



SUSTAINABLE DEVELOPMENT UNIT ■ LATIN AMERICA AND THE CARIBBEAN

Disaster Risk Management in Central America: GFDRR Country Notes

Panama



THE WORLD BANK



GFDRR
Global Facility for Disaster Reduction and Recovery



COUNTRIES MOST EXPOSED TO MULTIPLE HAZARDS

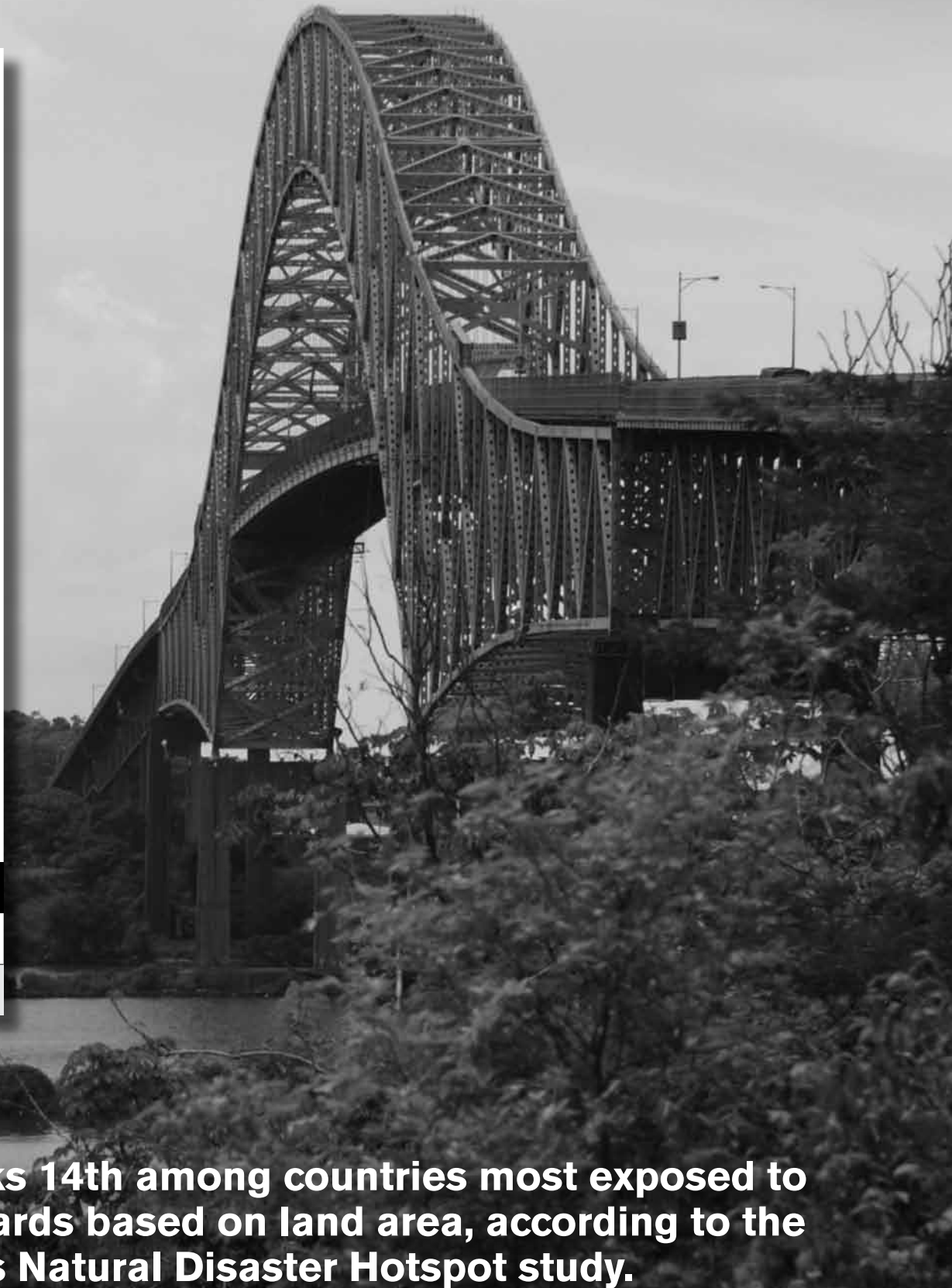
(Top 15 Based on Land Area with 3 or more hazards)^a

1. Taiwan, China
2. Costa Rica
3. Vanuatu
4. Philippines
5. Guatemala
6. Ecuador
7. Chile
8. Japan
9. Vietnam
10. Solomon Islands
11. Nepal
12. El Salvador
13. Tajikistan

14. PANAMA

15. Nicaragua

^a Dilley et al. (2005). Table 1.1.



