and drought risk management from a regional view.
- *Emerging urban risks*: While the priority is on rural, begin actions towards identifying and assessing emerging urban risks

- *Risk financing*: Begin actions towards disaster risk financing (private sector engagement, agricultural insurance, credit schemes, etc);
- Capitalize on existing DRM experience (from pilots) such as in education sector
- Tie with existing World Bank projects where possible
- Promote organizations with regional expertise on disaster risk management
- Prepare engagement framework with other donors
- Prepare a cadre of Damage and Loss Assessment experts.
- Consolidate GFDRR Phase-I activities

Key Program Targets

- Key structure and non-structural measures implemented in the high priority provinces;
- DRR elements integrated into the provincial sector planning and implemented on the ground;
- Adequate capacity for disaster management built at the provincial, district, and the community level, and the national level capacity strengthened

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Indicative Program for GFDRR Funding (Projects and engagement areas)	Partners	Indicative Budget (US\$)	SNAP Priority/ HFA Activity Area
Capacity building of Hydmet agencies for Early Warning and weather forecast systems	MoWRAM, NCDM	200,000	Critical/ 2, 4
Consolidate Phase I GFDRR activities in Svay Rieng and Pray Veng provinces/ Expand to 3 provinces of Eastern Mekong Delta <ul style="list-style-type: none"> - Public consultation and preparation of risk mapping - Capacity assessment of PCDMs for disaster risk management - Development of Sector Adaptation Plans (transport, health, education and agriculture) - Contribution to National and Regional Food and Drought Strategy - Support for Early Warning and weather forecast systems - Flood and Drought Vulnerability Mapping (possible co-operation with WFP) - Disaster-proofing existing critical infrastructures - Support efforts by stakeholders for better coordination (AA/ Oxfam/Care) - Support Roadmap for Developing and Implementing Flood and Drought Risk Reduction Programs (2008-2012) for high risk/ vulnerable communities - Climate Adaptation: Support priority projects in NAPA <ul style="list-style-type: none"> -Conclusion of activities in Prey Veng and Svay Rieng as outlined in Phase I. 	Various relying on comparative advantages	2,400,000	First/1-5
<u>Task Based Strengthening of NCDM: to make them effective in coordinating WB support to Cambodia</u> <ul style="list-style-type: none"> - Organizational strengthening in terms of human and material capacity - Support NCDM to integrate disaster risk reduction in national development strategies including National Poverty Reduction Strategy (NPRS) and National Strategic Development Plan (NSDP). 	NCDM	Part of Above	
Developing DRM components within Sector Wide Approach (SWAp) in Transport and Health Sectors	Various (ADB, GTZ, AusAID, IDA); MoH; MoPWT	2,300,000	First/4
Strengthening existing technical standards and design specifications in different sectors (transport, school) to ensure that they meet Cambodian standards for disaster resilience	Various; MoLMUPC	Part of Sector SWAp	First/ 4
<u>Emerging urban risks</u> <ul style="list-style-type: none"> - Identifying and assessing emerging urban risks for Phnom Penh, Siem Reap and coastal areas - Strengthening National Building Code that respond to Cambodian conditions and supporting their enforcement 	MoLMUPC	300,000	First/2,4
Issue paper on disaster risk financing (agriculture insurance, private sector participation, etc.)	MoRD, MoAFF	50,000	First, third/ 4
Strengthening capacity for DRM (3 years)	NCDM	100,000	
Total Indicative Budget		5,350,000	

LAO PDR

To prepare the Country DRM Note, consultations were undertaken with the National Disaster Management Office (NDMO) and members of the World Bank's Country team. Working closely with NDMO, consultations were held with Ministry of Health, Ministry of Education, Ministry of Public Works and Transport, Ministry of Agriculture, Lao National Mekong River Commission, Department of Meteorology and Hydrology, Mekong River Commission, Asian Development Bank, JICA, UNDP and Oxfam-Australia. Consultations were also held with the Provincial Disaster Management Committees in Vientiane and Khammouane provinces; and line departments representing the committees. In Khammouane, discussions were held with Khammouane Development Project (KDP) including Department of Irrigation; authorities of Nongbok District Disaster Management Committee. Together with ADPC and KDP, flood prone areas were visited and consultations were also held with flood vulnerable people in Sokbo village. The findings were presented to the National Disaster Management Committee and the guiding principles for engagement in the country agreed upon.

1. DISASTER RISK PROFILE

Lao PDR has made significant gains in the area of disaster risk management in recent years and presents a suitable environment to grow further DRM initiatives: National institutions at various levels are making efforts to expand their roles from disaster managers to proactive disaster risk reduction planners. A Strategic Plan on Disaster Risk Management (SPDRM) was adopted in 2003 and there is considerable presence of donors willing to support Lao PDR in the field of DRM. By managing its disaster risks more systematically, Lao PDR also has an opportunity to preserve development gains, reduce poverty and improve the living standards of rural farmers, and ultimately graduate out of its status as a Least Developed Country.



Source: CIA Fact book

2. DISASTER RISK MANAGEMENT FRAMEWORK

Table 1. Top 5 Natural Disasters in Lao for the Period 1980-2009 (sorted by numbers of total affected population)

Disaster	Date	No Total Affected	Damage (1000 US\$)
Storm	August 1995	1,000,000	Not available
Drought	Dec-88	73,0000	Not available
Flood	Aug-01	45,3000	Not available
Flood	Sep-00	450000	Not available
Flood	15/08/1996	42,0000	Not available

Created on: May-25-2009 - Data version: v12.07; Source: *EM-DAT: The OFDA/CRED International Disaster Database; www.em-dat.net - Université Catholique de Louvain - Brussels, Belgium

The major natural disasters Lao PDR faces are floods and droughts: Most flooding occurs during May to September when Monsoon rains accumulate in the upper Mekong river basin. In

addition to river basin flooding, flashfloods in the northern mountainous region are also common. It is estimated that the south and central regions, where about two thirds of the country's population live, face on an average of 1.5 serious floods or droughts every year. Lao PDR is also susceptible to landslides, pest infestations and fire due to slash and burn agriculture. Most recently, the floods of August 2008 are estimated to have affected about 204,000 people, damaged an estimated 50,000 Ha of arable land and caused a damage and loss of over US\$ 9 million.

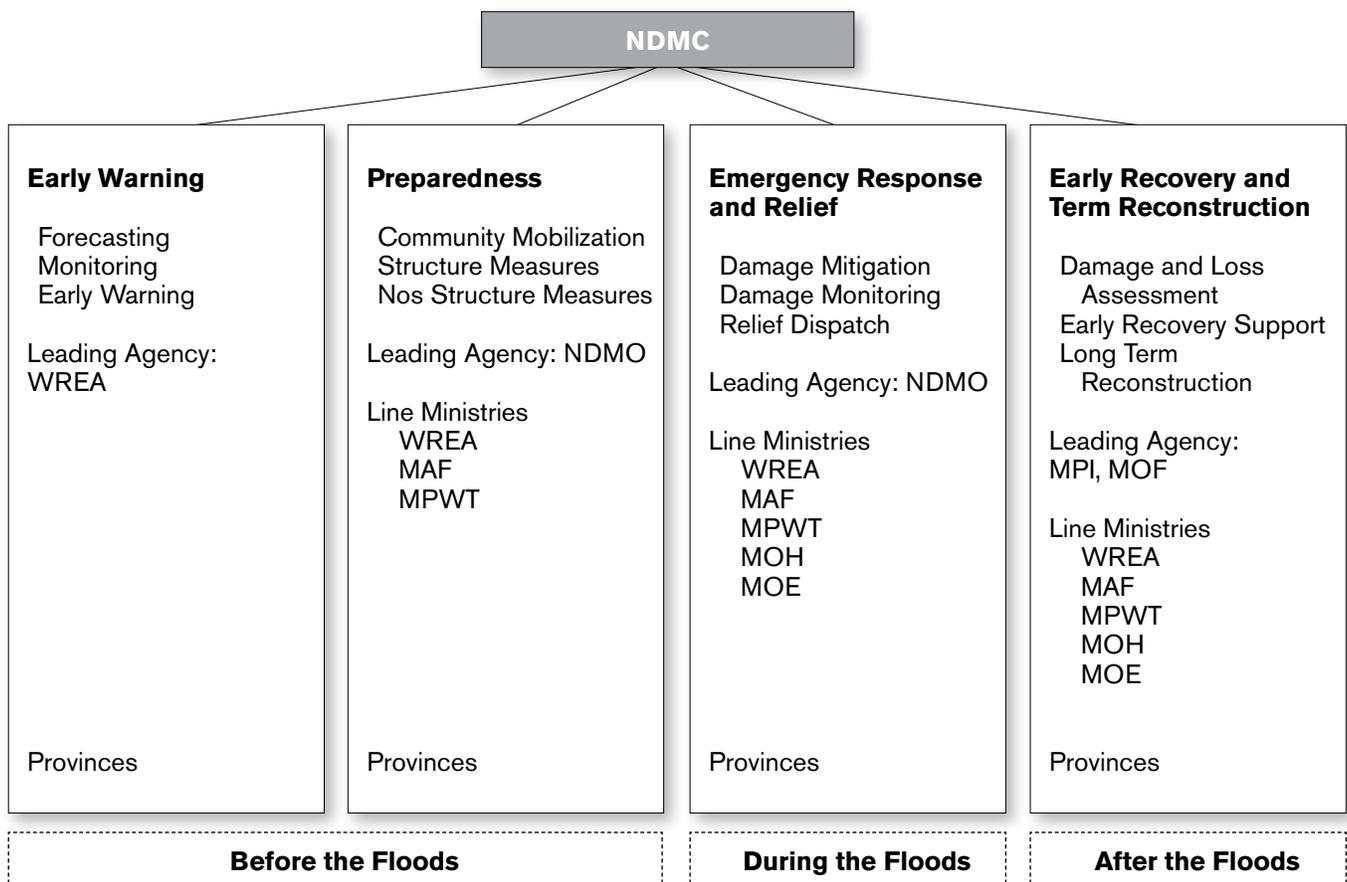
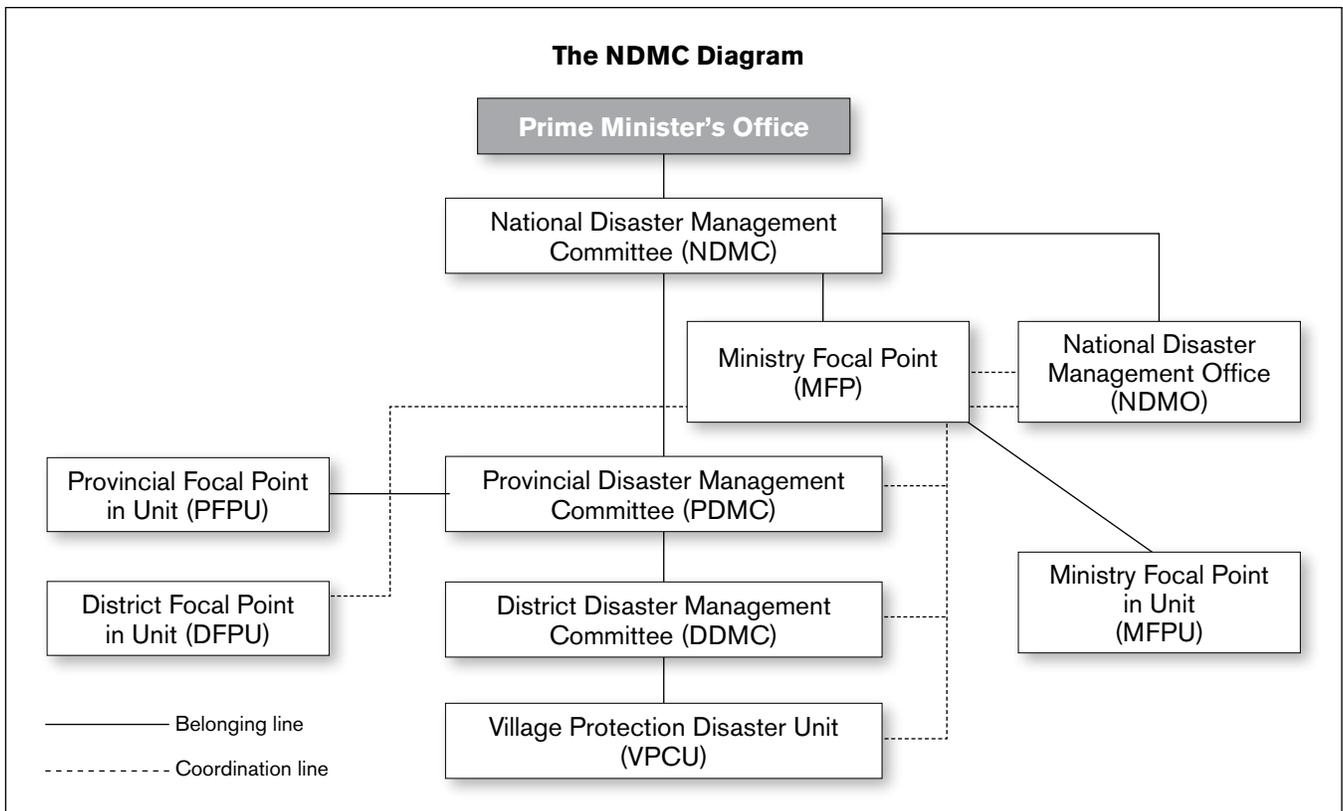
High degree of poverty in the rural areas means even low intensity natural disasters increase the vulnerability of rural farmers: Agriculture is mostly dependent on rainfall, and a modest drought could increase food insecurity.

On the other side of the spectrum, the capital Vientiane is urbanizing rapidly: As newer infrastructures are built with inadequate land use planning and loosely enforced building codes, newer vulnerabilities are fast accumulating with typical urban trademarks in the capital Vientiane.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Ensure that disaster risk reduction is a national and local priority with a strong institutional basis for implementation

- National Disaster Management Committee (NDMC), an inter-ministerial committee, is the apex body with responsibilities for developing policies and coordinating DRM activities in the country. NDMC was established through a prime ministerial Decree No. 158/PM in August 1999. National Disaster Management Office (NDMO) is the secretariat of NDMC and is located in the Ministry of Labor and Social Welfare (MLSW). Roles and responsibilities of the NDMO and each member of NDMC have been defined by the internal MLSW decree No. 097/MLSW of June 2000. Under this decree, disaster management committees are established at the Provincial, District and Village levels.
- As a result of directions by NDMC, the Provincial Disaster Management Committees (PDMC) are now chaired by the provincial governor instead of the vice-governor which gives them more authority to act on DRM issues. Also, more and more line departments are being represented in the PDMCs.
- NDMC is currently represented by several important sectors such as health, education, public works, transport, etc. A proposal is under consideration for expanding the membership of the NDMC to include additional important sectors such as energy and mining, planning and investment, water resources and environment, science and technology and agencies such as Lao PDR Women Union, and Lao Youth Union.
- A Ministry of Labor and Social Welfare decree (1139/MLSW) of April 2003 defined the Strategic Plan on Disaster Risk Management (SPDRM) corresponding to three different periods 2003-2005, 2005-2010 and 2010–2020.) The SPDRM emphasizes sustainable development through DRR, risk reduction through environmental protection, more preparedness than relief. The Strategic Plan also aims to share the disaster risk management responsibility between the communities and the government.
- Disaster risk management is integrated into the Lao PDR's Sixth National Socio Economic Development Plan NESDP (2006-2010) and the National Growth & Poverty Eradication Strategy (NGPES). The United Nations Development Assistance Framework lists DRM as a key area for cooperation and one of the critical components of poverty reduction framework.
- National Disaster Management Office, with UNDP support, is planning to prepare a Strategic National Action Plan for DRM by 2010. The draft is planned for December 2009. The Action Plan will focus on getting more ownership by various sector ministries in advancing DRM in the country.



HFA Priority # 2: Identify, assess and monitor disaster risks and enhance early warning

- Limited risk mapping in selected communes and districts have been funded under donor projects, but no comprehensive or composite country-wide hazard or risk mapping exists.
- Department of Meteorology and Hydrology (Ministry of Agriculture and Forestry) is the main agency that produces the early warning information and disseminates to disaster management organizations, mainly to the National Disaster Management Office (NDMO). The NDMO then sends this information to the local disaster management organizations to take appropriate actions and disseminate early warnings to communities at risk.
- When disaster occurs, information from the local level to the national level is slow. The capacity and the resources available with the local Disaster Management Committees for data collection and dissemination is extremely weak.
- Flood Vulnerability Assessment and Mapping Project (FVAMP) of the Mekong River Commission (MRC) is working to provide flood vulnerability indices to better manage flood and drought indices.
- Hazard, Vulnerability and Capacity Assessment is being carried out under Lao Red Cross project 'Community Based Disaster Preparedness Program (2007–2011) in 5 flood and drought prone villages in Khammoaune and Savannakhet province.
- The World Bank's GFDRR pipeline project will fund risk mapping in two to three provinces.

HFA Priority # 3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels

- There is lack of comprehensive disaster information management system. The National Disaster Management Office is responsible to carry out the function but it lacks human and information management capacities. A project with Save the Children Australia and Asian Disaster Preparedness Center (ADPC) aims to strengthen the information management system, currently being piloted in Sayaboury province.
- Phase II of the Mainstreaming DRR in the Education Sector in Lao PDR project between Ministry of Education MOE, NDMO, Asian Disaster Preparedness Centre, ADCP, and UNDP (with Support from ECHO), is taking up further activities to mainstream disaster risk reduction in the education sector such as supporting institutionalization of the disaster risk reduction module of phase I in the national curriculum and in the teachers training system; pilot testing of disaster risk reduction teaching aid materials in six schools; developing a framework curriculum plan to aid in the future integration of disaster risk reduction in Lao PDR and identifying specific opportunities for integrating hazard resilience school construction features in one pipeline project.
- A comprehensive national action plan for disaster resilient school systems is lacking. Further the following needs were identified by Ministry of Environment: Building more trainers at all levels; sensitizing (for better understanding of DRR) high ranking officials in the ministry, heads of local education departments, head of schools and primary school children; experience sharing with other countries; and expansion of curriculum across all technical sectors.
- Under the Laos-Australia NGO Cooperation Agreement (LANGCOCA), a project Tools for Disaster Risk Assessments (TDRA) is being conducted by NDMO and Save the Children Australia with the support of ADPC. The project will support the development of a risk assessment system for use in Sayaboury district and will support the provincial and district capacities in hazard and risk identification, assessment, and financing.
- The national government has no specific disaster risk management public awareness and education programs in place. However activities under donor programs such as (i) Flood Preparedness Project (ADPC-MRC) (ii) Mainstreaming in education Sector (ADPC) and (iii) DRR Project (Oxfam/Save the Children Australia) have awareness and education programs.

HFA Priority # 4: Reduce the underlying risk factors

- Most recently the National Action Plan for Adaptation (NAPA) for Climate Change has been approved by the government. The NAPA has identified 45 priority project proposals to implement adaptation activities in four main sectors: agriculture, forestry, water and water resources, and public health. 12 of these projects have been prioritized as primary while remaining 33 as of secondary priority. There is a greater need for NDMO and Climate Change Office to work closely to advance DRR components of the NAPA.
- Some limited efforts in agriculture sector such as river embankment, protection of dams, seed stocking during floods, maintenance and rehabilitation of irrigation canals have been carried out.
- JICA is supporting the update of Urban Development Master Plan for Vientiane capital which has a component of improving building codes. Similarly Component 5 of the Mekong River Commission project on Flood Mitigation and Management Program has a land management component.
- Capacity building for Damage and Loss Assessment is being carried out by National Disaster Management Office and Ministry of Planning and Investment (MPI) with support of World Bank. This capacity building effort aims to prepare a cadre of local experts for damage and loss assessment who can be readily deployed in the event of a major natural disaster.

HFA Priority # 5: Strengthen disaster preparedness for effective response at all levels

- Practically, there is very limited budget for disaster risk management or recovery activities. Funds are mobilized from the national and local budgets in the event of a disaster. One Billion kip, about US \$120,000 through the Ministry of Labor and Social Welfare (MLSW) for emergency response per year is earmarked by government. The government does not have a national disaster relief reserve fund that provides funding for emergency response and recovery activities when a disaster strikes. Some departments have their own funds albeit limited such as agriculture (seed, water pump repair), public works (road repair), social welfare and labor (relief) etc.
- Department of Social Welfare compiles from provincial departments the loss/damage and need for assistance, then the department makes request to Minister for use of funds.
- NDMO is inadequately mandated (resource poor) and its mandate for risk reduction is yet to be understood by other line ministries.
- No contingency plan for natural disaster events is prepared by the NDMC. However every year NDMC meets prior to the disaster season, collects preparedness plan from line ministries. NDMC notifies Provincial Disaster Management Committees suggesting them to prepare response plans. Some province do well; those provinces without disaster history have difficulty in planning. However planning is poor and there is need to strengthen the process. Information from line ministries may or may not become available in a timely fashion. There is need to have better intra governmental cooperation and inter agency-cooperation.
- There is a need for a uniform methodology for making post disaster damage and needs assessments for consistency and coming up with nationally agreed upon damage and loss figures. Also, there is need to have a disaster information centre at NDMO.

4. KEY DONOR ENGAGEMENTS

REGIONAL INITIATIVES

1. The ARPDM (ASEAN Regional Program on Disaster Management (2004-2010) and subsequent AADMER (ASEAN Agreement on Disaster Management and Emergency Response) signed by member states in 2005, Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations (SASOP).
2. The Regional Consultative Committee on Disaster Management (RCC) RCC Program on Mainstreaming Disaster Risk Reduction into Development (MDRD) Phase I (2004-2007) and Phase II (2008-2012). Lao PDR is an active member.
3. ASEAN, UNISDR and WB 5 year Memorandum of Cooperation (2009-2014).
4. (Forthcoming) Memorandum of Understanding (2009) between Asian Disaster Preparedness Center (ADPC), and World Bank, sets forth the framework for a collaborative alliance between the two organizations.
5. Mekong River Commission: Created as an intergovernmental body by the countries of the Mekong Basin, MRC is supporting member countries in the following five areas: Flood Management and Mitigation programme, including Establishment of Regional Flood Management and Mitigation Centre (RFMMC); Structural Measures and Flood Proofing; Enhancing Cooperation in Trans-boundary Flood Issues; Flood Emergency Management Strengthening; and Land Management.
6. Asian Disaster Preparedness Centre: The Asian Disaster Preparedness Center (ADPC) is a regional non profit resource center based in Bangkok, with substantial experience in implementing disaster risk management projects in countries of the region including Lao PDR.

DONORS/IFIS

- Laos-Australia NGO Cooperation Agreement (LANGOCA), a consortium between Australian NGOs and Lao government, funded by AusAid is strengthening community level preparedness and response to natural disasters. LANGOCA works closely with National Disaster Management Office.
- National Disaster Management Office, with UNDP support, is planning to prepare a Strategic National Action Plan for DRM by 2010. The draft is planned for December 2009. The Action Plan will focus on getting more ownership by various sector ministries in advancing DRM in the country. UNDP is also working with NDMO to enhance capacity at all levels of government disaster management for preparedness, response and rehabilitation.
- Lao National Mekong Commission, Asian Disaster Preparedness Center and National Disaster Management Office are continuing to prepare and improve Flood Preparedness Plans for Khammouane and Savannakhet province with financial support from the Gesellschaft fur Technische Zusammenarbeit (GTZ) and ECHO.
- Emergency Relief for the 2008 Floods has been provided by most major UN Agencies (FAO, WHO, UNICEF) and NGOs and bilateral donors (ECHO, USAID, Japan, Singapore, Sweden, Canada and Germany).
- Mekong River Commission (MRC) is currently implementing Flood Mitigation and Management Program (FMMP) with the support of donors such as Japan and Denmark. Asian Development Bank is preparing a TA for flood management project.
- A Priority Investment Plan was developed for mainstreaming disaster risk reduction into Agriculture sector by NDMO and Ministry of Agriculture with technical support from ADPC and GTZ.
- Japanese International Cooperation Agency (JICA) is supporting pilot works in riverbank protection in Vientiane Municipality.
- Most recently the World Bank is working with NDMO, Water Resources and Environment Administration (WREA)

and Ministry of Planning and Investment (MPI) to support the operationalization of the Strategic Plan for Disaster Risk management (SPDRM). This includes funding a US \$1 million project assisting the Government to design an implementation plan for its disaster risk management strategy and strengthen the hydromet, early warning and river basin management. It is also helping strengthen the Government's capacity in carrying out damage and loss national assessment (DALNA) to measure impact of natural disasters.

Guiding Principles for GFDRR/WB interventions

The main objective of the GFDRR/WB support will be to safeguard livelihoods of rural poor against floods and drought risks and help address persistent poverty and maintain sustainable economic development. Following will be the guiding principles for WB engagement in DRM in Lao PDR for 2010-2012:

- Consolidate current GFDRR activities and tie in with existing World Bank and bi-lateral operations where possible (Education SWAp, Transportation Sector Project, Khammoune Development Project, Integrated Water Resources Management Project);
- *Focus on rural poverty*: The focus will be on flood and drought risk management that is directly linked to the rural poverty;
- *Promote national strategies*: Advancing priorities as set out in the Strategic PDM and the DRR components of the National Adaptation Plan of Action (NAPA);
- *Incorporate disaster risk reduction elements into investment planning* (Priority Investment Plan and National Economic and Social Development Plan);
- Engage with the provinces in implementing the DRR on the ground;
- *Focus on people and livelihoods*: Taking a people centered approach to safeguard their livelihoods from disaster;
- *Engage in a multi-sector approach*: Engaging the provinces in implementing the DRR on the ground to enable a multi-sector approach (education, transport, agriculture, water resources and health) to mainstream the DRR into the sector policy and plan; build a cadre of disaster risk reduction champions across sectors;
- *Assess emerging urban risks*: While the priority is on rural, begin actions towards identifying and assessing emerging urban risks;
- *Researching risk financing*: Begin actions towards disaster risk financing (private sector engagement, agricultural insurance, credit schemes, etc);
- *Expand partnerships*: NDMO will be the coordinating partner at the national level and line ministries will be focal points; PDMO/DDMO will be partners at implementation level. Where possible we will rely on respective comparative advantages of other stakeholders;
- Strengthen overall capacity of NDMO and support to establish a broader engagement framework for the donors (ADB, UNDP, LANGOCA, JICA);
- *Include regional consideration*: Engaging riparian countries and MRC to address the flood and drought risk management from a regional view;
- Promote organizations with regional expertise on disaster risk management;
- Explore implementation of existing DRR plans (such as Flood Preparedness Plans in Khammouane, JICA work on Urban Strategic Dev Plan) and capitalize on existing DRM experience (from pilots) such as in education sector.

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Program Targets

- DRR elements are integrated into the national and sector planning and implemented on the ground;
- Key structure and non-structural measures are implemented in the high priority areas;
- Adequate capacity for disaster management is built from the national, provincial, district, and the community level.

Indicative Program for GFDRR Funding (Projects and engagement areas)	Partners	Indicative Budget (US\$)	HFA Activity Area(s)
Capacity building of Hydmet agency for early warning and weather forecast systems	DMH, WREA, NDMO	US \$200,000	4
Develop DRM components within Sector Wide Approach (SWAp) in Education, Health and Transport Sector	Various relying on comparative advantages; MOE, MOH, MPWT, NDMO	US \$2,000,000	1–5
Incorporating DRM component in Mekong Water Resources Management Project	Various, MRC, ADB, WREA	US \$2,000,000	1–5
Incorporating DRM component in Khammouane (Province) Development Project, and Second Province Development Project	Various	US \$1,000,000	1–5
Strengthening existing technical standards and design specifications in different sectors (transport, school)	MPWT, MOE, NDMO	Part of Sector SWAps	4
<u>Emerging urban risks</u> Identifying and assessing emerging urban risks for Vientiane Capital	JICA, MPWT, NDMO	US \$300,000	2, 4
Issue paper on disaster risk financing (agriculture insurance, private sector participation, etc)	MAF, MRD, NDMO	US \$50,000	4
Strengthening capacity for DRM (3 years)		US \$100,000	
Total Indicative Budget		US \$5,450,000	

6. BIBLIOGRAPHY

ADPC. *Mainstreaming DRR into Development Policy, Planning and Implementation in Asia*.

ADPC. 2008. Incorporating Disaster Risk Assessments as part of Planning process before Construction of New Roads.

ADPC. 2001. *Policy, Legal and Institutional Arrangements, and Planning for Disaster Management in Lao PDR*.

ADPC. 2004. *Reducing Fire Threats to Homes: Piloting Community-based Fire Risk Assessment in ban Hatsady Village*.

ASEAN. 2007. *ASEAN Agreement on Disaster Management and Emergency Response*.

Department of Disaster Prevention and Mitigation, ASEAN. 2007. Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations (SASOP).

Government of Lao PDR. *National Socio-Economic Development Plan (2006-2010)*.

ISDR. 2008. *HFA Progress Monitoring and Review: 2007-2009*.

NDMO/Ministry of Education/ EC/ UNDP/ADPC. 2008. *Mainstreaming Disaster Risk Reduction in the Education Sector in Lao PDR*.

Provincial Disaster Management Committee (PDMC). 2007. *Flood Preparedness Program Khammouane Province 2007*.

Science and Technology and Environment Agency/United Nations Development Program. 2005. *Laos National Adaptation Program of Action Annual Project Report (October 2004 to September 2005)*.

UNOCHA. 2007. *UNDAC Disaster Preparedness Mission Lao PDR*.

World Bank. 2007. *Country Assistance Strategy Progress Report 2007*.

PHILIPPINES

To prepare this Country DRM Note, consultations were undertaken with members of the World Bank Philippines Country Team, the National Disaster Coordinating Council of the Philippines, the Department of Budget Management, and the Department of Interior and Local Government. The report builds on the Strategic National Action Plan (2009-2019) for Strengthening Disaster Risk Reduction in the Philippines, which the Philippine government and a broad base of stakeholders are finalizing to support the Hyogo Framework for Action.

1. DISASTER RISK PROFILE

To prepare this Country DRM Note, consultations were undertaken with members of the World Bank Philippines Country Team, the National Disaster Coordinating Council of the Philippines, the Department of Budget Management, and the Department of Interior and Local Government. The report builds on the Strategic National Action Plan (2009-2019) for Strengthening Disaster Risk Reduction in the Philippines, which the Philippine government and a broad base of stakeholders are finalizing to support the Hyogo Framework for Action.



The Philippines is considered one of the most disaster-prone countries in the world. Its location makes it vulnerable to a variety of natural disasters. Lying on the western rim of the Pacific and along the circum-Pacific seismic belt, it is subject to storms, typhoons, earthquakes, floods, volcanic eruptions, droughts and faces other natural hazards. Disasters are a serious threat to people and economic assets, particularly in densely populated areas. At least 60 percent of the total land area of the country is exposed to multiple hazards, and as a result 74 percent of its population is vulnerable.

With 268 recorded disaster events over the last three decades, the Philippines ranks 8th according to World Bank's Natural Disaster Hotspot list of countries most exposed to multiple hazards (Table 1). Almost 30 percent of the disasters that occurred in Southeast Asia for the period 1990-2009 (Table 2) occurred in the Philippines.

Table 1

COUNTRIES MOST EXPOSED TO NATURAL HAZARDS FROM MULTIPLE HAZARDS (Top 60 based on land area with 2 or more hazards)
1. St. Kitts and Nevis
2. Macau, China
4. Hong Kong, China
6. Vanuatu
7. Vosta Rica
8. Philippines
9. Nepal
10. Guatemala
12. Ecuador
13. Reunion
15. Somalia
16. South Africa
17. Japan
19. Bangaldesh
26. Solomon Islands

Table 2

TOTAL NUMBER OF DISASTERS IN SOUTHEAST ASIA 1990-2009*		
Country	Number	Sample %
Cambodia	15	1.9
East Timor	19	2.4
Indonesia	223	27.6
Lao PDR	22	2.7
Malaysia	52	6.4
Myanmar	21	2.6
Philippines	237	29.4
Singapore	3	0.4
Thailand	89	11.0
Timor-Leste	2	0.2
Vietnam	124	15.4
Total	807	100.0

Source: EM-DAT: The OFDA/CRED International Disaster Database www.emdat.be – Université Catholique Louvain – Brussels – Belgium.
*as of data generated on April 2009.

Historic Overview of Disasters

Earthquakes: The U.S. Geological Survey lists 168 significant (with a magnitude of 6.5+ on the Richter scale) earthquakes in the Philippines since 1959, equivalent to an event every 2.5 years. The Philippine Institute of Volcanology and Seismology (PHIVOLCS) has recorded 12 destructive earthquakes in the last 40 years; the most damaging of which were the 1976 Mindanao Earthquake, which killed approximately 6,000 and caused about US \$400 million (in present value) in damage, and the 1990 Central Luzon Earthquake, which killed over 1,000 people and caused damages of about US \$400 million (in present value).

A comprehensive seismic hazard analysis for the Philippines has not been prepared. However, more recent studies shows that accelerations in the Metro Manila area are about 0.4g, comparable to those in San Francisco, Tokyo and other high-seismic areas.

Volcanoes: Out of 220 volcanoes in the archipelago, 22 are classified as active. The most active volcanoes in the Philippines are Bulusan, Mayon, Canlaon and Taal. The most recent major eruption in the country is the Mount Pinatubo eruption in June 1991. PHIVOLCS forecast of the event saved at least 5,000 lives and US \$250 million worth of property and infrastructure.

A review of historic record indicates that central and southern Luzon are likely to experience a significant eruption about once every three years, with a major eruption perhaps every few decades. Mayon and Taal are the most active of these volcanoes.

Tropical cyclones: The climate of the Philippines is tropical and is strongly affected by monsoon (rain-bearing) winds, which blow from the southwest from approximately May to October and from the northeast from November to February. From June to December, an average of twenty typhoons hits the country accompanied by strong winds, intense rainfall and flooding. Five to seven of which are expected to be destructive. Most storms come from the southeast, with their frequency generally increasing from south to north. Luzon has significantly higher risk than the southern part of the country, where typhoons are heaviest in Samar, Leyte, eastern Quezon Province and the Batanes Islands.

Flooding: Floods are usually triggered by typhoons, tropical depression and continuing heavy rains. They are also triggered by man-made causes such as dam failures, blockage of water ways by garbage and improper design of street drainage.

Exposure and Vulnerability

The average annual damage caused by disasters amounts to Pesos 19.7 billion in the past two decades, equivalent to an average of 0.5 percent of GDP each year. In addition, agricultural damage is estimated at Pesos 12 billion per annum, and an average of 1,008 people are killed annually by natural disasters. Typhoons are the most frequent and the most damaging of all natural disasters in the Philippines. The poor are the most vulnerable to the damage caused by natural disasters as they are the ones left homeless and whose livelihoods are destroyed by the vagaries of the weather. Since almost one-third of the country's employment is based on agriculture, natural disasters have contributed to the increasing incidence of poverty, especially in the rural areas.

In urban areas, those living in calamity-prone areas such as riverbanks and estuaries are vulnerable to natural and man-made disasters. Those in flood-prone areas, along the coast and on steep slopes in upland areas are also at risk. Natural disasters increase their vulnerability and perpetuate deprivation and marginalization.¹

¹ National Assessment on the State of Disaster Risk Management of the Philippines. Final Report (October 2008).

The scale and significance of disasters is illustrated by the impact on lives and livelihoods illustrated in Table 3 below. As a result of 121 disasters that struck the country from 2000 to 2008, more than 36 million people were affected, 8,177 lives were lost, 374,798 became homeless and 6,261 were injured

Table 3

IMPACT OF DISASTERS 1990–2008					
Disaster type	Number	Death	Affected	Homeless	Injured
Drought	2	0	–	0	0
Earthquake	1	15	73,351	0	100
Epidemic	3	35	774	0	0
Flood	35	434	2,996,037	56,750	108
Mass movement (dry)	1	11	–	0	0
Mas movement (wet)	7	1693	235,341	0	142
Storm	67	5,989	32,898,135	318,048	5,911
Volcano	5	0	209,532	0	0
Total	121	8,177	36,413,170	374,798	6,261

Source: Emergency Events Database (EMDAT)

Determinants of Vulnerability to Natural Disasters in the Philippines²

Urbanization: Rapid urbanization in the country has led to urban squalor and the proliferation of unplanned, informal and overcrowded settlements, often in hazard-prone areas. As of 2002, the country had about 1.2 million families of informal settlers who were vulnerable to typhoons and flooding. Demographic growth and urbanization have also affected provision of basic services, resulting in deteriorating solid waste management and siltation of rivers and drainage channels. These poor urban practices are aggravating flooding in urban areas for the past years and are expected to make the situation more severe in the future.

Environmental degradation: Environmental degradation has hugely contributed to increasing natural disaster occurrence in the Philippines. Demographic growth and poor land-use planning have led to the massive depletion of natural resources and destruction of the environment. Flash flooding, landslides and drought have increased in the past two decades as a result of declining forest cover. Certain areas that have substantially lost their forest cover are also more exposed to typhoons.

Climate change: Risks from global climate change are further exacerbating the country's vulnerability to natural hazards. In the last 15 years alone, the country has recorded the strongest typhoon, the most destructive typhoons, the deadliest storm and the typhoon with the highest 24-hour rainfall. These climate trends seem to fit the scientific evidence that rising sea surface temperatures enhance the destructiveness of tropical cyclones. The Philippines is expected to experience substantial rise in sea levels, making 70 percent of the 1,500 municipalities located along the coast vulnerable to this phenomenon. The country is also witnessing longer episodes of drought or El Niño, causing a large drop in the volume of agricultural production and sharp declines in GDP.

² Sourced from the Joint Study of World Bank and the National Disaster Coordinating Council, "Natural Disaster Risk in the Philippines: Enhancing Poverty Alleviation Through Disaster Reduction" pp.20-23.

The mandate for overall policy and coordination of disaster risk management (DRM) efforts in the Philippines is enshrined in Presidential Decree Nos. 1 (1972) and 1566 (1978), which led to the creation of the National Disaster Coordinating Council (NDCC). These laws: (a) adopt a Comprehensive Disaster Management Framework that divides DRM into four phases: mitigation, preparedness, response and rehabilitation; (b) call for the preparation of a National Calamity and Disaster Preparedness Plan; and (c) allow for the utilization of the Calamity Fund for activities related to DRM.

The NDCC is an inter-agency council responsible for disaster preparedness, prevention and mitigation. It is chaired by the Secretary of National Defense with the heads of 18 departments as members. In the discharge of its functions, the NDCC utilizes the facilities and services of the Office of Civil Defence as its operating arm. It serves as the President's adviser on disaster preparedness programs, disaster operations and rehabilitation efforts undertaken by the government and the private sector. NDCC is a policy and coordinating agency and does not implement activities related to DRM. It operates through member agencies and its local networks (i.e., the regional and local disaster coordinating councils), which are responsible for planning, implementing, funding and carrying out specific activities related to DRM. The NDCC adopted a Disaster Management Framework to address the different stages of disaster management.

2. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority #1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

THE NATIONAL DISASTER RISK MANAGEMENT AGENCY

The NDCC has been working towards strengthening decentralization of DRR in different sectoral agencies and LGUs. A more timely and responsive national DRM framework, along with the SNAP, are being prepared through a consultative process to improve DRM at the national and local levels. The SNAP and the National Framework for DRM will be the basis for creating a national platform for DRR.

At the sub-national level, local governments are expected to take the lead in DRM through local Disaster Coordinating Councils (DCCs) that they create (i.e., Provincial, City, Municipal and Barangay DCCs). The enactment of the Local Government Code in 1991 amplified the role of local governments in ensuring the overall security of their constituents and in assuming the role of first responders in time of emergency. For this purpose, local governments are allowed by law to set aside a portion of their income to fund expenditures related to post-disaster relief, rehabilitation, reconstruction and mitigation services in connection with a disaster/calamity.

LEGISLATIVE FRAMEWORK

There is a general recognition that DRM related policies in the country are outdated and need to be revisited in the context of emerging challenges (e.g., climate change). Efforts are ongoing to improve the policy framework, including the enactment of new laws. Discussions are ongoing to build consensus on issues and directions among stakeholders, especially among lawmakers and implementers.

The adoption by the Philippines of the 2005 Hyogo Framework of Action provides additional impetus for improving DRM. The NDCC spearheaded the formulation of the Strategic National Action Plan for Strengthening Disaster Risk Reduction. The SNAP, as it is called, will serve as the road map indicating strategic objectives and vision for the next 10 years in pursuing the strategic goals of the HFA at the country level. Under the SNAP, priority actions are clustered into 5 strategic objectives, as described in the preceding section.

DISASTER RISK MANAGEMENT IN THE POVERTY REDUCTION STRATEGY AND COUNTRY DEVELOPMENT PLANS

The Medium Term Philippine Development Plan (MTPDP) has integrated DRR issues and investment projects in the Medium Term Development Plan (MTPDP) 2004–2010. DRR is also incorporated into the National Physical Framework Plan (NPPF), which is yet to fully mainstreamed at the local level. The National Economic and Development Authority (NEDA) hopes to address this problem by developing and rolling out guidelines for the mainstreaming of DRR in LGU development plans. These guidelines will incorporate DRM considerations into the comprehensive land use, and development and budget plans of the local governments. Concerned line agencies are also encouraged to include a DRR component in their mandate, such as on infrastructure projects undertaken by the Department of Public Works and Highways (DPWH).

The NDCC recognizes the need to shift its paradigm from disaster preparedness and response to disaster risk reduction strategies as well as engaging different sectors of the society in this effort. A national multi-sectoral platform for disaster risk reduction is being institutionalized. As a result, the private sector, civil society and academia are beginning to actively take part in NDCC activities, consultations and workshops. Although not yet comprehensive, institutional commitments of sectoral leaders have been attained.

Climate Change and Disaster Risk Management

HFA Priority #2: Identify, assess and monitor disaster risks and enhance early warning

NATIONAL, REGIONAL, LOCAL AND SECTOR RISK ASSESSMENTS

The NDCC is undertaking a multi-hazard mapping and assessment project in partnership with key government agencies such as, PHIVOLCS, PAG-ASA, MGB, NAMRIA, and others government agencies. The project called “Hazards Mapping and Assessment for Effective Community-Based Disaster Risk Management Project” (or READY) is being prepared to cover 27 provinces mostly located along the eastern part of the Philippines. This is funded by a US \$1.9 million grant from the AusAID with technical assistance from UNDP. The project has helped established hazard maps and community-based early warning systems. Under the project, PHIVOLCS has also introduced the use of hazard and risk assessment software called Rapid Earthquake Damage Assessment System (REDAS). The software includes dynamic evaluation of earthquake hazards and information of at risk elements at the community.

The data and information generated are used for disaster risk management and development planning by sectoral agencies and LGUs. Many of the LGUs, however, are technically constrained in terms of data interpretation and use. Thus, the national disaster agencies need to closely work with them to maximize the use of hazard and vulnerability maps and help them integrate these data in their DRM programs. Early warning systems are being installed and an intensive education campaign is undertaken in disaster-prone communities to equip them in handling disaster risks.

NDCC and other government and private organizations had been documenting disasters and their impacts in the country. However, there is no systematic effort to coordinate, consolidate and establish a common or shared database among the organizations undertaking this task. Furthermore, the task of monitoring, recording and documenting disasters had been taken by national agencies. LGUs, NGOs and communities are constrained to contribute more substantially to the development of a database of disasters and impacts, especially as capacities are limited at this level.

Community participation in hazard and vulnerability mapping is essential, and there is significant emphasis on developing community-based disaster risk management capacity. Their own experience with disasters had taught communities to know the signs and indications of impending disasters such as volcanic eruption, earthquakes and

even typhoons. However, this wealth of knowledge is not properly documented, published or disseminated. PHIVOLCS reported that it is closely working with communities for geological and modeling information. Local knowledge has been tapped and even used and efforts on documenting these have been explored. Tools for identifying signs of disasters at the community level have been designed by PAG-ASA to promote self-reliance of communities.

EARLY WARNING SYSTEMS

The government is strengthening on early warning systems for all major hazards. PHIVOLCS and PAGASA are expanding facilities and equipment and training of personnel to enhance monitoring and forecasting capabilities. National government's early warning system had improved with the acquisition of new Doppler radars of PAG-ASA which enable it to give accurate local weather forecasts in five regional centers in the country.

