

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

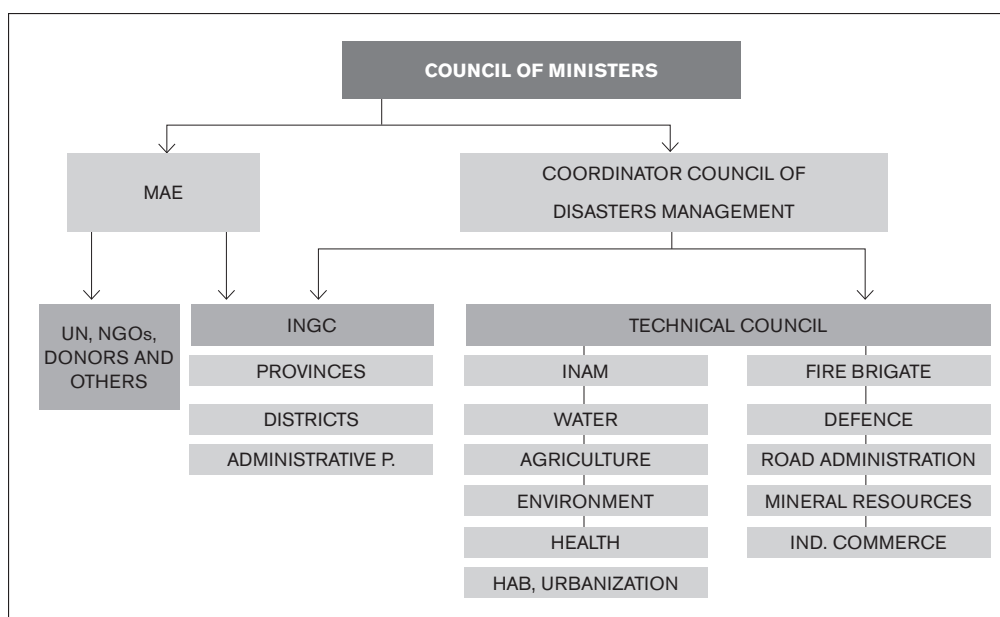
The National Institute of Disaster Management (INGC), established in 1999, coordinates disaster risk management activities in Mozambique. INGC operates under the Ministry of State Administration (MAE) and is mandated to coordinate emergencies, promote disaster prevention through population and government 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 re-

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