LGUs still vary in their capacity for early warning systems. While some LGUs already have their own warning systems for typhoons and flooding, many still do not have the technical capacity and lack access to equipment and facilities. For these LGUs, mass media is an important source of information during disasters.

The government takes account of regional and transboundary risks, with a view to promote regional cooperation on risk reduction. The government has linked up with international agencies in monitoring and increasing alertness level on natural and biological disasters. Through ASEAN and UN support, appropriate tools and models for disaster risk reduction are being shared. Although the government does not have adequate funding for engaging in regional and transboundary risk management, it receives support and assistance from international and bilateral donor organizations.

HFA Priority # 3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels

Information on disaster risk management is available but is often not widely or properly disseminated. While much of this information is available online in the NDCC members' websites, many people and communities - especially in the rural areas - do not have access to computers and internet connection, and cannot access this information.

NGOs, private and civic organizations and government agencies at both the national and local levels undertake public awareness and information campaigns on disaster risks in many vulnerable areas. However, oftentimes, these campaigns are not systematic and coordinated. There are also instances when vulnerable communities that had been already advised to evacuate refused to move out due to inadequate transportation, facilities in the evacuation centers, and availability of food and medicines.

There is no countrywide public awareness program on DRR. The media thru television and radio broadcasting has helped in disseminating information on different types of disasters, risks and adopting safeguards on disasters. Their scope, however, does not fully cover all disaster-prone areas.

Schools are integrating DRR concepts in their curricula. The Department of Education (DepEd) is working on including DRR in elementary and secondary curricula. The teachers are also educated in DRR by including the concepts in Teacher's Education Curriculum. At present, education in DRR is still limited in scope and education materials are still inadequate. NDCC and DepEd, in partnership with ADPC, undertook a project to develop DRM modules for integration into the secondary school curriculum. The module includes information on disaster preparedness, prevention and mitigation of hazards and risks of natural events to vulnerable communities and areas. Disaster awareness has formed part of the learning core competencies under the Science and Social studies subjects in public elementary and high schools. Private schools, however, are not required to include these in their curriculum.

Programs such as Hospital Preparedness for Emergencies (HOPE) under the Program for Enhancement of Emergency Response (PEER) has been organized by NDCC, along with concerned government agencies and supported by NZET and USAID. Awareness-campaign programs and DRM-relevant courses are also through programs hosted by the World Bank Institute, Earthquakes and Megacities Initiatives (EMI) and NDCC. Technological and scientific institutions like PAGASA and PHIVOLCS provide knowledge building for NGOs, schools and the media. NGOs and professional organizations also provide trainings on DRR focusing on mitigation and preparedness.

Research methods and tools for multi-risk assessments and cost benefit analysis are under development.

The National Science and Technology Plan for 2002-2020 prepared by the DOST has given some attention to DRM. The plan includes natural disaster mitigation under the Environment in the National Program for Basic Research. Some assessment tools have been developed or used by DOST and the Department of Environment and Natural Resources (DENR). A study of the vulnerability of critical sectors to climate change was initiated using the Millennium Development Goals Achievement Fund of the Spanish government.

HFA Priority #4: Reduction of the underlying risk factors

RISK FINANCING FRAMEWORK

Funding for DRR in the country is inadequate as national and local calamity funds are primarily used for response, relief operations and rehabilitation of damaged infrastructure. This has made the government rely on donor support to promote DRR policies and programs. Domestic funding for DRR activities is incidental in the plans and budgets of national agencies. Utilization of the national calamity fund is difficult to track and monitor as they are lost in existing categories prescribed in budget reports.

LGUs are mandated to allocate five percent of their estimated revenues from regular sources as Local Calamity Fund (LCF), which can only be used upon declaration of a “state of calamity” by the local legislative body. In 2003, a Joint Memorandum Circular issued by the Department of Budget and Management (DBM) and the Department of Interior and Local Government (DILG) permits the use of the LCF for disaster preparedness and other pre-disaster activities. However, many local officials find this instruction unclear because it is perceived to focus only on man-made disasters. Moreover, LGUs are not obligated to submit reports on the utilization of the calamity funds to NDCC or DBM, hence it is difficult to evaluate how efficiently the funds are used.

ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT

While laws on sound environmental management and regulation (e.g., mining, forestry, protected areas, agriculture and fisheries, wildlife resources, toxic substances, hazardous and nuclear wastes and pollution control) exist, most of these laws are not explicit about any disaster risk plan or response.

LAND USE PLANNING

In addition, some laws and policies for disaster risk reduction are present but enforcement has been weak.

Poor enforcement of easement zone regulations contributed to the burgeoning of informal settlers along riverbanks and near coastlines. Many structures do not fully comply with the safeguards required under their Environmental Compliance Certificates (ECCs) and building codes. In some cities and municipalities, appropriate building codes and standards are set aside to reduce construction costs, and in some cases zoning regulations are poorly enforced and/or blatantly violated by some building and housing developers. Poor regulation in the construction of buildings and other physical establishments in disaster-prone areas contribute to the risks in these communities.

NEDA is actively building awareness and capacity to mainstream DRR in land use and physical framework plans. The National Land Use Committee prepared the National Framework for Physical Planning which indicated hazard-prone areas for future land use and physical plans. Some progress is foreseen as capacities of regional and local level development councils are strengthened to implement risk-sensitive planning.

On a broader scale, NEDA is implementing a project entitled “Strengthening the Philippines’ Institutional Capacity to Adapt to Climate Change” that also fosters understanding of the linkage between DRM and climate change adaptation.

Social development policies and plans are being implemented to reduce the vulnerability of populations at risk. The government has implemented policies and programs such as housing for informal settlers, livelihood projects and health care that will reduce the vulnerability of people to disasters. However, many LGUs lack the resources to sustain these programs. In many cases, informal settlers do not easily leave their homes even if they know that they are at risk in the absence of means to available and feasible resettlement areas. The government is currently working towards the establishment of a conditional cash transfer system that will help to cushion shocks experienced by poor households. Special focus for those adversely affected by disasters is likewise being considered.

Economic and productive sectoral policies and plans to reduce the vulnerability of economic activities exist, but need to be strengthened. In February 2008, the Government Service Insurance System (GSIS) called on all government agencies to insure government properties. Despite existing legal mandate, local governments, have not internalized a system of protecting economic activities and productive sectors, with the exception of first income class local governments. . Crop insurance for palay and high value crops and livestock insurance through the Philippine Crop Insurance Corporation (PCIC) are available but many farmers do not subscribe or are not aware that such an insurance exists. Existing legal frameworks do not encourage the development of insurance schemes particularly for the poor.

DRR measures are integrated into post-disaster recovery and rehabilitation processes. Rehabilitation measures include the construction of infrastructure such as flood control, drainage, dikes and levees to minimize flooding and the devastating effects of strong typhoons in areas frequently hit by disasters. More typhoon resistant schools are being built and safe evacuation centers are being established or designated. Although many build back better programs are being undertaken both by national and local governments, the construction of infrastructure projects to mitigate the impacts of natural disasters is limited due to financial resources constraints they face.

HFA Priority #5: Strengthen disaster preparedness for effective response at all levels

The government is intensifying efforts to institutionalize DRR at the national, regional and local levels. This needs a lot of effort considering the challenges in vertical and horizontal coordination and weak and poorly-funded institutions at the national and local levels that would implement DRR. Nonetheless, steps had been undertaken in the form of preparation and contingency plans crafted by DCC and implemented in 50 provinces.

EMERGENCY MANAGEMENT

Disaster preparedness and contingency plans are in place at all administrative levels and regular training drills and rehearsals are held to test and develop disaster response programs. The NDCC has been assisting local DCCs in preparing and implementing contingency plans through training programs.

3. KEY DONOR AND INTERNATIONAL FINANCIAL INSTITUTION ENGAGEMENTS IN DISASTER RISK MANAGEMENT

Existing Projects with Donor and International Financial Institutions	Funding Agency/Local and International Partners	HFA Activity Area (s)
Case Study on the Institutionalization of Albay Provincial Safety and Emergency Management Office	OXFAM-GB, Development Academy of the Philippines (DAP) and PDCC-Albay	1
ASEAN Agreement on Disaster and Emergency Response (AADMER)		1
Hazard Mapping and Assessment for Effective Community-Based Disaster Risk Management (READY)	AUSAID; UNDP; PHIVOLCS, PAG-ASA; Mines and Geosciences Bureau-DENR, NAMRIA and the OCD.	2
Improvement of Methodologies for Assessing the Socio-economic Impact of Hydro-meteorological Disasters	UN-ESCAP; UN-ECLAC ; UNDP	2
Emergency Response Network (ERN)	IBM International Foundational (ERN Sahana Philippines)	2
Mainstreaming Disaster Risk Reduction in the Education Sector	ADPC	3
Web-based Event Data Base (CALAMIDAT.PH)	ADRC	3
Disaster Preparedness through Educational Multi-Media	DEPED	3
Simultaneous Nationwide Earthquake Drills and the Nationwide Water Search and Rescue (WASAR) Training and the Program for Enhancement of Emergency Response (PEER)	Miami Dade Fire Rescue Department; USAID, ADPC	3
Contingency Planning Manual	UN High Commissioner for Refugees	3
Online Natural Disaster Risk Management Program	World Bank Institute (WBI); Hazard Management Unit and ProVention Consortium	3
Mainstreaming DRR in Development Plans particularly on Land Use and Physical Framework Plans	NEDA; DEPED	4
2 nd Phase of the Mainstreaming Disaster Risk Reduction into the Infrastructure Sector	ADPC, DPWH	4
National Geohazards Mapping and Assessment	DENR; PHIVOLCS, PAG-ASA	4
Construction of Hazard Resilient School Buildings	DEPED	4
Construction of Innovative Buildings	United Architects Philippines; Private Sector Disaster Management Network	4
Community-based Disaster Preparedness: Development of Information and Education Campaign Materials (2 nd component of the READY project)	AUSAID; UNDP; PHIVOLCS, PAG-ASA; Mines and Geosciences Bureau-DENR, NAMRIA and the OCD.	5
Search for Excellence in Disaster Management (Gawad KALASAG) 2007	NDCC	5
Upgrading the forecasting capability of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) and the Philippine Institute of Volcanology and Seismology (PHIVOLCS)	Japanese Grant Aid Program, JICA, MMDA	5
Enhancing the capabilities of local chief executives and their DCCs	LGUs	5
Housing and Livelihood Support to Disaster Victims	DSWD	5

OPPORTUNITIES FOR ACTION

The groundwork to mainstream Disaster Risk Reduction has already been laid out in the Philippines. The country is committed to include the HFA 2005-2015 in its long term development agenda as evidenced by the various initiatives conducted. There is recognition from all sectors of society that knowledge, capacities, and awareness on DRR have to be improved and mainstreamed. But many actions require reforms in policies and resource allocation and distribution.

The existing GFDRR funding is supporting the government to identify local governments at risk based on historical information and develop a program for building local government capacities for DRM. As a result of this exercise, 23 provinces identified to be at risk to impacts of disasters. Five provinces and select component municipalities and/or cities will be initially supported with the existing funds to conduct risk identification assessments and developed strategic actions to reduce risk over time.

Consultations with the government have indicated the desire to expand support to local governments initiated under the ongoing GFDRR program. This will allow the government to reach out to the remaining 18 provinces identified in the risk assessment. Another high priority of national government is to carry out a separate activity for Metro Manila aimed at addressing the potential risk posed by an earthquake, based on the Metro Manila Earthquake Impact Scenario (MMEIRS).

The work will be continued with the Department of Interior and Local Government, which is expected to play a bigger role in DRM once the enabling law has been in place. The Department has committed to translate the lessons learned from the pilot into concrete policy instruments to mainstream and institutionalize DRM in local governance in the Philippines. The Bank will complement the plans with funding instruments that are being discussed with the national government (e.g., *CAT DDO, LGU DRM sub-loans, and catastrophe pool for LGUs*).

Funding options for DRM are currently being assessed in the context of a broad risk finance strategy, which is also being developed with support from existing GFDRR funds. This strategy will cover not only LGUs but the key segments of the population, including households and public utilities. Weaknesses in policies related to catastrophe risk financing, such as disincentives to the private sector and institutional constraints, are proposed to be addressed with additional funds from GFDRR. The results are expected to guide the government to determine appropriate reforms and strategies that can be taken in the short, medium, and long-term planning horizon. Additional funds from GFDRR can likewise be used to design concrete instruments for implementation as identified and agreed with the Philippine Government

Improvements in risk finance will be complemented by the parallel development of better tracking and monitoring capacity at all levels. For example, strengthening capacity to track damages and losses, and record corresponding receipts and expenditure, is a high priority for several national agencies to promote efficiency, transparency, and accountability of fiscal and other resources for DRM

Indicative Program for GFDRR Funding (Projects and engagement areas)	Implementing Agency / International Partners	Indicative Budget (Years Covered)	HFA Activity Area(s)
Expanding support for high risk Local Government Capacity to Manage Natural Disasters Risk in the Philippines (Capacity building for the 23 most vulnerable LGUs in the Philippines) <i>Priority activities:</i> - Strengthen capacity in target LGUs and disaster-prone areas in risk financing and transfer options - Strengthen tools that will upgrade and enhance planning and early warning systems for DRM in select LGUs or national government agencies	NDCC/DILG	2009-2011 US \$3.5million	1, 5
Improving systems for tracking/monitoring damage, losses and corresponding receipts and expenditure for disaster management <i>Priority activities:</i> - Support for training to enhance transparency and accountability, efficiency and effectiveness on the use of DRM funds, especially at the local level	NDCC/DBM	2009 -2011 US \$250,000	1
Support for hotspots analysis and preparedness and mitigation planning for the Metro Manila Earthquake Impact Scenario.	NDCC/MMDA	2009 -2011 US \$250,000	1, 5
Training for LGUs and NGAs for integrating DRM in urban/economic and physical planning	NDCC/DILG	2009 -2011 US \$5000,000	1, 5
Support the national government to develop its risk finance strategy	NDCC/DOF	2009 -2011 US \$5000,000	5
Total Budget Requested			US \$5 million

4. BIBLIOGRAPHY

Interim Report on Progress in Implementation of the Hyogo Framework for Action (HFA) in the Philippines, 2007-2008 (NDCC).

National Disaster Coordinating Council website (<http://ndcc.gov.ph>).

National Disaster Coordinating Council (NDCC), Asian Development Bank (ADB) and UNDP. *National Assessment on the State of Disaster Risk Management in the Philippines-Final Report (October 2008)*.

The World Bank and National Disaster Coordinating Council. *Natural Disaster Risk Management in the Philippines: Enhancing Poverty Alleviation through Disaster Risk Reduction*.

International Emergency Disaster Database (<http://www.emdat.be/>).

VANUATU

To prepare this Country DRM Note, consultations were undertaken with members of the World Bank Country Team, the National Disaster Management Office, the Ministry of Lands and Natural Resources, the National Tourism Development Office, the Ministry of Infrastructure and Public Utilities, the Pacific Islands Applied Geoscience Commission (SOPAC), ADB, UNDP and other key donors in the region.

1. DISASTER RISK PROFILE

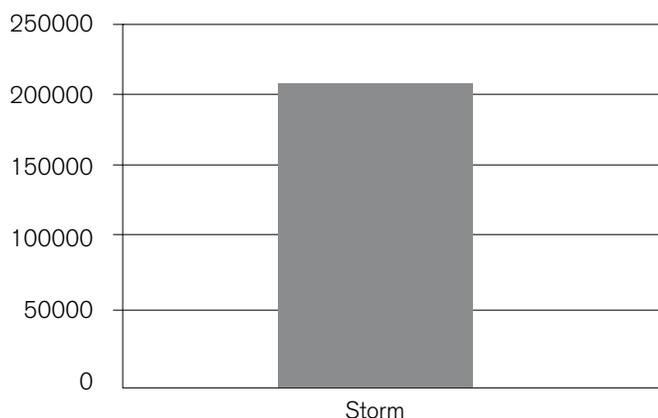
Vanuatu ranks as one of the countries with the highest exposure to multiple hazards, according to the World Bank's Natural Disaster Hotspot study. Vanuatu is geographically located in the "ring of fire" and the "cyclone belt" of the Pacific. Almost 81 percent of its landmass and 76 percent of its population is vulnerable to two or more hazards including volcanic eruptions, cyclones, earthquakes, droughts, tsunamis, storm surge, coastal and river flooding and landslides. For this reason, Vanuatu has a UN Least Developed Country (LDC) status despite a per capita GDP above the LDC threshold.

Vanuatu is made up of 83 islands with a total land area of 12,300 km spread over 1,300 km in a north to south direction. The islands are located some 1,750 kilometers east of Australia with New Caledonia to the south, and the Solomon Islands to the northwest. The current population is 235,000, of which 80% live in rural villages on the seven islands of Efate, Espiritu Santo, Tanna, Malekula, Pentecost, Ambae and Ambrym.

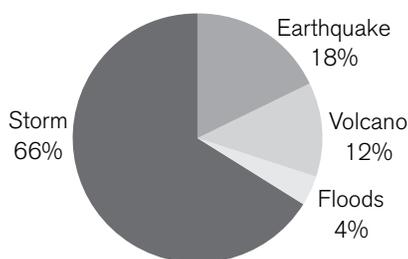
Recent disasters include the Penama earthquake and tsunami of November 1999, which affected over 23,000 people and the 2002 Port Vila earthquake which caused structural and infrastructure damage. The country is subject to climatic variability and extremes. Vanuatu's latitude places it in the path of tropical cyclones, making it vulnerable to the cycles of El Nino and La Nina, which, respectively, increase the risks of droughts and floods. Future climate change and sea-level rise threaten to exacerbate the risks posed from tropical cyclones, coastal and river flooding, coastal erosion, heavy rainfall events, and droughts.



Economic Damages by Disaster Type (1000s USD)



Population Affected by Disaster Type



COUNTRIES AT RELATIVELY HIGH MORTALITY RISK FROM MULTIPLE HAZARDS (Top 60 based on land area with 2 or more hazards)

1. St. Kitts and Nevis
2. Macao, China
4. Hong Kong, China
6. VANUATU
7. Costa Rica
8. Philippines
9. Nepal
10. Guatemala
12. Ecuador
13. Reunion
15. Somalia
16. South Africa
17. Japan
19. Bangladesh
26. Solomon Islands

Capital	Port Vila
Languages	Bislama (Pidgin), English (official), French (official), over 100 tribal languages
Independence	(from France and U.K.): July 30, 1980
Area	-11,830 sq. km. (4,568 sq. miles) archipelago of 83 islands
Land Use	arable land: 1.64% permanent crops: 6.97% other: 91.39% (2005)
Government	Parliamentary democracy.
Population	235,000 (2008)
GDP	\$343.6 million. (2006)
HDI	120 out of 177 (2007)
Terrain	Mostly mountains of volcanic origin, narrow coastal plains
Climate	Tropical or sub tropical
Natural resources	Forests, agricultural land, marine resources
Major products	Agriculture: Products--copra, cocoa, coffee, cattle, timber. Industry: copra production, beef processing, sawmilling, tourism, financial services
Main development donors	Australia, the United Kingdom, France, and New Zealand Japan, Canada, Germany, and the United States

The World Fact Book, World Bank Country Reports,

Historic Overview of Disasters

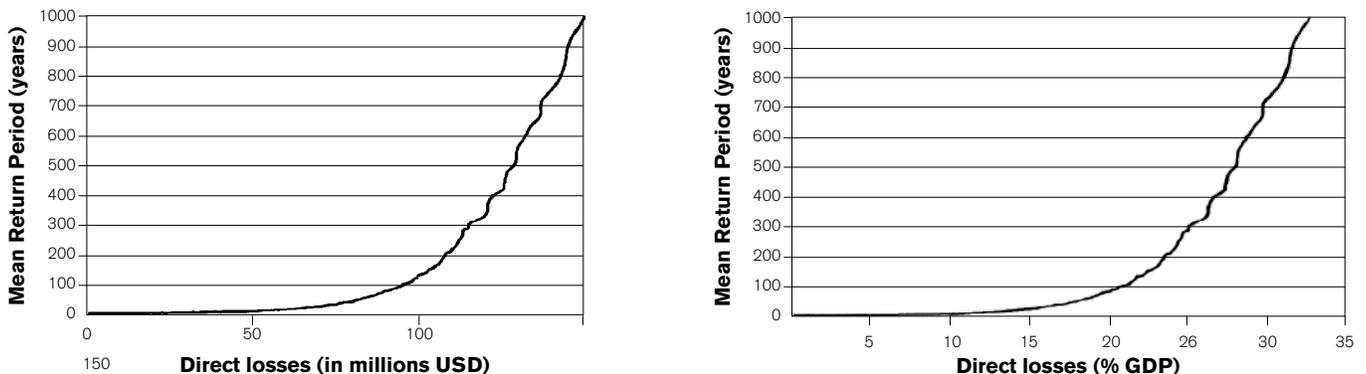
Since 1939 Vanuatu has experienced 124 tropical cyclones, of which 45 were categorized as having hurricane force winds. A category 3–4 Cyclone, Uma struck Port Vila, Vanuatu, in February 1987. While the insured loss was only about US \$20 million, 55 people were killed and 95 percent of the buildings in the capital city were damaged. Power and water supplies were cut, 40 boats in the harbor were lost and a storm surge of 2–4 meters reached Rue Higginson, the main street. The economic cost was estimated at around 150 percent of annual GDP. A natural disaster with comparable GDP impact on Japan, for example, would have a death toll of nearly 34,000 people and a cost of around US \$5 trillion.

Other recent natural disasters include:

- Cyclone Ivy, 2004, damage of US \$1.7 million in the education sector alone
- Cyclone Danny, 1999, US \$8.5 million estimated damage
- Lake Vui volcanic activities in 2005-6, estimated damage of US \$427,313
- Earthquake 2002, US \$851,628 estimated damage
- Tidal waves generated by the 1999 earthquake, 5 lives lost
- Penama earthquake and tsunami of November 1999, which affected about 23,000 people
-

Exposure and Vulnerability

The following two figures show the mean return period of direct losses (in US \$million and as percent of GDP, respectively), due to the combined impacts of earthquake, tsunami and tropical cyclones on Vanuatu.



A narrow economic base and a weakly developed economy contribute to the country's vulnerability. While small-scale agriculture provides a living for 65 percent of the population, 65 percent of GDP is generated by the service sector. Agriculture and a small industry sector accounts for about 25 percent and 10 percent of GDP, respectively. The local market is small. The growing tourism sector, with 60,000 visitors (in 2005) mainly around Port Vila, is the main foreign exchange earner. This narrow economic base makes the cash economy particularly vulnerable to disruption by natural disasters¹.

Weak inter- and intra-island communication and transport networks also increase the islands' vulnerability. Many areas lack national radio reception. Road transport is only well developed near population centers – only 111 km of roads are sealed – mostly on the larger islands. While air service is daily to the main islands, there are only 5 airports with sealed runways (out of 29 in total)².

1 World Bank Vanuatu Country Risk Assessment (Draft) 2009

2. *Ibid*

Wide dispersal is a further factor in vulnerability. The 83 islands are spread over a maritime exclusive economic zone (EEZ) of 680,000 km². Many areas of the country are very isolated and therefore extremely vulnerable in the event of disaster.

2. DISASTER RISK MANAGEMENT FRAMEWORK

In 2006, Vanuatu created a 10 year National Action Plan (NAP) for Disaster Risk Reduction derived from the National Disaster Act (2000). The NAP was adopted by the government in 2007. This determines eligibility to apply for funding for implementation under the LDC Fund, which is managed by the Global Environmental Facility (GEF).

Vanuatu is the only Pacific Island Country to complete both a National Action Plan (NAP) for disaster risk reduction and a National Adaptation Program of Action (NAPA). An additional Disaster Risk Management Framework and arrangements flowchart was adopted by the government in early 2007 as the basis for developing new legislation, a new disaster management plan and new government organizational arrangements.

In August 2007, a three year Provisional Indicative Implementation Program (PIP) 2008-2010 was adopted by the government as the means to implement the NAP. The government has committed VT25million (US \$220,887) towards the implementation subject to discussions with donors on supporting the full implementation of the PIP at a cost of approximately US \$3.3 million.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

THE NATIONAL DISASTER RISK MANAGEMENT AGENCY

Responsibility for disaster risk management lies with the Ministry of Internal Affairs (MoIA), which supports the National Task Force (NTF) for Disaster Risk Reduction and Disaster Management. The NTF comprises representatives of departments with a role in disaster risk management and is co-chaired by the Director of the Meteorological Service and the National Disaster Management Office.

The NTF for DM and DRR takes a proactive as well as reactive approach – thus it does not meet solely in response to a disaster events.

The National Disaster Committee (NDC), established by the National Disaster Act is tasked with developing the country's disaster risk reduction policy and strategy. It is made up of representatives of the Director General of the MoIA, the Commissioner of Police; the Director of the National Disaster Management Office who is to provide secretarial support to the Committee and three NGO representatives.

The National Disaster Management Office is its secretariat; The NDMO has a staff of three, and is tasked with implementing the strategies and policies of the National Disaster Committee (NDC). However the NDMO has no powers to require other agencies to act on any identified prevention measures. The NDC coordinates response and recovery activities including coordination with donors.

LEGISLATIVE FRAMEWORK

The relevant legislation in this area is the National Disaster Act of 2000 which focuses primarily on preparedness and response arrangements for disasters. While the act includes a definition of prevention, it is not specific about requirements and powers for addressing prevention measures. The legislation is currently administered by the Ministry of Internal Affairs through the National Disaster Management Office.

The governance arrangements for disaster risk reduction are being reviewed at the national level and should include explicit structures, accountabilities and connections for cross sector arrangements. Provisions should extend to the provincial and local levels.

DISASTER RISK MANAGEMENT AT THE SUB-NATIONAL LEVEL

Both the NAP and the PIP include provisions for extending disaster risk management to the provinces. However, lack of funding prevents implementation of the NAP. Provinces are, in theory, also mandated to prepare their own Disaster Plans which should be approved by the NDMO Director, reviewed annually, and updated as needed.

Moreover, lack of action on the central NAP has prevented the creation of provincial action plans. Provincial authorities are responsible for coordinating responses under the guidance of the NDMO and NDC. Each village should have a disaster management committee to coordinate response at the local level, works in consultation with the provincial level and is responsible for local level damage and loss assessments.

LEGISLATIVE AND ORGANIZATIONAL GAPS

The current legislative, policy and organizational structures for disaster risk reduction are weak. Initiatives like the NAP are unfunded. The Natural Disaster Act, the National Action Plan and the organizational arrangements of NDMO should be reviewed to strengthen disaster management arrangements and mainstream disaster risk reduction. While work on arrangements for disaster risk reduction at the national level is being undertaken, this initiative should be extended to provincial and local levels as well.

DISASTER RISK MANAGEMENT IN THE POVERTY REDUCTION STRATEGY AND COUNTRY DEVELOPMENT PLANS

Disaster risk management is integrated in the country's Priorities and Action Agenda 2006-2015. Its key priorities and strategies are as follows: Implement the environment management and conservation act and the regulate of related activities; Encourage development of protected areas; Improve sewage treatment and reduce pollution in the harbors and lagoons near urban centers; Conduct a solid waste disposal study; Encourage eco-tourism as a means to protect the environment where feasible; Conduct community awareness of the need to protect the environment; Develop and implement risk reduction programs in communities; Prepare a Port Vila development plan which mainstreams climate change and disaster risk reduction measures.

The action agenda recognizes Vanuatu's vulnerability to natural disasters and states that "the emphasis in disaster management has been on making communities aware of the need for preparedness and promoting the renewal of traditional knowledge of mitigation and preparedness." It further states that "the National Disaster Management Office, with the assistance of the National Disaster Committee, is mandated to develop strategies for the prevention of, preparation for, response to and recovery from, disasters." The Land Reform Policy which is currently under development will lead to a five-year action plan that includes land-use zoning maps and vulnerable area mapping, addressing both disaster risk reduction and climate change adaptation.

INTERMINISTERIAL INVOLVEMENT IN DISASTER RISK MANAGEMENT

Vanuatu's government has a high level of awareness and appreciation of the potential risks to sustainable development posed by the country's exposure to geological, hydrological and climatic hazards. This is evident across a range of ministries and departments. As a consequence, there appears to be a willingness to work across sectors to address areas of common interests in risk reduction.

A number of ministries and agencies participate in disaster risk management: Vanuatu's Meteorological Department which is responsible for day to day weather forecasting, cyclone and tsunami warnings and advisories, and long term seasonal forecasting; the Agriculture Department which is involved in disaster response; the Department of Internal Affairs which coordinates responses between provincial authorities; the National Advisory Committee of Climate Change which assists in raising awareness on disaster risk reduction through its climate change core team; and the Ministry of Lands and Natural Resources (MLNR), which incorporates risk reduction into to land, water and energy planning.

CLIMATE CHANGE AND DISASTER RISK MANAGEMENT

Vanuatu has a National Adaptation Plan of Action (NAPA) which was adopted by Government in 2007 and was posted on the UNFCCC web site in December 2007. This determines eligibility to apply for funding for implementation under the LDC Fund, which is managed by the Global Environmental Facility (GEF).

The NAPA identifies four priority sector areas: Agriculture and Food Security, Sustainable Tourism Development, Community Based Marine Resource management and Sustainable Forestry Management. Climate change activities are coordinated by the National Advisory Committee of Climate Change (NACCC). It is made up of department heads and chaired by the Director of the Meteorological Service. The Director of the Meteorological Services is co-chair of the National Task Force for Disaster Risk Reduction and Disaster Risk Management.

HFA Priority # 2: Identify, assess, and monitor disaster risks—and enhance early warning

NATIONAL, REGIONAL, LOCAL AND SECTOR RISK ASSESSMENTS

Despite the multiple risks faced by Vanuatu and in spite of the moderately high level of awareness and commitment to risk reduction at the national level, there are only rudimentary understanding and assessments available of the degrees of risk, who is at risk, and where. There are no tsunami hazard maps for most volcanoes available other than a single scenario inundation map for the greater Vila area, according to the World Bank's Draft Country Risk Assessment.

While there is some information on areas prone to flooding based on past events, there are no detailed flood maps that would be of use in the development of flood risk and land-use zoning. For most of the volcanoes there are volcanic hazard maps, largely derived from general understanding of specific volcanic hazards.

A National Water Strategy Plan has been prepared proposing risk assessments and vulnerability mapping. This work has not commenced and there is very little capacity to undertake it. The biggest impediment to the development of risk and vulnerability assessments and maps is the lack of climatic, hydrological and geophysical data.³

The Country Risk Profile prepared the World Bank and SOPAC under the Pacific Catastrophe Risk Financing Initiative are currently in draft and will map country level risks. Currently no risk maps reflect the influence of climate change on future risk levels. However, software has been purchased that will allow such effects to be estimated when maps are produced in the future.

³ World Bank Draft Vanuatu Country Assessment 2009.

In general, there is a severe paucity of data, tools and capacity to quantify natural hazard risks and to interpret them in a manner which allows risk reduction to be integrated explicitly into development planning and decision-making. For example, for water resources and water-related risks such as floods and droughts, there are currently only six hydrological monitoring stations that are operational: two on Efate and four on Santo according to the World Bank's Draft Country Risk Assessment.

Furthermore, these were established for water supply and hydro-power purposes and in support of developments having to do with mining, and not for long-term monitoring for risk assessment (two stations were removed after they were no longer needed for immediate development purposes). Yet, flooding is recognized as a major hazard, particularly in peri-urban Vila (Mele and Teuma) and Luganville (Sarakata R) and the risks are increasing with the growing population. Long-term hydrological data to underpin risk reduction in such areas do not exist. Moreover, the hydrological (and other) data, both digital and paper, were destroyed in a fire in 2007. Efforts are underway to retrieve data from SOPAC and other regional and national databanks, but the retrieval will only be partial.

The variability and extremes of rainfall are central to understanding the flood, drought and water supply risks facing the country. There is very limited rainfall intensity data and analyses of extreme rain events available and few rainfall stations in Vanuatu. The monitoring network, once quite extensive prior to the country's independence, has dwindled. There is only one automated weather station and eight manual rain gauges, with three-hourly readings and reporting of daily rainfall. There is a proposal for 60 manual stations (for 10 provinces), which would need Vt 3 million (approximately US \$30,000) for installation and Vt 5 million (approximately US \$50,000) annually for operations.

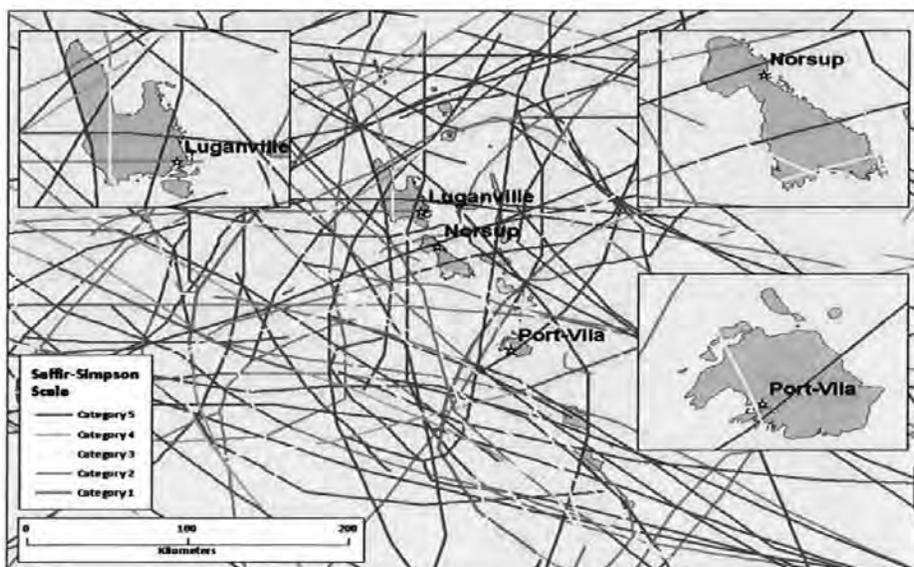
In terms of volcanic hazards, nine active volcanoes which characterized as low-probability, high-impact hazards. However, there is only one permanent volcano monitoring station (on Tanna). There is limited water sampling of crater lakes at Ambae, Ambrym and Tanna and no ability to provide 24/7 warning. Currently, there is a proposed NZAID-funded project (NZD\$1 million over 10 years, but not yet approved) to establish a volcanic monitoring network on nine volcanoes with 20 automated/telemetered stations providing real-time data, and IRD has a EURO 2 million volcano research project. Use is being made of internationally available monitoring data for volcanoes and EQ, but these data have limited scope for country-specific application.

Earthquakes are recognized as posing significant risks across the islands of Vanuatu. While there is a reasonable understanding of the broad seismic hazard from past studies, detailed understanding, which depends on data slacking. There is a seismic hazard map available for greater Vila area, but not for other population centers such as Luganville. In terms of seismic earthquake monitoring, there was a three-station network on Efate but it is currently dysfunctional due to the fire in 2007 (one accelerometer also was lost).

There is extensive tsunami risk for coastal communities throughout Vanuatu, while well recognized historically, the data on tsunami occurrence is sparse. There is a proposal for a paleo-tsunami study and collection of oral histories, but currently funding is only available for a small pilot project.

Cyclone track data are available to calculate frequencies, but fall short of full risk estimation and evaluation due to lack of additional data and capability. Sea-level monitoring is carried out in Port Vila and Luganville as part of SEAFRAME, but the observational record is still quite short.

The following figure shows the path of tropical cyclones that affected Vanuatu since 1945. The color of the path reflects the intensity of the storm (reference: World Bank and SOPAC, 2008). A similar map is available for historical earthquake activity in Vanuatu since 1945.



The following table shows the mean return period for a tropical cyclone of the given Saffir-Simpson category passing within 100 km of Port Vila (reference: World Bank and SOPAC, 2008).

Saffir-Simpson Category	Mean Return Period (years)
≥ 1	2
≥ 2	4
≥ 3	16
≥ 4	400

The following table summarizes the risk profile for Vanuatu due to future tropical cyclones and earthquakes. The effect of climate change is not included. In addition to direct losses, which reflect the cost needed to repair or replace the damaged assets, the table lists the emergency losses. These are the expenditures that the Vanuatu government may need to sustain in the aftermath of a natural catastrophe, to provide necessary relief and conduct repair activities such as debris removal, setting up shelters for the homeless or supplying medicine and food. The emergency losses are estimated as a percentage of direct losses (reference: World Bank and SOPAC, 2008).

Mean Return Period(years)	50	100	250
Risk Profile: Tropical Cyclones			
Direct Losses			
(USD million)	43	49	57
(% GDP)	9%	11%	13%
Emergency Losses			
(USD million)	10	11	13
(% of total government expenditures)	11%	12%	14%
Risk Profile: Earthquake and Tsunami			
Direct Losses			
(USD million)	35	48	57
(% GDP)	8%	11%	13%
Emergency Losses			
(USD million)	7	9	11
(% of total government expenditures)	7%	10%	12%

A map showing population and building stock (residential, commercial, industrial and public assets) exposure for Vanuatu has been compiled. The exposure distribution is color coded by concentration of replacement value.

EARLY WARNING

Vanuatu has the capacity to undertake accurate one, three to five, ten day and seasonal forecasts. The Weather Forecasting Section of the Vanuatu Meteorological Service consists of eight staff. The Section is located at the Head Office and operates 18 hours a day, 7 days a week. The Section also houses the Vanuatu Tropical Cyclone Warning Center (VTCWC), which is responsible for disseminating tropical cyclone warnings to the public if and when a cyclone enters Vanuatu's area of responsibility.

The primary purpose of the Weather Forecasting Section is to provide daily weather forecast to the public, daily marine weather forecast to the mariners, provide aviation forecast and provide warnings for severe weather events. The center is also temporarily responsible for disseminating Tsunami information and advisories to the public.

The islands do not currently have adequate Doppler radar coverage and there is need for extended coverage of the hydro-met centers, particularly to cover the rainfall data collection. Vanuatu does have real time data communications. For sea level monitoring – tide gauges throughout the region which give tide measures, pressure, wind speed and direction and sea surface are linked to the Australian National Tidal Facility in Adelaide. This was established as part of the South Pacific Sea Level and Climate Monitoring Project.

HFA Priority # 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

INFORMATION MANAGEMENT AND EXCHANGE

The Meteorology and Geohazard Departments provide relatively timely information to the public. For example, the forecasting section of the Meteorology Department provides advice based on analysis of situation then an advisory or warning is issued by the Director of Meteorology Dept which is provided to radio and TV and then disseminated throughout the country. Cyclone warnings are issued at every stage from every three hours down to every hour.

EDUCATION AND TRAINING

While the NDMO has had a public hazard and preparedness awareness program, resources are limited and provide for only one province to be covered each year. One day workshops are also run for government and provincial officers for preparedness for the cyclone season and the Geohazards department runs awareness programs across the country from time to time. Risk reduction and climate change awareness is being added to these programs but guidance on practical application is very limited. Within the Ministry of Education, there is an element of disaster risk reduction/disaster risk management being discussed for potential inclusion in curriculum development nation-wide, with potential support from UNESCO for treating Vanuatu as a pilot application.

HFA Priority # 4: Reduction of the underlying risk factors

MAINSTREAMING DISASTER RISK REDUCTION INTEGRATION INTO LAND USE, ZONING, BUILDING CODES, LOCATION AND CONSTRUCTION OF PUBLIC INFRASTRUCTURE

The NAP will develop policies and legislation which would create the enabling environment for mainstreaming through a 10 year program. However, it is still awaiting funding. Disaster risk management is not

incorporated into the national land use law but the Land Reform Policy which is currently under development will lead to a five-year action plan that includes land-use zoning maps and vulnerable area mapping, addressing both disaster risk reduction and climate change adaptation. Disaster risk reduction is not addressed in provincial level planning. This issue is recognized in the policies being developed for climate change adaptation and is contained in the NAP for disaster risk reduction.

Few initiatives are underway to ensure that development is undertaken in a sustainable manner as regards disaster and climate risks. Tourism is fast growing sector in the country and, as a main contributor to the economy, is seen as a viable pilot for disaster risk reduction in sustainable development.

PRIVATE SECTOR INVOLVEMENT IN DISASTER RISK MANAGEMENT

The limited private sector involvement focuses on delivery of relief supplies following natural disasters but there is no regular mechanism to involve the private sector in disaster risk management. Once a year, there is a designated disaster week in which the private sector and NGOs participate in raising awareness. The NDMO has had a public hazard and preparedness awareness program for a number of years, principally run as the annual National Disaster Day with support from the Meteorological Service and the Ministries of Education and Health.

RISK FINANCING FRAMEWORK

There is budget line item in the national government budget for disaster risk reduction but the NTF is currently in abeyance awaiting funding at both the national budget level and through donor contributions. A Council of Ministers (COM) commitment of Vt 25million (approximately US \$225,000) to initiate the Program Management Unit for the NAP did not reach the appropriation commitment through lack of sponsorship and so did not reach donors for consideration of the wider package. For their part, in-country donors said they would not have considered it a priority for bi-lateral funding but were aware of it as a regional issue, according to a World Bank assessment.

Vanuatu does not have a national disaster relief reserve fund. The national planning office in the Department of Social and Economic Planning has had the role of monitoring budget developments against Government decisions. They did not have disaster risk reduction or climate change adaptation in their checklist and saw these as the responsibility of specific departments.

There is no disaster insurance scheme in place. A pilot was initiated with support from the World Bank and AusAid and concluded that it would more beneficial to have a regional disaster insurance system because of the high cost of a national scheme. Current legislation does not require the government to cover to public assets. According to ND Act, "A person ("first mentioned person") may not bring legal proceedings against the State, a Minister or any other person or body for any damage, loss, death or injury sustained: (a) during a state of emergency; and (b) because of anything done or omitted to be done in good faith under this ACT by an emergency services officer, a volunteer, a police officer or any other person acting in accordance with this Act."

HFA Priority # 5: Strengthen disaster preparedness for effective response at all levels.

EMERGENCY MANAGEMENT

The country's hazard monitoring departments - the Geohazard and Mines and the Meteorology Department - are linked to the NDMO through the DDC, and all departments are expected to be housed under one roof in 2009. The country does not currently have academic research institutions designated to studying different hazards. The Meteorological Service has primary responsibility for climate-related data and analyses, and sees the expansion of climate data monitoring as a high priority.

Vanuatu holds annual emergency simulation exercises.

COMMUNICATIONS.

While the national emergency management function possess a communications system, the information management system is weak. For weather related risks, the Meteorological Department issues warnings while NDMO issues evacuation orders, and NDMO convenes meeting of the NDC if necessary. The Geohazard Department also provides warnings and advisories on seismic activity and NDMO oversees evacuation.

DAMAGE AND LOSS ASSESSMENT

Currently there are no procedures or capacity for systematic, consistent collection of damage and loss data following disasters – reports based largely on anecdotal information are available for some disasters.

The consequence lack of impact data is a constraint to economic analyses of the benefits of disaster risk reduction and climate change adaptation, evaluation of benefits and costs of risk reduction, and therefore investments by government and donors in disaster risk reduction and climate change adaptation.

4. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
<i>Pacific Catastrophe Risk Pool Feasibility Study</i> (Cook Islands, Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu)	World Bank	2008 - present \$400,000	1, 2, 5
<i>Sustainable management through reduced risk from disasters and climate</i> (Fiji, Kiribati, Marshall Islands, Papua New Guinea, Solomon Islands, Timor-Leste, Vanuatu)	World Bank	2008 – present \$1,900,000	2, 3, 4, 5
Disaster Management in Marginal Communities of Port Villa	DFID	1995-present \$3,906,813	1, 2, 3, 4
<i>Pacific Islands Disaster Assistance Program (PDAP):</i> The Cook Islands, Fiji, Kiribati, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu , Federated States of Micronesia and the Republic of the Marshall Islands.	USAID/OFDA	\$4,001,756. 1995-present	5
<i>Reducing Vulnerabilities of Pacific ACP States</i> (Fiji, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu , Vanuatu., Cook Islands, Federated States of Micronesia, the Marshall Islands, Nauru, Niue and Palau).	SOPAC/EU	2003 –present \$2,797,329	Not available
Integrated Coastal Management in the Pacific	Pacific Regional Environmental Programme (SPREP)	Not available	
<i>Pacific Islands Climate Change Assistance Program (PICCAP),</i> (Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Samoa, Solomon Islands, Tuvalu and Vanuatu)	SPREP	1997-present	4
The Millennium Challenge Account	United States	2006 – 2011 US\$65.69 million	

(Cont.)

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
Environmental sustainability mainstreamed into regional and national policies and planning frameworks Federated States of Micronesia, Fiji, Kiribati, Nauru, Palau, Marshall Islands, Solomon Islands, Tonga, Tuvalu, Vanuatu);	UNDP	2008 - 2012 \$16,831,000	1, 4
Pacific Islands Climate Prediction Project (Cook Islands, Fiji, Kiribati, Niue, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu, Papua New Guinea)	AUSAID and the Australian Bureau of Meteorology	AUS \$ 5.5 million 2004 - present	2
South Pacific Sea Level and Climate Monitoring Project (Cook Islands, Federated States of Micronesia (FSM), Fiji, Kiribati, Marshall Islands, Nauru, Papua New Guinea (PNG), Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.)	AUSAID	1991 - 2010	2, 5

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

The proposed next round of GFDRR activities will build recommendations from the country specific and regional work undertaken under prior GFDRR projects (such as the NAPA stock-take and pilot catastrophe insurance activities).

Considering the country's available resources, existing capacities, operational plans and procedures, specific priorities of national authorities, identified gaps and also taking into consideration projects which may be covered under other regional activities (such as the Pacific Catastrophe Risk Initiative and the pipeline NZ funding for early warning system upgrades), the following key activities are proposed for the next round of funding:

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
Risk Mapping to Support Town Planning and Village Development Support a demonstration programme for the communities of Luganville and the Mele-Teouma Plains to: 1. Identify and map all hazards including potential changes in climate variability 2. Assess vulnerabilities and engage with communities in assessing risks 3. Establish development zones and other risk mitigation measures for community assets and infrastructure 4. Develop disaster management arrangements and warning arrangements for flooding and storm surge	Ministry of Lands and Natural Resources with Geohazards, Rural Water Resources, Meteorological Service, Municipalities, French, Vanuatu, and Mele Red Cross Societies, Ports, SOPAC	3 years \$ 1.6 million	2, 4

(Cont.)

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
Support to the NAP Implementation and its integration with arrangements for CCA in the NAPA. <i>Priority activities:</i> <ol style="list-style-type: none"> 1. Address issues of integration of arrangements for DRM and CCA and establish a management structure for implementation of the NAPA and NAP 2. Support the TA role over two years to facilitate the initial implementation. 3. Address funding issues for the on-going implementation of the NAP 	Dept of IA, with National Task Force and NDMO, NACCC and Meteorological Service	2 years, \$1.3 million	1, 2, 4
Promote disaster risk reduction and CCA in the tourism sector for Vanuatu <i>Priority activities</i> <ol style="list-style-type: none"> 1. Prepare hazard risk profiles for a range of existing tourism facilities for key areas, including exposure to climate change related risks in order to understand the extent of risk exposure. 2. Develop a development guideline for future tourism developments to address this risk exposure (which has the potential to severely impact the industry nationwide). The guideline should address: 3. Promulgating application of the guidelines in order to demonstrate the benefits of DRR and CCA to tourism developments and to promote nation-wide application 	National Tourism Development Office with NACCC, Met Service	2 years, \$475,000	2, 4
Support for Ministry of Lands in reforming Land-Use Policy and Regulation <i>Priority Activities</i> <ol style="list-style-type: none"> 1. Develop a strategic framework for a land-use regulatory regime related to risk, including provincial and community consultation 2. Develop and implement an action plan to meet the needs of the project. 3. Develop land-use policy framework and link all Vanuatu islands in a common regulatory regime. 4. Championing, adoption and demonstration through a pilot zoning program on one island 5. Carry out provincial and community awareness and implementation program 	Ministry of Lands and Natural Resources	3 years, \$480,000	1, 4
Support the Ministry of Internal Affairs to establish appropriate building code <i>Priority activities</i> <ol style="list-style-type: none"> 1. Encourage the revision of existing and development of new building codes, standards, rehabilitation and reconstruction practices 2. Reinforce the capacity to implement, monitor and enforce such codes, through a consensus-based approach, with a view to fostering disaster-resistant structures. 	Dept of IA, with National Task Force and NDMO and NACCC	2 Years, \$300,000	

(Cont.)

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
Reduce energy risk by lowering dependency on imported fossil fuels through greater use of renewable energy <i>Priority activities</i> 1. Support the Ministry of Lands to Implement the Action Plan of the Energy Policy Framework 2. Develop a Renewable Energy Strategy	Ministry of Lands and Natural Resources and NACCC	3 Years \$400,000	
Support the Ministry of Infrastructure & Public Utilities to Identify key infrastructure for strengthening (roads and bridges, buildings, water storage facilities, etc.) <i>Priority activities</i> 1. Support the development of a regulatory regime related to risk, including provincial and community consultation 2. Develop and implement an action plan to meet the needs of the project. 3. Develop land-use policy framework and link all Vanuatu islands in a common regulatory regime. 4. Championing, adoption and demonstration through a pilot zoning program on one island 5. Carry out provincial and community awareness and implementation program 6. Ensure that all new World Bank infrastructure activities integrate disaster risk reduction measures	Ministry of Infrastructure & Public Utilities	3 Years \$445000	
Total Budget Requested:		US\$ 5 million	

BIBLIOGRAPHY

- Bettencourt, Sofia, Richard Croad, Paul Freeman, John Hay, Roger Jones, Peter King, Padma Lal, Alan Mearns, Geoff Miller, Idah Pswarayi-Riddihough, Alf Simpson, Nakibae Teuatabo, Ulric Tritz, Maarten Van Aalst *'Not If, But When: Adapting to Natural Hazards in the Pacific Island Region'* The World Bank. 2005
- Dilley, Max, Robert S. Chen, Uwe Deichmann, Arthur L. Lerner-Lam, and Margaret Arnold *'Natural Disaster Hotspots; A Global Risk Analysis'* World Bank 2005
- EM-DAT: OFDA/CRED International Disaster Database, Catholic University of Louvain, Brussels, Belgium 2009
- Framework for Action 2005-2015: An Investment for Sustainable Development in the Pacific Island Countries Disaster Risk Reduction and Disaster Management; Building the Resilience of Nations and Communities to Disasters.*
- Global Fund for Disaster Risk Reduction Vanuatu Country Assessment
- Government of Vanuatu, *National Disaster Plan 2004*
- Government of Vanuatu Supplementary PAA (Priorities and Action Agenda), 2006
- Government of Vanuatu. Provisional Indicative Implementation Programme (PIP) 2008 -2010., 2007
- Government of Vanuatu National Adaptation Program of Action
- Government of Vanuatu Priorities and Action Agenda 2006-2015 "An Educated, Healthy and Wealthy Vanuatu", Department of Economic and Sector Planning, Ministry of Finance and Economic Management June 2006 (Medium Term Development Plan)
- Government of Vanuatu National Disaster Act No. 31 of 2000
- Hyogo Framework for Action 2005-2015: I S D R International Strategy for Disaster Reduction
- Priorities and Action Agenda 2006-2015 Supplementary for Mainstreaming Disaster Risk Reduction and Disaster Management
- Sikivou Mosese What do Pacific Developing Member Countries Want from Catastrophe Insurance, Pacific Islands Applied Geoscience Commission, National Catastrophe Risk Insurance Mechanisms for Asia and the Pacific, November 4-5, 2008, Tokyo, Japan
- UNDP *'Human Development Index'* 2007
- UNDP Country Background 2009
- UNISDR, *Living with Risk: A Global Review of Disaster Reduction Initiatives* 2002
- The World Bank (Draft) Vanuatu National Action Plan (for Disaster Management) Country Risk Profile prepared the World Bank and SOPAC under the Pacific Catastrophe Risk Financing Initiative
- The World Bank (Draft) *Pacific Catastrophe Risk Financing Initiative* 2009
- The World Factbook 2009*



DISASTER RISK MANAGEMENT

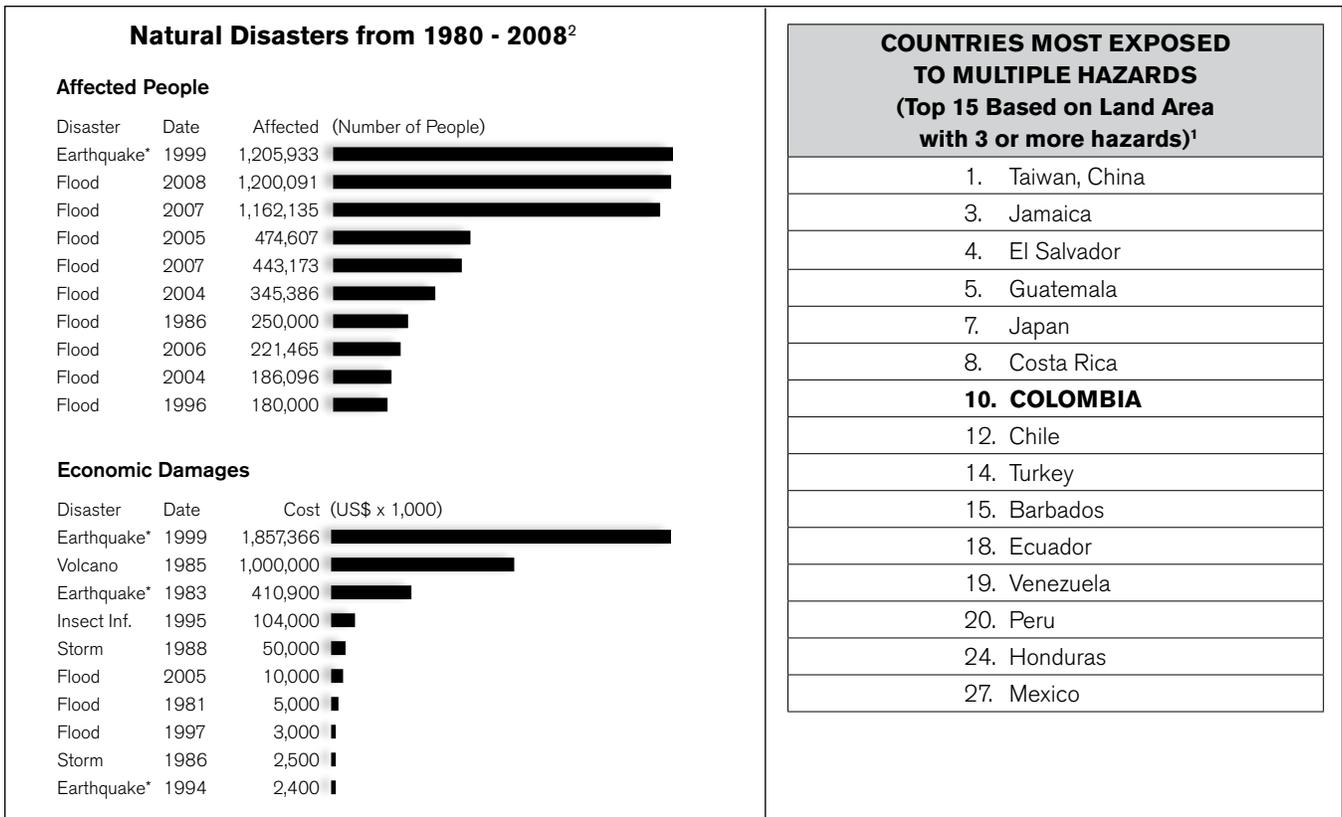
Latin America & Caribbean

Colombia / Costa Rica / Ecuador / Guatemala

COLOMBIA

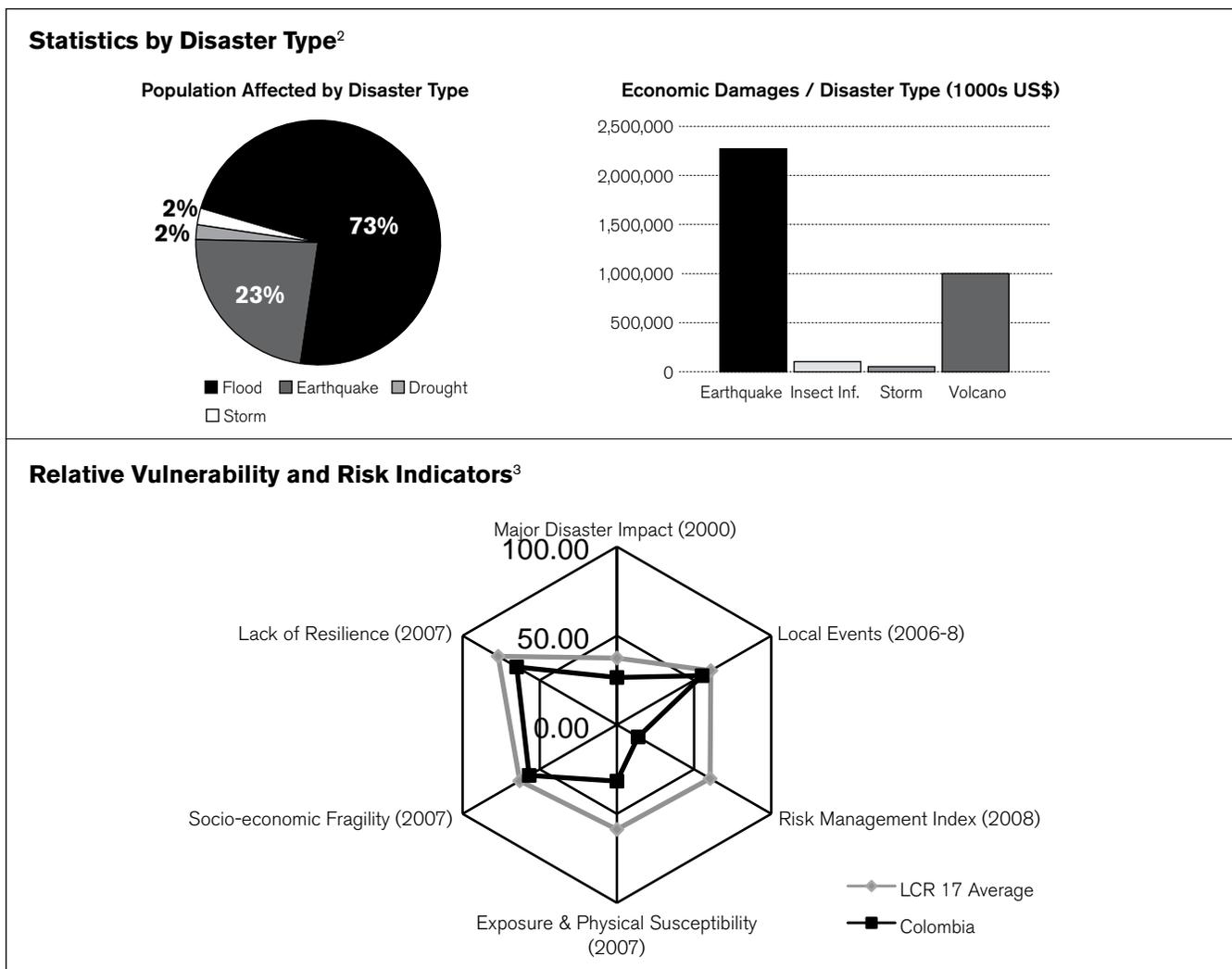
1. DISASTER RISK PROFILE

Colombia has the 10th highest economic risk to three or more hazards in the world, according to the Natural Disaster Hotspot study by the World Bank. 84.7% of Colombia’s population and 86.6% of its assets are located in areas exposed to two or more natural hazards.¹ The exposure is to both low-frequency/high-impact events such as earthquakes, volcanic eruption, and an occasional Atlantic hurricane, and to high-frequency but lower-impact events, such as floods and landslides. Climate change is already thought to exacerbate flooding and landslides in large parts of the country.



1 Dilley et al. (2005). Table 7.2.

2 UN (2009). <http://www.preventionweb.net/english/countries/statistics/?cid=37>. Source data from EM-DAT. Data displayed does not imply national endorsement.



Geological Hazards

Most of Colombia, including all major urban areas, is located in zones of high or very high seismic activity. Colombia is situated on the confluence of three tectonic plates—the Nazca Plate, the Caribbean Plate, and the South American plate—and is traversed by various geological fault lines: the Romeral fault line, Cauca and Magdalena, and Palestina and Frontal de la Cordillera Oriental.⁴

There are six very active volcanoes in Colombia distributed along the central mountain range of the country. The six active volcanoes are: Nevado de Ruiz, Galeras, Dona Juana, Purace, Tolima, and Huila. Galera and Huila have had eruptions in the last five years causing severe damages and forcing significant evacuations.

³ Relative Vulnerability and risk Indicators are adapted from IADB-IDEA-ERN (2009). Values are normalized on scale of 0 – 100 and presented against the average for 17 LCR countries. Major disaster Impact taken from disaster deficit Index: the ratio of economic losses which a country could suffer during a Maximum Considered event and its economic resilience. Local events taken from Local disaster Index: the propensity of a country to experience recurrent, small-scale disasters and their cumulative impact on local development. risk Management Index is presented as the negative (i.e. 0 = optimal, 100 = incipient) of IADB's risk Management Index: measures a country's risk management capability in (i) risk identification, (ii) risk reduction, (iii) disaster management, and (iv) financial protection. resilience, Fragility and exposure are taken from the component indices of Prevalent Vulnerability Index. Date for local event data depends on information available for each country. Data, and the respective LCR 17 average, from 2000 is used for Dominican Republic, El Salvador, Guatemala, Jamaica and Nicaragua. Data, and the respective LCR 17 average, from 2006-08 is used for Bolivia, Colombia, Costa Rica, Ecuador, Panama and Peru. All LCR 17 averages are calculated based on available data.

⁴ IADB-IDEA (2004).

Floods and Landslides

Large parts of Colombia's territory are susceptible to flooding, especially in the lower basins and valleys of the principal rivers: the Magdalena, Cauca, Sinu, Atrato, and Putumayo. These regions are susceptible to flooding, as demonstrated by the area's topography and previous events that have occurred.

Landslides are the most frequently occurring disasters in the country. These are most frequently attributed to hydrological phenomena. The main causes stem from the softening of the ground from heavy rains and the flooding of bodies of water. The Natural Disaster Hotspot study by the World Bank⁵ indicates that Colombia has the highest landslide risk in the South American region, in terms of the number of fatalities per year per square kilometer.

Determinants of Vulnerability to Adverse Natural Events in Colombia

Rapidly increasing urban population has concentrated exposure to adverse natural events. As is the case in most Latin American countries, Colombia has seen a large increase in its urban population in the last fifty years. From 1950 to 2005, the percentage of Colombia's population living in urban areas increased from 39% to 73%⁶, and it is projected that by 2020, 80% of the population, or approximately 43 million people, will live in cities. This trend will bring with it important economic, social, and environmental challenges.⁷ In Colombia, the seven most important cities house 40% of the country's households and 60% of total household income.⁸ The biggest city is by far Bogotá, accounting for 18% of households and 30% of the nation's household income generation.

Unplanned urban growth has disproportionately increased Colombia's vulnerability to adverse natural events. Most Colombian cities have followed an unplanned growth pattern. Some of the most important challenges in urban areas include: the predominance of unplanned expansions, a sharp increase in informal settlements, lack of adequate construction practices, environmental degradation, poor transport infrastructure, and a lack of adequate public spaces.

Informal settlements are a physical and spatial manifestation of poverty and inequality in cities. According to the latest census conducted in 2005, in four of Colombia's main cities, 18% of the residential area corresponds to informal settlements. These areas usually suffer from a lack of basic and social services and from prevalent unemployment. Currently close to 1.3 million homes in the country are in this situation (affecting 16% of the total urban families in Colombia). Of these homes, 63% suffer from poor construction quality, and 20% are located in high-risk areas. It has been estimated that 17% of homes are in such inadequate quality or high risk that it is not possible to retrofit them.

Colombia has made substantial progress through important urban reforms and comprehensive legislation on territorial planning,⁹ but implementation of these laws has been weak. For example, by 2005, eight years after the Territorial Planning Law # 388 passed in 1997, 97% of all the municipalities in the country and every major city with more than 100,000 inhabitants had adopted a Territorial Organization Plan (POT in Spanish). The quality of the POTs varies substantially—there are a few very high-quality plans, but most are weak. Only a few of these plans have implemented the management and financial tools made available by the legislation. For most, the relation between the POTs and the Municipal Development Plans is not very clear. The Government of Colombia is working to change the perception of the POTs so that they are understood as a valuable tool for long-term planning and not just another document to comply with.

5 Dilley et al. (2005).

6 *Departamento Administrativo Nacional de Estadística* (2005).

7 *Departamento Nacional de Planeación* (2006).

8 Including Bogotá, Medellín, Cali, Barranquilla, Cartagena, Bucaramanga, and Pereira.

9 Law 9 on Urban Reform, 1989, and Law 388 on Territorial Development, 1997.

2. DISASTER RISK MANAGEMENT FRAMEWORK

Colombia is widely considered a leader in instituting a policy and legal framework that enables a comprehensive, multi-sectoral approach to disaster risk management. Colombia has built a National System for Disaster Management and Prevention, articulated around a comprehensive National Disaster Prevention and Attention Plan. Since the early 2000s, Colombia has decentralized disaster risk management responsibilities and made disaster risk management a national development priority.

Under the presidency of Álvaro Uribe, the Government of Colombia has integrated disaster risk management into its development plans. Chapter 5 of the National Development Plan 2006-2010 presents and describes the areas of actions for disaster risk management: (i) to develop policies and strengthen institutions, (ii) to identify and monitor risk and to disseminate its knowledge, (iii) to reduce and prevent risk, and (iv) to reduce fiscal vulnerability using risk transfer instruments. These efforts need to continue to be supported and enhanced to ensure long-term, effective disaster risk management in Colombia.

Investments in disaster risk management, including risk reduction, are done at three levels in Colombia involving the national government, departmental governments, and municipal governments. Significant investments are also carried out by the agencies dedicated to infrastructure.

For both hydrometeorological and geological hazards, Colombia is probably the most densely monitored country in Latin America. At the same time Colombian experts and their graduate-level trainees in disaster risk management have played an important role in developing a knowledge base and a political space for disaster prevention. The country is a leader in such risk-reduction approaches and measures as the introduction of building codes and enforcement, municipal programs, and the integration of science and technology with public policy making.

In spite of great progress, the task remains to address existing disaster risk through corrective actions, while simultaneously improving planning processes to avoid unreasonable accumulation of new vulnerability. For a country with more than 600 declared natural disasters every year, this is a daunting task that will require continued and improved attention by the Colombian Government.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Policy, institutional capacity and consensus building for disaster risk management

Colombia has built a National System for Disaster Management and Prevention, articulated around a National Disaster Prevention and Attention Plan. The system (SNPAD in Spanish) has its mandate in Law 46 from 1988 and includes both public and private agencies with responsibilities for risk mitigation and prevention as well as emergency response and rehabilitation. The system is coordinated by the Directorate of Disaster Prevention and Management presided over by the Minister of Government. Furthermore, the system has an operative arm coordinated by a National Operative Committee and a technical/scientific arm coordinated by the National Technical Committee. Vertically, the system has regional committees presided over by the provincial governors and local committees presided by mayors. SNPAD is responsible for (a) the prevention and mitigation of risk, (b) attention to emergencies, and (c) the rehabilitation of territories affected by disasters.

Colombia, through its National System for Disaster Management and Prevention, has been a leader in instituting a policy and legal framework that enables a comprehensive, multi-sectoral approach to disaster risk management. The role of Colombian experts and graduate-level trainees in disaster risk management in the country has been important in this shift and in the effectiveness of this consolidated framework.¹⁰ The country is a leader in such risk reduction approaches and measures as the introduction of building codes and enforcement, municipal programs, and the integration of science and technology with public policy making.

Since the early 2000s, Colombia has decentralized disaster risk management responsibilities and made disaster risk management a national development priority. In 2001, recognizing the high cost that disasters extract from local authorities and the need to encourage investment in disaster mitigation, the national government created an investment category¹¹ for disaster prevention and response in the list of investments permitted under the national revenue-sharing system. According to Law 715/2001, Articles 76.5, 76.9, and 79, municipalities can now elect to spend budgetary transfers on disaster prevention and response. At the close of the Pastrana administration, a National Policy Statement¹² (CONPES, 3146 of December, 2001) followed up on the earlier decree, raising disaster vulnerability reduction to the level of national development priority for the first time, and stipulating its inclusion in the National Development Plan.

One institutional challenge for Colombia is to resist pressures to fall back into an emergency focus. To resist these pressures implies the need to upgrade, integrate, and further consolidate the National System for Disaster Management and Prevention. Though good work is being done in most institutions in the system, technical capacity is a limiting factor in several institutions, particularly at local levels, and institutional coordination remains a challenge. The World Bank, through a disaster vulnerability reduction investment loan, is supporting improved inter-institutional coordination and strengthening capacity building for risk management at local levels.

Despite great progress, the task remains to address existing disaster risk through corrective actions, while simultaneously improving planning processes to avoid unreasonable accumulation of new vulnerability. This remains a difficult challenge and will require continued and improved attention by the Colombian Government.

HFA Priority #2: Disaster risk assessment and monitoring

Colombia has strengthened information collection and analytic capacity for early warning and risk mapping related to hydrological, seismic and volcano events. With national budget and technical as well as financial support from the World Bank, the Colombian Institute for Geology and Mining (*Instituto Colombiano de Geología y Minería – INGEOMINAS*) and the Colombian Institute for Hydrology, Meteorology and Environment Studies (*Instituto de Hidrología, Meteorología y Estudios Ambientales de Colombia – IDEAM*) have purchased and installed equipment to update existing systems for monitoring catastrophic events. The three regional volcanic observatories and the national earthquake monitoring network managed by INGEOMINAS are fully operational and provide real-time information and early warnings also available via the Internet. IDEAM has recently modernized the hydrometeorological monitoring network, installing close to 500 new automatic stations, in addition to the 2,500 existing conventional stations. This likely positions Colombia as the most densely monitored country in Latin America. The new stations provide real-time information on river levels and rainfall through satellite communication used with daily satellite imagery to provide early warnings on flooding, forest fires land slides. Over the next

¹⁰ See resources under La Red at <http://www.desinventar.org>.

¹¹ Indexing numbers in parentheses refer to the categories assigned in the DNP publication, “*Sistema General de Participaciones–Informe de Ejecución Presupuestal Municipal Vigencia 2003*.”

¹² *Consejo Nacional de Política Económica y Social* (National Council of Social and Economic Policy, CONPES) are policy statements issued by the *Departamento Nacional de Planeación* (National Planning Department, DNP).

three years, both agencies will continue to update and expand their monitoring capacity seeking to enhance coverage by an additional 5-10 percent.

Colombia has improved and organized information and information flows for disaster vulnerability, risk evaluation, and risk reduction programs. At a national scale, risk maps for the main river basins and for Galeras volcano have been updated. At the local level, earthquake risk maps have been produced for more than 15 cities (including Bogotá, Medellín, Cali, and Manizales). Urban landslide and flooding maps have been produced for Bogotá, Medellín, Manizales and Bucaramanga. This information is publicly available and has been used for prioritizing investment in risk reduction, such as relocating communities and retrofitting hospitals in Bogota, conducting land planning and urban slope stabilization in Manizales, and protecting urban streams in Medellín.

Colombia has worked to build a culture of risk reduction through integration of disaster risk management in education and research. DGR has worked with Colciencia and the National System of Science and Technology (*Sistema Nacional de Ciencia y Tecnología, SNCyT*) to develop a strategy to strengthen science and technology for disaster risk management. The strategy was adopted in 2002. DGR has also worked with the Ministry of Education to include risk management into environmental education.

The National Planning Department (DNP in Spanish) is with support from the World Bank and financing from GFDRR working to develop decision making support tools based on Probabilistic Risk Assessment platforms¹³. The platform will help establish standards for sharing data and a common language for understanding risk. Initially four tools will be developed for volcano, tsunami, flood and earthquake risk. The transparent nature of the models and open architecture of the platform ensure that future users can understand, adjust, and continue to evolve their tools as their needs change.

HFA Priority #3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

One of the reasons for Colombia's relative success in moving towards a proactive disaster risk management institutional environment is the existence of a human capital base with the appropriate technical training. There are at least 10 higher-education institutions in Colombia that offer post-graduate training and specialization in risk management. At primary and secondary school levels, the curricula include concepts and good practices for risk management. The legal basis for the inclusion of disaster risk management in school curricula is the 1991 Constitution. The school curricula have gradually been improved, in particular since the promulgation of the National Policy for Environmental Education (2002). The Government of Colombia has developed and implemented various tools and strategies to train teachers and community leaders to incorporate disaster risk management into the school curriculum.

HFA Priority #4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience)

Corrective action to address existing disaster risk is one of Colombia's main disaster risk challenges. Investments in risk reduction can involve both structural mitigation works, such as seismic retrofitting, and nonstructural investments, such as relocating people from high-risk areas. Most often these decisions should be made at a decentralized level, as close as possible to the assets and people at risk. Given that the legal responsibility for disaster risk reduction has been placed with the municipalities and the relatively high quality of its risk identification information, the basic conditions then exist for municipalities to make significant and efficient investments in disaster risk reduction.

¹³ <http://ecapra.org>.

With such a high exposure to natural hazards, the political challenge is to define the acceptable level of risk and to finance the mitigation of the unacceptable risk.

Investments in disaster risk management, including risk reduction, are done at three levels in Colombia involving the national government, departmental governments, and municipal governments. Compared to the national government, municipalities invest a larger share of their total disaster risk management budgets in preventive work. The highest volume of investments in risk reduction is also done by municipalities through their regular budgets.

In addition to investments by the three levels of core public administration, agencies dedicated to infrastructure also invest significantly in risk reduction. The Colombian National Institute for Roads (*Instituto Nacional de Vías* – INVIAS) is responsible for risk mitigation work related to roads, ports, and riverine infrastructure. With financing from the World Bank, INVIAS invested more than US\$30 million in risk mitigation works in 2007 and US\$35 million in 2008. The Colombian Oil Company (ECOPETROL) recently finalized a large program retrofitting all its critical installations to become seismic-resistant.¹⁴

Most of the investments in risk reduction in Colombia at the municipal level are done by a handful of the larger municipal entities. This is a logical consequence of the larger municipalities bearing most of the natural hazard exposure and possessing the capacity to address the issue. Due to the combination of legal responsibility, capacity and needs to invest in disaster risk reduction, the larger municipalities in Colombia are currently a good entry point for promoting risk reduction investments. Both the Bogotá River Management Project and the proposed Barranquilla Flood Mitigation Projects. GFDRR financing is playing an important role for integration of disaster risk reduction in the Barranquilla project and thereby potentially will leverage significant amounts of additional resources for reducing disaster risk.

Much work still needs to be done in terms of building awareness and capacities among local governments in smaller municipalities. One indicator of the status is that only 20% of municipalities reporting floods in the period from 2004 to 2007 have invested in risk reduction measures for flood protection in the same period. This is likely to be linked to a generally weak capacity for territorial planning. Although 97% of all municipalities in the country have adopted a Territorial Organization Plan (POT), the quality of the POTs varies substantially—there are a few very high-quality plans, but most are weak. Only a few of these plans have implemented the management and financial tools made available by the legislation. For most, the relation between the POT and the Municipal Development Plans is not very clear. Both the Ministry of Environment, Housing and Territorial Development (MAVDT) and the National Directorate for Disaster Prevention and Management (DGR) have active programs in building capacity and awareness among municipalities for disaster risk reduction and in integrating risk reduction with the territorial and development planning processes which the Bank is supporting. These programs, supported by the World Bank through a loan with the National Government, will expand coverage to reach up to 40% of municipalities in the country over the next three years and thereby form the basis for more widespread and more effective investments in risk reduction at the municipal level. In addition, the DNP (National Planning Department) is monitoring municipal investments in risk reduction to track if the capacity building efforts have any impact on municipal decision-making with regards to risk reduction.

¹⁴ In accordance with the existing Colombian building code, all new construction must be seismic-resistant, and existing key public buildings must be retrofitted or rebuilt to be earthquake-resistant (Law 400 of 1997).

HFA Priority #5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

In Colombia, the disaster response structure has four levels of organization. Response to a given natural event starts with the local level determining if the event is of a magnitude that the local response committee can manage or if help needs to be requested at the municipal, departmental or national level.

Since 2006, the National Directorate of Disaster Prevention and Response has been providing training at local, municipal, and departmental levels through the Local, Municipal and Departmental Committees for Disaster Prevention and Response. A new plan for training municipalities was approved in 2007 and is under implementation with support of the APL 1. In 2008, 60 municipalities were trained and another 150 in 2009.

To test existing capacity, simulations and drills have been carried out in major cities. The latest and largest exercise was an earthquake simulation in Bogotá supported by USAID/OFDA and UNDP in October 2009. First responders, national and district authorities, and the general population all participated in the exercise as part of the mass prevention campaign “with feet on the ground” (www.conlospiesenlatierra.gov.co). Bogotá has developed advanced disaster recovery plans based on sophisticated and detailed risk assessment models.

The response capacity of all levels in the system activated at the same time has only been tested once since its creation. This was in 1999 after the Armenia earthquake, which caused thousands of deaths and a high level of structural damage. Immediately after the earthquake, the Government of Colombia established the Reconstruction Fund for the Coffee Region (FOREC). FOREC reported to the Office of the President with the National Planning Department (DNP) acting as secretariat. FOREC was to finance, execute and coordinate the economic, social and environmental reconstruction of the disaster-affected region. Judging from the response and reconstruction after the Armenia earthquake, Colombia has a well functioning response system.

With regard to disaster response, the main challenge for the Government of Colombia is to finance and rapidly initiate the recovery phase in the aftermath of a natural disaster. In June 2009 The World Bank and Colombia signed a Development Policy Loan (DPL) with a Catastrophe Deferred Draw Down Option (CAT DDO) which has been designed to provide a financing bridge—after a disaster of a scale that cannot be funded with the internal reserve—to other sources of relief as they become available. As part of a catastrophe risk-financing strategy, this instrument will provide the Government with bridge financing in response to adverse natural events generating losses beyond the capacity of the annual budget allocation to the Risk Management Directorate (DGR) for responding to disasters.

CONPES¹⁵ 3146 of 1998 raised the issue of the fiscal vulnerability of the state to natural disasters and identified concerns for the financing of reconstruction should a major catastrophic event occur. Cardona et al. (2005) estimate that the Government of Colombia would face a long-term resource gap, that is, a shortfall of funding available compared to funding needs, if confronted with a disaster with a return period of 100 years.¹⁶

The Government of Colombia is working on a series of policy documents related to the retention and transfer of the residual risk in Colombia. In Colombia, all public buildings are required by law to be insured (Law No. 42 of 1993). The Ministry of Finance (MHCP) is currently investigating options to design a cost-effective insurance program for public assets and a catastrophe insurance program for private dwellings. The MHCP has conducted a series

¹⁵ A CONPES is a cross-sector socio-economic policy document.

¹⁶ See Annex 9, “Potential Economic Losses of Disasters in Colombia.”

of technical studies on earthquake risk assessment to evaluate the physical damage caused by a major earthquake on public assets. This complements other studies carried out by the District of Bogotá on the impact of earthquakes on public buildings and private dwellings. These studies, based on state-of-the-art catastrophe risk-modeling techniques, provide the Government of Colombia with very detailed information on earthquake risk assessment.¹⁷

4. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
Colombia Disaster Vulnerability Reduction Project	World Bank	110 million 2005-2011	1, 2, 3, 4, 5
Bogota Disaster Vulnerability Reduction Project	World Bank	80 million 2006-2011	1, 2, 3, 4, 5
Colombia Disaster Risk Management Development Policy Loan	World Bank	150 million 2009-2012	1, 2, 3, 4, 5
Colombia Probabilistic Risk Assessment Platform	GFDRR/World Bank	500,000 2010-2011	1, 2
Technical assistance for the preparation of Barranquilla Flood Mitigation Project	GFDRR/World Bank	150,000 2010-2011	4
Project preparation of Barranquilla Flood Mitigation Project	Spanish Trust Fund/World Bank	725,000 2010-2011	4
Support for DesInventar online disaster database creation of National online Disaster Prevention and Management Information System (SIAPAD)	European Commission through the PREDECAN project	140,000 ¹⁸ 2003-2009	2

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Although there have been significant advances in disaster risk management, remaining challenges have been identified based on Colombia's risk profile and indicative program. Strategic actions are needed in the following areas to enhance disaster risk management in Colombia: (i) increase awareness and resilience at local levels, (ii) mainstream disaster risk management (DRM) in priority sectors, and (iii) institutionalize disaster risk financing.

In spite of the important advances in data gathering and knowledge production and some advances in awareness raising, Colombia still has significant challenges. The main challenge lies in knowledge creation among decision-makers and citizens at local levels. This is critical for improving urban planning processes that will avoid development patterns that exacerbate vulnerability. Successful implementation of the probabilistic risk assessment platform will help address this challenge. GFDRR support for the platform is essential for its success.

Due to the combination of legal responsibility, capacity and needs to invest in disaster risk reduction, the larger municipalities in Colombia are currently a good entry point for promoting risk reduction investments. GFDRR

¹⁷ These studies include ERN (2005a), ERN (2005b), and CEDERI (2005).

¹⁸ Approximate amount to support Colombia directly, although broader program has larger resource allocations.

could continue to play an important role by providing grant funds for integration of disaster risk reduction in urban development projects and thereby leverage significant amounts of additional resources for reducing disaster risk.

While progress has been made to institutionalize disaster risk management in general, work remains for Colombia to institutionalize its disaster risk financing. A main challenge relates to the risk to private housing. Legally this is private risk, but in the event of a major disaster, the Government is likely to be called upon as the insurer of last resort. A solution is being sought that involves collaboration between the national government and key municipalities, as well as public-private partnerships involving the national and international insurance markets. GFDRR resources would support work among the Ministry of Finance, the Secretary of Finance of the District of Bogotá, as well as the insurance association, in an attempt to launch an insurance scheme to protect both private and public assets from natural disasters.

The following activities have been identified in consultation with local authorities and reflect HFA priority action areas. These actions support Colombia's disaster risk management program.

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)¹⁹
Strengthening the policy framework, tools and institutional coordination of the national system for disaster risk management	National Planning Department, Directorate of Disaster Prevention and Management	800,000 2011-2012	1
Implementation framework for Climate Change Adaptation activities focused on disaster risk management	National Planning Department	500,000 2011-2012	1, 2, 3
Development of a Risk Assessment Platform for Colombia (2nd phase)	National Planning Department	500,000 2011-2012	2, 3
Municipal Disaster Vulnerability Reduction Project	Municipality to be determined	1.2 million 2011-2012	4
Insurance of public assets and risk financing	Municipality of Bogotá	200,000 2011	5
Initial Budget Proposal:		US\$4.834 million	

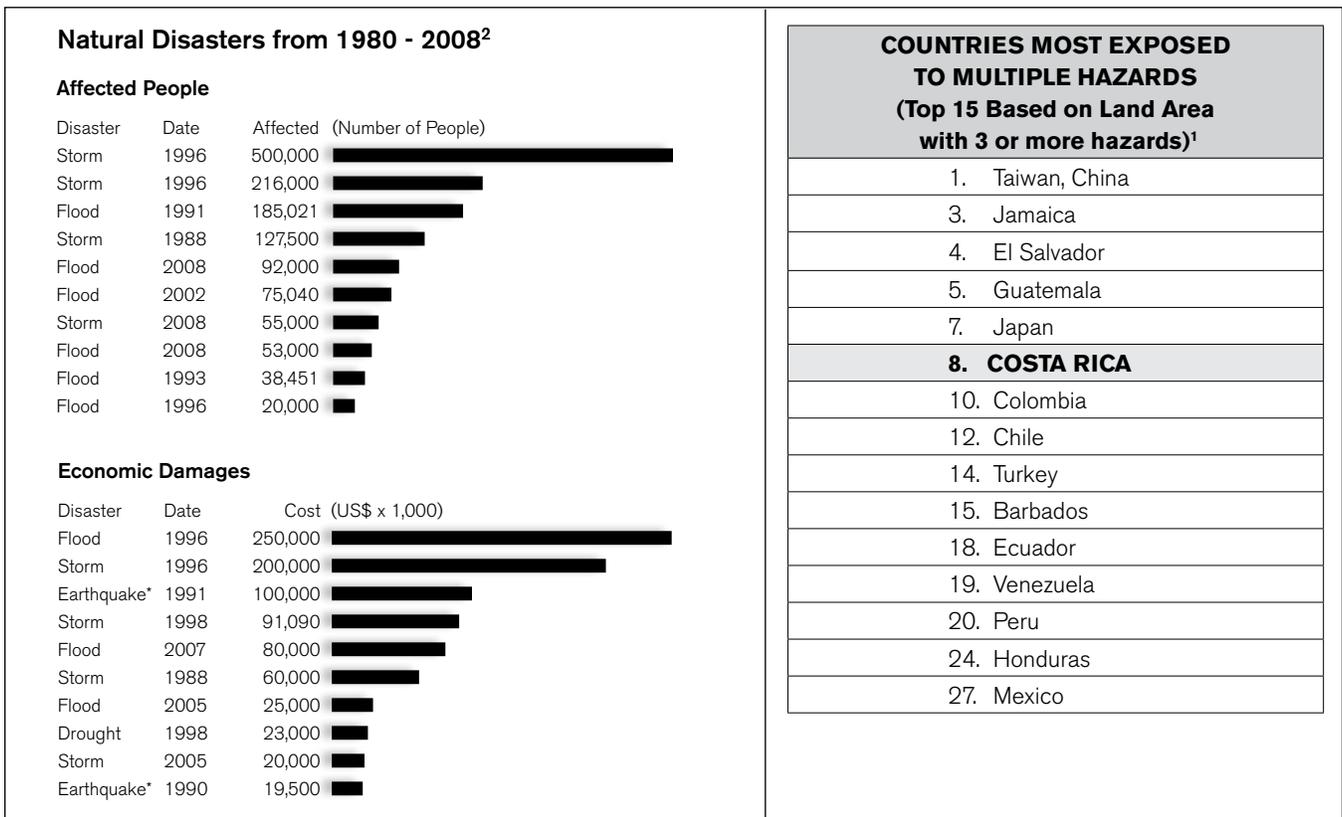
In addition to the above-mentioned activities, opportunities are under consideration to maximize South-South cooperation in the Andean countries with key participation of Colombia. Continued dialogue with the Government of Colombia will lead to the prioritization of future initiatives to ensure adequate mainstreaming and implementation of disaster risk management measures.

¹⁹ HFA Priority Action Areas: 1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2. Identify, assess, and monitor disaster risks—and enhance early warning; 3. Use knowledge, innovation, and education to build a culture of safety and resilience at all levels; 4. Reduce the underlying risk factors; 5. Strengthen disaster preparedness for effective response at all levels.

COSTA RICA

1. DISASTER RISK PROFILE

Costa Rica has the 8th highest economic risk exposure to three or more hazards, according to the Natural Disaster Hotspot study¹ by the World Bank. This study also ranks Costa Rica as second among countries most exposed to multiple hazards based on land area, with 36.8% of the total area exposed to three or more natural hazards. The study estimates that 77.9% of Costa Rica’s population and 80.1% of the country’s GDP reside in areas exposed to high risk from multiple hazards.



Geological Hazards

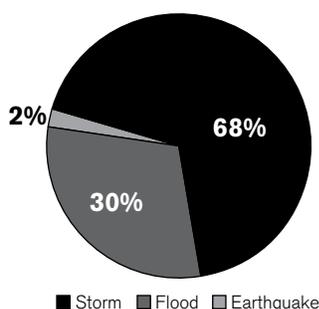
Due to its geographic location and geotectonic characteristics, Costa Rica is exposed to a variety of natural hazards, including hydrometeorological and geophysical hazards. The country has recently experienced floods, hurricanes, earthquakes, and landslides.

1 Dilley et al. (2005). Table 7.2.

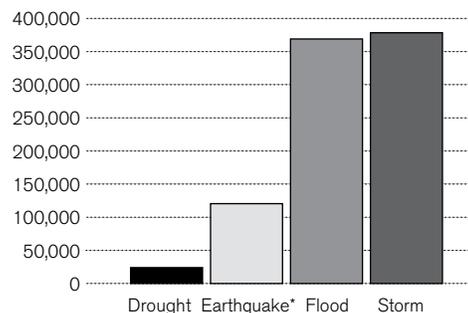
2 UN (2009). <http://www.preventionweb.net/english/countries/statistics/?cid=41>. Source data from EM-DAT. Data displayed does not imply national endorsement.

Statistics by Disaster Type²

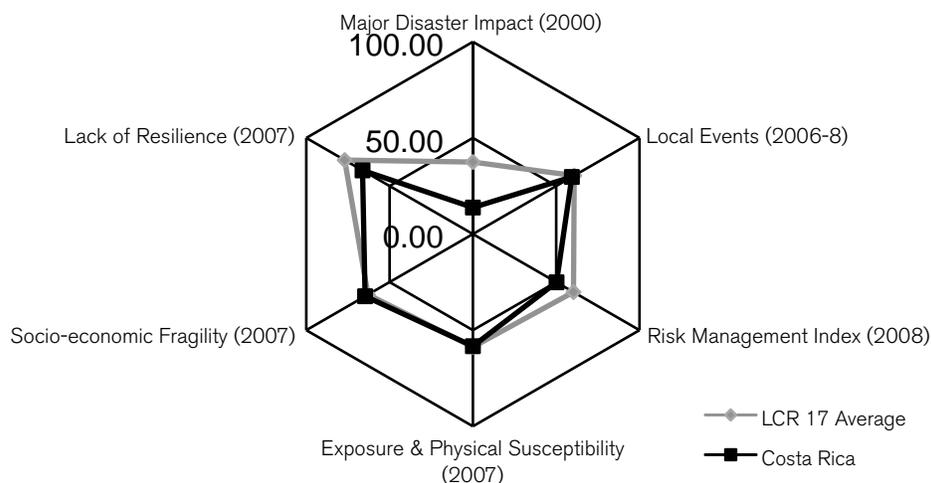
Population Affected by Disaster Type



Economic Damages / Disaster Type (1000s US\$)



Relative Vulnerability and Risk Indicators³



Costa Rica has been identified as one of the most earthquake-prone and volcanically active countries in the world. The country is located on the subduction zone of the Caribbean and Cocos tectonic plates, and the fracturing movements of these two plates have caused frequent earthquakes. In January 2009, an earthquake reaching 6.2 on the Richter scale, killed 22 people and caused more than US\$150 million in losses from damage to infrastructure and the agro-industry (public infrastructure was particularly affected by this event, with damages to eight bridges and several roads. Total insured losses are estimated at US\$72 million, most of them caused by damage to several hydro-electric plants). The country also has three mountain ranges that span the entire country—with 16 peaks of known volcanic origin and 9 active volcanoes. Five active volcanoes in Costa Rica have caused significant damage and economic losses in the past.

³ Relative Vulnerability and risk Indicators are adapted from IADB-IdeA-ern (2009). Values are normalized on scale of 0 – 100 and presented against the average for 17 LCR countries. Major disaster Impact taken from disaster deficit Index: the ratio of economic losses which a country could suffer during a Maximum Considered event and its economic resilience. Local events taken from Local disaster Index: the propensity of a country to experience recurrent, small-scale disasters and their cumulative impact on local development. risk Management Index is presented as the negative (i.e. 0 = optimal, 100 = incipient) of IADB's risk Management Index: measures a country's risk management capability in (i) risk identification, (ii) risk reduction, (iii) disaster management, and (iv) financial protection. resilience, Fragility and exposure are taken from the component indices of Prevalent Vulnerability Index. Date for local event data depends on information available for each country. Data, and the respective LCR 17 average, from 2000 is used for Dominican Republic, El Salvador, Guatemala, Jamaica and Nicaragua. Data, and the respective LCR 17 average, from 2006-08 is used for Bolivia, Colombia, Costa Rica, Ecuador, Panama and Peru. All LCR 17 averages are calculated based on available data.

Floods and Landslides

The frequency of floods has been increasing in Costa Rica and this natural hazard currently represents the main source of losses in the country. During February 2009, heavy rains affected the Pacific Coast and the Central Valley of Costa Rica, causing floods and landslides in at least 65 of the country's 81 counties, with 18 deaths reported. There was serious damage reported to at least 27 major roads, including cutoffs on the Pan-American Highway. At least 2,000 homes were flooded in the northern province of Guanacaste, which forced 1,500 people into temporary shelter.

Triggered by intense rainfall, earthquakes, and volcanic eruptions, landslides and torrential debris flows are among the most costly in terms of human lives. During the heavy rains in October 2007, a total of 14 people died in a landslide in the city of Atenas. After the January 2009 earthquake, at least 10 people died in another landslide in Cinchona, a rural community 50 miles west of the capital city, San José.

Hurricanes

Costa Rica is also exposed to a hurricane hazard on its Caribbean coast. Hurricane Mitch, one of the most destructive events in Central America, caused economic losses amounting to approximately US\$98 million.

The following table outlines the estimated losses and budget allocations for declared emergencies between 1999 and 2007. The figures demonstrate a significant gap between budget allocations and resources needed to recover the estimated losses incurred.

Estimated Losses and Budget Allocation for Declared Emergencies (US\$ million)

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007
Estimated Losses	29.8	24.5	23.8	15.8	1.5	1.6	39.6	10.8	50.3
Budget Allocation	8.3	3.1	1.6	1.1	1.5	1.7	7.0	13.1	7.9

Source: CNE.

Additional Vulnerabilities

The fast-growing metropolitan population in the Central Valley generates major stresses on the limited natural resources, public utilities and municipal services. The high concentration of the Costa Rican population in the Central Valley is the result of historical processes, exacerbated by the concentration of industrial developments and other sources of employment. Under these circumstances, affordable housing becomes a major socio-economic constraint that forces low-income families to relocate to higher-risk areas.

2. DISASTER RISK MANAGEMENT FRAMEWORK

Costa Rica has a comprehensive legal and institutional framework for disaster risk management (DRM). The recent strengthening of the institution and the legal framework is reflected in key disaster risk management actions such as the adoption of Law No. 8488 of 2006 and its consequent regulation (Executive Decree No. 34 361-MP of 2008). The law requires all central government entities and local governments to allocate resources for relevant disaster and risk activities in their programs and budgets. The Law also established a mandatory contribution of 3 percent of financial surplus or profit from all governmental institutions to be transferred to the National Emergency Fund (NEF).

In the event of a national emergency, the National Risk Prevention and Emergency Management Commission (CNE⁴) acts as the highest-ranked coordinating authority. CNE's capacity to coordinate and incentivize disaster risk management emergency activities was enhanced by the approval of the Emergencies and Risk Prevention Law No. 8488 in 2006.

The National Risk Management System (NRMS) has been mainstreamed by the Government of Costa Rica (GoCR). The NRMS integrates all the risk reduction and emergency relief efforts of the public entities, the private sector, and civil society, at the national, municipal, and regional levels.

The National Plan for Risk Management was updated according to Law 8488. A National Forum for Risk Management (October 14-16, 2009) proposed the National Plan for Risk Management (NPRM), which was approved in January 2010.

Disaster Risk Management (DRM) was incorporated into the 2006–2010 National Development Plan through the strategic action on land planning as part of the Social Development and Poverty Reduction component. The incorporation of DRM in this National Development Plan (NDP) obliges all line ministries to include risk analysis and mitigation initiatives in their annual programs. Currently, the Ministry of National Planning and Economic Policy (MIDEPLAN⁵) and CNE are proposing to incorporate the concept of risk management as a transversal policy axis in the new NDP (2011-2015). The Costa Rica National Platform has also adopted the recommendations of the strategic objectives and priority actions of the “Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters.”

MIDEPLAN has strengthened risk management in the selection process of national investment projects to be approved by MIDEPLAN, through the establishment of a legal framework which supports the incorporation of risk analysis into the national investment process.

As an integral part of the strategy for disaster risk management, the GoCR is designing and implementing a strategy for financing catastrophic risk. In the case of the GoCR, the NEF is used to finance emergency rehabilitation and reconstruction for the lower levels of risk (high-frequency/low-cost). This fund consists of mandatory transfers, public entity transfers, and donations from various sources. Law 8488 stipulates that all public institutions should transfer to NEF 3% of its financial surplus or profit. The Catastrophe Deferred Drawdown Option (CAT DDO) loan signed in November 2008 complements the emergency funding system mentioned. The CAT DDO provides bridge financing at the time of a declared emergency. This enables the country to maintain its development programs while mobilizing other sources of funding to address the emergency. This is one of four lending operations agreed upon with the World Bank as part of the Country Partnership Strategy for FY09–FY11. Additionally, in order to reduce its fiscal vulnerability to the occurrence of natural disasters, the GoCR will create a Catastrophic Risk Transfer Vehicle (CRTV) to improve, in a first stage, the financial protection of public buildings and social housing.

The GoCR recognizes the connection between climate change and increased vulnerability and is taking steps to build awareness throughout the country. Under the Ministry of Public Education, the National Educational Plan for the Reduction of Risk to Disasters is being incorporated into environmental education curricula. The GoCR is also implementing the National Strategy on Climate Change, which is expected to generate important recommendations on assessing risks of public and private investment projects.

4 *Comisión Nacional de Prevención de Riesgos y Atención de Emergencias.*

5 *Ministerio de Planificación Nacional y Política Económica.*

Costa Rica has nationwide networks of volcanological and meteorological monitoring stations with highly qualified scientists and engineers involved in a wide variety of DRM-related research topics. Public universities and research institutions in Costa Rica cooperate with leading research organizations around the world.

Costa Rica has been effective in the development of building codes and ensuring that private and public works adhere to construction standards that minimize risk exposure. Under the provisions for a declaration of a state of emergency, the phases of immediate response and reconstruction must integrate disaster risk reduction measures.

A major challenge in implementing the DRM national policies is the development of local capacity at the municipal level, where technical and human resources can be very constrained.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK FOR ACTION

Hyogo Framework for Action (HFA) Priority #1: Policy, institutional capacity and consensus building for disaster risk management

The Costa Rica National Platform has adopted the recommendations of the strategic objectives and priority actions of the “Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters.” In agreement with the Framework guidelines, Costa Rica has a national platform for a DRM framework that includes the National Risk Prevention and Emergency Management Commission (CNE⁶), the National System for Risk Management (NSRM), the NPRM, and coordinating entities. The CNE monitors and reports annually on the country's progress in its “National Report on the Implementation of the Hyogo Framework for Action.”⁷ Given the emphasis on prevention established by Law 8488, a restructuring process is in progress at CNE. The restructuring proposal was approved by CNE's Board in August 2010.

The Government of Costa Rica (GoCR) strengthened its institutional framework and established the legal framework to guarantee the reduction of the causes of risk and timely, coordinated risk management in times of disaster. Through the 2006 approval of Law No. 8488, the regulations define in greater detail the DRM system, the mandate and role of the CNE, the GoCR's disaster prevention responsibilities, the process of a declaration of a state of emergency, a general emergency plan, and financial resources. To facilitate timely coordination, the CNE's Board of Directors is composed of the CNE President, the Ministers of Presidency, Health, Public Works and Transport, Public Security, Environment and Energy, Housing and Human Settlements, and Finance, the heads of the Institute of Social Assistance (IMAS), the National Insurance Institute (INS), and a representative from the Red Cross of Costa Rica.

The GoCR's institutional framework for disaster risk management (DRM) ensures that disaster risk reduction is a national priority. The NPRM recognizes the need to carry out disaster risk reduction and mitigation activities. This involves coordinated participation of civil society and the private sector, and national and local government institutions throughout the country. The NPRM 2010–2015 emerged from public consultation, with the participation of more than 94 entities involved in risk management, who participated in the National Forum for Risk Management (October 14-16, 2009). Consequently, there is a collective definition of strategic actions and goals from an interagency and interdisciplinary approach. The NPRM was approved by CNE's Board and presented at the Governing Council in January 2010.

⁶ *Comisión Nacional de Emergencias.*

⁷ *PreventionWeb (2009a).*

The GoCR has greatly enhanced its ability to ensure the effective and efficient allocation of resources for disasters. All central government entities and local governments must allocate resources for relevant disaster and risk activities in their programs and budgets. In addition, 3% of financial surplus or profit from all governmental institutions must be transferred to the NEF to finance the National Risk Management System. This strengthens the government's capacity to effectively support disaster mitigation activities in a sustainable manner. In the event of a declaration of national emergency, NEF funds are readily available to the CNE, which has the authority to allocate those funds as appropriate, without having to follow the lengthy administrative processes needed for allocations of funds during non-emergency situations. Once the emergency has passed, the CNE is still responsible for the proper accounting of any funds disbursed.

The Catastrophe Deferred Drawdown Option (CAT DDO) loan signed in November 2008 complements the NEF. The CAT DDO provides bridge financing at the time of a declared emergency. This enables the country to maintain its development programs while mobilizing other sources of funding to address the emergency. Additionally, there is a proposal for a Catastrophe Risk Transfer Vehicle that would allow for segregation of catastrophic risk from Government assets and social housing, in the first stage. In the second phase the infrastructure of roads and bridges will be included in the CRTV. The integration of the CAT DDO with this proposal and with the NEF would make a robust risk-financing strategy. The CRTV proposal is in line with the goals approved in the NPRM, which included among their goals "(...) the timely use of hedging instruments and financial management, in order to raise the quality, safety and longevity of goods and services", and assigned responsibilities to INS to fulfill this goal. Additionally, the Agreement VI, No. 8987 of INS' Board session, held on February 8, 2010, approved to institutionalize as one of the core projects of the organization the development of a Catastrophic Risk Transfer Program for the GoCR.

The GoCR understands the importance of mainstreaming disaster risk management (DRM) and significant progress has been made in Costa Rica. DRM was incorporated in the 2006–2010 National Development Plan (NDP), through the strategic action on land use planning as part of the Social Development and Poverty Reduction component. The incorporation of DRM in the NDP obliges all line ministries to include risk analysis and mitigation initiatives in their annual programs. A comprehensive monitoring mechanism for disaster risk prevention and reduction investments by key line ministries is being prepared, so that information on DRM mainstreaming activities in all sectors can be used in the future for analysis. In addition, the CNE has been asked to (i) establish the National Risk Management System (NRMS), (ii) design and implement the NPRM, (iii) strengthen early warning systems, and (iv) strengthen risk management at the community level. Continued efforts need to be made to ensure that the integration of DRM priorities within line ministries and other government agencies are not relegated to the back burner when competing mandates arise. In this sense, MIDEPLAN and CNE will incorporate the concept of risk management as a transversal policy axis in the new National Development Plan (2011-2015).

Costa Rica has also integrated risk management considerations into the review process of all investment projects for the country. The Ministry of National Planning and Economic Policy (MIDEPLAN) recently added a disaster risk review in the project proposal format for national investments, through the Executive Orders 34 694-PLAN-H of August 2008 (Public National Investment System), 35 098-PLAN of March 2009 (National Public Investment Plan) and 35 374-PLAN of July 2009 (Technical Standards, Guidelines and Procedures for Public Investment). Under this measure, government agencies submitting investment projects for approval by MIDEPLAN are now required to conduct a disaster risk assessment of the proposed investment and include mitigation measures in case the project is exposed to adverse natural events. This improvement, along with the environmental review, has great potential to control and effectively address disaster risk in future investment programs. The country is currently assessing systems that could assist public officials in the decision-making process by assessing the disaster risk of planned investment projects. Additionally, MIDEPLAN implemented an ambitious training program, which includes risk assessment, for public functionaries involved in the public investment process.

Although significant advances in inter-institutional coordination have been made, Costa Rica has operative and financial constraints that diminish the country's ability to more effectively respond to emergency situations. This was recognized by the GoCR's self-assessment of progress and was highlighted during recent flood events and the recent earthquake of 6.2 on the Richter scale that generated losses of more than US\$150 million according to GoCR estimates.

HFA Priority #2: Disaster risk assessment and monitoring

The GoCR has attained significant achievements in the area of DRM and monitoring. The country has a National Risk Atlas at the national and municipal (county) levels. Working closely with several national universities and research institutions, the CNE develops and maintains national- and local-level risk assessment maps for each type of hazard. The goal is to provide each municipality with up-to-date maps that can be integrated—using computer-based technologies such as geographic information system (GIS) mapping—as inputs for the preparation of the municipal urban zoning and land use maps, and enforcement of zoning and building codes. The CNE, in collaboration with these research partners, is also building databases with information on historical events to improve its prediction capabilities.

A major constraint in the process of delivering information to the local municipalities is the level of local technical capacity to absorb this information. Some municipalities have sophisticated mapping systems, while others have very little or no technical or human resources to fully benefit from the available information on hazards and related risks.

The CNE coordinates a national network of early warning stations for monitoring and registering rain data, river flows, and landslides, with the goal of providing local communities with critical, timely information about their level of exposure to flooding events. Every station in the network has access to radios and/or phones to help relay their data in real time. They also compile information on other threats, such as earthquakes, and relay data on intensity and damage to infrastructure and/or personal injuries to local communities, to the CNE, and first responders, using the nationwide 911 system.

The CNE also coordinates a network of 400 community-level, 100 municipal-level, and 6 regional-level Emergency Management Committees. These committees are organized to allow dissemination of critical time-sensitive information and to receive and distribute emergency aid should a localized event occur. Depending on the geographic scope of a given emergency, command and control escalates from the community level to the municipal level, and so forth. The CNE is authorized by law to disburse funds to local communities in the event of a local level emergency, and to help reduce the risk of threats such as floods and landslides by providing funding to retrofit schools, hospitals, bridges, and levees, and to dredge rivers and creeks, among other activities.

The GoCR is currently developing a set of disaster risk indicators for use in public investment projects, along with better metrics to assess the costs of investment projects and to improve predictions of actual losses caused by disasters.

The country is also working on the implementation of the National Strategy on Climate Change, which is expected to generate important recommendations on assessing risks of public and private investment projects. The implementing agency is under the authority of the Minister of the Environment, who is also a member of the CNE Board, and it is expected that important synergies between work on climate change and DRM will continue to evolve.

In February 2008, the GoCR requested the World Bank's inclusion of Costa Rica within the CAPRA initiative (Central American Probabilistic Risk Assessment)⁸ to strengthen its risk management strategy to the occurrence of natural disasters. The CNE is working on the implementation of CAPRA through the Technical Advisory Committees of the National Risk Management System. This should help facilitate a comprehensive understanding of risk and risk management.

HFA Priority #3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

Costa Rica has a long history of advances in scientific and technical research in areas directly related to DRM. Highly qualified scientists and engineers are involved in a wide variety of DRM topics such as the development of national networks of volcanological and meteorological monitoring stations and detailed geographic and geological studies. Public universities and research institutions in Costa Rica cooperate with leading research organizations around the world.

Costa Rica has recognized the link between environmental degradation and disaster risk and is incorporating DRM into the curricula on environmental education. To further disseminate information on DRM, the GoCR is implementing the "National Educational Plan for the Reduction of Risk of Disasters" under the Ministry of Public Education.

Public universities in Costa Rica are also incorporating DRM training courses in the programs of those careers related to environmental sciences, health, geography, geology, and psychology. Public universities are organized under the National Deans' Commission (CONARE), which dictates general guidelines for their operation. CONARE created a commission composed of representatives from its member institutions charged with coordinating activities for developing DRM curricula in three main target areas: Community Outreach, Research, and Education. Concurrently, each university develops its own internal "Risk Management Program," consolidating relevant activities from all ongoing research and education projects. As part of these efforts, the University of Costa Rica is offering a Masters degree in DRM.

Several government agencies at the municipal level have developed information management systems by incorporating GIS technologies to improve their capabilities to manage their urban development, titling, and land use data assets. A growing number of municipalities are also developing their presence on the Internet by creating their own websites and thereby increasing information dissemination to local and global communities.

The national government has clear policies on the development of e-government and the CNE has made important progress in developing its own website, where up-to-date information is published and made readily available to the general public. Important resources such as a catalogue of natural hazard maps, along with important studies related to DRM in Costa Rica, can be accessed through CNE's website.

Concerted efforts need to be made to overcome the unevenly distributed technical capacity at the local level, particularly in smaller municipalities. This constraint can be overcome through enhanced use and incorporation of available knowledge into municipal planning processes.

⁸ <http://ecapra.org>.

HFA Priority #4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience)

Given Costa Rica's high exposure to natural and anthropogenic hazards, there is still room for improvement in the reduction of the underlying risk factors despite the progress that has been made. For example, continued efforts are needed to unify the agendas on Climate Change and disaster risk management, including the enhancement of adaptability to changes in hydrological and water resource management issues.

Costa Rica has been effective in the development of building codes that ensure that private and public works adhere to construction standards that minimize the risk of exposure to certain natural and man-made hazards, such as earthquakes and fires. Along with the implementation of zoning regulations, the country is moving in the right direction.

As noted previously, any public works performed during immediate response and reconstruction phases under the provisions of a declaration of a state of emergency must integrate measures aimed at removing or reducing the conditions that created the risk in the first place. However, financing available for reconstruction is limited while in many instances the amount of financial resources needed to effectively reduce the risk and vulnerability to hazards is greater than the actual losses.

Increased private sector participation is essential to further reduce the underlying risk factors in Costa Rica. The country is trying to improve participation of the private sector in the DRM process by implementing mechanisms on a voluntary basis and also through the enforcement of the existing legal and regulatory frameworks.

The strict enforcement of building codes has become a major challenge for local authorities and it is necessary to reduce risk exposure of vulnerable socio-economic groups living in unplanned settlements in high-risk areas. Frequent, low-intensity emergency events, mostly affecting unplanned settlements in areas unsuitable for urban development, consume an important percentage of the available resources for DRM and social assistance. Relocating vulnerable families to lower-risk areas provides a temporary solution until a new wave of squatters tend to settle into these high-risk areas, repeating the vicious cycle.

The DRM and social themes are linked and supported under the GoCR's commitments to achieving the goals of the Millennium Development Agenda. Although the GoCR's social policy is not explicitly geared to reducing vulnerability to disasters, the National Development Plan includes an annex on "Social Development and the Fight against Poverty." Strategic Action 9 of the annex contains several goals specifically geared to reducing vulnerability, including community organization and development of communal infrastructure, strengthening early warning systems, and implementing the NPRM.

To reduce the generation of new risk, MIDEPLAN established a legal framework for public investment that ensures that new investments to be approved by MIDEPLAN will comply with safe practices for handling disasters.

HFA Priority #5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

The CNE develops and coordinates the early warning system and defines mechanisms for addressing DRM issues at the municipal level throughout the country. The CNE also builds its own technical capacity for the data gathering, analysis, and dissemination of knowledge about threats, and is developing maps of hazards, and databases

that are used as inputs for the preparation of municipal and local regulatory plans (zoning plans). Land use and urban development recommendations derived from these zoning plans are legally binding, and the CNE has the authority to stop public and private works that do not abide by them.

Many of the components of the National Climate Change Plan relate to the GoCR's ongoing DRM efforts.

An Office of the National Strategy on Climate Change (ENCC)⁹ was created within the Ministry of the Environment, Energy and Telecommunications to prepare plans to minimize the effects of climate change on the priority axes of the strategy through mitigation, vulnerability and adaptation, and metrics. Other important components of the National Climate Change Plan such as public awareness and local capacity/technology transfer can further advance the existing DRM efforts in Costa Rica.

In line with the National Development Plan (NDP), Costa Rica is confronted with the challenge of strengthening the institutional capacities for DRM under policies of decentralization of authority and resources, making municipal governments accountable for designing and implementing changes to the regulatory framework for zoning and urban and industrial developments, congruent with the government's principles on "development in harmony with nature." These principles translate, within the DRM, into the promotion of a culture of risk prevention oriented toward preventing loss of human lives, protecting assets, and the reduction of environmental deterioration. This challenge continues, as it is intrinsic to a long-term vision of sustainable development, requiring permanent attention.

It is expected that mainstreaming of risk reduction into the national planning process and promoting the integration of DRM into the development plans will continue. It is also expected that improving strategic risk management planning will continue in relevant sectors such as health, environment, education, agriculture, public works and investments, housing, and human settlements.

With regard to disaster response, one of the main challenges of the GoCR is to finance and rapidly initiate the recovery phase in the aftermath of a natural disaster. The CAT DDO, signed with the World Bank in November 2008, provides bridge financing at the time of a declared emergency. Additionally, there is a proposal for creating a Catastrophe Risk Transfer Vehicle that would allow for segregation of catastrophic risk from Government assets and social housing, in the first stage. Roads and bridges infrastructure will be included in the second phase.

The GoCR used to do emergency drills to prove the response capacity of the CNE and the COE. An earthquake drill in the city of Cartago, involving different search and rescue operations in collapsed structures, and a volcanic eruption drill in different communities of Turrialba, were done in November 2009.

Critical to this process is the implementation of the recently approved NPRM, as a strategic planning tool to drive the actions of government institutions and to promote a more active participation of civil society and the private sector.

9 <http://www.encc.go.cr/>.

4. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
Integration of Disaster Risk Information in Costa Rica Planning System	World Bank (IDF)	450,000 2009-2012	2, 3, 4
Support for the Pilot Project on Early Warning Systems for Hydrometeorological Hazards in Central America	World Bank (GFDRR) World Meteorological Organization	262,000 2009-2011	1, 2, 3, 4, 5
Costa Rica Public Asset Catastrophe Risk Insurance Facility Feasibility Study	World Bank (GFDRR)	460,000 2008-2011	1, 3, 4, 5
Probabilistic Risk Measurement for Central America (CAPRA)	World Bank (GFDRR)	360,000 2008-2010	2, 3
Costa Rica Catastrophe Deferred Drawdown Option (CAT DDO)	World Bank	65 million 2008-2009	1, 3, 5
Strengthening a Municipal Information System for Disaster Prevention in Latin America and the Caribbean (SIMPDI) Mitigation National Disasters	International Development Research Centre (Canada)	100,000* 2006-2009	2
Awareness Campaign on the Threat of Tsunamis in Some School Districts Within the Regional Directorate in Puntarenas, Costa Rica	Japan International Cooperation Agency	16,000 2007	3
Disaster Risk Management in Talamanca	UNDP	100,000 2006-2008	2, 4
Web-COE Project	Southern Command of the United States Army	not available permanent	5
"Prevention is Better" Community Intervention Strategy	ProVention Consortium, Organization of American States, British Red Cross, Finland Red Cross, Disaster Preparedness Programme of the European Commission's Humanitarian Aid Department (ECHO/DIPECHO)	50,000* 2007-2008	3
Regional Humanitarian Information Network (REDHUM) for Latin America and the Caribbean in the event of disasters	Spanish International Cooperation Agency (AECI), Switzerland Cooperation Agency (COSUDE), Government of Kuwait	100,000* 2006-2009	3, 5
Regional Program for the Reduction of Vulnerability and Environmental Degradation (PREVDA)	European Commission	1.65 million 2007-2011	1, 2, 4
Development of disaster risk management capacity at the local level	Japan International Cooperation Agency	300,000 2008-2011	2, 4
Regional Plan for Disaster Reduction (PRRD)	Norway Spanish International Cooperation Agency	400,000 2006-2011	1
Earthquake Risk Reduction In Guatemala, El Salvador and Nicaragua with regional cooperation support to Honduras, Costa Rica and Panama (RESIS II)	Norway	2.4 million 2007-2010	2
Regional Program of Environment in Central America (PREMACA)	Danish Cooperation (DANIDA)	not available	2, 4
Mesoamerican coordination system for territorial information	IADB	800,000 2009-2011	2
Strengthening of Information and Communication for CEPREDENAC and National Commissions	World Bank	446,000 2007-2009	1, 2

* Estimated

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Given Costa Rica's risk profile and its existing framework for disaster risk management, the key priority in Costa Rica is to continue to mainstream disaster risk reduction at the sectoral and local levels. Strategic actions are needed in the following areas to enhance disaster risk management in Costa Rica: (i) strengthen institutional capacity at sectoral and local levels, (ii) develop a comprehensive risk assessment and monitoring capacity, and (iii) advance risk financing strategies.

The following activities have been identified in consultation with local authorities and international donor agencies. These actions support Costa Rica's disaster risk management program and reflect HFA priority action areas.

Indicative Program for GFDRR Funding (Projects and engagement areas being considered for GFDRR funding)	Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s) ¹⁰
Support the development and implementation of: (i) a monitoring mechanism for disaster risk prevention and reduction investments by key line ministries, that will support the implementation of the National Plan for Risk Management 2010-2015; (ii) a collection mechanism for the National Emergencies Fund	Ministry of Finance, CNE, MIDEPLAN, Contraloría General de la República	400,000 2010-2012	1, 2, 4
Enhance CNE's institutional capacity and DRM activities by: (i) supporting the implementation of CNE's restructuring plan; (ii) strengthening DRM activities at the sectoral level; and (iii) supporting vulnerability reduction efforts by improving CNE's safety and resilience programs at the community level	National Emergency Commission (CNE), MIDEPLAN	1 million 2010-2012	1, 3, 4
Support phase II of the development of a Risk Assessment Platform for Costa Rica	World Bank (GFDRR)	750,000 2010-2012	2, 3, 4, 5
Support phase II of the development of Costa Rica Public Asset Catastrophe Risk Insurance Facility Feasibility Study for including hydrometeorological risk	World Bank (GFDRR)	500,000 2010-2012	1, 3, 4, 5
Initial Budget Proposal:		US\$2.65 million	

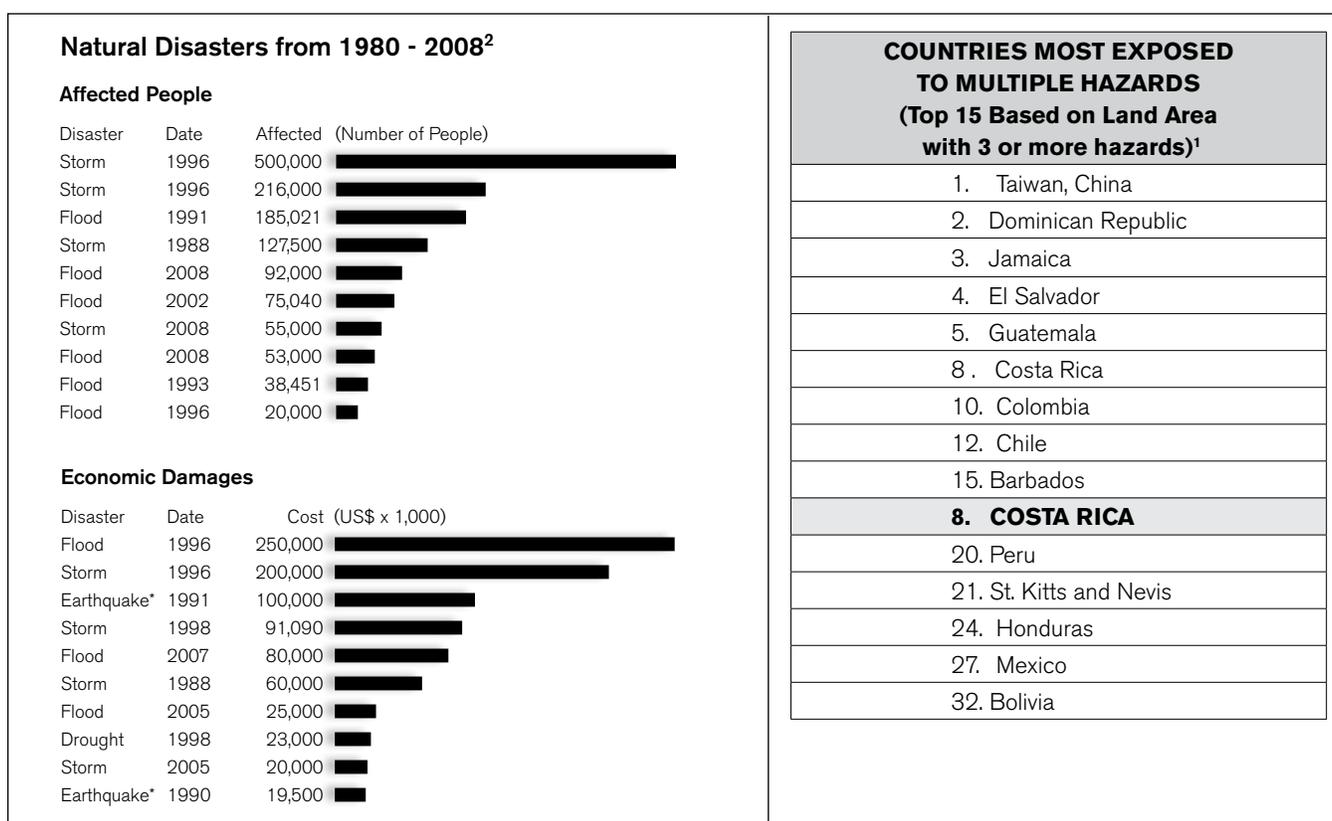
In addition to the above-mentioned activities, it is expected that dialogue will continue with Costa Rican authorities to assess the feasibility of a Vulnerability Reduction Plan for Crime and Violence in the City of San José.

¹⁰ HFA Priority Action Areas: 1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2. Identify, assess, and monitor disaster risks—and enhance early warning; 3. Use knowledge, innovation, and education to build a culture of safety and resilience at all levels; 4. Reduce the underlying risk factors; 5. Strengthen disaster preparedness for effective response at all levels.

ECUADOR

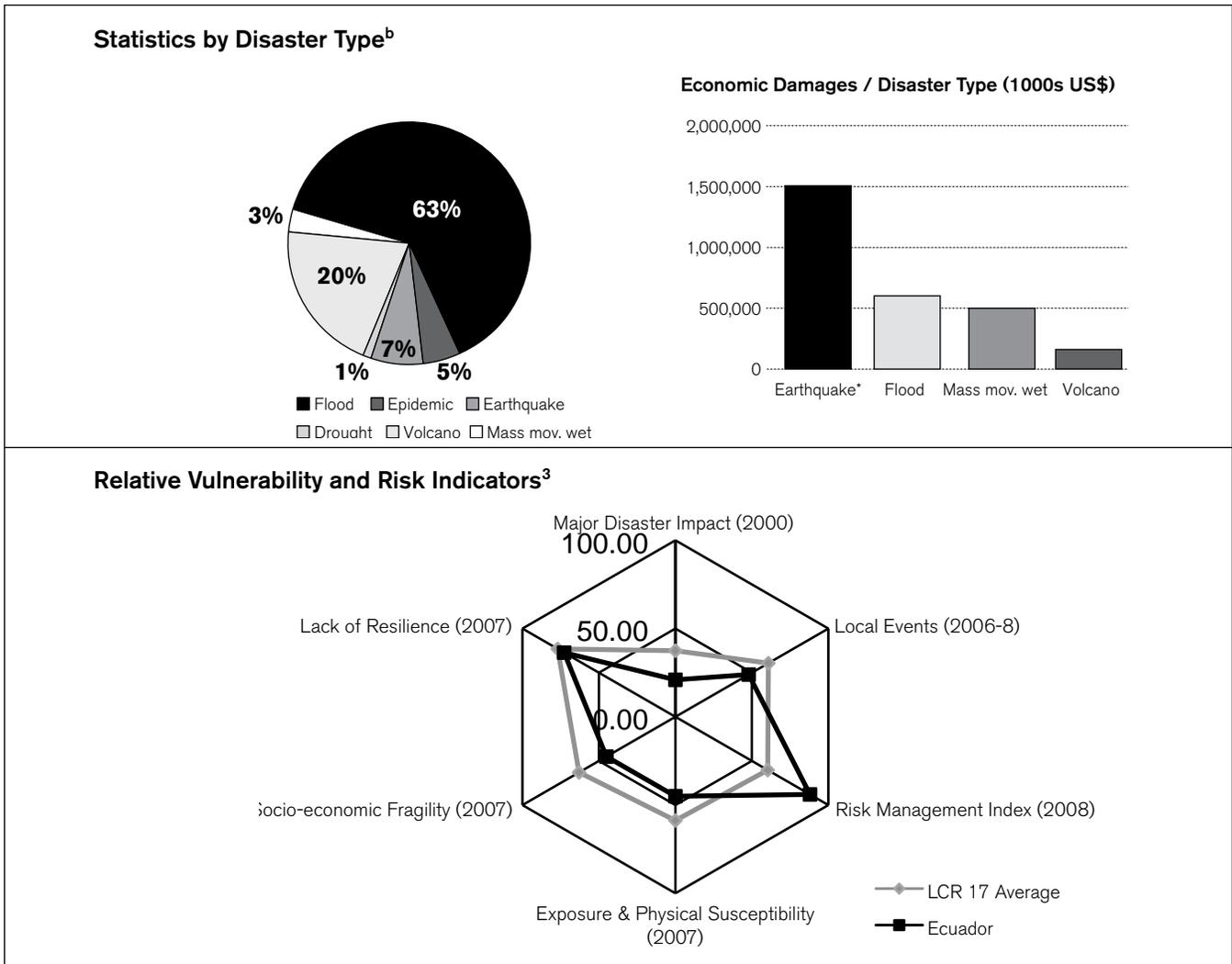
1. DISASTER RISK PROFILE

According to the World Bank's Natural Disaster Hotspot study¹, Ecuador ranks 18th among countries with the highest economic risk exposure to three or more hazards. 66% of the population lives in urban areas and 96% of this population lives in the coastal and mountainous regions, exposed to seismic, volcanic, flood, landslide, and El Niño hazards. The volcano Tungurahua is currently active. Floods and landslides occur frequently and affect the population as well as the productive sectors.



¹ Dilley et al. (2005). Table 7.2.

² UN (2009). <http://www.preventionweb.net/english/countries/statistics/?cid=53>. Source data from EM-DAT. Data displayed does not imply national endorsement.

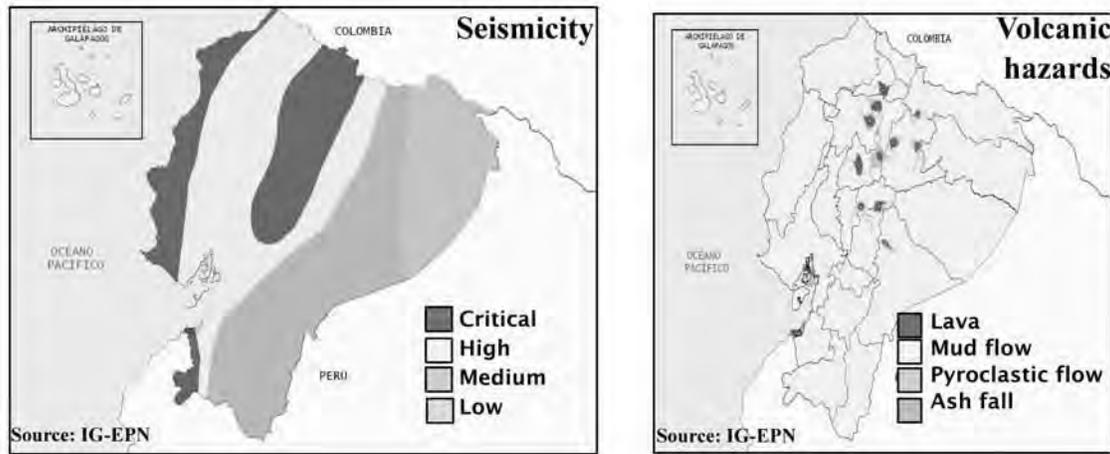


Geological Hazards

Ecuador is a highly seismically active territory. The subduction zone of the Nazca and the South American plates has been the source of the major earthquakes of Esmeraldas (1906, 1958, and 1979) and Caraquez Bay (1998). Likewise, the continental fault system which crosses the country in the northeast direction and in the foothills of the Cordillera Real has caused strong earthquakes (1541, 1987). The largest cities in the country (on the coast and in the mountains) are located in areas with high seismic risk (See Figure 1). Quito, the capital, is also in a high-risk area.

³ Relative Vulnerability and risk Indicators are adapted from IADB-IdeA-ern (2009). Values are normalized on scale of 0 – 100 and presented against the average for 17 LCR countries. Major disaster Impact taken from disaster deficit Index: the ratio of economic losses which a country could suffer during a Maximum Considered event and its economic resilience. Local events taken from Local disaster Index: the propensity of a country to experience recurrent, small-scale disasters and their cumulative impact on local development. risk Management Index is presented as the negative (i.e. 0 = optimal, 100 = incipient) of IADB's risk Management Index: measures a country's risk management capability in (i) risk identification, (ii) risk reduction, (iii) disaster management, and (iv) financial protection. resilience, Fragility and exposure are taken from the component indices of Prevalent Vulnerability Index. Date for local event data depends on information available for each country. Data, and the respective LCR 17 average, from 2000 is used for Dominican Republic, El Salvador, Guatemala, Jamaica and Nicaragua. Data, and the respective LCR 17 average, from 2006-08 is used for Bolivia, Colombia, Costa Rica, Ecuador, Panama and Peru. All LCR 17 averages are calculated based on available data.

Figure 1. Seismic and volcanic hazards in Ecuador
(taken from the Instituto Geofísico de la Escuela Politécnica Nacional IG-EPN).



Ecuador is home to the greater part of the Northern Volcanic Zone of the Andes range. 41 main volcanoes are distributed in four alignments: the Eastern Range (10), the Inter-Andean Valley (15 volcano junctions), the Cordillera Real (12), and the East (4). An eruption of the Cotopaxi volcano is the most complex volcanic risk scenario for Quito, the capital city. The volcanoes Tungurahua, Pichincha, and El Reventador have all been active within the past decade. Tungurahua is currently (2010) active as well. Due to these events over the past 10 years, the country has had to deal with population resettlement and very important economic losses, mainly in the agricultural and livestock sectors.

Hydrometeorological Hazards

Ecuador is highly vulnerable to the El Niño phenomenon due to the concentration of the development and the population on the coast and in the mountains. This alteration of the ocean-atmospheric system develops mainly in the Equatorial Pacific. The El Niño of 1997-1998 caused damages in the order of US\$280 million, equivalent to almost 15% of the Gross Domestic Product (GDP) in the year 1997.⁴ This phenomenon especially increases the frequency and intensity of floods on the coast, and of landslides and storm surges in the mountains. According to the historical records of events⁵, the most affected sectors in the central and the eastern regions of the country are health, education, agriculture, and road infrastructure.

The floods are very frequent and have caused major emergencies in the past few years. As is typical of the Andean region, the hydrological regime in the three natural regions (the mountains, the coast, and the jungle) has particular conditions which favor the occurrence of floods. In Ecuador, the major floods have been associated with the El Niño phenomenon (1982-1983 and 1997-1998), affecting especially the coastal region and causing major human and economic losses. Periods of intense rains also cause significant floods, the most recent along the coastline in 2008.

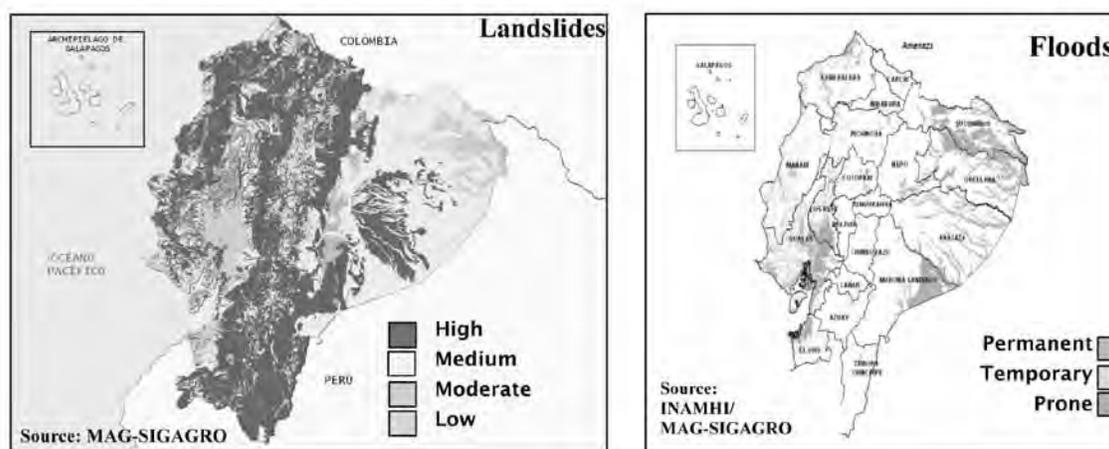
The concentration of development in the mountains leads to the fact that landslides form, a phenomenon that frequently affects urban areas and infrastructure. After floods, landslides are the second most frequent hazard phenomena. In the last two decades, they have caused several river blockages with important losses (Pisque River, 1990; Paute River, 1993; Chanchán River, 1999; Guasuntos River, 2000)⁶. The road infrastructure is also often affected.

⁴ "Las lecciones de El Niño 97-98 Ecuador", Corporación Andina de Fomento.

⁵ <http://www.desinventar.net>.

⁶ Rivera Magno. *Consecuencias de los deslizamientos en el Ecuador. IV Jornadas en Ciencias de la Tierra.*

Figure 2. Landslide and flood hazards in Ecuador
(taken from the Instituto Nacional de Meteorología e Hidrología – INAMHI).



Main determinants of vulnerability to natural events

The concentration and growth of the population in the urban areas increases the level of exposure to adverse natural events. The city populations have continued to grow over the past ten years. In 2001, 61.2% of the inhabitants were living in urban areas (approximately 7.6 million), and it is estimated that in 2009 the number could be around 66% of the population (around 9 million).⁷ 96% of the urban population is distributed in the coastal and mountainous regions, where most of the natural hazards are concentrated.

Weaknesses in the policies and land use planning instruments, in combination with migration towards the urban areas, result in inadequate localization of the population. Despite the fact that the Metropolitan District of Quito and a few other cities have made advances in their urban regulation strategies, the country's land use planning in general has not had the legal and institutional framework needed for the consolidation of sustainable development policy and practice. The available regulatory instruments are insufficient and do not adequately incorporate risk reduction criteria. The peripheral urban areas of low value expand because of unregulated informal and unplanned settlements, which have great weaknesses in terms of their location and safe construction.

Environmental deterioration of the river basins and the expansion and intensity of farmland use have entailed an increase in the frequency and intensity of phenomena like landslides and floods. The main causes of degradation of hydrographic basins, which results in changes in the water cycle (behavior of surface and underground currents) and the equilibrium in the surface processes of erosion, meteorization, and landslides are as follows: the accelerated loss of biological diversity (2,180 species endangered due to the destruction of their habitats)⁸, deforestation (238,000-340,000 hectares annually)⁹, expansion of the agricultural frontier¹⁰, and environmental deterioration due to hydrological contamination and inadequate disposal of industrial and residential waste.

There are a number of weaknesses in the reduction of the existing vulnerabilities and in the planning of new development in the productive sectors. There is an accumulated delay in the evaluation of vulnerability of constructed

7 National Institute of Statistics and the Census (*Instituto Nacional de Estadísticas y Censos, INEC*).

8 International Union for Conservation of Nature (IUCN), in its Red List of Threatened Species (2006).

9 Ministry of Environment et al. (2001).

10 Modernization Program of Agricultural Services (2001).

infrastructure with respect to seismic and volcanic risk in particular. The hydrocarbon sector, which represents between 10-14% of GDP, has an important part of its facilities in the province of Esmeraldas, which is an area with high seismic hazard. However, the facilities were built decades ago according to seismically resistant design parameters inferior to those currently defined in recent studies specific to the region.

2. DISASTER RISK MANAGEMENT FRAMEWORK

Ecuador's current institutional and policy situation is very favorable for structural changes in the area of disaster risk management. The new Constitution includes specific aspects of disaster risk management, creating the Technical Secretariat of Risk Management (*La Secretaría Técnica de Gestión del Riesgo*), which replaces the Civil Defense (*Defensa Civil*), and initiating the organization of the new Decentralized National System of Risk Management (*Sistema Nacional Descentralizado de Gestión del Riesgo*, SNDGR). The results achieved through this process over the upcoming years will be decisive in establishing the long-term disaster risk management conditions in the country.

However, Ecuador faces very important challenges to reduce its seismic and volcanic vulnerability. These two phenomena constitute the highest risks of the country and the vulnerability accumulated over the course of decades is very high. The reduction and management of these risks will require important changes in urban regulation, building codes and regulations, critical investments in structural reinforcements, and land use planning in the areas exposed to the volcanic phenomenon.

The revision and strengthening of the land use planning system in Ecuador is essential to effectively reduce underlying hazards and related risks. The land use planning system in Ecuador requires the integration of disaster risk reduction criteria into the policies, strategies, mechanisms and instruments of the planning institutions. Improved technical capacity, information generation, and development of methodological instruments are critical elements to facilitate this process.

Capacity building of local governments is a necessary condition for consolidating and effectively implementing Ecuador's disaster risk management system. Because of the decentralized nature of the new 'Decentralized' National System of Risk Management, the provinces, districts, and parishes should assume the responsibilities for management and control of risks in their respective territories.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK FOR ACTION

Hyogo Framework for Action (HFA) Priority #1: Policy, institutional capacity and consensus building for disaster risk management

The new constitution of Ecuador has set the foundation for consolidating disaster risk reduction as a policy integrated into the country's overall development. The Constitution of September 2008 includes specific aspects for risk management related to planning, environmental rights, land use planning, decentralization, participation, and security.¹¹ Unlike those of all other Latin American countries, this new Constitution offers the legal and political foundations for the development of a new system that will incorporate the lessons learned from the past and make use of the modern approaches to risk management from the development perspective. The upcoming years will determine

11 Constitution of Ecuador. Title VII, System of Well-Being. Chapter I, Inclusion and Equity. Section 9, Risk Management.

the development of the institutional organization, the complementary standards, and the financial instruments necessary to make the said constitutional regulations a reality.

The Technical Secretariat of Risk Management is the key governmental institution for heading the new approach and vision of risk management. In the new institutional organization, this secretariat replaces the former Civil Defense and assumes the management and coordination of SNDGR.¹² It is responsible for creating policies, strategies and regulations to promote capacities oriented at identification, analysis, prevention, and mitigation of risks with the goal of facing and managing disaster events, as well as of recovery and reconstruction of social, economic and environmental conditions affected by eventual emergencies or disasters.

The risk management institutional development, legal framework, and policies should create capacity for attending to short, medium, and long-term needs. One of the main challenges for the government in this process of the political and administrative reorganization is maintaining an adequate balance for capacity building at all levels, which would on the one hand guarantee the results in the long run, and on the other allow for the management of short-term needs. Because of the high frequency of events such as floods and landslides, the lines of action related to risk mitigation and emergency response are currently of highest priority.

The capacity building of the local governments is a necessary condition to consolidate the system. In general, the new Constitution and the political reform promote the decentralization of the functions of the State. With respect to risk management, the provincial, district, and parish levels have direct responsibility in risk management and consequently should develop their own institutional organization and technical and operational capacity according to national regulations and plans. Thus, significant efforts are necessary in the areas of technical strengthening, information systems, local capacity building, and communication, among others.

HFA Priority #2: Disaster risk assessment and monitoring

The monitoring system of volcanic activity has been strengthened to confront the volcanic eruptions of the past ten years. The recent eruptions of the Pichincha, El Reventador and Tungurahua volcanoes required the government, with international cooperation, to make important investments in the modernization and expansion of the monitoring equipment network, administrated by the Geophysical Institute of the National Polytechnic School (*Instituto Geofísico de la Escuela Politécnica Nacional*, IG-EPN). The level of current development of this system in Ecuador is comparable to that achieved in developed countries like Japan or the United States.¹³

Ecuador has increased the capacity of its national technical institutions and of some local governments to evaluate disaster risk. In the past decade institutions like the IG-EPN, the IRD¹⁴, the *Instituto Nacional de Meteorología e Hidrología* (INAMHI), and the National Secretariat of Planning and Development (*Secretaría Nacional de Planificación y Desarrollo*, SENPLADES) have made important strides in the evaluation and modeling of hazards, vulnerability, and risks.¹⁵ In the same way, the Quito Metropolitan District has developed specific studies on this topic and continues to progress in the strengthening of its technical capacity.

It is necessary to expand the scope of the monitoring systems and apply advanced technological tools for modeling and evaluation. Despite the advances already achieved, coverage of the seismologic and

12 Constitutional Executive Decree of the President of Ecuador No. 1046, April 26, 2008.

13 <http://igeqn.edu.ec>.

14 A French public institution of science and technology research with presence in Ecuador since 1974.

15 See Informe Nacional para la conferencia mundial sobre la reducción de desastres (National report for the world conference on disaster reduction in Kobe-Hyogo, Japan, January 18-22, 2005).

hydrometeorological network still needs to be amplified, and hazard, vulnerability and risk studies need to be expanded, especially with regard to seismic vulnerability of essential buildings and the infrastructure of the productive sector.

HFA Priority #3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

There is some experience with education projects in emergency response. The country lacked official plans and programs for the inclusion of risk management in school curricula until shortly before the current reform. However, through Civil Defense, and especially with international cooperation, numerous pilot projects were carried out which form an important precedent for the design of a new policy in this sector. The emphasis of these training efforts was on emergency plans and the Ministry of Education is currently designing specific content for the curricula.

Establishing a culture of prevention and preparedness for disaster risk is one of the priorities of the new agenda. The National Strategy for Risk and Disaster Reduction being formulated by the Technical Secretariat for Risk Management defines the promotion of risk prevention in civil society through communication strategies, education, citizen supervision mechanisms, and information dissemination, as one of its most important policies. This policy will be supported by the implementation of an Information System to support these objectives.

HFA Priority #4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience)

Projects on environmental management and recovery of hydrographic basins have contributed to a reduction of disaster risk. The principal investments for landslide and flood risk mitigation were made through projects of hydraulic recovery of basins and environmental recovery of degraded areas. One of the most notable projects was carried out by the Quito Metropolitan District through the Quito Metropolitan Sewerage and Drinking Water Company (*Empresa Metropolitana de Alcantarillado y Agua Potable de Quito*, EMAAP-Q) on the slopes of Pichincha (34 recovered streams) with financing from the Inter-American Development Bank (IADB). At the national level, projects to highlight include the coastal resource management program and the protection of the water systems in Chimborazo and Tungurahua from ash fall, among others.

The majority of risk reduction projects have had local and community focus. Over the last decade, numerous risk reduction projects have been implemented at the parish and district levels through international cooperation. Especially notable were the projects promoted by the Ecuador Association of Municipalities (*Asociación de Municipios del Ecuador*, AME) for development and land use planning, and for environmental management. The results of these projects yielded important lessons learned, which can be very useful in the current planning process.

In the current process of institutional reorganization, it is crucial to incorporate risk management into the new policies, strategies and instruments of the Development Plan and land use planning, and to build local capacity for its implementation. The government's task to design and implement the new planning systems, and to include effective disaster risk reduction mechanisms, is significant. Some of these instruments include updating and adopting building codes and regulations, generating baseline information for the regions¹⁶, zoning of hazard and/or risk areas and definition of specific regulation of land use and occupation, development of methodological guidelines and training for formulation and implementation of development plans, territorial/land use plans, and implementation of monitoring and evaluation mechanisms.

¹⁶ Physical, economic, and population information.

Seismic vulnerability reduction of the infrastructure in the hydrocarbon sector and of the essential buildings in the main cities is a priority. Because of the direct or indirect impact which can be generated by any of these systems on social and economic stability in the country, it is imperative to press forward in the process of determining the current seismic vulnerability of key buildings and of the different components of the hydrocarbon production, and to take on the necessary vulnerability reduction measures. Because of the level of investment required for this, it is necessary to carry out a cost-benefit analysis and to prioritize such interventions.

HFA Priority #5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

International cooperation has supported projects in this area over several years. International cooperation has invested the most in this topic in support of Ecuador's Civil Defense. European Commission's humanitarian aid department (ECHO), through its program for Disaster Preparedness (DIPECHO), along with its partners, has implemented more than 20 projects since 2000. The Red Cross of Ecuador, the PREDECAN project¹⁷, the Swiss, Spanish, and US partners, and the US' Comando Sur have been other partners in important projects. The United Nations system has offered support for the strengthening of Ministries of Education and Health, and for SEMPLADES, through the Pan-American Health Organization, UNDP and UNICEF. Even though there are no consolidated numbers available, it is estimated that at least the local populations and institutions in more than 60 districts have participated in disaster preparedness projects, benefiting at least 600,000 people. The provinces that benefited most from these projects are Esmeraldas, Manabí, Los Ríos, El Oro, Tungurahua, Chimborazo, Cotopaxi, Pichincha, Zamora, Loja, and Bolívar.

The response to a 2008 flood disaster demonstrated new possibilities and capacities in the current institutional context. In 2008, the unexpected increase in rainfall produced the most extensive floods registered in the last few decades along the Ecuador coastline. 13 of the 24 provinces of the region and 275,000 inhabitants were affected and 170,000 hectares of crops were lost, among many other impacts.¹⁸ The response to this disaster was carried out in the transition of the new Technical Secretariat of Risk Management and the new Ministry of the Coast. The latter assumes the leadership and coordination of emergency response and recovery. The final result was a successful process which demonstrated a great capacity for response in a region that generally has had inadequate conditions for timely organization and coordination.¹⁹

The implementation of the capacity building strategy of the Decentralized National System of Risk Management requires a great effort both institutionally and from the local governments. Despite the advances achieved in the past years by the Civil Defense, it is now necessary to design an emergency response capacity-building strategy adjusted to the new institutional structure and organization, and integrate the functions and responsibilities at territorial levels. Because of the decentralized character of the risk management system, the capacity development at subnational levels requires adequate resources and should remain a priority.

It is necessary to develop a comprehensive financial strategy to attend to post-disaster situations. Risk transfer is one of the main propositions for the SNDGR. Similar to other aspects analyzed, it is important to promote the design of a financial protection strategy on the basis of the results of risk analyses and models and the fiscal considerations of the Government of Ecuador.

¹⁷ Prevention of Disasters in the Andean Region.

¹⁸ Ministry of the Coast, "Ecuador 2008, response to the coastline floods", with the support from Pan-American Health Organization and UNDP.

¹⁹ Ministry of the Coast, "Compilation of protocols, operative proceedings, and functional structures used for response to the effects of the Ecuador coastline floods of 2008."

4. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
Emergency grant for Tungurahua and Litoral	IADB	400,000 2008	5
Strengthening of the Technical Secretariat of Risk Management (US\$5 million IADB loan and US\$1.25 million counterpart financing)	IADB	6.25 million 2006-2011	1,4
Humanitarian assistance for Tungurahua and Litoral	UN (FAO, UNDP, UNICEF, IOM, OPS)	3.76 million 2008	5
Emergency preparedness and response	European Commission's Humanitarian Aid Department (ECHO)	2.6 million 2007-2008	5
Andean program	PREDECAN	16.12 million 2005-2009	1, 3, 4
Quito community safety project	World Bank (GFDRR) UNDP	980,000 2009-2012	1, 3, 4
Protection of slopes in Quito South III (Loan for the Environmental Sanitation Program III)	IADB	42 million 2008-2013	4
South-South Cooperation for City Collaboration: Kathmandu, Makati and Quito	World Bank (GFDRR)	400,000 2009-2012	1, 3, 5

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Given Ecuador's disaster risk profile and its existing framework for disaster risk management, the key priority in Ecuador is to continue to build institutional capacity and ensure long-term vulnerability reduction at local levels. Strategic actions are needed in the following areas to enhance disaster risk management in Ecuador: (i) identification and monitoring of risks, (ii) reduction of vulnerabilities at the local level, and (iii) strengthening of institutional capacity for strategic planning and coordination at national and local levels.

In light of an agenda as broad as the National Strategy for Risk and Disaster Reduction of Ecuador, it is necessary to prioritize and focus support on policies and projects with high impact.

Access to knowledge and advanced technological tools are critical to guarantee the availability of information for decision-making in the current process of institutional change and reorganization. The design and implementation of a probabilistic risk assessment initiative²⁰ would offer an exceptional opportunity towards this objective. It would help the country to better understand, communicate and support disaster risk management.

Ecuador has a very high deficit in the programs of seismic vulnerability reduction in key buildings and the infrastructure of the hydrocarbon sector. The advances in the assessment and design of medium- and long-term programs which could be achieved with support from GFDRR funds will have a very high impact.

In practice, the incorporation of disaster risk management into development plans and territorial/land use plans is often limited by the lack of information and/or practical methodological tools accessible to non-expert technicians. Ecuador has an opportunity to grow in this direction and GFDRR's support would be very effective.

²⁰ Similar to the CAPRA initiative in Central America.

Institutional development and risk management frameworks should create capacity to attend to short-, medium-, and long-term needs. Emergency and disaster response capacity building is a short-term need which should be guaranteed by the Technical Secretariat of Risk Management.

Capacity building of local governments is an essential line of action to ensure that the decentralized system in Ecuador is viable and effective. As its name suggests, the Decentralized National System of Risk Management (SNDGR) assigns the primary responsibility for risk management to the local level and secondarily to higher levels of government.

The following activities have been identified in consultation with local authorities and international donor agencies. These actions support Ecuador's disaster risk management program and reflect HFA priority action areas.

Indicative Program for GFDRR Funding (Projects and engagement areas being considered for GFDRR funding)	Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s) ²¹
DRM capacity building of local governments in priority areas of the national strategy, e.g. technical assistance, training, tools, etc.	Municipalities UNDP	1.3 million 2009-2012	1, 3
Development of a Risk Assessment Platform for Ecuador to advance technological tools and information systems available for risk evaluation	Technical Secretariat of Risk Management, UN ISDR, PREDECAN	914,000 2010-2011	2
Technical assistance to incorporate risk reduction into Ecuador's new planning system e.g. updating codes, regulations, generating risk information, training, tools, etc.	Technical Secretariat of Risk Management, Secretary of Planning, UNDP, PREDECAN	700,000 2009-2012	1, 4
Technical assistance to reduce seismic vulnerability by supporting the design and prioritization of programs for structural reinforcement of essential city buildings and infrastructure of the hydrocarbon sector	Technical Secretariat of Risk Management, UNDP	1.1 million 2009-2012	4
Support the design and formulation of programs to manage and recover hydrographic basins	Sectoral Ministries	700,000 2009-2011	4
Support emergency/disaster response capacity building activities at territorial and sectoral levels	Technical Secretariat of Risk Management, Sectoral Ministries, UNDP, Disaster Preparedness Programme of the European Commission's Humanitarian Aid Department (DIPECHO)	270,000 2009-2010	5
Initial Budget Proposal:		US\$4.984 million	

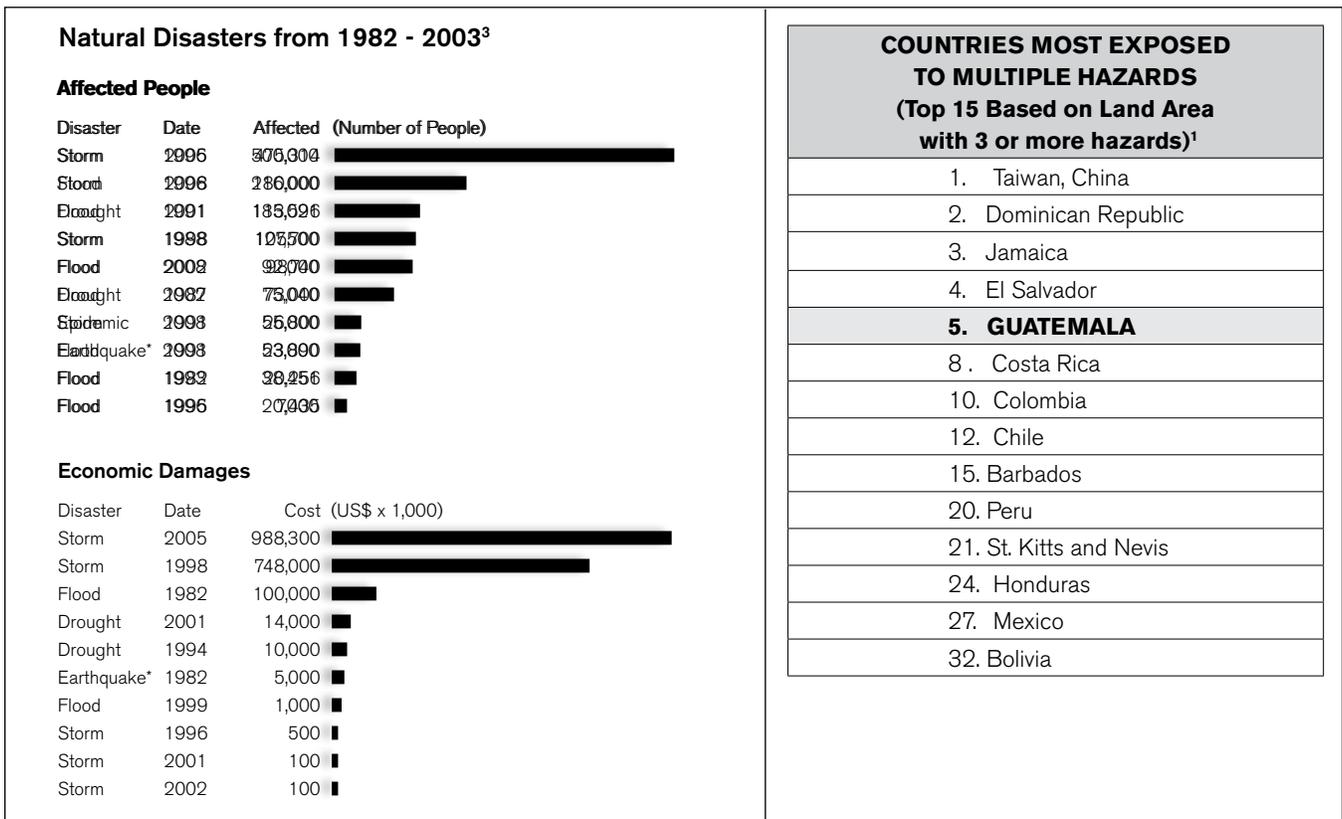
Additional consideration should be given to financial protection against disasters. Initial discussions with the Government of Ecuador have confirmed interest in technical assistance to study and design necessary mechanisms to ensure comprehensive financial protection in Ecuador. The following activities have been identified in consultation with local authorities and international donor agencies. These actions support Ecuador's disaster risk management program and reflect HFA priority action areas.

21 HFA Priority Action Areas: 1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2. Identify, assess, and monitor disaster risks—and enhance early warning; 3. Use knowledge, innovation, and education to build a culture of safety and resilience at all levels; 4. Reduce the underlying risk factors; 5. Strengthen disaster preparedness for effective response at all levels.

GUATEMALA

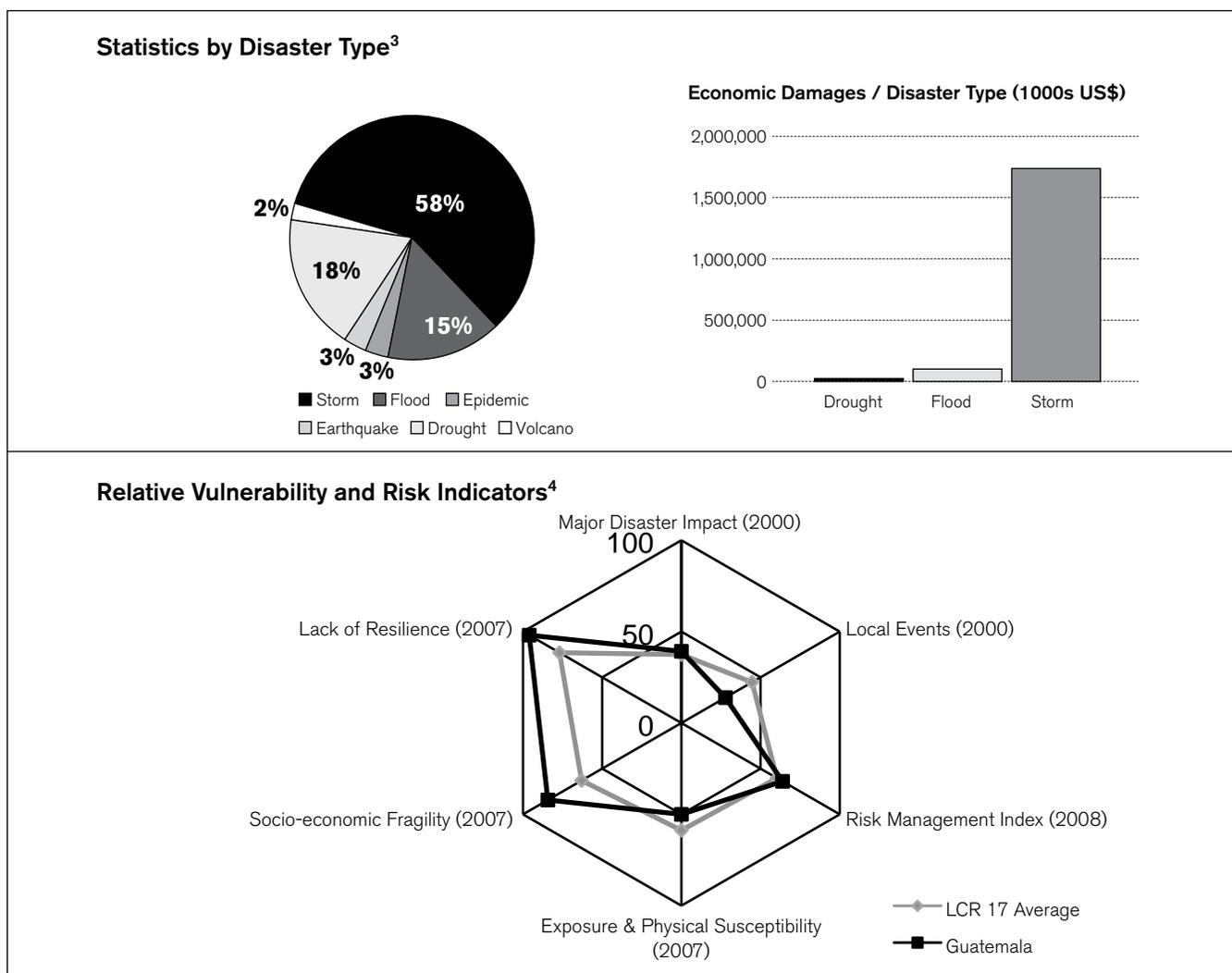
1. DISASTER RISK PROFILE

According to the World Bank’s Natural Disaster Hotspot study¹, Guatemala ranks 5th among countries with the highest economic risk exposure to three or more hazards. Guatemala is ranked as a high-risk country due to the vulnerability of its gross domestic product (GDP) to multiple hazards, with 83.3% of Guatemala’s GDP located in areas at risk. As one of the most densely populated countries in Latin America, with approximately 13 million inhabitants in a territory of 108,890 square kilometers, the country is also one of the poorest in the region. Between 1902 and 2005, Guatemala experienced 62 natural disaster events, which affected approximately 6 million people.²



Exposure in Guatemala is to both low-frequency and high-impact events, such as earthquakes, volcano eruptions and hurricanes, and to high-frequency and low-impact events, such as floods and landslides. It is this combination of high population density, poverty, and exposure to natural hazards in Guatemala that constitutes a high risk to adverse natural events.

1 Dilley et al. (2005). Table 7.2.
 2 See the hotspot study’s Annex 6 for details on Guatemala’s exposure to natural hazards and the number of reported disasters in Guatemala.
 3 UN (2009). <http://www.preventionweb.net/english/countries/statistics/?cid=70>. Source data from EM-DAT. Data displayed does not imply national endorsement.



Geological Hazards

Guatemala is situated in a zone of high seismic risk due to the conjuncture of three tectonic plates: the North American plate, the Caribbean plate, and the Cocos plate. The most catastrophic adverse natural event in Guatemala would be an earthquake in Guatemala City, in the case of a 500-year event.

There are approximately 288 volcanoes in the country, 8 had been active in historic times, and 4 continue to pose a threat at present. The volcanoes of concern are: Fuego, Pacaya, Cerro Quemado, and Santiaguito.⁵ Volcanism in Guatemala exists as a result of the subduction of the Cocos plate beneath the Caribbean plate.

⁴ Relative Vulnerability and risk Indicators are adapted from IADB-IdeA-ern (2009). Values are normalized on scale of 0 – 100 and presented against the average for 17 LCR countries. Major disaster Impact taken from disaster deficit Index: the ratio of economic losses which a country could suffer during a Maximum Considered event and its economic resilience. Local events taken from Local disaster Index: the propensity of a country to experience recurrent, small-scale disasters and their cumulative impact on local development. risk Management Index is presented as the negative (i.e. 0 = optimal, 100 = incipient) of IADB's risk Management Index: measures a country's risk management capability in (i) risk identification, (ii) risk reduction, (iii) disaster management, and (iv) financial protection. resilience, Fragility and exposure are taken from the component indices of Prevalent Vulnerability Index. Date for local event data depends on information available for each country. Data, and the respective LCR 17 average, from 2000 is used for Dominican Republic, El Salvador, Guatemala, Jamaica and Nicaragua. Data, and the respective LCR 17 average, from 2006-08 is used for Bolivia, Colombia, Costa Rica, Ecuador, Panama and Peru. All LCR 17 averages are calculated based on available data.

⁵ USGS (202).

Hurricanes and Drought

Guatemala is exposed to two coasts, with the Pacific Coast more vulnerable to hurricanes, and the floods associated with them, especially at river mouths. The interior of Guatemala is greatly affected by drought; while the agricultural sector suffers the most, other important sectors such as water, energy, and health are also impacted.

In recent years, storms and droughts have had the highest human and economic impact in Guatemala. Losses during 1997-2010 averaged at 0.51 % of GDP, with storms (five events) affecting 749,991 people (around 5.8% of the country's population) with damage costs reaching US\$2 billion, and 113,596 people (around 1% of the population) affected by drought (1 event) with the costs of damages reaching US\$14 million.⁶

Floods and Landslides

Guatemala is continually affected by low-impact, high-frequency disasters, such as landslides and flooding. These disasters occur at local levels, largely due to the topography of the river basins and slopes and the exposure of the country to two coasts. Nearly 1,733 communities and 210,000 inhabitants are vulnerable to flooding with a total of 30% of the territory at high risk of flooding.

Determinants of Vulnerability to Adverse Natural Events

Vulnerability in Guatemala is due to a large extent to increased urbanization and insufficient planning. Guatemala is one of the most densely populated countries in Central America and unplanned urban growth has greatly increased population and infrastructure vulnerability. Given the high vulnerability of the country, natural hazard events result in disasters that have a high human cost and negative impact on productivity, which in turn delays developmental progress.

Guatemala is characterized by inadequate application and enforcement of building codes. With increases in urban population and a lack of building code, both the population and infrastructure are increasingly at risk to natural hazards. This is compounded further by environmental degradation.

Informal settlements are also considered high-risk areas given the poor quality of housing construction and absence of building codes. These risks must be addressed to decrease vulnerability and mitigate disaster risk in Guatemala.

2. DISASTER RISK MANAGEMENT FRAMEWORK

The Government of Guatemala has placed disaster risk management (DRM) firmly in its development agenda. This is evident with the inclusion of DRM in the National Development Plan (Plan de la Esperanza), and the National Program for Disaster Prevention and Reduction 2009-2011, approved in January 2009. The institutional coordinating mechanism that provides a legal framework for disaster prevention in the country and inter-ministerial coordination in cases of emergency is the National Coordinator for Disaster Reduction (CONRED in Spanish) and its Secretariat (SE-CONRED).

Over the last decade, the Government of Guatemala has moved towards a more proactive disaster risk management approach. The Government has passed two laws that demonstrate this commitment: the Social

⁶ World Bank (2008a) and CEPAL-IADB-UNDP-WB-GFDRR (2010).

Development Law (Decree 42-2001) and the Law of Housing and Human Settlements (Decree 120-96). Both of these laws include the concept of disaster vulnerability reduction in development planning.

Guatemala has made substantial progress towards addressing vulnerability. The Social Development Law (Decree 42-2001) establishes that there is a reciprocal relationship between the advancement of development planning and reducing disaster risks. In Articles 37 and 38, the Ministry of Planning (SEGEPLAN in Spanish), in coordination with other government institutions, is charged with the strategy for disaster risk prevention and protection of vulnerable populations. In 2004, Project GUA 04/021 sought to strengthen capacities for reducing risk in development processes. The principal objective was to create an inter-institutional program with a vision to incorporate disaster risk management in development planning.

In addition, the Government has a National Program for Disaster Prevention and Reduction 2009-2011 (PNPMD in Spanish). This program focuses on enhancing risk monitoring and assessment, reducing risk, strengthening institutions, and developing risk financing strategies. It ensures a comprehensive disaster risk management strategy in the country.

Despite great progress the country has made in addressing disaster risk, Guatemala remains vulnerable to disasters triggered by adverse natural events and continued attention by the Government of Guatemala is needed. Guatemala's economic and social development is regularly interrupted by earthquakes, volcanic eruptions, hurricanes, floods, and forest fires. Major disasters in Guatemala, such as the 1976 Earthquake, which resulted in more than 23,000 deaths and damages estimated at 17.9% of GDP, and Hurricane Mitch in 1998, which caused estimated damages of 4.7% of GDP, have crippling effects on the country's sustainable development and long-term growth.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK FOR ACTION

Hyogo Framework for Action (HFA) Priority #1: Policy, institutional capacity and consensus building for disaster risk management

The current Government in Guatemala has placed disaster risk management firmly among its development priorities. The *Plan de la Esperanza 2008–2012*, the policy program of the administration, focuses on increasing growth and reducing poverty and inequality. It articulates disaster risk management as a self-standing policy issue in the context of securing productivity. This demonstrates significant political commitment. The government is aware of the economic consequences of business interruptions associated with the transfer of funds to address a disaster caused by adverse natural events and acknowledges the importance of continuing efforts to reduce poverty and inequality.

Learning from recent disasters, Guatemala has made progress towards a more proactive disaster risk management system. The establishment of the Social Development Law (Decree 42-2001) includes the concept of disaster vulnerability reduction and notions of demographics and development planning as contributors to risk scenarios. The Law of Housing and Human Settlements (Decree 120-96) mandates that all territorial entities take disaster risk into account in development planning.

The creation of the National Coordinator for Disaster Reduction (CONRED in Spanish) introduced disaster prevention in the disaster management system in Guatemala for the first time. CONRED works as a coordinating mechanism to provide a platform and legal framework for inter-ministerial coordination in the case of emergency, while also handling disaster prevention. It is supported by an Executive Secretariat (SE-CONRED) which is organized around seven work areas: coordination, financial management, comprehensive disaster risk management,

response, preparedness, mitigation, and logistics. During a disaster, CONRED has the power to enlist the cooperation of all public institutions and any private bodies within their areas of competence.

Guatemala's National Program for Disaster Prevention and Reduction (PNPMD in Spanish) aims to articulate institutional and private-sector efforts to achieve sustainable development through initiatives that incorporate disaster risk management in development planning. The PNPMD is a program that addresses disaster risk reduction in a comprehensive manner. Designed with support from the United Nations Development Program (UNDP), the PNPMD includes four lines of action: (i) improving risk identification and monitoring; (ii) investing to reduce risk; (iii) strengthening institutional and planning capacity for risk management; and (iv) developing risk-financing strategies.

The PNPMD aims to significantly strengthen institutions and planning between 2009 and 2011. Programs include: (i) the formulation of the National Policy for Disaster Risk Management, which involves all sectors and the development of a National Strategy for Disaster Risk Management, coordinated by SE-CONRED and involving both public and private institutions; (ii) the strengthening of SEGEPLAN's planning systems to incorporate risk concepts in public investments; (iii) the implementation of territorial planning in 12 municipalities by an inter-institutional committee involving SEGEPLAN, Ministry of Environment (MARN in Spanish), and Municipal Development Institute (INFOM in Spanish); and (iv) the establishment of a roundtable with private, academic, and international cooperation. Supported by UNDP and the World Bank, the Vice President's Office and SE-CONRED will coordinate these efforts and will convene at least twice a year.

HFA Priority #2: Disaster risk assessment and monitoring

Guatemala has strengthened risk identification and monitoring systems through the development of methodologies to analyze and evaluate hazards and vulnerabilities. The National Institute of Seismology, Volcanology, Meteorology and Hydrology (INSIVUMEH in Spanish) has developed an inventory of historical landslide event maps, implemented an early warning alert system for flooding in six water basins, and conducted hydrological studies in six basins. Various educational facilities have also been prepared for the technical study of monitoring and prognostic elements of the systems.

The PNPMD in Guatemala aims to significantly augment the effort to improve risk identification and monitoring over the next two years. This program includes projects that will advance the methodology to identify hazards, vulnerability, and risks, while strengthening national capacity to identify and monitor such risks. Key components of the sub-programs include: (i) a space to exchange existing methodologies on the analysis of risk and vulnerability, while creating new methodologies in a participatory manner; (ii) the production of hazard risk studies on landslides and flooding, and vulnerability risk studies, especially analyzing the vulnerability of the most important water basins to determine population, infrastructure, and economic vulnerability; and (iii) the construction or strengthening of existing observation networks, particularly the technical and scientific capabilities of the INSIVUMEH.

In recent years, the Ministry of Agriculture (MAGA in Spanish) has made efforts to identify risk using Geographic Information System (GIS) tools on a very large scale. This has complemented the more traditional monitoring of natural hazards carried out by the INSIVUMEH, and the geographic and cartographic information produced by the National Geographic Institute of Guatemala (IGN in Spanish). MAGA has produced hazard maps for volcanic eruptions, developed at a scale of 1:50,000 with the support of Japan's International Cooperation Agency.

Risk evaluations of 250 geographic areas earmarked for relocation of families affected by Hurricane Stan were developed by the Secretariat of Agrarian Matters (Secretaría de Asuntos Agrarios, SAA) in

2006. The Gerencia de Riesgo, a professional risk evaluation group, worked with SAA in evaluating 50 additional geographic areas that continue to be affected by landslides and mudslides.

The Government has requested support for various technical assistance projects related to disaster risk management. Guatemala's Vice-President's Office, in coordination with the National Committee for Risk Management, is implementing a Technical and Scientific Information for Municipal Planning project, with financing from the Global Facility for Disaster Reduction and Recovery (GFDRR). This project was designed over a two-year period in a participatory process with institutions including INSIVUMEH, MAGA, SE-CONRED, SEGEPLAN, and the relevant municipalities.

Guatemala is working to strengthen risk identification at the municipal level in order to integrate this knowledge into territorial development planning. This activity, funded by a GFDRR grant, will help hazard-prone municipal governments to include risk considerations in their territorial development process. The project will: (i) develop scientific information on hazards, vulnerability, and risk; ii) provide specific risk information for land use and urban zoning; and (iii) provide scientific information for emergency plans. The information provided will help local authorities place appropriate controls to avoid future generation of risks and will also aid in the design of risk mitigation programs. The project, supported by the GFDRR, includes the seismic building codes updated by the Guatemalan Association of Seismic Engineers (AGIES in Spanish) that could be adopted by different municipalities.

Currently, the Inter-Institutional Committee for Risk Reduction led by the Vice-Presidency of Guatemala, has finished strategic studies with the support of the Global Facility for Disaster Reduction and Recovery (GFDRR). This is a new effort in four basins focused on natural hazard maps for floods and landslides at a 1:25,000 scale, with an action plan for risk reduction in the basins of the rivers Coyolate, Nahualate, Madre Vieja, and Suchiate.

SEGEPLAN is working on Spatial Data Infrastructure for Guatemala to support disaster risk management and the national planning. This is an initiative designed by SEGEPLAN in order to share the spatial data generated by different institutions with the concept of information updated by each institution according to its role. This initiative will save time and cost for planners, and is named SINIT (Spanish for the National System Information for Territorial Planning).⁷

SE-CONRED has developed an early warning alert system for the Fuego Volcano. This is aimed at reducing risk in the Escuintla, Sacatepequez and Chimaltenango Departments. The initiative was supported by Japan's International Cooperation Agency.

The Government of Guatemala is not yet in a position to identify or monitor needs for investments in risk reduction across sectors. The Government of Guatemala also lacks capacity to provide a strategic overview of hazard exposure or contingent risk for the country as a whole or for different sectors. To address this challenge, the Government has drafted a new regulation to strengthen the mandates of CONRED, SE-CONRED, CORRED⁸, COMRED⁹, and COLRED¹⁰ to document and monitor disaster risk, as well as to promote prevention and mitigation activities. In addition, the new regulation for the Law of CONRED has been prepared and requires that all public infrastructure investments comply with seismic building codes. The regulation is ready for the President's signature and, if approved, could have a significant positive impact on risk reduction in future investments.

⁷ <http://ide.segeplan.gob.gt>.

⁸ Regional Coordinator for Disaster Reduction.

⁹ Municipal Coordinator for Disaster Reduction.

¹⁰ Local Coordinator for Disaster Reduction.

HFA Priority #3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

Guatemala has taken steps to include disaster risk reduction concepts in the educational sector. This is demonstrated by the scientific knowledge program to identify high-risk areas, the introduction of the subject disaster reduction in primary and secondary schools, the strengthening of the disaster documentation center, the national campaign “We Can Act”, the raising of awareness by the media, and finally, the consolidation of the CONRED website.¹¹

Guatemala is working with CEPREDENAC, the UN ISDR, IADB, and the World Bank to develop the Central American Probabilistic Risk Assessment (CAPRA) platform¹², an innovative initiative with a strong educational element. CAPRA helps facilitate a comprehensive understanding of risk and risk management. The platform enables governments and scientific communities to identify and evaluate the sources of potential losses (both geographically and by sector) from disasters, risk reduction investment opportunities, and government capacity to finance and manage recovery operations. This knowledge provides the basis to formulate strategies and policies to strengthen the national risk prevention and emergency management system, and to develop a comprehensive risk financing strategy. It is anticipated that CAPRA software will be included in university curricula.

HFA Priority #4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience)

The PNPMD aims to significantly augment investments in risk reduction over the next two years. The main components of the program include: (i) developing national standards for including disaster risk assessment in construction planning; (ii) elaborating National Regulation for the Construction of Schools and guidelines for its application; (iii) the implementation of a public infrastructure auditing program through the National General Auditing Agency (*Controloría General de Cuentas*); (iv) two pilot programs in Guatemala City to transform high-risk zones into secure zones; and (v) identification of mitigation works in river basins managed through the Water Cabinet.

A series of risk reduction activities that incorporate mitigation and guarantee safe construction, especially in the health and education sectors, have been earmarked. These initiatives include the development of building codes; national regulations for hospitals and schools combined with municipal disclosure of these codes; infrastructure auditing; works to prevent landslides (retaining walls, slope reinforcements); rehabilitation and maintenance of road infrastructure; and integrated management of river basins. The Vulnerability Reduction and Environmental Degradation Regional Project (PREVDA in Spanish) has already been initiated.

SE-CONRED developed and disseminated better-construction standards according to risk assessment methodologies post-Hurricane Stan. The methodology was developed in coordination with line ministries responsible for reconstruction as well as the rehabilitation and retrofitting of public buildings. The aim is to introduce construction standards that result in better and safer buildings on the basis of risk assessment methodologies. Although SE-CONRED does not have the capacity to supervise the processes nor to monitor to what extent the methodology is being followed, the methodology has been passed on to implementing agencies that have been encouraged to use this for construction and rehabilitation activities.

¹¹ <http://conred.gob.gt>.

¹² <http://ecapra.org>.

COVIAL (*Unidad de Conservación Vial*, or the Road Conservation Unit) is overseeing the implementation of investments in river dredging and the strengthening of river banks to prevent significant adverse impacts of natural events on road infrastructure. These investment decisions are made on the basis of documented cost for road maintenance. In areas where COVIAL experiences significant recurrent costs of rehabilitation of the road network due to the impacts of floods, the agency invests in flood prevention as a cost-minimizing strategy. Over the last five years, COVIAL has dredged more than 150,000 cubic meters of rivers and canals per annum.

INSIVUMEH has developed landslide event maps to improve land use planning. As a result of the development of these maps, there has been substantial investment in the upgrading and expansion of monitoring networks.

Disaster risk management is not yet explicitly part of the land use planning processes, but authorities are working towards a screening process for both public and private investment. SEGEPLAN has developed a methodology that will help territorial entities integrate disaster reduction and recovery into land use planning. This is a significant first step for developing the instruments and capacities that will allow the territorial entities to effectively manage their development planning in a way that reduces the construction of new risk.

Despite progress, Guatemala does not have a systematic investment program for risk reduction. Interventions in risk reduction have generally been done in an ad hoc manner. The Government of Guatemala does not track or monitor investments in risk reduction across sectors.¹³ This means that there is little understanding of the significance or effectiveness of these investments in reducing the disaster risk exposure of the country or even of specific geographic areas in the country; this makes it difficult to demonstrate results in terms of risk reduction activities. Nevertheless, some of the ad hoc activities represent significant investments and have been good starting points to reduce the country's disaster risk.

HFA Priority #5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

The institutional structure for disaster risk management in Guatemala is organized around CONRED and is replicated in regional (Regional Coordinator for Disaster Reduction – CORRED), municipal (Municipal Coordinator for Disaster Reduction – COMRED), and local (Local Coordinator for Disaster Reduction – COLRED) committees. These committees include representatives from public agencies, private sector and civil society organizations, and are convened by the most senior government representative in the relevant locality. Delegates of SE-CONRED support the committees, whose main functions are to (i) coordinate disaster prevention and response activities; (ii) relay information to the next level of the system; and (iii) implement actions relating to alerts, evacuation, security, and emergency shelter.

Until recently, Guatemala has relied on ex-post budget allocations to respond to disasters caused by adverse natural events. In the past, financing for disaster response and reconstruction was almost entirely allocated after the disaster event through two mechanisms: (i) the National Fund for the Reduction of Disasters, coordinated by CONRED and financed according to the guidelines provided by the National Plan for Disaster Prevention and Response (each year the fund receives US\$2 million from the national budget, the *Presupuesto General de Ingresos y Egresos del Estado*); and (ii) on an event-by-event basis. CONRED coordinates the implementation of reconstruction with additional funding via budget reallocations by the Ministry of Finance. The funds are generally channeled to three entities that are responsible for implementing and managing rehabilitation and reconstruction projects after disasters: the *Unidad de Conservación Vial* (COVIAL), which manages the funds allocated to the maintenance of the road

¹³ Recently, the Ministry of Finance has developed the budgetary classification for monitoring public investments in risk reduction, which is currently in implementation phase.

network; the *Fondo Nacional para la Paz* (the National Fund for Peace, or FONAPAZ), which develops and implements projects to eradicate poverty and extreme poverty (communal buildings, halls, sport fields, and recreation, education, and nutritional programs); and the *Secretaría Coordinadora Ejecutiva de la Presidencia (SCEP)/Unidad de Convoyes Regionales*, a unit specializing in the implementation and management of construction and maintenance projects of rural roads.

Guatemala's Ministry of Finance is preparing a comprehensive strategy to cover contingent liabilities that will include adverse effects of natural events. The Catastrophe Deferred Drawdown Option (CAT DDO) is included as one of the elements in this strategy. The National Program for Disaster Prevention and Reduction in Guatemala outlines three specific areas where the Government will advance towards this strategy over the next two years. The objective of these activities is to improve the government's capacity to mobilize and efficiently execute resources in case of disasters. The three specific areas are: (i) viability studies for a tag system in the budget by the Ministry of Finance, identifying resources in the budget that may be dedicated to disaster risk management; (ii) an analysis of the fiscal exposure to adverse natural events, which will also determine in which way investments lost after a disaster may be recovered; and (iii) a feasibility study to determine the Ministry of Finance's ability to maintain a contingency fund for disasters.

Despite great progress, local community capacity to prepare for, and respond to, disasters caused by adverse natural events should be improved and strengthened. During the last 10 years, the response and preparation capabilities in Guatemala have improved; however, Hurricane Stan, the 2008 floods, and recently Tropical Storm Agatha and the Pacaya Volcano eruption in May 2010, revealed that despite good response capabilities at the municipal level, CONRED response skills remain weak at the local level and require additional support to be adequately prepared in the future.

4. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency / International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s)
Modernization and updating of the meteorological system in Guatemala	Central American Development Bank (BCIE)	12.5 million	2
Program for the Reduction of Vulnerability and Environmental Degradation Guatemala (PREVDA)	European Commission	3.34 million 2007-2011	2, 3
Development of scientific information to promote municipal planning to reduce disaster risks	World Bank (GFDRR)	730,000 2008-2010	1, 2, 3, 4
Disaster risk management development policy loan with a Catastrophe Deferred Drawdown option (CAT DDO)	World Bank	85 million 2009-2011	1, 2, 3, 4, 5
Strengthening of Information and Communication for CEPREDENAC and National Commissions	World Bank	446,000 2007-2009	1, 2
Development and application of a Risk Assessment Platform for Guatemala (CAPRA)	IADB	350,000 2009-2010	2, 3
Community Risk Management and risk mapping with local actors	GTZ	not available	2, 3, 4
National Policy for Risk Reduction in Guatemala	IADB	750,000 2009-2010	1
Institutional support to technical groups related with risk reduction	UNDP	90,000 2009	1, 3
National program for risk reduction on the reconstruction process PROREC	UNDP, Sweden, Norway, USAID	13 million 2007-2010	
Regional Program of Environment in Central America (PREMACA)	Danish Cooperation (DANIDA)	not available	2, 4
Earthquake Risk Reduction In Guatemala, El Salvador and Nicaragua With regional cooperation to Honduras, Costa Rica and Panama (RESIS II)	Norway	2.4 million 2007-2010	2
Strengthening of CEPREDENAC and National Commissions for disaster vulnerability reduction in Central America	Spanish International Cooperation Agency	130,000 2005-2009	1
Regional Plan for Disaster Reduction (PRRD)	Norway, Spanish International Cooperation Agency	400,000 2006-2011	1
Development of disaster risk management capacity at the local level	Japan International Cooperation Agency	300,000 2008-2011	2, 4
Mesoamerican coordination system for territorial information	IADB	800,000 2009-2011	2
Strengthening of communication systems at national and regional levels (Regional program)	China (Taiwan)	1,130,000 2009-2011	3
Capacity Building for Risk Management in Central America (BOSAI)	JICA	2,500,000 2007-2012	1, 2
Urban Risk Reduction (Guatemala, Costa Rica, El Salvador, Honduras)	UNDP	300,000 2009-2010	3, 4
Action Plan AECID-CEPREDENAC (Regional level)	Spanish Cooperation for International Development (AECID in Spanish)	763,750 2009-2010	1, 2
Strengthening of CAPRA Implementation (Regional Level)	CEPREDENAC	50,000 2010	1, 2

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Given Guatemala's disaster risk profile and its existing framework for disaster risk management, the key priority is to implement the recently approved national program for disaster risk management. Strategic actions are needed in the following areas in Guatemala: (i) strengthen institutional capacity for strategic planning and coordination, (ii) mainstream disaster risk reduction in specific sectors, and (iii) develop a comprehensive risk assessment and monitoring capacity.

The following activities have been identified in consultation with local authorities and international donor agencies. These activities are built on the PNPMD and the current GFDRR grants for Guatemala, which are coordinated by the same agencies (CONRED, Vice-Presidency) that would coordinate the proposed activities. These actions support Guatemala's disaster risk management program and reflect HFA priority action areas.

Indicative Program for GFDRR Funding (Projects and engagement areas being considered for GFDRR funding)	Implementing Agency / International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s) ¹⁴
Support for the development of territorial planning that integrates disaster risk considerations at the municipal level	INSIVUMEH, Municipalities	1.4 million 2009-2012	1, 2, 4, 5
Technical assistance to support the national program for disaster risk reduction and mainstreaming disaster risk reduction in other sectors	Vice-Presidency, CONRED, Ministry of Finance	800,000 2009-2011	1, 2, 3, 4
Studies and designs for mitigation measures for critical infrastructure	CONRED	1.2 million 2009-2010	1, 3, 4
Mitigation works in key sectors that will be identified during implementation of the PNPMD	Sectoral Ministries, Municipalities	980,000 2009-2011	1, 4
Support for the development a Risk Assessment Platform for Guatemala	Vice-Presidency, CONRED, Universities, Sectoral Ministries, INSIVUMEH	564,000 2009-2010	1, 2
Initial Budget Proposal:		US\$4.944 million	

In addition to the above-mentioned activities, ongoing dialogue with national and local officials will continue to identify disaster risk management measures that consider climate change as part of their adaptation strategies.

¹⁴ HFA Priority Action Areas: 1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2. Identify, assess, and monitor disaster risks—and enhance early warning; 3. Use knowledge, innovation, and education to build a culture of safety and resilience at all levels; 4. Reduce the underlying risk factors; 5. Strengthen disaster preparedness for effective response at all levels.



DISASTER RISK MANAGEMENT

South Asia

Bangladesh / Pakistan / Sri Lanka

BANGLADESH

The preparation of the integrated, multi-stakeholder proposal or DRM Action Plan for possible GFDRR funding, was carried out over a nearly 3-month period between March-May 2009. The first round entailed soliciting proposals from different government and non-government entities and concerned donor agencies. In the second stage, these proposals were analyzed by a 3-member team comprising of the Bank's Regional and Country DRM Coordinators and other staff. The third stage included a consultative process involving a range of stakeholders including the Economic Affairs Department, the Ministry of Food and Disaster Management including its various directorates, the Bank's ECRRP Team, and the Comprehensive Disaster Management Program (CDMP) and its present financiers including the UNDP, DFID and EC. However the present proposal is still in draft form and shall be further deliberated upon with the concerned stakeholders in a final consultative round, subsequent to receiving preliminary GFDRR feedback.

1. DISASTER RISK PROFILE

Historical Profile of Natural Disasters in Bangladesh

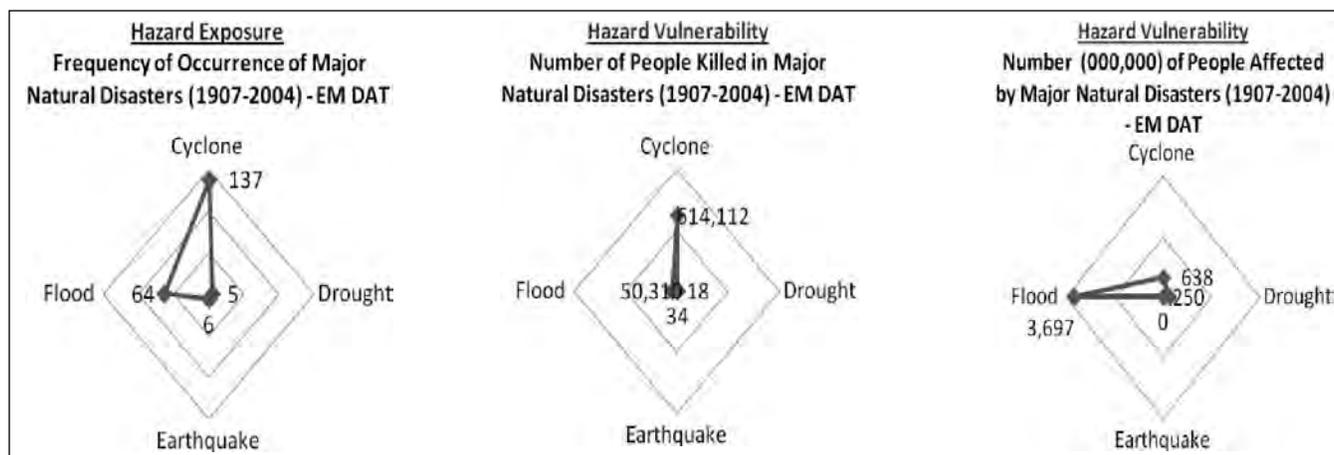
Bangladesh's geographical location and land characteristics make it one of most hazard-prone countries in the world. The country has been frequented by a range of natural hazards throughout its history, including cyclones, floods, droughts, tornadoes and river bank erosion. Other major hazard risks to the country include earthquake, Tsunami, high arsenic contents in ground water, water logging and salinity, etc. Wide-scale flooding has been the most recurring type of disaster striking Bangladesh, and the country remains one of the worst sufferers of cyclonic casualties in the world. The transitional pre- and post-monsoon periods are also frequented by severe local storms and tornadoes. In addition, riverbank erosion affects many people and hectares of land annually. Droughts have also been a common occurrence over the years.

Bangladesh has experienced a number of earthquakes over the past 200 years – between 1869 and 1950, 7 earthquakes ranging between 7.0 to 8.7 on the Richter scale have been recorded in the Bangladesh region. Even though Bangladesh is located in a seismically active and high-risk region, seismic risk awareness, mitigation and reduction has not been mainstreamed into the country's core disaster management agenda and strategy. Not only is there great need for such mainstreaming of seismic risk reduction and mitigation, but for the country to urgently start devising and implementing major preparedness interventions and capacity building efforts.

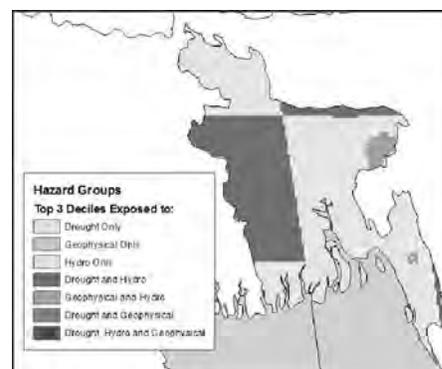
Bangladesh is currently ranked as the most climate vulnerable country in the world (World Bank 2005). Climate change in particular, is likely to considerably exacerbate Bangladesh's disaster vulnerability. Projections of the Intergovernmental Panel on Climate Change (IPCC) suggest that warmer temperatures will increase both the frequency and intensity of cyclones in the Bay of Bengal. In addition, rapid snow melt in the upper Himalayas coupled with increased peak discharges, would likely increase the depth and spatial extent of flooding in the Ganges-Brahmaputra-Meghna Basin. Added to these risks are the likely consequences of sea level rise, which can cause economic losses of an unprecedented magnitude in Bangladesh's case.

Bangladesh's Exposure and Vulnerability to Hazard Risks

Historically, cyclones and floods have posed the greatest risk to Bangladesh on a country level. The charts below indicate that cyclones have by far been the most recurring and devastating natural hazard in terms of the frequency of their occurrence and their human toll., floods in Bangladesh affect a greater population base than any other natural hazard. The country remains one of the worst sufferers of cyclonic casualties in the world. There have been at least 8 major cyclones since 1965, wreaking huge damages and loss of life – the 1970 and 1991 cyclones caused 300,000 and 140,000 human casualties respectively. The November 2007 cyclone SIDR, although of no less magnitude than some of the earlier cyclones, led to lesser (3,363) casualties, due to among other factors, the much improved state of disaster management in the country.



Moreover, in most years, between 30-50% of the country has been affected by floods. As illustrated by the Hotspots Study by the University of Columbia's Earth Institute, sub nationally, the northern and eastern regions of the country are susceptible to earthquakes while the southeast is particularly vulnerable to all five hazards. The combined multi-hazard maps for mortality and GDP show that Bangladesh ranks in the top 3 deciles of risk when compared to the rest of the world.



The Key Underlying Risk Factors

Deficiencies and Gaps in Implementation of Disaster Preparedness and Risk Reduction Plans (A Case Study of the 2007 Cyclone Sidr) – The country's geographical location and land characteristics overwhelmingly and unmistakably remain the biggest underlying risk factors for Bangladesh. Over time, the country's ability to manage disaster risks, in particular floods and cyclones, has evolved and improved, as a result of a gradual shift from a response-based approach to a strategy that incorporates elements of greater emergency preparedness and risk mitigation. However key deficiencies and gaps remain in the actual implementation of national DRM policies and local risk reduction action plans, as was evidenced in the 2007 SIDR cyclone event. The event highlighted the following unmet needs that continue to remain the key underpinning risk factors for Bangladesh: (a) further strengthening and institutionalizing disaster preparedness, especially among the various sub-national disaster management committees; (b) mobilizing adequate resources for improved local disaster preparedness and response management resources; (c) mainstreaming disaster risk reduction and mitigation across sectors and down to the lower levels of governance, and; (d) taking stock of deficiencies in key risk mitigation infrastructure such as shelters and coastal and river embankments.

Inadequate Attention to Seismic Risks - Even though Bangladesh is located in a seismically active and high-risk region, seismic risk awareness, mitigation and reduction has not been mainstreamed into the country's core disaster management agenda and strategy. This is probably because of the long period of time that has elapsed since the last major earthquake in 1950, but predictions now suggest that a major earthquake might be just around the corner. Hence, there is a need for mainstreaming seismic risk reduction and mitigation in Bangladesh's disaster management strategy and plans, and to start devising and implementing major preparedness interventions and capacity building at various levels.

Lack of Technical and Financial Capacities for Climate Change Adaptation – With the added climate change factor, which is likely to exacerbate the intensity and impacts of floods, cyclones and droughts in particular, there is a need for greater urgency for further improving disaster management and preparedness in the country, including quickly mobilizing substantial additional financial and technical support from the international community and development partners. The up-gradation and modernization of Bangladesh's hazard risk management regime is vital for the country to continue the economic growth it has achieved over the last decades. The Government's PRSP must place even greater emphasis on Disaster Risk Reduction (DRR), along with the cross-sectoral mainstreaming of DRR, in order to be able to achieve the millennium development goals.

2. DISASTER RISK MANAGEMENT FRAMEWORK

Bangladesh's Disaster Management Strategy

The present national strategy for disaster management, although in an early phase of implementation, is based on 3 key elements including:

- Defining and redefining the risk environment, entailing systematic and improved hazard analysis and vulnerability/ community risk assessments; and risk treatment and ranking, including incorporation of climate change impacts;
- Managing the risk environment, including achieving a good balance of risk reduction options; moving from generic hazard to risk specific programs, and; mainstreaming risk reduction across sectors through advocacy, policy and planning reform, and capacity building;
- Responding to the threat environment, including activating systems and mobilizing resources; utilizing vulnerability and risk databases for emergency response planning; and maintaining effective communications and early warning systems

Institutional Structure for Disaster Management

The National Disaster Management Council (NDMC), headed by the Prime Minister, is the highest level forum for the formulation and review of disaster management policies. The Inter-Ministerial Disaster Management Coordination Committee (IMDMCC) is in-charge of implementing disaster management policies and decisions of the NDMC, assisted by the National Disaster Management Advisory Committee (NDMAC). The Ministry of Food and Disaster Management (MoFDM) is the apex institution responsible for coordinating national disaster management interventions across all agencies. The MOFDM comprises of a Central Disaster Management Bureau (DMB), Director General Food, Directorate of Relief and Rehabilitation (DRR) and a Cyclone Preparedness Program Implementation Board (CPPIB). In addition, various other committees are tasked with coordination functions, dissemination of warning signals and training and public awareness building. Moreover, at the sub-national level, disaster management committees are functioning at the district, upazila, union, pourashava (municipal), and city corporation levels, tasked with coordinating and reviewing disaster management activities in their respective jurisdictions.

Presently Articulated National Priorities for Disaster Management

The Draft National Plan for Disaster Management (NPDM, 2007-15), is an umbrella plan attuned with the achievement of disaster management goals and priorities set out in the HFA (2005-15) and the SFA (2006-15). The Plan is to be used for: (a) articulating the long-term strategic focus for disaster management in Bangladesh; (b) acting as national driver for change broadly aimed at disaster risk reduction and climate change adaptation, and; (c) providing a roadmap for the development of disaster management plans by various lower level entities.

The NPDM is centered around the following strategic priorities and goals: (i) professionalizing the present disaster management system; (ii) mainstreaming disaster risk reduction; (iii) strengthening institutional mechanisms for disaster management; (iv) empowering at-risk communities; (v) expanding risk reduction programming across all sectors and all hazards; (vi) strengthening emergency response systems, and; (vii) developing and strengthening networks for disaster management.

Further, the NPDM calls for the development and implementation of district, upazila, union, and paurashava/city corporation disaster management plans, and also lays out specific requirements to be addressed by these multi-tier plans. It also mandates the development of sectoral development plans incorporating disaster risk reduction, and hazard-specific multi-sectoral disaster management plans.

Priorities for Climate Change Research, Capacity Building and Adaptation

Under its strategic goal for expanding risk reduction programming, the NPDM provides an elaborate framework for 'establishing an integrated approach to disaster management, including climate change and climate variability impacts'. Key priorities identified vis-à-vis climate change include: (a) establishing and capacitating the Climate Change Cell (CCC) within DOE; (b) developing scenario and prediction models; (c) conducting research and strengthening knowledge on climate change and climate variability impacts; (d) identifying climate change adaptation options through action research; (e) incorporating climate change and climate variability impact information in DRR programs and strategies, and ; (f) designing and implementing capacity building programs to improve and enhance multi-stakeholder understanding of climate change impacts.

3. INTEGRATION OF DRM IN DEVELOPMENT STRATEGIES

Integration of DRM in National Policies and Linkages with International Conventions

Bangladesh's Poverty Reduction Strategy Paper (PRSP) provides for strengthening disaster management and risk reduction, mainstreaming DRR into national policies and developmental processes, and enhancing community capacity for disaster preparedness and risk reduction. Further, the Draft National Plan for Disaster Management (NPDM, 2005-15), is aligned with the objectives and priorities for action identified under various international conventions, such as the Hyogo Framework for Action (HFA, 2005-15), the United Nations Framework Convention on Climate Change (UNFCCC) and particularly, the SAARC Framework for Action (SFA, 2006-15). The NPDM has already been approved by, and incorporates the feedback of: (a) a dedicated MoFDM committee; (b) a wider stakeholder group comprising of government and non-governmental organizations and academic institutions; (c) relevant government ministries and departments; and lastly; (d) the IMDMCC. In the light of IMDMCC comments and decisions, the draft was further revised and prepared for Cabinet consideration and approval.

The Bank's Shifting Focus from Disaster Response to DRM Financing

Although the Bank's Country Assistance Strategy (2006-2009) supports the PRSP's broader objectives, specially towards strengthening local governance and community social safety nets, it currently falls short of specifically supporting the country's conscious shift towards the mainstreaming of DRM considerations in its developmental planning. The Bank's engagement in the disaster arena in Bangladesh has typically remained response-based, with a number of Emergency Recovery Loans in the wake of frequent floods and cyclones. However the Bank's 2008 cyclone Sidr response is marked by a full acknowledgement of the country's DRM needs through the development of a medium to long term (15-year) strategic plan of action for strengthened disaster risk reduction and mitigation under the Joint Damage, Loss and Needs Assessment (JDLNA).

DRM Interventions under the ECRRP – Physical implementation of the above plan began with a support of US\$ 8 million extended towards DRM institutional capacity building and strengthening disaster preparedness under the Emergency Cyclone Recovery and Rehabilitation Project (ECRRP). This DRM strategy is structured along the Bank's international DRM strategic framework, while the ECRRP specifically supports 3 pillars of this framework including: (i) hazard risk identification and assessment; (ii) strengthening and enhancing emergency preparedness, and; (iii) institutional capacity building related to DRM. These entail structural and non-structural interventions both generally at the national and local levels, including: (a) capacity Building of the Disaster Management Bureau (DMB); (b) support towards a Detailed National-level Multi-Hazard Risk and Vulnerability Assessment, Modeling and Mapping, and; (c) strengthening and enhancing emergency preparedness in 12 severely cyclone affected districts.

The ECRRP also includes subprojects for physical risk mitigation, including river and coastal embankment improvement, new disaster shelters, and upgradation of the rural road network. It also provides for studies for establishing a disaster management response fund/facility and potential for buying catastrophe risk coverage.

Other Ongoing DRM Technical Assistance and Economic Sector Work – The Bank is currently carrying out economic sector work and technical assistance in the following areas: (a) decentralized disaster management and local governance; (b) an agricultural risk insurance feasibility study (GFDRR-funded); (c) ESW on implications of climate change on food security, and; technical assistance towards improving Bangladesh's response and recovery activities in the aftermath of disasters.

4. KEY DONOR ENGAGEMENTS

The national disaster management institutional apparatus above has collaborative linkages with a host of technical and scientific organizations, such as the Flood Forecasting and Warning Centers (FFWCs), Bangladesh Meteorological Department (BMD), Center for Environmental and Geographical Information Services (CEGIS), Institute for Water Modeling (IWM), and the Space Research and Remote Sensing Organization (SPARRSO).

A number of International Financing Institutions, multilateral and bilateral donor agencies are supporting disaster management and risk mitigation interventions in the country. The Disaster Emergency Response Group (DER) is a forum for information sharing, composed of government representatives, donor agencies and the NGO community.

The Comprehensive Disaster Management Programme (CDMP), under the auspices of the DMB, is undertaking a number of interventions aimed at strengthening and improving disaster management and risk mitigation capacities at various levels, and in promoting and implementing the national strategic priorities and plans set out by the Government. It is funded by

DFID, UNDP and the EC. The CDMP Phase I has effectively been under implementation since late 2005 and is scheduled to be completed by December 2009. The program has started to make significant contributions in the areas of:

- capacity building and professionalizing disaster management;
- partnership development including advocacy for mainstreaming disaster risk reduction and for expanding risk reduction across a broader range of hazards;
- community empowerment, community risk assessments (CRA) and community risk reduction programs funded through the Local Disaster Risk Reduction Fund (LDRRF);
- research and information management on earthquake and Tsunami preparedness and capacity building on climate change risk management;
- strengthening response management through the establishment and strengthening of Disaster Management Information Centers and a Disaster Management Information Network;

The CDMP has met with particular success in implementing CRAs, community-level Risk Reduction Action Plans and small scale risk mitigation interventions funded through the LDRRF in seven pilot districts. Phase II of the CDMP shall be able to scale-up these activities in additional program districts. In other areas, the CDMP has yet met with partial success, but is steadily moving towards achieving its strategic objectives, as per the program's mid-term evaluation report.

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

The preparation of the integrated, multi-stakeholder proposal or DRM Action Plan for possible GFDRR funding (Refer Table 1), was carried out over a nearly 3-month period between March-May 2009. The first round entailed soliciting proposals from different government and non-government entities and concerned donor agencies. In the second stage, these proposals were analyzed by a 3-member team comprising of the Bank's Regional and Country DRM Coordinators and other staff. This required an assessment of these proposals in respect of: (a) their relevance to the national and local contexts and DRM capacities, including their potential for addressing and mitigating the underlying risk factors for the country (refer sub-sections 5.6, & 7); (b) their relationship with, and leveraging potential for furthering the objectives of, the various existing national strategies, priorities and action plans in respect of improved DRM and strengthened disaster preparedness; (d) addressing present gaps in DRM interventions and avoiding duplications (although some overlaps are unavoidable in the country environment), and; (e) their responsiveness to the lessons learnt and gaps and weaknesses identified in recent disaster responses (refer sub-section 5).

The third stage included a consultative process involving a range of stakeholders including the Economic Affairs Department, the Ministry of Food and Disaster Management including its various directorates, the Bank's ECRRP Team, and the Comprehensive Disaster Management Program (CDMP) and its present financiers including the UNDP, DFID and EC. However the present proposal is still in draft form and shall be further deliberated upon with the concerned stakeholders in a final consultative round, subsequent to receiving preliminary GFDRR feedback.

Rationale for Selection of Proposed Activities

Selection Criteria and Expected Results – Following from above, the criteria used for selection of proposals towards the development of the proposed action plan, include: (a) relevance in addressing and mitigating underlying risk factors for the country; (b) leveraging potential for future DRM interventions; (c) potential for furthering national DRM priorities developed

in harmonization with the agreed priorities for actions under the Hyogo Framework for Action (HFA 2005-15); (d) meeting the challenge of increased DRM activity synchronization and synergy-building across various donor/IFIs, thereby improving the quality and effectiveness of donor aid in the DRM arena; (e) deepening and widening the association of the Bank with other players (particularly the UN) and among other players in the DRM area ; (f) fostering, deepening and widening DRM partnerships between the Bank, government and other donors, and; (g) ease and pace of activity implementation.

Reasons for Non-Selection of Some Proposals –The non-selection of some proposals was based on grounds of: (a) lack of clear objectives or potential for strategic impact; (b) duplications with existing or already funded planned activities, and; (c) availability of other more readily accessible funding mechanisms, such as climate change adaptation related proposals which can be funded through Bangladesh’s Multi-Donor Trust Fund of Climate Change, the Government’s own fund on climate change and various other funding windows.

GFDRR Guidance Request – As per earlier GFDRR guidance, some of the proposed activities are likely to be executed by the government or other players such as the UNDP. One proposal for contributing to the donor resource pool of the CDMP requires more clarity from the GFDRR over the various implementation modalities, particularly the issue of procurement methods and guidelines to be followed in such scenarios. For the time being, the proposed activity has been kept flexible with possibilities for both pool-funding or funding of a discrete set of Phase-II activities under the CDMP.

Indicative new program areas and projects for GFDRR funding	Partnerships	Indicative Budget and Duration	HFA activity area(s)
<p>1. Policy Advice, Technical Assistance and International/ Regional Experience Sharing for: (A) the Conceptualization of a National Disaster Management Authority; (B) Enhancing the Institutional Coordination, Monitoring and Oversight Capacities of the Ministry of Food and Disaster Management in respect of the multitude of DRM related activities and interventions (ongoing and planned) by various partners and stakeholders, and; (C) Conducting a Feasibility Study for the Establishment of a National Emergency Operations Centre</p>	<p>Ministry of Food and Disaster Management</p>	<p>\$1,500,000 3 years</p>	<p><u>Priority Area 1</u>: Ensuring that DRR is a national priority with a strong institutional basis for implementation. <i>Sub-Priority (i)</i>: National Institutional and Legislative Frameworks</p>
<p>2. Training and Capacity Building of a National Volunteers Force for supporting Multi-Hazard Emergency Response Management. This program will broadly following the operating model of existing and very successful Cyclone Preparedness Program which is co-financed and co-managed by the Government and the Red Crescent Society. The proposed intervention shall scale-up this model to include training and building of a volunteers force for multi-hazard response management in other hazard-prone districts in the areas of: (A) Search and Rescue; (B) Evacuation; (C) First Aid Provision, and; (D) Emergency Communications and Community Early Warning Systems</p>	<p>DMB, Directorate of Relief and Rehabilitation (DRR), Red Crescent Society, and Local Governments including District, Upazilla and Union Governments</p>	<p>\$ 2,900,000 3 years</p>	<p><u>Priority Area 1</u>: <i>Sub-Priority (iii)</i>: Community Participation; Strategic Management of Volunteer Resources</p> <p><u>Priority Area 3</u>: Use knowledge, information and education to build a culture of safety and resilience at all levels <i>Sub-Priority (ii)-I</i>: Promote community based training initiatives, considering the role of volunteers.</p>

(Cont.)

Indicative new program areas and projects for GFDRR funding	Partnerships	Indicative Budget and Duration	HFA activity area(s)
<p>3. Vulnerability Reduction of Health Facilities in Disaster Prone Districts. This shall involve scaling up of the Ministry of Health's (with USAID and ADPC) existing structural vulnerability program to focus on: (A) Detailed Structural Vulnerability Assessments of Health Facilities in Prioritized Multi-Hazard Prone Districts and Development of Retrofitting Techniques for Enhancing Building Safety; (B) Incorporation of DRM Considerations in the Design and Planning of Future Health Facilities, including development of district and local capacities in this respect, and; (C) Capacity Building of Key Health Staff in Disaster Prone Districts in Health Emergency Response Management, Provision of Life-Saving Equipment, and Training/Skill Development in life-saving operations/techniques including the use of such equipment in disaster events</p>	<p>Ministry of Health, APDC</p>	<p>\$ 2,400,000 3 years</p>	<p><u>Priority Area 2:</u> <i>Sub-Priority (i):</i> National and Local Risk Assessments</p> <p><u>Priority Area 4:</u> Reduce the underlying risk factors <i>Sub-Priority (ii)-E:</i> Integrate disaster risk reduction into the health sector, promoting the goal of "hospitals safe from disaster", by increasing their level of resilience, and implementing mitigation measures to reinforce and strengthen their capacity to remain functional in disaster situations.</p>
<p>4. Urban Vulnerability Reduction - Knowledge Sharing, and Development of Investment and Implementation Options. This shall be implemented in three 3 Major Urban Center, building upon the Risk Exposure and Structural Vulnerability Assessments carried out by CDMP under Phase-I. This activity will support: (A) Visits by International DRM Practitioners to Major Cities for development of Risk Mitigation Investment Options, and Exposure Visits for Local City Management Officers to Mega Cities where such mitigation options have been implemented; (B) Mainstreaming of DRM Considerations and Interventions in the City Investment Planning Processes; (C) Carrying out an assessment of strengths, gaps and weaknesses in the city/urban search and rescue capacities in respect of both natural and man-made hazards – also based on a comparison between present municipal and urban risk management action plans and the implementation capacities and systems of the respective cities.</p>	<p>CDMP, DMB City Corporations</p>	<p>\$ 1,500,000 1 year</p>	<p><u>Priority Area 4:</u> Reduce the underlying risk factors <i>Sub-Priority (iii)-N:</i> Incorporate disaster risk assessments into urban planning and management of disaster prone human settlements, in particular highly populated areas. <i>Sub-Priority (iii)-O:</i> Mainstream disaster risk considerations into planning procedures for major urban infrastructure projects. <i>Sub-Priority (iii)-R:</i> Encourage the revision of existing or the development of new building codes, standards, and rehabilitation and reconstruction practices.</p>

(Cont.)

Indicative new program areas and projects for GFDRR funding	Partnerships	Indicative Budget and Duration	HFA activity area(s)
<p>5. Support to the Comprehensive Disaster Management Program (a program under the auspices of the MoFDM and Disaster Management Bureau, and currently financed by UNDP, DFID and EC). This program supports: (a) capacity building and professionalizing disaster management at various levels; (b) partnership development including advocacy for mainstreaming disaster risk reduction; (c) community empowerment, community risk assessments (CRA) and community risk reduction programs; (d) research and information management on earthquake and Tsunami preparedness and capacity building on climate change risk management, and; (e) strengthening response management through the establishment and strengthening of a Disaster Management Information Network;</p>	<p>MoFDM, DMB, CDMP, UNDP, EC, DFID</p>	<p>\$ 6,000,000 3 years</p>	<p>Priority Area 1: <i>Sub-Priority (i):</i> National Institutional and Legislative Frameworks <i>Sub-Priority (iii):</i> Community Participation Priority Area 2: <i>Sub-Priority (i):</i> National and Local Risk Assessments Priority Area 3: <i>Sub-Priority (i):</i> Information Management and Exchange <i>Sub-Priority (ii):</i> Education and Training Priority Area 5: <i>Sub-Priority (a):</i> Strengthen policy, institutional and technical capacities for disaster management <i>Sub-Priority (b):</i> Support exchange of information across risk reduction and development agencies</p>
Total Indicative Budget - GFDRR Funding Request		US\$ 14.3 Million	

ANNEX 1

Donor Engagements and Plans for Medium to Long-term Disaster Risk Mitigation in Bangladesh
(Developed under the 2008 Cyclone SIDR JDLNA)

Strategy Pillar:	Planned Activities	Existing and Probable Development Partners	Indicative Timeframe		
			2008-12	2013-17	2018-22
I. Risk Identification and Assessment	(i) Detailed, National Level Multi- Hazard Risk and Vulnerability Assessment & Modeling	WB/GFDRR, UNDP, Others			
	(ii) Supporting Community Risk Assessments at the District, Upazila and Union Levels	UNDP, DFID, CDMP			
II. Strengthening and Enhancing Emergency Preparedness	(i) Disaster Forecasting and Warning	JICA, EC, CDMP			
	(ii) Construction of New, and Rehabilitation of Existing, Disaster Shelters	WB, ADB, JICA/JBIC, IDB, Kuwait, Saudi, and OPEC Funds			
	(iii) Strengthening and institutionalizing disaster preparedness	UNDP, DFID, CDMP			
	(iv) Strengthening Local Communication Systems and Sustained Public Awareness and Sensitization Campaigns	WB, CDMP, IFRC			
III. Institutional Capacity Building	(i) Establishing a Bangladesh Institute for Disaster Management Training	UNDP, DFID, CDMP			
	(ii) Professionalizing the Present Disaster Management Institutions	UNDP, CDMP			
	(iii) Building DMB Capacity for Damage, Loss and Needs Assessments	WB, ADB, UNDP, CDMP			
	(iv) Mainstreaming disaster risk reduction and mitigation across sectors	UNDP, CDMP			
	(v) Fostering National-level Public-Private Partnership Forums	WB, ADB, UNDP, CDMP			
IV (a). Risk Mitigation Investments	(i) River Bank Protection Improvement Program	WB, ADB, Dutch Govt.			
	(ii) Coastal Embankment Improvement Program	WB, ADB, Dutch Govt.			
	(iii) Program for upgrading the Standards of Construction for Roads	WB, ADB, JICA/JBIC, Others			
	(iv) Forestation of Coastal Belt	WB, ADB, Others			
	(v) Sundarbans restoration and improvement	WB, ADB, Dutch Govt., Others			
	(vi) Gorai River Restoration Program	WB, ADB, Dutch Govt., Others			
IV (b). Climate Change Risk Mitigation and Adaptation	(i) Capacitating and Strengthening the Climate Change Cell (CCC) within DOE	DFID, UNDP, CDMP			
	(ii) Developing climate change and climate variability scenario and prediction models	DFID, UNDP, CDMP			
	(iii) Conducting research and strengthening knowledge on climate change and climate variability impacts	DFID, UNDP, CDMP, Others			
	(iv) Identifying climate change adaptation options through action research	DFID, UNDP, CDMP			
	(v) Incorporating climate change and climate variability impact information in DRR programs and strategies	DFID, UNDP, CDMP, WB, ADB, JBIC/JICA, Others			
	(vi) Designing and Implementing capacity building programs to improve multi-stakeholder understanding of climate change impacts.	DFID, UNDP, CDMP, Others			
V. Introducing Catastrophe Risk Financing	(i) Establishment of Disaster Response Fund	GOB, IFIs, UN, Bilateral Donors			
	(ii) Catastrophe Risk Financing of Rare Events	GOB, WB, GFDRR, ADB			

PAKISTAN

Extensive internal and external consultations were undertaken for the preparation of the Country DRM Note. As part of the internal World Bank consultations various Country Sector Teams were involved in review of the concerned activities listed in the proposal and helped in further refinement and finalization of these activities. Members of the World Bank's Pakistan Country Team were also briefed on the proposal. Consultative meetings with external stakeholders such as the Government, Donors and other Bilateral International Agencies/UN were also held. This entailed detailed discussion with the National Disaster Management Authority (NDMA) on national priority areas in DRM in relation to the overall needs as well as all aspects of the country proposal. In addition, The Bank DRM Team also held three rounds of consultations under the G-7 Coordination Forum with the UN (UNDP, WFP, UN-Habitat, WHO), Japanese Embassy/JICA, USAID, European Commission, DFID, ADB and the WB. The proposed GFDRR grant funding proposal was finalized after incorporation of the views and suggestions of all the above stakeholders and therefore has strong ownership.

The matrix of priority areas and actions for DRM was developed in consultation with all members of the G-7 Coordination Forum and discussed with the National Disaster Management Authority (NDMA) and shared with The National Working Group (NWG) for mainstreaming DRM in the country which includes key ministries/line agencies representatives as members.

1. DISASTER RISK PROFILE

Pakistan has been at risk to various types of natural disasters of which cyclones, flooding, landslides, earthquakes and drought are more common. The country is one of the most flood prone countries in South Asia. During its history the floods of 1950, 1992 and 1998 resulted in a large number of deaths and severe loss of property valued at an estimated \$1.3 billion. Pakistan is also located in a seismically active zone on account of its proximity to the Indo-Australian and Eurasian plates. This vulnerability was proven in October of 2005 when a major earthquake measuring 7.6 on the Richter scale hit 9 Districts in NWFP and AJK, killing over 73,000 people and damaging / destroying about 450,000 houses. Droughts are also a serious hazard in the country as 60 percent of the country is classified as semi-arid to arid. The droughts of 2000-2002 are estimated to have cost economic losses of about \$ 2.5 billion. The country does not have a very high risk to cyclones; however fourteen cyclones have been recorded between 1971 and 2001 which have caused a certain amount of damage.

Pakistan is impacted by both manmade and natural disasters. The types of disasters that occurred from 1954-2004 and the frequency of the occurrence of the most common disasters are listed in Table 1.

However, the incidence of disaster events is not necessarily correlated with the loss of human life, the number of people impacted and/or the monetary damages inflicted by the disasters. To that end, efforts have been made to estimate the number of people who were killed and/or affected by many of the most significant disasters and their corresponding monetary damages over the years 1926-2006 (Table 2). These estimates illustrate the severity of the problem posed by disasters. However, some experts believe the true financial cost of disasters over the past 50 years comes close to \$50 billion—far more than the combined estimates in the table below. In particular, the monetary estimate for earthquake damage is a gross underestimate of the true costs since the devastating Azad Jammu and Kashmir and the NWFP earthquake in 2005 will require an estimated \$5.2 billion for reconstruction. This represents slightly more than 25 percent of Pakistan's entire national budget.

Table 1. Hazards in Pakistan and Frequency of Most Significant Hazards: 1954 - 2004

Natural	Frequency (%)	Human-Induced	Frequency (%)
Avalanches		Epidemics	6
Cyclones (Storms)	16	Industrial/Transport Accidents	
Droughts	4	Nuclear Accidents	
Earthquakes	18	Radiological Accidents	
Epidemics		Oil Spills	
Floods	33	Urban and Forest fires	
Glacial Lake Outbursts		Civil Conflicts	
Landslides	10		
Pest Attacks	1		
River Erosion			
Tsunami			
Extreme Temp.	12		

Source: *Disaster Risk Management, TWG Working Group Meeting, United Nations, May 17, 2007.*

Table 2. Estimated Number of People Impacted and Killed and the Financial Losses Associated with Various Selected Disasters: 1926-2006

Disasters	Number of Events	Killed	Frequency (%)	Damage (Millions U.S. \$)
Drought	4	223	2,269,300	247
Earthquake	22	142,812	4,236,110	5200
Epidemic	10	283	16,486	0
Extreme	15	1,406	574	0
Flood	53	11,767	47,600,694	2500-6000
Landslides	13	413	3,419	0
Windstorms	21	11,654	950,313	4
Transport	19	420	18,395	179

Source: *Disaster Risk Management, TWG Working Group Meeting, United Nations, May 17, 2007.*

SOME UNDERLYING RISK FACTORS

There are a number of underlying risk factors that increase vulnerability and contribute to the severity of disasters in Pakistan. These include:

- Poor construction practices and limited enforcement of existing building codes
- Weak early warning systems
- Lack of awareness and education on disasters and response
- Limited capacity and coordination between various government disaster response agencies
- Disaster susceptibility of large number of impoverished communities

EXPOSURE AND VULNERABILITY

Disasters are unevenly distributed among Pakistan's 139 districts as a result of at least some of the factors listed above (Table 3). Districts are distributed across Pakistan as follows: Punjab Province (35), Baluchistan Province (29), Sindh

Province (23) Northwest Frontier Province (NWFP) (24), Islamabad (ICT) (1), Federally Administered Tribal Areas (FATA) (13), Azad Jammu and Kashmir (AJK) (8) and the Northern Areas (6). However, the table below illustrates that several areas and provinces suffer a disproportionate share of either very high or high risk disasters or both. In particular, in the Northern Areas 33 percent of the districts face a very high risk of disasters while none of the districts in Punjab Province face a very high risk for disasters. This is particularly noteworthy since Punjab Province is the wealthiest province in Pakistan while the people who live in the Northern Areas are among the poorest. Clearly there is some relationship between economic prosperity and the incidence of disasters. In total, 50 percent of the provinces in the Northern Areas face either a high or very high risk of disasters followed by 30 percent of the districts in Baluchistan and only 3 percent in Punjab Province. The provinces and regions also face a wide range of different disaster threats. For example, southern Punjab is mostly impacted by the threat of droughts and flooding, Baluchistan is confronted by the risk of drought, earthquakes and flash floods, Sindh province is faced with the possibility of drought and floods, while the NWFP is faced with earthquakes, landslides, avalanches and glacial lake flooding.¹

Table 3. Percentage of Districts in Each Province or Area Potentially Impacted by Very High or High Risk Disasters

Province/Area	Very High Risk (%)	High Risk (%)	Total (%)
Baluchistan	21	17	38
NWFP	17	13	30
Northern Areas	33	17	50
AJK	13	13	26
Sindh	4	30	34
Punjab	0	3	3

Based on: Disaster Risk Management, TWG Working Group Meeting, United Nations, May 17, 2007.

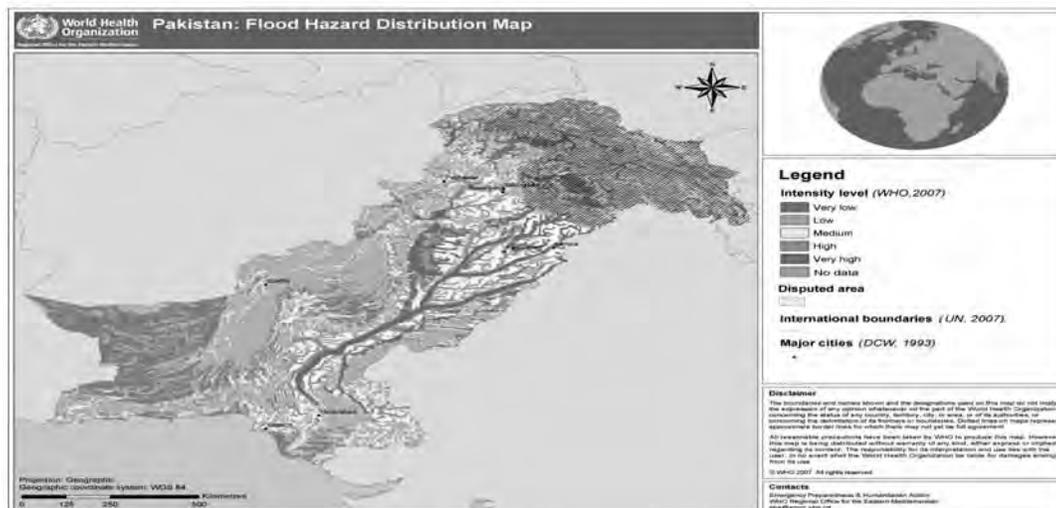
FLOODS

Pakistan is one of the most flood prone countries in South Asia. River related floods are the most severe in Punjab and Sindh provinces while hill torrents that are common in hilly terrain tend to affect NWFP, Baluchistan and the Northern Areas. There have been a number of floods in Pakistan that caused a significant amount of damage, particularly during 1950, 1992 and 1998 which resulted in a large number of deaths and a severe loss of property valued at an estimated \$1.3 billion. Most of the flooding occurs in late summer during the monsoon season but flooding can also occur as the result of glacial lakes breaking (termed GLOF) that are caused by high summer temperatures. In 2007 monsoon rain induced flooding damaged the rice crop in Sindh and Baluchistan provinces and reduced production by as much as 200 thousand tons—which equals approximately 3.5 percent of the crop. Since rice is a high value crop the loss will have a significant impact on the farm value added in the agriculture sector and lead to a reduction in export earnings.

EARTHQUAKES

The earthquakes in Pakistan are primarily related to the fact that the country along with India and Nepal lies on the Indo-Australian Plate. The plate is continuously moving northward and colliding with the Eurasian plate which formed the Himalayan Mountains. As part of this process the release of energy results in earthquakes. In addition, there are a number of fault lines in various parts of Pakistan due to the stresses resulting from the movement of the Indo-Australian plate which also cause earthquakes. The Koh-e-Sulieman, Hindu Kush and Korakuram mountain ranges are particularly vulnerable and the resulting devastation can be immense because of the poor construction of the buildings. In 1935, the entire city of Quetta—a city that now has a population of approximately 1 million in Baluchistan, was entirely destroyed and as many as 30 thousand people were killed. Five years earlier Quetta had also been destroyed by an earthquake. Prior to the October 8, 2005 earthquake in Azad Jammu and Kashmir and the NWFP there were other large destructive

¹ Based on National Disaster Management Authority (NDMA) Communications



earthquakes in 1974 and 1990 in which approximately 5669 people were killed in the Northern Areas, NWFP and Baluchistan. In February 2004, an earthquake in the NWFP killed 24 people and impacted another 129 thousand.²

DROUGHT

Pakistan is characterized by low rainfall, extreme temperature variations and as much as 60 percent of the country is classified as semi-arid to arid. Nearly all of Baluchistan province is arid—although its rainfall distribution ranges from a low of 50 mm in the SW to 400 mm in the NE. Arid regions receive less than 200 mm of rain per annum, while in comparison, Punjab province annually receives an average of 400 mm of rainfall while the NWFP receives an average of 630 mm of rainfall. Given the precarious nature of rainfall even a slight deviation can result in drought conditions. The most susceptible regions experience a drought 2 or 3 years every decade. Droughts were so severe in 2000 and 2002 that the livelihoods of people were destroyed, thousands of people were forced to migrate and millions of livestock were killed. By one estimate, 15 million cattle died and the drought caused overall economic losses of \$2.5 billion. The 2001 drought was so severe that the economic growth rate was reduced from an average of 6 percent to only 2.6 percent.³

WINDSTORMS/CYCLONES:

Cyclones cause significant damage in the coastal areas of Sindh and Baluchistan provinces. The low-lying coastal belt allows storms to travel several hundred kilometers inland and along the way destroy crops, agricultural productivity by creating water-logging and settlements. Fourteen cyclones have been recorded between 1971 and 2001. A 1999 cyclone in the Thatta and Badin districts of Sindh province destroyed 73 settlements, killed 168 people, impacted .6 million people, and killed 11 thousand cattle. The estimated economic losses amounted to \$12.5 million.⁴

GLOBAL WARMING & CLIMATE CHANGE:

Policy makers in Pakistan are quite concerned about the potential problems associated with global warming. They have observed that over the past decade weather patterns have changed for the worse resulting in more storms, longer droughts and most significantly that the glaciers, which form the core of the headwaters of the Indus River Basin, are receding at a rapid pace. By some estimates the glaciers are retreating by as much as 400 meters per year and if the glaciers vanish the immediate release of water will result in even more flash flooding. Even though Pakistan's dams in combination with recharged groundwater along the path of the Indus River canal system are capable of storing a significant amount of water, they would fall far short of storing sufficient water to meet Pakistan's needs for irrigation,

² WCDR, A Review of Disaster Management Policies and Systems in Pakistan, January, 2005.

³ National Disaster Risk Management Framework (NDRMF), 2007

⁴ NDMA, Disaster Risk Management Thematic Working Group, March, 2007.

drinking and power generation. In the short-term, there will likely be increased droughts and flooding, the agricultural sector will need by changing crops and cropping patterns, biodiversity will be adversely impacted and the composition of forests will change. In addition, the flow of irrigation water will become less predictable and power generation by existing facilities will likely be somewhat reduced.⁵ Over the long term, if temperatures increase by just a few degrees above the current average temperature, which has already, increased by 1.4 degree Celsius above the historical average⁶, it will be necessary to radically retool some sectors of the economy such as agriculture and power generation. If retooling is impossible either because of a lack of resources, political will and/or technology the resulting disaster could be far worse than anything Pakistan has experienced to date.

2. DISASTER RISK MANAGEMENT FRAMEWORK

National Disaster Risk Management Policy

The massive October 2005 earthquake that hit northern Pakistan highlighted the country's high vulnerability to disaster risks. Since then the Government of Pakistan has been making concerted efforts towards establishing a comprehensive disaster management regime. This has essentially involved a strategic shift from the previous reactive to a proactive approach; and the setting up of an integrated management structure that links the vital functions of preparedness/risk reduction, and early disaster recovery to longer term reconstruction and rehabilitation. The National Disaster Management Authority (NDMA) has been established and operationalized.

The NDMA is the apex coordinating agency for disaster risk reduction at the national level, which along with the Earthquake Reconstruction and Rehabilitation Authority (ERRA) and other agencies, is responsible for the various aspects of disaster management from early recovery to post-disaster reconstruction. The NDMA effectively serves as a secretariat to the National Disaster Management Commission (NDMC) chaired by the Prime Minister with representatives from various federal ministries and provincial governments. The NDMA is tasked with the broad overall regulation of the disaster management structures and functions in the country, along with the provincial and district disaster management authorities, tehsil and town authorities, and union council set-ups down to community based organizations.

Disaster response in Pakistan has historically been governed and regulated under the Calamity Act of 1958, recently replaced by the National Disaster Management Ordinance (NDMO) 2006. The NDMO provides the institutional and regulatory framework for the functioning of the overall national disaster management regime, including all federal, provincial, and local government institutions tasked with disaster management responsibilities.

The NDMA has in turn, through a multi-stakeholder consultative process, recently developed a National Disaster Risk Management Framework (NDRMF), which has been approved by the Government of Pakistan and constitutes the agreed national policy document on disaster risk reduction (DRR). The mandate of the NDRMF is comprehensive, including DRR in all relevant sectors of the economy. It calls for the integration of risk assessment in the planning and design stages of all new infrastructure projects, and holds the promotion of multi-stakeholder, multi-sectoral, and multi-disciplinary approaches in disaster risk reduction as its foremost policy principle.

Historically, the Government has pursued DRR in the developmental agendas for some of the key sectors, including flood protection and management programs covering irrigation, agriculture, and road infrastructure. Such programs have mostly been designed and executed by federal and provincial agencies including the Flood Relief Commissions and related line departments. However, with the enactment of the NDRMF, the scope of DRR has been expanded to cover developmental planning for all sectors of the economy. Promoting disaster risk management planning across multiple sectors figures high in the list of 5-year priorities set out by the NDRMF, including preparation of disaster risk

⁵ Pakistan Agricultural Research Council Estimates and Analysis

⁶ National Disaster Risk Management Framework (NDRMF), 2007

management plans of selected line ministries over the next 2-3 years. The NDRMF is considered as the national strategy document on DRM.

The NDRMF also accords high priority to proactive reduction of the enhanced disaster risks related to the global climate change phenomenon. It builds on the analytical work and studies carried out by various national and international agencies on the already visible impacts of climate change on the natural and ecological resources of the country. It concludes that climate change together with environmental degradation are likely to result in an enhanced frequency of natural disasters in Pakistan, as well as amplify the social, economic, and environmental impacts created by such disasters. In response to this situation assessment the NDRMF, while laying out disaster management priorities for the next 5 years, includes a composite national hazard and vulnerability assessment (Being funded by the Bank) in the first program year, followed by a detailed study on the impacts of climate change on glaciers and ice cap in Northern Pakistan in a 2-3 year time horizon. The NDRMF climate change risk mitigation strategy is attuned with mitigation measures proposed under various international conventions, including the Framework Convention on Climate Changes (UN FCC) - 1992, the Vienna Convention for the Protection of Ozone Layer and the Montreal Convention - 1992, and the all-encompassing Hyogo Framework for Action 2005-15.

The Government has also recently instituted a National Working Group (NWG) on Disaster Risk Management led by The National Disaster Management Authority (NDMA) which includes key government ministries and donors such as The World Bank as members with the mandate of integrating and mainstreaming Disaster Risk Management in planning processes / development agenda and overall coordination with different stakeholders. In addition to these government mechanisms the donor community in Pakistan, with the Bank in the lead have created a coordination mechanism between donors known as the G-7 which discusses national DRM issues and coordinates suitable interventions. NDMA recently conducted a meeting with key government agencies and donors including the Bank under the NWG and presented an immediate / short term 10 point action plan based on the NDRMF. Under this short term action plan the following activities were identified for immediate implementation in line with the NDRMF:

- i. National Capacity Building in Disaster Risk Management (NCBDRM) including design and construction of a National Institute of Disaster Management (NIDM)
- ii. Establishment of National & Provincial Emergency Operation Centers (NEOCs & PEOCs)
- iii. Operationalization of Provincial and District Disaster Management Agencies (PDMAs & DDMAAs)
- iv. Capacity Building of Urban Emergency Response Services including capacity assessments and required trainings
- v. Education, Training and Awareness in Disaster Risk Management (DRM)
- vi. Mainstreaming DRM in the Development Agenda through enhancing capacity of Planning Commission of Pakistan
- vii. Disaster Mitigation and Climate Change Initiatives related to earthquake flood and GLOF including studies and assessments
- viii. Formation of Mobile Response Teams for immediate disaster response, recovery and coordination
- ix. Improving Early Warning Capacity through Enhancement of Organizational Capacity and System Resources of Key Agencies such as Pakistan Metrological Department
- x. Conduct of a National Risk Assessment and Development of a Risk Atlas of Pakistan

NDMA is particularly fast tracking the national risk assessment exercise which is under way with Bank support so that

the overall risk environment could be better defined. This would subsequently be followed by a micro level hazard risk and exposure mapping of the identified hot spots which would lead to suitable mitigation investments. Some mitigation investments have already taken place in the housing sector through Bank support in the case of the earthquake affected areas where about 350, 000 earthquake resistant houses have been constructed. NDMA is also focusing on improving early warning and response capacity as a priority and is undertaking activities such as inundation profiling of vulnerable coastal communities and strengthening the existing flood forecasting / telemetry network. National Emergency Operations Centre operationalization and formulation of necessary protocols is also an activity being undertaken by Bank support which will improve the Government's disaster response capacity.

The Government is in the process of establishing the National Institute of Disaster Management (NIDM) for which land has already been allocated. This would act as a platform for promoting disaster management education in the country. Currently the Government frequently conducts DRM trainings, seminars work shops and other events, particularly on October 8 which has been declared as National Disaster Awareness Day.

3. INTEGRATION OF DRM IN DEVELOPMENT STRATEGIES

The NDRMF, as the overarching framework for DRR in the country, seeks to build and strengthen linkages with all applicable national and international protocols and sectoral developmental policies. At the national level, these include the Poverty Reduction Strategy Paper (PRSP), Medium Term Development Framework 2006-10, Ten Year Perspective Development Plan 2001-11, Agricultural Perspective and Policy, National Conservation Strategy, National Environment Action Plan - 2001, National Environment Policy - 2005 and the Draft National Water Policy - 2006.

Pakistan's PRSP recognizes that achieving sustained economic growth for poverty reduction would require enhancing the country's environmental sustainability, since the poor are mostly dependant on natural resources for their livelihoods as well as most affected by environmental degradation. Thus it identifies the linkage between environment and vulnerability as the key, noting that the poor are particularly vulnerable to environmental disasters. It then commits to providing sustained protection to vulnerable communities from natural disasters, particularly those triggered or catalyzed by environmental degradation. However, the current PRSP falls short of fully taking cognizance of the important role of broader DRR as a tool for reducing poverty through a reduction in the vulnerability of the poor to natural shocks. But with the NDMA, NDRMF and a NWG now in place, efforts are underway to mainstream DRR as a vital component of the broader poverty reduction / sustained development agenda and strategy.

Another recent development is the drafting of a revised multi-disaster risk responsive National Building Code, that will help reduce the vulnerability of public, private, and commercial buildings to seismic and other disaster risks. The code will be applicable to both urban and rural areas, although enforcement of the code would pose a significant challenge, and require requisite capacity and skills of the concerned agencies for proper implementation. Under the NDRMF, the development of a strategy for implementation of the Building Code is a priority over a 2-year horizon.

Pakistan CAS: Support for Hazard Risk Management and Disaster Risk Reduction

The Bank's current Country Assistance Strategy (CAS) for Pakistan is committed to supporting the government in the development of a comprehensive hazard risk management strategy for Pakistan, through dialogue, advisory activities, and technical assistance. CAS support for more effective hazard risk management and disaster risk reduction in the country is premised on: (a) the high and recurring fiscal costs of post-disaster reconstruction, as in case of the 2005 earthquake as well as recurrent floods, and its adverse impacts on public sector development budget/activities; and (b) supporting GOP's poverty reduction strategy which provides for targeting and reducing vulnerabilities of the poor and marginalized

sections of the population. (c) Pakistan's adhoc approach towards disaster management with interventions primarily focused on relief and recovery with insufficient ex-ante measures. Therefore a major portion of traditional post-disaster spending in Pakistan was aimed at providing direct monetary assistance to affected people. But such subsidies are untenable from a sustainability perspective and severely tax routine developmental spending. The CAS while highlighting Pakistan's susceptibility to natural disasters and its amplified impact based on mortality and economic risks induced by such hazards supports development of hazard prevention / mitigation strategies, development of a strategic approach to hazard risk management and building in-country capacity for effective implementation of these strategies.

The New CAS (2010-2014) which is currently being drafted and is at the concept note stage also supports the outcome for improvement in Pakistan's disaster risk management capacity under the sustainable development strategic pillar. It outlines Pakistan's vulnerability to various types of disasters and the paradigm shift in moving from a predominantly reactive approach to a more pro-active approach. While the CAS acknowledges the work being done for promotion of effective disaster management in the country it also underlines the various challenges such as a general lack of awareness and the limited in-country technical capacity in DRM. The current state of the DRM systems and response mechanisms are also highlighted as they are still in the process of being outlined and operationalized, while the national risk environment in terms of multiple disasters is yet to be fully defined. The CAS also presents the current and ongoing activities and some of the broad planned interventions by the Bank in order to support effective DRM in the country.

Bank's Disaster Risk Management Country Strategy

The Bank's country disaster risk management strategy is based on a 5 pillar approach. The 5 pillars include Risk Identification and Assessment, Risk Mitigation, Emergency Preparedness, Catastrophe Risk Financing or Transfer and Institutional Capacity Building. The various activities being initiated and undertaken by the Bank on DRM correspond to this approach and have been planned / staggered using the strategic framework as well as the national priorities identified through the NDRMF. The Bank's ongoing projects such as the Earthquake Emergency recovery Credit (ERC) and various activities under it support Pillar I, II, III and V of the DRM Country strategy through macro level hazard mapping exercise of earthquake affected districts, structural mitigation through seismic resistant reconstruction as well as building capacity of the government for effective disaster response and better coordination. Additional critical activities have been undertaken by making some ERC funds available to NDMA for undertaking a national level hazard risk assessment and operationalization of National Emergency Operations Centre which support Pillars I and III respectively. The Bank has also leveraged funds through other donors / sources such as inundation profiling exercise of cyclone affected districts of Baluchistan with UNDP assistance in line with strategy Pillar II while GFDRR ongoing activities on earthquake results documentation and lessons learnt as well as post disaster cash transfers support pillars III and V. Another GFDRR proposal on catastrophe risk financing which supports Pillar IV is under preparation. The activities under the current proposal are also in line with the Bank's Country's DRM strategy under the 5 pillar approach as well as the national priority areas identified through the NDRMF.

4. KEY DONOR ENGAGEMENTS

There has been an active donor consultation process in Pakistan ever since the 2005 earthquake disaster struck the country. These consultations include both multi-donor consultations as well as multi-stakeholder consultations, including the Government of Pakistan. In the aftermath of the earthquake donors formed a consultative group known as the G-7⁷. The group periodically met to discuss issues and collective strategies on how to deal with the disaster. Recently the group became more involved in overall disaster management issues in the country. The G-7 regularly holds internal meetings and then meets with the concerned government agencies such as Earthquake Reconstruction Rehabilitation

7. The Group consists of the WB, ADB, EC, USAID, UN, DFID and Embassy of Japan

Authority (ERRA) and the National Disaster Management Authority (NDMA). The key donor engagement table is based on the Country DRM Matrix which was developed after extensive consultations between all leading donors, G-7 members and the Government of Pakistan. All current and ongoing activities in DRM are listed in the table below while for planned activities please refer to Annex 1. It is apparent from both the table and the annex that there is quite a large need in the DRM sector while the realized commitments are a small percentage of the overall need.

Ongoing Projects and Organizations	Indicative budget (where available, details on years covered)	HFA activity area(s)
<p><i>The World Bank</i> ERRA DRM Program DRM Support Program to NDMA Activities funded through GFDRR</p>	<p>\$ 2.9 million \$ 4 million</p>	<p>HFA Priority 1: Ensure that Disaster Risk Reduction is a National and Local Priority with a strong institutional basis for implementation HFA Priority 2: Identify, Assess and Monitor Disaster Risks and Enhance Early Warning HFA Priority 3: Use Knowledge, Innovation and Education to Build a Culture of Safety and Resilience at All Levels HFA Priority 4: Reduce the underlying risk factors HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels</p>
<p><i>DFID</i> Disease Early warning System (DEWS) Joint Protection Monitoring System DRR Conference Urban Search & Rescue Project</p>	<p>UK£ 1.848 million UK£ 152,567 UK£25,000 UK£ 1.5 million</p>	<p>HFA Priority 2: Identify, Assess and Monitor Disaster Risks and Enhance Early Warning HFA Priority 3: Use Knowledge, Innovation and Education to Build a Culture of Safety and Resilience at All Levels HFA Priority 4: Reduce the underlying risk factors</p>
<p><i>United Nations: (UN joint Program)</i> Only about 10 % of the under-mentioned funding is expected to be immediately mobilized under following activities of the UN Joint Program which have commenced National Capacity Building for Disaster Risk Management (NCBDRM) Institutional Strengthening</p>	<p>\$ 46.5 Million \$ 60,000</p>	<p>HFA Priority 1: Ensure that Disaster Risk Reduction is a National and Local Priority with a strong institutional basis for implementation</p>

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Ongoing GFDRR Funded Activities

Ongoing GFDRR funded activities (years covered)	Partnerships	Budget and years covered	HFA activity area(s)
Documentation & Dissemination of Results and Lessons Learnt in the Rural Housing Reconstruction Response to the 2005 Pakistan Earthquake	NDMA, ERRA and UN-Habitat	\$ 250,000	HFA Priority 3: Use Knowledge, Innovation and Education to Build a Culture of Safety and Resilience at All Levels
Building capacity to effectively deliver Safety Nets in post-disaster situations in Pakistan	Pakistan Baitul Maal and Ministry of Social Welfare	\$ 250,000	HFA Priority 4: Reduce the underlying risk factors

Indicative New Program Areas and Projects for GFDRR Funding

Indicative new program areas and projects for GFDRR funding	Partnerships	Indicative budget for GFDRR funding and years covered	HFA activity area(s)
Development of public-private sector collaborative forums and partnerships on DRR	NDMA, relevant Line Ministries and Private / Corporate Sector	\$200,000 2 years	HFA Priority 1: Ensure that Disaster Risk Reduction is a National and Local Priority with a strong institutional basis for implementation [Sub Priority: Support the creation and strengthening of national integrated disaster risk reduction mechanisms such as multi-sectoral national platforms] HFA Priority 3: Use Knowledge, Innovation and Education to Build a Culture of Safety and Resilience at All Levels & HFA Priority 4: Reduce the underlying risk factors through improved building safety and protection of critical facilities
Study and strengthen existing forecasting and early warning systems for hydro metrological events in high risk areas	NDMA, Federal Flood Commission (FFC) and Pakistan Metrological Department (PMD) and WFP	\$ 1,000,000 3 years	HFA Priority 2: Identify, Assess and Monitor Disaster Risks and Enhance Early Warning
Disaster Risk Assessment and Risk-based Microzonation of One Major City and in One Medium Industrial City	NDMA, City Government, PDMA and UN-Habitat	\$ 1,000,000 3years	HFA Priority 2: Identify, Assess and Monitor Disaster Risks and Enhance Early Warning HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels
International Exposure Visits for Government Officials & Bank staff in DRR	NDMA, ERRA and Line Ministries	\$ 300,000 1 year	HFA Priority 3: Use Knowledge, Innovation and Education to Build a Culture of Safety and Resilience at All Levels

(Cont.)

Indicative new program areas and projects for GFDRR funding	Partnerships	Indicative budget for GFDRR funding and years covered	HFA activity area(s)
Development and implementation of a school safety program	NDMA, ERRA, Ministry of Education and UNESCO	\$ 1,000,000 3 years	HFA Priority 3: Use Knowledge, Innovation and Education to Build a Culture of Safety and Resilience at All Levels HFA Priority 4: Reduce the underlying risk factors through improved building safety and protection of critical facilities
Analytical work towards identification of potential disaster risk insurance options and development of a strategy for catastrophe risk financing mechanisms and solutions.	NDMA, Ministry of Finance, SECP, Adamjee Insurance, KASHF Foundation / Bank, RSPN and PPAF	\$ 300,000 2 years	HFA Priority 4: Reduce the underlying risk factors [Sub Priority: Promote the development of financial risk sharing mechanisms, particularly insurance and reinsurance against disasters] HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels
Technical assistance in development of a national action plan on climate change for Pakistan	NDMA, Ministry of Environment and Planning Commission	\$ 200,000 2 years	HFA Priority 4: Reduce the underlying risk factors [Sub Priority: Promote the integration of risk reduction associated with existing climate variability and future climate change into strategies for the reduction of disaster risk and adaptation to climate change] HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels
Capacity and skill gap assessment of urban emergency services and subsequent training to enhance emergency response capability in one large/medium/small city/s.	NDMA, Urban Fire and Rescue Services and Planning Commission	\$ 400,000 3 years	HFA Priority 1: Ensure that Disaster Risk Reduction is a National and Local Priority with a strong institutional basis for implementation HFA Priority 3: Use Knowledge, Innovation and Education to Build a Culture of Safety and Resilience at All Levels HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels
Human Resource Capacity Development through creation of a DRM / GFDRR Focal Point position in the Pakistan Country Office to facilitate mainstreaming and better coordination of all DRM related activities with donors and all national / international DRM platforms	NDMA, UN and other donors	\$ 100,000 2 years	HFA Priority 1: Ensure that Disaster Risk Reduction is a National and Local Priority with a strong institutional basis for implementation [Sub Priority ii - Resources] HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels
Technical Assistance and hardware support for Operationalization of the National Emergency Operations Centre	NDMA & JICA	\$ 500,000 3 years	HFA Priority 1: Ensure that Disaster Risk Reduction is a National and Local Priority with a strong institutional basis for implementation HFA Priority 2: Identify, Assess and Monitor Disaster Risks and Enhance Early Warning HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels

(Cont.)

Indicative new program areas and projects for GFDRR funding	Partnerships	Indicative budget for GFDRR funding and years covered	HFA activity area(s)
Technical Assistance and hardware support for operationalization of selected Provincial / District Disaster Management Agencies	NDMA & UN	\$ 500,000 3 years	HFA Priority 1: Ensure that Disaster Risk Reduction is a National and Local Priority with a strong institutional basis for implementation HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels
Program of Rapid Emergency Preparedness, Assessment and Response Execution (PREPARE)	NDMA, Ministry of Health & WHO	\$ 400,000 3 years	HFA Priority 2: Identify, Assess and Monitor Disaster Risks and Enhance Early Warning HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels
Institutionalization of Damage and Needs Assessment Methodology and Expertise in Pakistan	NDMA & Relevant Line Ministries / Departments / Agencies	\$ 100,000 3 years	
Total Indicative Budget:			\$ 6.0 Million

ANNEX 1

Ongoing Projects and Organizations	Indicative budget (where available, details on years covered)	HFA activity area(s)
<i>European Commission</i> 1. NWFP & Baluchistan Program (Program areas to be determined)	Euro 30 million	To be determined
<i>JICA</i> 1. Technical Assistance in Development of design of National Institute of Disaster Management (NIDM) 2. Technical Cooperation in capacity development of NDMA & PDMA & District Governments 3. Up-gradation and Modernization of Weather Forecasting and Early Warning System 4. Flood/Disaster Protection Works 5. The Project for Strengthening of Flood Risk Management	To be determined To be determined To be determined To be determined To be determined	HFA Priority 2: Identify, Assess and Monitor Disaster Risks and Enhance Early Warning HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels
<i>United Nations: (UN joint Program)</i> 1. DRM Training Initiative 2. Support to DRM Planning 3. DRR Mainstreaming into Development Process 4. Earthquake Vulnerability Reduction and Preparedness Programme for Muzaffarabad and Mansehra Municipalities 5. Capacity Building of DDMA's and Community based Mitigation in Badin, Thatta, Kech, and Quetta 6. Glacial Lake Outburst Flood (GLOF) Risk Reduction in the HKH Region - Pakistan 7. Program for Enhancement of Emergency Response (PEER) 8. Urban Search and Rescue Project 9. Strengthening Tsunami Early Warning System in Pakistan 10. Integration of Seismic Resistant Design and Construction Elements in Diploma in Associate Engineering Curricula	Only about 10 % of the under-mentioned funding is expected to be immediately mobilized under UN Joint Program \$ 94,000 \$ 50,000 \$ 80,000 \$ 760,000 \$ 370,000 \$ 150,000 8.4 Million \$ 340,000 \$ 600,000 \$ 47,000	HFA Priority 1: Ensure that Disaster Risk Reduction is a National and Local Priority with a strong institutional basis for implementation HFA Priority 2: Identify, Assess and Monitor Disaster Risks and Enhance Early Warning HFA Priority 3: Use Knowledge, Innovation and Education to Build a Culture of Safety and Resilience at All Levels HFA Priority 4: Reduce the underlying risk factors HFA Priority 5: Strengthened Disaster Preparedness for Effective Response at All Levels

SRI LANKA

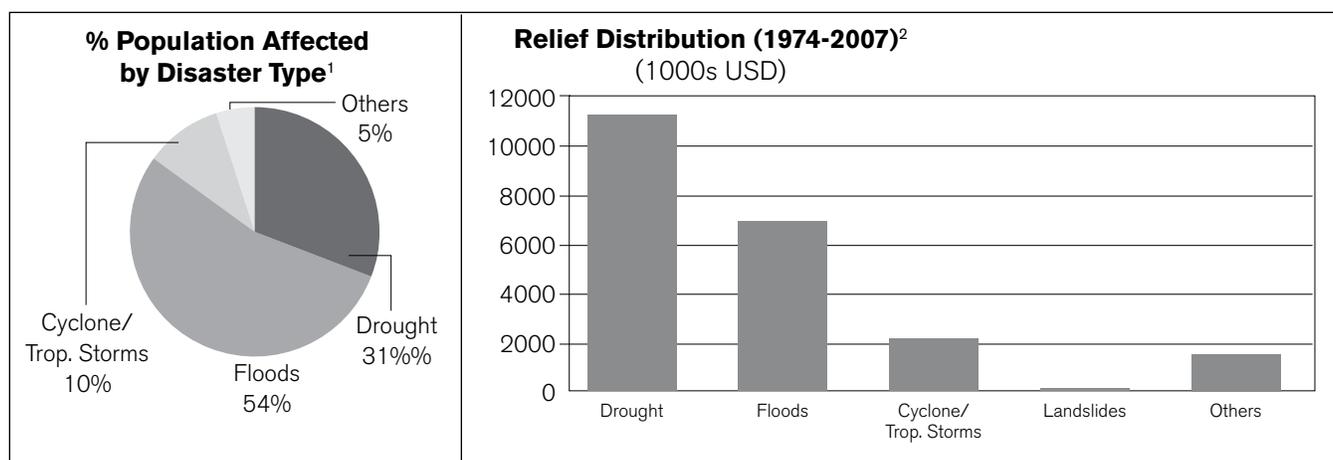
To prepare the Country DRM Note, consultations were undertaken with members of the World Bank's Sri Lanka Country team. Meetings were held with the Ministry of Disaster Management & Human Rights (MoDMHR) and with the three departments contained within the ministry—Disaster Management Centre (DMC), the National Building Research Organization (NBRO) and the Sri Lanka Meteorological Department (Met). The team also met with the Ministry of Disaster Relief and Resettlement, Ministry of Nation Building & Estate Infrastructure Development and Ministry of Education. In addition, the team discussed the proposed GFDRR grant funding proposal with bilateral agencies and other relevant stakeholders including the UNDP, UN OCHA, WHO, GTZ and JICA.

The matrix of priority areas and actions for DRM and estimated budget allocations were discussed and cleared at a debriefing meeting held on May 6, 2009 with participation of stakeholders from Government, donors, and NGOs. There is strong support and ownership and endorsement by the MoDMHR for the matrix of priority areas and actions.

1. DISASTER RISK PROFILE

Sri Lanka is an island country located in the Indian Ocean in the equatorial zone. The principle topographic feature is an anchor-shaped mountain massif in the south-central part of the island, thus creating three zones, the central highlands, the plains and the coastal belt. With a population of more than 19 million people within a total area of 65,000 sq. km., the country has a densely populated coastal belt.

The most frequent natural hazards that affect Sri Lanka are droughts, floods, landslides, cyclones and coastal erosion. Tsunamis are infrequent but the 2004 Asian Tsunami caused severe damage.



Over the past 30 years floods have affected more than 10 million people while droughts have affected more than 6 million. During the last two decades, the severity of landslides has increased in the highland regions through a combination of heavy rains, geological changes in the hill country and human activity including indiscriminate clearance of steep slopes.

1 EM-DAT: OFDA/CRED International Disaster Database, catholic university of Louvain, Brussels, Belgium, www.emdat.net

2 Historical Disaster Information System in Sri Lanka, Desinventar Disaster Inventory database, 2007

3 World Bank, Natural Disaster Risks in Sri Lanka: Mapping Hazards and Risk Hotspots, DRM Series No. 6, 2006

Cyclones affect the northern region of the country and though historically, their severity has been comparatively mild, increasing climatic changes could result in increased frequency and magnitude of cyclones and all other climate-related disasters. The 2004 tsunami claimed more than 39,000 lives in Sri Lanka. Historically, though the risk of earthquakes has been relatively mild, recent understanding of the tectonics of the Indian Ocean region points to an increasing risk of earthquakes.³

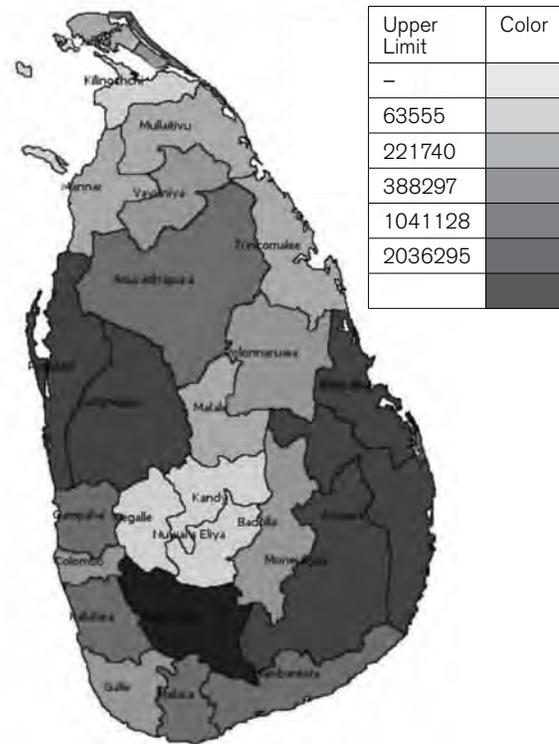
Exposure and Vulnerability

The south-west monsoons (May to September) cause severe flooding in the western and south-western provinces while the north-east monsoon (December – February) causes flooding in the eastern, northern and north-central provinces.

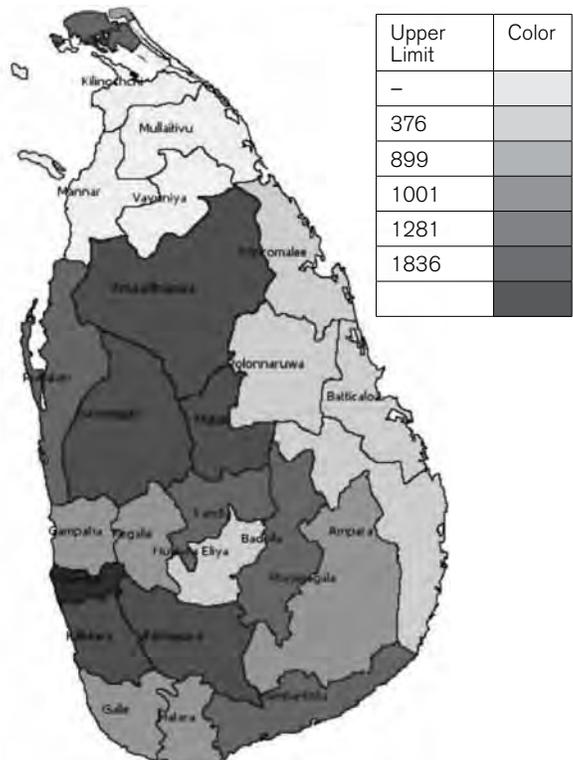
Though Sri Lanka receives an average of 1,800 mm of rainfall annually, it is distributed unevenly both spatially and temporally. Therefore, a large part of the island is drought prone from February to April and, if the subsidiary rainy season from May to June is deficient, drought may continue into September.

Landslides, in Sri Lanka, are caused by a combination of natural and human-induced triggers. The districts of Badulla, Nuwara Eliya, Ratnapura, Kegalle, Kalutara, Kandy and Matale are the most prone to landslides. The eastern and north-eastern parts of Sri Lanka are highly vulnerable to cyclones especially in the months of November and December. The effects of coastal erosion are largely felt in the west, south-west and southern coastal belt. About 50% of Sri Lanka’s population lives in villages and towns in the coastal areas. Coastal erosion severely affects infrastructure facilities and economic activities along the coast⁴.

No. of People affected by District (1974 – 2007)



Frequency of Disaster Events (all) by District (1974 – 2007)



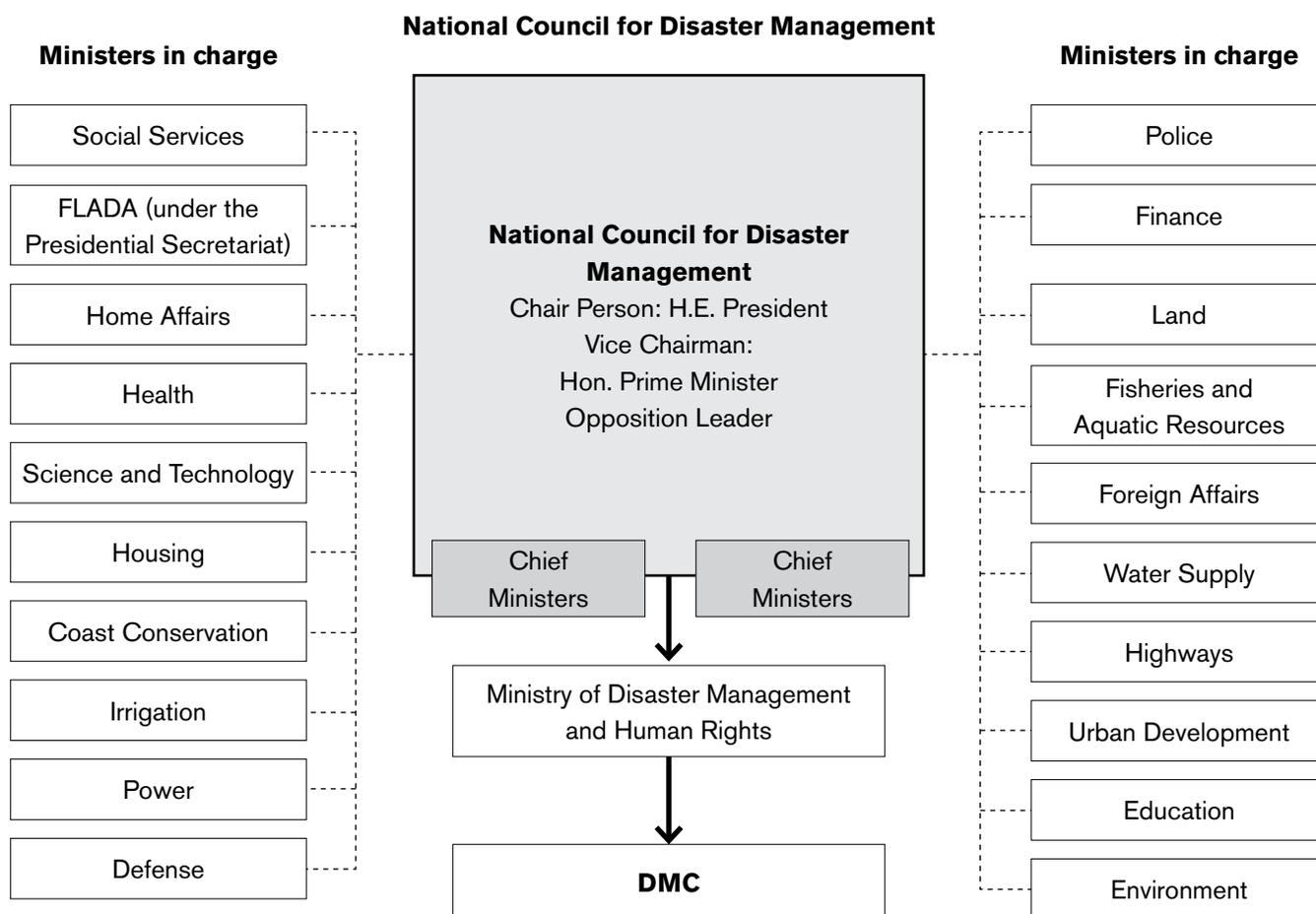
4 Towards a Safer Sri Lanka: Road Map for Disaster Risk Management, Ministry of Disaster Management, 2005

Colombo, Kalutara and Gampaha are the most populated districts in Sri Lanka. Unplanned patterns of human settlement, development and land use have resulted in severe encroachments into flood plains and unstable slopes, further exacerbating the risks of disasters. A poverty level of 23% and a substantial number conflict related internally displaced people (IDPs) add to peoples' vulnerability to disasters.

2. DISASTER RISK MANAGEMENT FRAMEWORK

In the immediate aftermath of the Tsunami, a Select Committee established by the Sri Lankan Parliament investigated the country's preparedness to meet emergencies and to recommend steps to be taken to minimize the damage caused by similar natural disasters. Based on the Select Committee's Recommendations⁵, the Sri Lanka Disaster Management (DM) Act, No. 13 of 2005 was enacted in May 2005. The National Council for Disaster Management (NCDM) was established as the national body for disaster risk management coordination and monitoring in Sri Lanka as per the DM Act. The Ministry of Disaster Management & Human Rights as the leading Ministry and the Disaster Management Center (DMC) as the executing agency for disaster risk management (DRM) were established in implementing the directives of NCDM.

One of the important outcomes of this institutional development process is that the DMC became the national level nodal agency to formulate national and local level disaster risk management programs and to align them with sector development programs. DMC is primarily responsible for managing the risk management process: disaster risk mitigation



5 Sri Lanka Parliament Select Committee Report on Natural Disasters, August 2005

policies and plans – damage assessments – rescue and relief operations – rehabilitation and reconstruction as part of the recovery programs in coordination with other line departments. The DMC is also the nodal agency to coordinate disaster management initiatives with Non Government Organizations for achieving timely, effective and efficient management of the resources during the emergency and reconstruction operations.

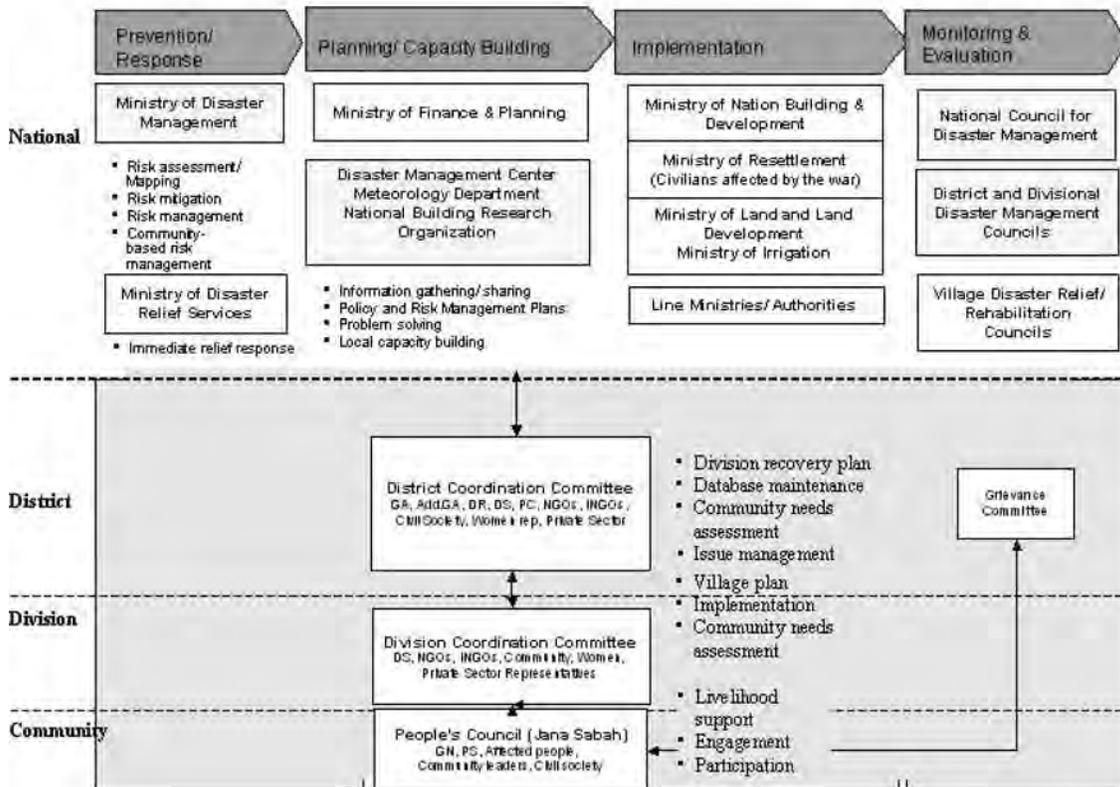
The Sri Lanka DRM framework is based on two critical aspects of managing risk reduction and mitigation and streamlining the roles and responsibilities of DMC.

Risk Management: This component entails the following priority activities:

- Preparedness, Planning Emergency Response and Recovery, which would entail activities such as: Formulation of DRM Strategies, identification of various risks and formulation of mitigation interventions; and
- Risk Evaluation: This requires the improvement of broad stakeholder capacity to receive timely early warning messages, act proactively and respond effectively when warnings are provided. Risk communication is an important component of the risk evaluation and mitigation process.

Early Warning Systems: One of the main responsibilities of the DMC is to capture risk and hazard early warning information, evaluate the intensity of the risks and communicate them to the various stakeholders through effective communication and early warning mechanisms. A mechanism for monitoring and evaluation, which includes agreement on specific, risk reduction indicators and means of gathering information, delivering the early warnings and guide evacuation of people from the risk prone is being streamlined.

Disaster Risk Management Mechanism



3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority # 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

The Sri Lanka Disaster Management (DM) Act, No. 13 of 2005 was enacted in May 2005. The National Council for Disaster Management (NCDM) was established as the national body for disaster risk management coordination and monitoring in Sri Lanka as per the DM Act. The Ministry of Disaster Management & Human Rights as the leading Ministry and the Disaster Management Center (DMC) as the executing agency for disaster risk management (DRM) were established in implementing the directives of NCDM. In December 2005, the Disaster Management Center developed "Towards a Safer Sri Lanka: A Road Map for Disaster Risk Management."

However, coordination with the various line departments engaged in the disaster management activities as part of their responsibilities such as the Ministry of Irrigation and Water Management and Ministry of Agricultural Development for Flood Risk Management; Ministry of Urban Development and Ministry of Land Development, Ministry of Housing, and Ministry of Environment and Natural Resources for Landslide Management; Ministry of Fisheries and Aquatic Resources and Ministry of Housing for mitigating Cyclone / Sea Surge Risk Management, and Ministry of Plan Implementation for designing and implementing integrated disaster mitigation plans, etc is weak.

Inadequate institutional capacity of the Ministries and District administrations to manage the resources mobilized for disaster response and recovery programs after a national disaster has been observed after the 2005 tsunami.

The establishment of a Sri Lanka Disaster Management Fund was called for in the Sri Lanka Disaster Management Act (no. 13 of 2005). The Act stated that the Fund shall be constituted with the moneys received from the Consolidated Fund of the GoSL and all such sums of money as may be received by the Council by way of loans, donations, gifts or grants from any lawful source, whatsoever, whether in or outside Sri Lanka (DM Act, clause 17). However, at present a Fund has not been established. The World Bank, through funding from the Global facility for Disaster Reduction and Recovery (GFDRR) has been initiating the process for developing a Disaster management Fund framework.

HFA Priority # 2: Identify, assess, and monitor disaster risks – and enhance early warning

The National Building Research Organization (NBRO) has developed national level hazard maps for landslides. Also, local level hazard maps have been prepared by communities affected by the tsunami. However, national level maps for any of the other hazards have not been created.

The DMC has developed a database on disasters in Sri Lanka from 1974 until 2007 with the support of the UNDP. This database is based on Desinventar. A Sri Lanka Disaster Resource Network Database (SLDRN) is being developed and will be updated by district level organizations. Any organization within the network will be able to access the website.

A nationally based early warning system for floods, tsunami, cyclone, landslides and sea surges is being developed. Focal points for formulation of warning messages have been identified. The DMC will be responsible for dissemination of early warning messages up to the last mile. Community level early warning systems have been made operational in select sites on a pilot basis.

Sri Lanka does not have financial capacity to acquire and maintain equipment for data collection and technical expertise for analysis and forecasting of natural hazards. Regional sharing of information is also weak.

HFA Priority # 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels

Training programs have been conducted for district and divisional officers for analysis / assessments of disaster risks in their respective districts/divisions and developing projects for disaster risk reduction.

The Ministry of Education and Ministry of Disaster management & Human Rights with support from German Development Cooperation have developed “Towards a Disaster Safe School: National Guidelines for School Disaster Safety” in 2008.

District level school DRM awareness and training programmes with special focus towards tsunami were conducted along coastal belts and mock drills were practiced in all schools identified as being vulnerable to a tsunami hazard. However, there is severe shortage on trained personnel at the government level and lack of coordination towards development of training modules amongst different line ministries.

HFA Priority # 4: Reduction of the underlying risk factors

There exists a need for development of institutional resources and technical expertise for better risk assessment, forecasting and management. The Department of Meteorology has been developing its short-to-medium range forecast capabilities but requires additional technical capacity and investments for implementing a medium term forecast strategy. Similarly, the National Building Research Organization requires additional technical and financial assistance to improve the landslide predictability and for scaling up the preparation of the risk hazard maps on 1:10,000 scale.

Land use policies are being developed in consultation with stakeholders. Currently land use plans are almost non-existent and available in only a few areas. The impact of poor land use and lack of enforcement has led to serious increase in the number of landslides in the central highlands region.

Buffer zones have been declared in coastal areas to prohibit unauthorized constructions. Establishment of natural dense vegetation along coastal belts has been completed in several districts to prevent against high winds and wave surges.

Progress is being made in identifying and supporting vulnerable and low income populations through “Samurdhi” and “Gamidiriya” micro financing and social protection programmes.

Insurance schemes for protecting against disaster losses are not popular in Sri Lanka due to high premiums. A pilot project is being implemented involving CBOs as insurance agents and some finance agencies acting as re-insurers.

HFA Priority # 5: Strengthen disaster preparedness for effective response at all levels

The government has identified disaster preparedness as a priority in the Disaster Management Policy. However, there is a need for capacity strengthening towards disaster risk reduction, preparedness and an overall “proactive” approach for disaster management.

Certain communities, especially those affected by the tsunami, have developed risk maps, developed village level volunteer teams who have been given adequate trainings, and have their own community level early warning dissemination systems. However, these need to be expanded to other areas of the country as well as for multiple-hazard risks.

The DMC has established a 24x7 Emergency operations Center to coordinate emergency response and early warning

dissemination activities. Warehouses for providing emergency supplies are ill-equipped and do not have basic emergency and relief supplies. Only one warehouse maintained at the national level.

An intra-government network has been established with assistance from JICA to connect Irrigation department, NBRO, the Meteorological department, DMC, Police communications, Media networks and 7 district offices most vulnerable to disasters. The plan is for this network to facilitate sharing of GIS maps and other data to better coordinate response and relief operations.

4. KEY DONOR ENGAGEMENTS

Some of the ongoing DRM initiatives are supported by multilateral assistance. These initiatives are listed below:

JICA: From 2006 onwards, JICA has been actively involved in the design and implementation of DRM programs in the country. JICA program covers: Technical Assistance for the DMC primarily for preparing disaster management plan (Flood Management Master Plan) and operational mitigation strategies and Designing and Piloting Early Warning Systems (Weather Stations) in the Country. The technical supports also included capacity building of government officials through in-house and foreign training and development of community based disaster response plans. The design and implementation of early warning and evacuation systems and streamlining these systems through pilot programs are some of the successful projects implemented by the government through the JICA technical assistance. The JICA program ended on 31st March 2009, and it is designing the second phase of the DRM program, which would be primarily driven by the governments proactive approach and identified needs.

UNDP: In relation to disaster risk management, UNDP Sri Lanka is actively assisting in the development of a legal and institutional framework on disaster risk management; promotion of efforts to decentralize DRM; streamlining of various local DRM efforts under a common platform; strengthening end-to-end early warning systems and incorporating DRM into national development planning.

UN OCHA is also currently assisting the DMC in the areas disaster database and Geographical Information System and hazard mapping. As part of this initiative, OCHA has supported DMC to procure baseline satellite imageries (UNOSAT) and digital evaluation models useful for disaster risk mapping and disaster management planning. Two UN OCHA staff members positioned at DMC are currently providing technical support in the development of disaster management database and risk and hazard mapping.

International Center for Emergency Techniques (ICET): An agreement signed by the Ministry of Disaster Management and ICET to establish emergency communication system at the DMC to facilitate uninterrupted communication to the stakeholders at District and Divisional levels as to respond to emergencies is an important step forward. The system consists of VHF Radio Communication and HF and Satellite Communication. Besides, construction of nearly 50 Multi Hazard Early Warning Towers will be done in vulnerable locations for effective early warning and evacuation communications.

Disaster Emergency Warning Network: The early warning communication system has been further enhanced with the initiation of the Disaster Emergency Warning Network (DEWN) in collaboration with the Sri Lanka Dialog Telekom. An agreement to provide private virtual networking facility to the DMC to communicate with Disaster Risk Management Units at the District and Divisional levels and with other stakeholders responsible for rescue and relief operations has enhanced the early warning capability of the DMC significantly.

Sri Lanka Red Cross Society: The Sri Lanka Red Cross Society with support from the IFRC and other national Red

Cross Societies (American, Danish) has been actively engaged in community based disaster risk management since 2006.

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Ongoing GFDRR Funded Activities

Ongoing GFDRR funded activities	Partnerships	Budget	HFA priority area(s)
Improving Sri Lanka's response and recovery in the aftermath of natural disaster including supporting the preparatory steps for implementation of the Disaster Management Fund	Ministry of DM & HR, UNDP	\$ 200,000	HFA Priority 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

Indicative New Program Areas and Projects for GFDRR Funding

INSTITUTIONAL STRENGTHENING AND BUILDING TECHNICAL EXPERTISE

The Ministry of Disaster Management and Human Rights (MDM&HR) is comprised of its operating agencies the DMC, Meteorology Department and the National Building Research Organization (NBRO). The institutional mechanism and technical capacity of these three departments to implement disaster risk mitigation plans and to guide the emergency assistances/resources mobilized after national disasters are weak and require strengthening. There is requirement for both in-house training and training in foreign institutions in specialized technical fields and better DRM skills.

FLOOD MANAGEMENT PROJECT - GAMPAHA DISTRICT

The Road Map for Safer Sri Lanka and the comprehensive disaster management plan and flood management master plan prepared with the technical assistance from JICA has identified flood risks across the country. Gampaha district suffers floods almost every monsoon season. Floods impact majority of the 2.1 million people living in the district (in 2006, 12 of the 13 divisions in the district were impacted by floods). Gampaha is also an industrial and manufacturing hub and floods cause huge economic losses for the district and the country overall.

Based on analysis of the flood management master plan produced by JICA for the Gampaha district, the project proposes working with vulnerable communities living along the canals in Gampaha towards risk preparedness, canal management and waste disposal programs and flood early warning dissemination.. The project also proposes strengthening livelihoods through piloting flood resistant paddy cultivation in Gampaha. A risk financing pilot will be initiated for farmers as well as the private industry vulnerable to flood impacts.

The DMC will spearhead the Flood management project in collaboration with the Irrigation department, the Agrarian services department, JICA, relevant district and division local government bodies and other relevant stakeholders.

LANDSLIDE MANAGEMENT PROJECT: NUWARA ELIYA DISTRICT

According to the landslide risk assessments done by the NBRO, nearly 20,000 km² in ten major districts have been identified as landslide prone. However, three districts; Nuwara Eliya, Badulla and Ratnapura are the highly landslide prone areas. Major landslides occurred during the past two decades have taken thousands of lives, made nearly 175,000 families homeless and incurred heavy economic loss.

The project will strengthen overall capacity of the NBRO in mitigating landslide risks through risk mapping, development

of landslide mitigation and reduction plans, formulation of land use guidelines and land development regulations, establishment of appropriate land development regulatory systems in landslide prone areas, and establishment of monitoring mechanisms and early warning systems. The NBRO will also undertake a community awareness and landslide safe construction campaign across the different landslide prone districts. These activities will be piloted in Nuwara Eliya district in collaboration with relevant line ministries, local government bodies, other relevant stakeholders and vulnerable communities.

ENHANCING WEATHER FORECAST FOR DISASTER PREPAREDNESS

Presently, the Sri Lanka meteorological department has limited capabilities in making weather forecasts beyond 24 hours with acceptable accuracy. New Numerical Weather prediction (NWP) systems with higher resolution model outputs in global scale can be down-scaled to regional and even tailored to local conditions for better probabilistic or quantitative forecasting. The meteorological department needs to build capacity on NWP techniques for more reliable 1-5 day weather forecasts. Need has also been identified for a High Resolution Picture Transmission (HRTP Cloud imagery) receiver for detection of meso-scale features such as intense rains and potential fishing information for fishermen etc. The Meteorological department in collaboration with the DMC will also undertake a lightening safety national campaign to reduce deaths and damage from lightening strikes.

PROGRAM MANAGEMENT AND OPERATIONALIZING THE DISASTER MANAGEMENT FUND

The DM Act mandates the Ministry of Disaster Management and Human Rights to establish a disaster management fund as part of emergency response and recovery strategy. Presently, a GFDRR funded initiative is focusing on developing the institutional structure and operational framework of the Disaster Management Fund. As part of this initiative, the World Bank has agreed to a request from the Ministry of Disaster Management to engage a technical consultant to undertake this study.

The Fund is envisioned to allow for a comprehensive strategy towards both *ex ante* and *ex post* disaster and social risk management (DSRM) activities as they pertain to natural disasters in terms of both high impact but infrequent “geophysical” disasters such as tsunami-type events, as well as low impact but frequent “hydrometeorological” hazards such as droughts and rainfall related floods. This would entail having the following five funding windows that would address the following activities:

Ex ante Disaster Risk Mitigation

- (i) Mitigation and preparedness
- (ii) Risk transfer arrangements
- (iii) Capacity Development and Technical Assistance

Ex-Post Disaster Recovery

- (iv) Relief /early recovery and safety nets
- (v) Emergency response and reconstruction

The following are some options to consider as to who would be able to access and use resources from the Fund:

- Government agencies could be the principal users of the Fund to support risk reduction activities of the Ministry of Disaster Management and Human Rights, relief and resettlement operations of the Ministry of Disaster Relief Services and Resettlement, social protection programs of the Ministry of Nation Building such as Samurdhi and Gama Neguma, social care services of the Ministry of Social Services and Social Welfare, and reconstruction investments by various line ministries.
- Non-governmental actors could also receive support from the Fund. These would include local and international

NGOs (with support from the NGO Secretariat and the Consortium for Humanitarian Assistance), international organizations such as UN agencies and the Red Cross, and the private sector for interventions such as risk insurance and micro-finance.

- Partnerships of Government agencies and non-governmental entities could be financed by the Fund to jointly develop and implement disaster management activities.

Fund Financing and Governance

The size of the Fund could initially be supply driven based on government commitment and the extent of interest from donors. Based on the performance of the Fund it could then be leveraged to become a demand driven financing mechanism which is able to meet identified gaps in overall disaster and social risk management activities. Some of the potential sources of financing for the Fund include:

- Sole or partial financing from domestic revenues such as the Government's voted budget, special levies, a portion of lottery earnings, private and charitable contributions, and so forth.
- Additional external grants from development partners, including bi- and multilateral donors, international NGOs, foreign foundations, United Nations' initiatives such as flash appeals, international organizations such as the Red Cross, and multinational companies.
- Standby financing from concessional loans such as the World Bank's Catastrophic Deferred Drawdown Option (CAT DDO) for which the Fund could pre-qualify.

SCHOOL EMERGENCY PLANNING AND SAFETY INITIATIVE

The Ministry of Education (MoE) has identified the need for upscaling the work done on the "National Guidelines for School Disaster Safety", which were developed by the MoE with support from GTZ and ADPC.

Indicative Program and Budget for GFDRR Funding

Indicative new program areas and projects for GFDRR funding	Partnerships	Indicative Budget for GFDRR funding	HFA priority area(s)
Institutional Strengthening and Building Technical Expertise <ul style="list-style-type: none"> - DRM skill training for DMC staff - Damage & needs assessment methodology training - Specific training for NBRO staff regarding landslide risk assessment & landslide early warning systems - Specialized training for Meteorology department scientists (to PAGASA in Philippines) - Relevant exposure visits and trainings for MDM&HR officials and technical staff 	DMC, Met Dept., NBRO, UNDP, PAGASA Philippines, relevant international DRM training organizations	\$ 750,000 (3 years)	HFA Priority 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation HFA Priority 3: Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels
Flood Management Project - Gampaha District <ul style="list-style-type: none"> - Community preparedness and flood early warning dissemination Strengthening livelihoods through flood resistant paddy cultivation - Risk financing pilot initiative 	DMC, Relevant line ministries, JICA	\$ 1,200,000 (3 years)	HFA Priority 2: Identify, assess, monitor disaster risks, enhance early warning HFA Priority 4: Reduction of the underlying risks HFA Priority 5: Strengthen disaster preparedness for effective response
Landslide Management Project: Nuwara Eliya District <ul style="list-style-type: none"> - Risk Mapping, land use and development regulatory systems, landslide early warning system - Pilot landslide mitigation in Nuwara Eliya district - Public awareness and landslide safe construction campaign 	NBRO, DMC, relevant line ministries, UNDP	\$ 2,500,000 (3 years)	HFA Priority 2, and 4:
Enhancing Weather Forecast for Disaster Preparedness <ul style="list-style-type: none"> - development of NWP system for reliable 1-5 day weather forecasts - procurement of HRPT (cloud imagery) equipment - national lightning safety campaign 	Meteorological Dept., DMC, WMO, relevant international climate institution,	\$ 1,250,000 (3 years)	HFA Priority 2 and 5
Program Management & Disaster Management Fund <ul style="list-style-type: none"> - Operationalizing the Disaster Management Fund through providing seed money 	MDM&HR, relevant ministries, UNDP, Donors & Bilaterals	\$ 5,000,000 (3 year)	HFA Priority 1 and 5:
School Emergency Planning and Safety Initiative <ul style="list-style-type: none"> - Taking forward the national guidelines on school safety through specific pilot initiatives 	Ministry of Education, GTZ, ADPC	\$ 250,000 (3 years)	HFA Priority 3
TOTAL		\$ 11,950,000	



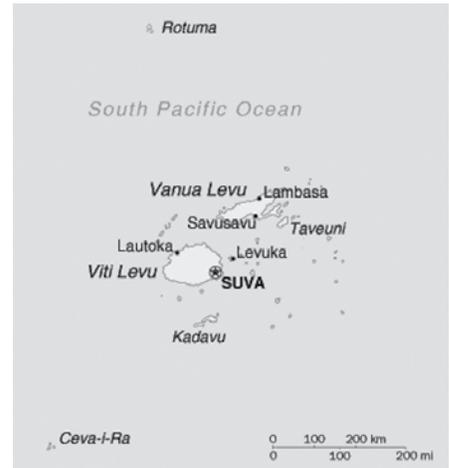
DISASTER RISK MANAGEMENT

East Asia and Pacific

Fiji

FIJI

To prepare this Country DRM Note, consultations were undertaken with members of the World Bank Country Team, the National Disaster Management Council, the National Disaster Management Office, the Ministry of Public Utilities, Works and Transport, the Ministry of Lands, Mineral Resources and Environment, the Fiji Meteorological Services, the Land and Water Resources Management Division (Ministry of Agriculture), the Pacific Islands Applied Geoscience Commission (SOPAC), ADB, UNDP, AUSAID, NZAID and other key donors and international organizations involved in DRM.

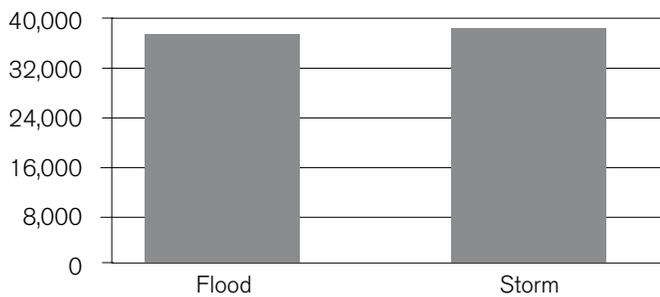


1. DISASTER RISK PROFILE

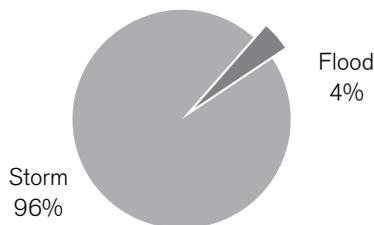
The Republic of Fiji is exposed to a wide range of geological, climatological and hydrological hazards. It has the 24th highest exposure to two or more hazards, according to the *Natural Disaster Hotspot* study by the World Bank. This study notes that 23.2 percent of Fiji’s total area is exposed to two or more adverse natural events and 29 percent of Fiji’s 944,720 inhabitants live in areas exposed to high risk from multiple hazards.

The country covers a total area of some 194,000 sq km of which around 10 percent is land. Of the 320 islands and 522 islets, only 105 are inhabited. The inhabited islands are mostly volcanic in origin, including the largest - Viti Levu (10,390 sq km) and Vanua Levu (5,538 sq km). Together these islands make up about 87 percent of the nation’s landmass.

Economic Damages by Disaster Type (1000s US\$)



% Population Affected by Disaster Type



COUNTRIES AT RELATIVELY HIGH MORTALITY RISK FROM MULTIPLE HAZARDS (Top 96 based on population with 2 or more hazards)	
1.	Bangladesh
2.	Nepal
4.	Burundi
5.	Haiti
7.	Malawi
10.	Guatemala
20.	Niger
30.	Burkina Faso
35.	Jamaica
40.	Barbados
55.	Grenada
50.	Afghanistan
53.	FIJI
55.	Mexico
60.	Benin

Source: EM-DAT: The OFDA/CRED International Disaster Database.

KEY NATURAL HAZARDS

Key Natural Hazard	Key Man-made or Human-induced Hazard
Flooding and droughts	Fire (dwellings and wildfires in forests)
Tropical cyclones and non-TC-related high winds	Oil and chemical spills
Storm surge, swells and waves and coastal inundation	Contamination of water supplies
Landslides	Disease outbreaks
Earthquakes	Slope instability due to over-clearing
Seabed volcanism	Contaminated storm run-off
Tsunami	Coastal siltation

The core natural hazards are weather and climate-related. They are caused by tropical storms and cyclones that produce storm surge, flooding and heavy seas. Drought, which affects coastal and upland areas, is another outcome of a climatic condition. The threats can become significantly higher due to a longer-term climate change.

Other priority hazard includes: landslides on unstable slopes as a product of geological and soil conditions and excessive clearing of vegetation. Additionally, storm surge, and rising sea level contribute to coastal erosion. Since 1978 several droughts have also had a major impact on the economic productivity and subsistence livelihoods across the country.

Fiji's location on the Pacific "ring of fire" puts it at risk from geological hazard, in particular earthquakes and locally-generated tsunamis. The last major destructive earthquake and tsunami was registered in 1953. The threat from volcanic eruptions is rather low and their effects are primarily limited to the impact of large pumice rafts on the maritime sector from submarine eruptions to the east of Fiji.

Capital	Suva
Official Language	English, Bau Fijian, Hindustani
Independence	10 October 1970 (from the United Kingdom)
Area	Total 18,274 km ² (155th) 7,056 sq mi water (%) negligible
	Arable land: 11.11% Permanent crops: 44.44% Other: 44.45% (2005)
Government	Republic
Population	944,720 (July 2008 est.)
GDP	Per capita US \$4,185 (2007)
HDI	92nd
Natural Resources	timber, fish, gold, copper, offshore oil potential, hydropower.
Major products	tugar and garment exports, and a growing tourist industry are the major sources of foreign exchange
Terrain	tostly mountains of volcanic origin
Climate	tropical marine; only slight seasonal temperature variation

Source: World Fact Book, World Bank Country Reports.

2. DISASTER RISK MANAGEMENT FRAMEWORK

Disaster risk reduction policies are currently in place but the institutional arrangements for implementation are to date ineffective and they lack national and sector planning and budgetary provisions. To address disaster risk reduction and disaster management, the Government of Fiji adopted its *Strategic Development Plan 2007-2011*, based in large part on the regional *Framework for Action 2005-2015*. In November 2007, the Interim Fiji Government promulgated a new policy strategy paper titled *Sustainable Economic and Empowerment Development Strategy (SEEDS) 2008-2010*. One of the key goals of the SEEDS is to reduce vulnerability to disasters and risks, while promoting sustainable development. An assessment of the practicality of the strategy and DDR efforts can be found in the chapter *Inter-Government and Agency Disaster Coordination*. The strategy currently lacks practical targets and an implementation plan and there are no planned risk reduction activities arising from the strategy.

The Comprehensive Hazards and Risk Management (CHARM) guidelines adopted by the previous government also endorsed the need for disaster risk reduction. Those guidelines led to some activities directed by the Ministry of Regional Development. However, CHARM has not been adopted across all governmental departments, thus limiting the bulk of coordinated efforts.

At the sector level, a national framework for DRR had been proposed through two instruments: an updated draft of the 1995 National Disaster Management Plan (NDMP) and a draft re-write of the National Disaster Management Act 1998. Both instruments focus mainly on disaster prevention and mitigation and their effectiveness could be insured through institutional and political commitment that is now lacking. Implementation of the NDMP awaits the development of a National Action Plan (NAP) which depends on governmental priorities and donor funding.

3. ACTIVITIES UNDER THE HYOGO FRAMEWORK OF ACTION

HFA Priority #1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

THE NATIONAL DRM AGENCY

At present, the overall coordination of the National Disaster Management Plan (NDMP) and the Natural Disaster Management Act is a responsibility of the National Disaster Management Council (NDMC). This body is currently chaired by the Minister of Defense as the minister in charge of disaster management and the National Disaster Management Office (NDMO). The NDMO services the NDMC and was recently transferred from the Ministry of Provincial Development and Multi-Ethnic Affairs to the Ministry of Defense, National Security and Immigration and Disaster Management. The *National Disaster Management Council (NDMC)* has three committees: the *Emergency Committee* has central control during emergency operations; the *Preparedness Committee* is responsible for community awareness activities; and the *Mitigation and Prevention Committee* initiates and coordinates the implementation of disaster mitigation activities.

Measures have been underway to review the NDMP and the Natural Disaster Management Act in order to address some of the critical gaps. The NDMO has the role to promote disaster risk reduction through all government sectors and – as a sign of increased commitment - the office is currently strengthening its staff to assist with this.

The Natural Disaster Management Act of 1998 provides authority and institutional arrangements for all actions related to disaster management, and defines the functions and duties of government and relevant

agencies. It also stipulates the establishment of the National Disaster Management Council (NDMC). While adequate legislative steps have been taken (i.e., the current redrafting of the Natural Disaster Management Act), they are not always followed by appropriate action. An improved institutional and political commitment is needed.

DISASTER RISK MANAGEMENT IN THE COUNTRY PARTNERSHIP STRATEGY

“Mainstreaming risk management into national economic planning” is a goal of the World Bank for all projects with the Pacific Island Nations, according to the its Regional Strategy for the Pacific, 2006-2009.

INTERMINISTERIAL INVOLVEMENT IN DRM

There is a need to increase coordination amongst the ministries and some of the key line agencies on disaster risk reduction. Specifically, the limited participation of the Ministry of Financing and Planning in disaster risk reduction was highlighted in a 2009 World Bank report.

CLIMATE CHANGE AND DISASTER RISK MANAGEMENT

While the 2005 Environment Management Act (EMA) had the potential to become the vehicle for promoting the climate change adaptation effort, this statutory underpinning was not stated explicitly in the Act. In December 2007, the Government of Fiji adopted its *Climate Change Policy Paper*. This document commits the government to addressing governance issues, integrating policies, data collection and capacity building. Since the paper neither lists targets nor provides budget or action plans, no progress in its adaptation has been achieved. Fiji issued a *First National Communication on Climate Change Strategic Actions* in 2005, pursuant to commitments under the United Nations Framework Convention on Climate Change (UNFCCC).

HFA Priority #2: Identify, assess and monitor disaster risks and enhance early warning

NATIONAL, REGIONAL AND LOCAL SECTORAL RISK ASSESSMENTS

There is an absence of accessible risk profiles in Fiji. Over the past 20 years, the quantity of assets at risk has increased significantly, particularly with the proliferation of tourism development facilities and infrastructure along the coast of the main island and on an increasing number of smaller offshore islands. In this context tourism, which is an important sector of Fiji’s economy, is vulnerable in two ways: firstly, in the short term, to the possible impact of category 3, 4 or 5 cyclonic events, storm surge and waves, and tsunamis; and secondly, to climate change and consequent sea-level rise and other impacts in the medium to long term.

Disaster risk often appears to be based on post-event perceptions and usually is non-quantifiable. Moreover, the descriptions of threats are often anecdotal. Characteristically, analytical work for risk assessment, hazard mapping, etc. is also difficult in the absence of a comprehensive database containing raw geophysical, climatological and hydrological data, hazard maps and synthesized biophysical information.

Where datasets have been collated, the quality is often questionable due to incomplete or missing data. Furthermore, data are not shared between specific data gatherers in the various governmental sectors, for example, between the Mineral Resources Department (MRD) and the Environment Department, which are responsible for impact assessments.

A strong body of hazard knowledge, nevertheless, is available within each of the hazard agencies. For example, the Fiji Meteorological Service (FMS) has reasonably good historical climate and Tropical Cyclone records. The current set of hazard monitoring, data collection and analysis tools is acknowledged by the Government of Fiji as being deficient and in need of strengthening. Much of available information is not readily accessible or transferable to other agencies.

EARLY WARNING SYSTEMS AND FORECASTING

The hydrological monitoring network has become non-operable over the past decade. The Hydrology Section of the Public Works Department notes that its operational budget has been slashed to a critical level in recent years with a serious shortage of skilled personnel. The lack of technical capability means maintaining a credible gauging and monitoring program proves impossible. A 2007 EU-funded Navua catchment flood monitoring and warning project is still not operating satisfactorily because of communication problems and the fact that the gauging stations cannot be maintained. A similar prognosis exists for the 2008 HYCOS funded Rewa catchment flood monitoring and early warning system.

The Fiji Meteorological Service (FMS) has a well established national and regional cyclone warning system. However, it also suffers from the resource problems common to Pacific Island countries: That is, lack of funding and limited professional and technical capacity. The FMS is a critical regional asset and should be supported by guaranteed long-term international technical support, appropriate capacity building programs, and adequate funding and staff.

Planning is underway in Fiji and throughout the region on an all hazards early warning system. The NDMO plans to promote this initiative at the village level. As such, the early warning could herald the revival of traditional early warning and disaster preparedness customs and practices.

The meteorological network is better served and is regarded as providing a regional service with support from WMO and with links to the Bureau of Meteorology (BOM) in Australia and the New Zealand Meteorological Service. However, the FMS suffers from capacity and sustainability issues. In addition, its monitoring network and the analysis tools need to be enhanced to identify and quantify the increasing climate variability potentially associated with climate change. As of April 2009, 70 percent of FMS's weather observation and reporting network for outer islands was not operating satisfactorily with more than half the stations down fully. Some of these stations form part of the Global Climate Observation System (GCOS), which has also been affected as a result. The only upper air reporting station in Fiji that forms part of Global Upper Air Network (GUAN) was also facing problems.

The current seismological monitoring network is degraded and does not have 24 hour per day capability. The Japanese International Cooperation Agency (JICA) has identified a program to upgrade the network and monitoring capability.

Hazard monitoring and prediction is done through a combination of national and international initiatives. For example, cyclones and other meteorological hazards are handled by the Fiji Meteorological Service, which operates the Regional Specialized Meteorological Centre for Tropical Cyclones under WMO. Tsunami warnings issued by the Hawaii-based Pacific Tsunami Warning Centre (PTWC) are used for generating local warnings which is still under development. The Mineral Resources Department requires capacity development in this area. Flood forecasting and warning capability also needs to be developed together with other hydrology and hydro-meteorological services.

Overall, the monitoring level of climatological, hydrological and geophysical systems in Fiji is very basic. More importantly, systematic monitoring of policy implementation and/or programmed actions within or between governmental agencies is lacking. Thus, it is extremely difficult to ascertain whether DRR- and CCA-related activities and programs are achieving their desired outcomes.

DATA SHARING

Currently, there is very limited ability to store, analyze and map hazard data and to make it available across and between agencies to provide the basis for decision-making on DRR and CCA. The following is a list of

Government of Fiji and other organizations and institutions that provide technical data within their areas of statutory responsibility and operational interest:

- Fiji Meteorological Services (FMS): weather and climate data including rainfall, temperature and tropical cyclones;
- Land and Water Resources Management Division (LWRMD): drainage, irrigation and land use planning;
- Mineral Resources Department (MRD): Hydrogeology, seismology, engineering geology and coastal processes;
- National Disaster Management Office (NDMO): disaster risk management coordination, training, awareness and research;
- Environment Department : EIAs, waste management and pollution control;
- Divisional Engineer (Hydrology Section): hydrological data;
- Fiji Land Information System (FLIS): land and remotely sensed information; and,
- Ministry of Health and Fiji School of Medicine: water and vector-borne diseases.

Fiji has limited meteorological and hydrological datasets, databases, ecosystem monitoring and information system management. Specifically, a unified and consistent data and information system for all government sectors does not exist, and government agencies have no channels by which to exchange information. This must be addressed as a matter of urgency and may need donor support.

Moreover, asset data and information is not made available for the purposes of assessing exposure to risks. These data are required to ensure effective management and planning. Currently, activities are largely ad hoc as data collection and information for risk reduction management is neither required nor part of the governmental strategy. DRR programs have no rigorously documented socio-economic base to build on for risk assessment and reduction.

COMMUNICATIONS

HFA Priority #3: Use of knowledge, innovation and education to build a culture of safety and resilience at all levels

EDUCATION AND TRAINING

Ongoing disaster risk management awareness programs, coordinated by the NDMO, focus primarily on disaster management with some elements of family risk reduction. These programs, as recognized by the NDMO, need to be strengthened to include community exercises. Awareness activities are usually conducted at the national level with little filtering down to the provincial and community levels, in part due to the lack of effective support for the NDMO across the government. Lack of funding also prohibits NDMO and other specialized agencies like FMS and MRD to take training down to community level.

AWARENESS RAISING

The main awareness raising effort in Fiji is the NDMO-led annual National Disaster Awareness Week held in October, at the beginning of the hurricane season. During 2007 this event encompassed a range of activities in nineteen different centers throughout three of the four national administrative divisions. The budget for the event is rather small: in 2007 the NDMO's government budgetary allocation for its awareness activities was less than 2 percent of its annual budget. Similar problems were faced in 2008.

A number of governmental bodies, non-government organizations and representatives of the tourism sector see hazards as major socio-economic concerns. These are often expressed in terms of identifiable threats such as sea-level rise, coastal erosion and deposition, food and water security (especially in terms of availability and quality), pollution of the marine environment and the degradation of terrestrial and marine ecosystems.

The media in Fiji provides substantial coverage of disaster-related news. Awareness of the potentially catastrophic situation of the Fiji water sector needs to be heightened at all levels of government and across communities, and better still converted into action. The continued use of the media will be an important tool in achieving higher levels of awareness of risks to water security from climatic variability and change.

An effort to mainstream DRR into the education curriculum has started and includes six pilot schools. The Fiji Schools of Medicine and Nursing have also introduced DRM courses to its second-year students. Discussion is underway with the Ministry of Education in incorporating DRM provisions into the school curriculum.

Over the past 12-13 years the Asia Foundation/Office of U.S. Foreign Disaster Assistance has provided a significant amount of training to Fiji nationals. The offered package included six training courses covering disaster management, damage assessment and risk management. Another course on DRR is soon to be developed. The AF/OFDA has run about 20 in-country courses with an average of 24-28 participants and 18 regionally-run courses that attracted participants from Fiji. This would equate to over 500 nationals being exposed to some form of awareness training. Regional organizations and NGOs, such as the Fiji Red Cross and Live & Learn, also participate in awareness programs.

HFA Priority #4: Reduction of the underlying risk factors (reduction of exposure and vulnerability and increase of resilience)

Fiji's Department of Environment under the Ministry of Housing and Urban Environment acts as an advisory body to the government on environmentally-related issues and coordinates with other departments and ministries when environmental impact assessments of development projects are required. However, the absence of explicit environment laws and minimal emphasis placed on environmental protection should be addressed.

LAND USE PLANNING

Building codes are used on a voluntary basis as informal guidelines, because no institution regulates or monitors their implementation. The main risk design standards applied to the roofs of buildings as a prerequisite to securing home insurance coverage are planned to be introduced by a government program to adapt the standards to public buildings, such as schools.

On the other hand, there is no evidence that land use regulations have been updated to incorporate DRR and CCA. Evidence shows that if legal instruments (e.g., land-use regulations, continue to be inadequate or are not being enforced, adverse impacts caused by some coastal development – particularly by the tourism industry – will continue in the future (ADB 2005). Across Fiji the institutional capacity to control the spread of settlement and tourism developments in the sensitive coastal margins is viewed by representatives of the public and private sector interest as being somewhat limited. Physical, social, economic and cultural vulnerability of these settlements is higher when low institutional capacity is coupled with land degradation and changes in rural land-use that can influence food, water security and the quality and productivity of inshore marine waters.

HFA Priority #5: Disaster preparedness, recovery and reconstruction at national, regional, and local levels

RISK FINANCING

A common response of the government to disaster is to freeze capital expenditure. At the present time this freeze extends to the recurrent expenditure of a range of ministries. This action is taken by the government to offset rehabilitation and rebuilding costs. Such a standard practice was assessed by a 2009 World Bank report as ineffective: It prevents the delivery of risk reduction by line agencies.

DAMAGE AND LOSS ASSESSMENTS

The National Disaster Management Office coordinates the national effort in carrying out post-disaster damage assessments. Fiji also has access to the UN Disaster Assessment and Coordination (UNDAC) team. Additionally, in the past Fiji could also call upon New Zealand and Australia for post-disaster airborne surveys.

EMERGENCY MANAGEMENT

Emergency response and relevant infrastructure, early warning mechanisms and community arrangements are limited, with scattered islands particularly vulnerable to cyclones and droughts with subsequent food shortages.

4. KEY DONOR ENGAGEMENTS

Existing Projects with Donors and International Financial Institutions	Funding Agency/ International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s) ¹
<i>Pacific Catastrophe Risk Pool Feasibility Study</i> (The Cook Islands, Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu)	World Bank	2008–present US \$400,000	1,2,5
Sustainable Management Through Reduced Risk from Disasters and Climate (Fiji, Kiribati, Marshall Islands, Papua New Guinea, Solomon Islands, Timor-Leste, and Vanuatu)	World Bank	2008–present US \$1,900,000	2,3,4,5
Navua Local Level Risk Management Pilot Project	UNDP	2007–present –	3
The Pacific Center	UNDP	2006–present –	1,2,3,4,5
<i>Reducing Vulnerabilities of Pacific ACP States</i> (The Cook Islands, Federated States of Micronesia, Fiji, the Marshall Islands, Nauru, Niue, Papua New Guinea, Palau, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu)	The Pacific Islands Applied Geoscience Commission (SOPAC) /EU	2003–present –	1,2
<i>Pacific Islands Disaster Assistance Program (PDAP)</i> (The Cook Islands, Federated States of Micronesia, Fiji, Kiribati, the Marshall Islands, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu)	USAID/OFDA	1995–present US \$4,571,307	5
<i>Pacific Islands Climate Change Assistance Program (PICCAP)</i> (The Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Samoa, Solomon Islands, Tuvalu, and Vanuatu)	SPREP	1997–present –	4

(Cont.)

Existing Projects with Donors and International Financial Institutions	Funding Agency/ International Partners	Allocated Budget and Period (US\$)	HFA Activity Area(s) ¹
<i>Pacific Islands Climate Prediction Project</i> (The Cook Islands, Fiji, Kiribati, Niue, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu and Papua New Guinea)	AUSAID and the Australian Bureau of Meteorology	2004–present AUS \$5.5 million	2
South Pacific Sea Level and Climate Monitoring Project Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu	AUSAID	1991–2010	2,5
Environmental Sustainability Mainstreamed into Regional and National Policies and Planning Frameworks Federated States of Micronesia, Fiji, Kiribati, Nauru, Palau, Marshall Islands, Solomon Islands, Tonga, Tuvalu and Vanuatu	UNDP	2008–2012 US \$16,831,000	

1 HFA Priority Actions Areas: 1/Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2/ Identify, assess, and monitor disaster risks—and enhance early warning; 3/Use knowledge, innovation, and education to build a culture of safety and resilience at all levels; 4/ Reduce the underlying risk factors; 5/ Strengthen disaster preparedness for effective response at all levels.

5. GLOBAL FACILITY FOR DISASTER REDUCTION AND RECOVERY (GFDRR): ACTION PLAN

Indicative Program for GFDRR Funding (Projects and engagement areas being considered for GFDRR funding)	Implementing Agency/ International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
<p>Strengthen Integrated Hazards Information System and Tools (with GIS capability)</p> <p><i>Priority activities</i></p> <ul style="list-style-type: none"> □ TA for an assessment of data needs and products for DRR/CCA □ Identification of long-term storage requirements, analysis tools and mapping needs □ Supporting capacity building through populating the information system with available historical data and undertaking vulnerability mapping and risk modeling and for CC and risk prediction 	To be determined with Ministry of Lands and the NDMO	2009–2011 US \$400,000	2
<p>Strengthen Risk Reduction Policy, Planning and Budgetary Arrangements</p> <p><i>Priority activities</i></p> <ul style="list-style-type: none"> □ TA for a review of the hazard profile of Fiji and the potential effects of climate change in exacerbating climate risks □ Development of a policy framework for a whole of government mechanism for addressing risk as a development issue within sector planning and budgeting. Complete the review of the DMP and the Act and address the integration of DRR and CCA □ Strengthening the Ministry of Finance and National Planning capacity for understanding and bringing a focus to this issue □ Strengthening political and departmental awareness of hazard risk issues and how to reduce them, in order to enhance sustainable development 	Ministry of Finance and National Planning with the Department for Environment and the Ministry for Provincial Development	2009–2011 US \$400,000	1,2,3,4

(Cont.)

Indicative Program for GFDRR Funding <i>(Projects and engagement areas being considered for GFDRR funding)</i>	Implementing Agency/ International Partners	Indicative Budget and Period (US\$)	HFA Activity Area(s)
Strengthen the Hydrological and Meteorological Capability <i>Priority activities</i> <ul style="list-style-type: none"> □ Review the meteorological and hydrological observational networks, data collection, and processing and information dissemination systems □ Identify gaps and establish requirements for effective meteorological and hydrological monitoring, forecasting and end-to-end warning system and service delivery, at the same time addressing hazard management and climate change needs □ Review and develop institutional arrangements to support a credible and sustainable level of service □ Implement institutional and sustainable service arrangements □ Design and implement systems and tools to support regular meteorological and hydrological monitoring, forecasting, end-to-end warning and effective service delivery □ Enhance the climate database and operational systems for effective climate change monitoring, prediction and evaluation □ Identify skills gap and assist with training and capacity building 	Ministry of Transport, Works and Public Utilities (Ministry responsible for Fiji Meteorological Service and Hydrological Section)	2009–2012 US \$2.2 million	2,3,5
Total budget requested:	US \$3 million		

6. BIBLIOGRAPHY

Bettencourt, Sofia, Richard Croad, Paul Freeman, John Hay, Roger Jones, Peter King, Padma Lal, Alan Mearns, Geoff Miller, Idah Pswarayi-Riddihough, Alf Simpson, Nakibae Teuatabo, Ulric Tritz, Maarten Van Aalst 'Not If, But When: Adapting to Natural Hazards in the Pacific Island Region' The World Bank. 2005.

EM-DAT: OFDA/CRED International Disaster Database, Catholic University of Louvain, Brussels, Belgium 2009.

UNDP, 2007, Human Development Reports, Country Sheet.

The World Bank Pacific Regional Strategy 2006–2009.

The World Bank Draft Country Assessment – Fiji 2009.



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