Panama ranks 14th among countries most exposed to multiple hazards based on land area, according to the World Bank's Natural Disaster Hotspot study.

Natural Disasters from 1983 - 2008^b

Affected People

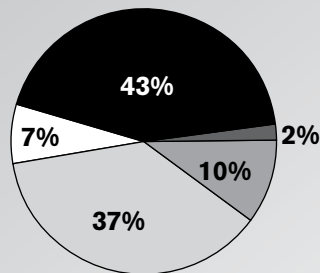
Disaster	Date	Affected (Number of People)
Drought	1993	81,000
Flood	2008	23,292
Flood	1991	20,061
Earthquake*	1991	18,060
Flood	2002	15,000
Flood	2004	11,650
Flood	2002	11,500
Storm	1988	8,732
Flood	2004	7,698
Storm	1998	7,500

Economic Damages

Disaster	Date	Cost (US\$ x 1,000)
Storm	1988	60,000
Storm	1992	10,000
Flood	2008	10,000
Flood	1995	7,000
Flood	2005	7,000
Flood	2000	1,300
Flood	2002	500
Flood	1996	350
Storm	1998	50
Drought	1983	0

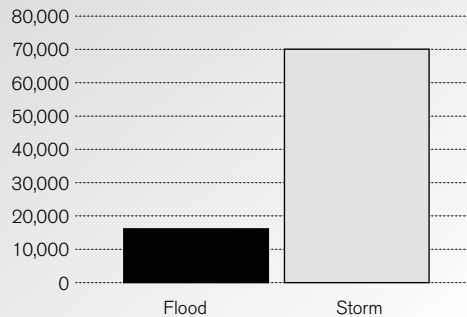
Statistics by Disaster Type^b

Population Affected by Disaster Type

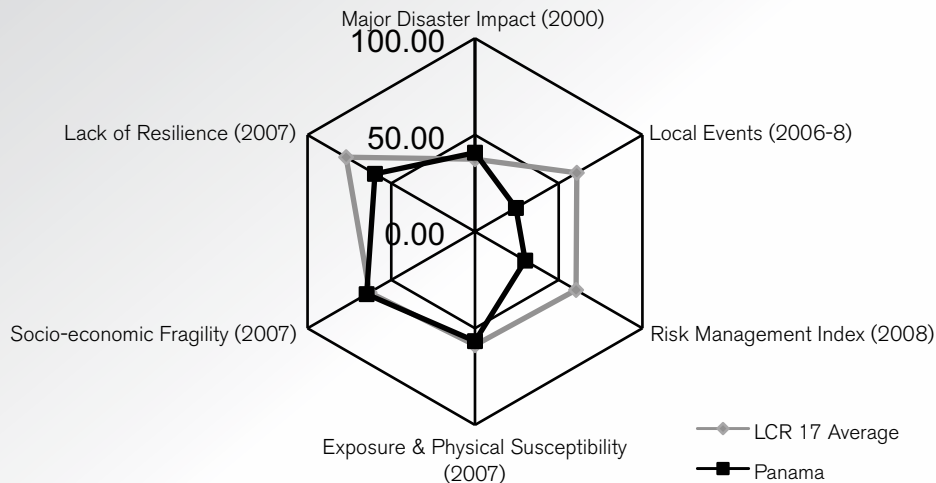


Flood
 Epidemic
 Earthquake
 Drought
 Storm

Economic Damages / Disaster Type (1000s US\$)



Relative Vulnerability and Risk Indicators^c



^b UN (2009). <http://www.preventionweb.net/english/countries/statistics/?cid=131>. Source data from EM-DAT. Data displayed does not imply national endorsement.

^c 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. Data 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.

DISASTER RISK PROFILE

Panama ranks 14th among countries most exposed to multiple hazards based on land area, according to the World Bank's Natural Disaster Hotspot study.² Panama has 15% of its total area exposed and 12.5% of its total population vulnerable to two or more hazards. The same study ranks Panama 35th among countries with the highest percentage of total population considered at a "relatively high mortality risk from multiple hazards."

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 ENSO³/El Niño-La Niña episodes. Natural Disaster Data from Panama published on the Prevention website⁴ 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 fatalities.⁵ 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.⁶ 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.

² Dilley et al. (2005).

³ El Niño-Southern Oscillation; commonly referred to as simply El Niño, a global coupled ocean-atmosphere phenomenon.

⁴ Prevention Web (2010b).

⁵ Damage caused by the 2005 earthquake: <http://www.igc.up.ac.pa/info.jpg>.

⁶ *Instituto de Geociencias* (2010).

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 at about US\$1.8 billion, and other road and urban development projects included in the Government's investment plan for 2010-2014. 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.⁷ 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 revenues⁸, 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 models⁹ 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.¹⁰ 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.

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.

DISASTER RISK MANAGEMENT FRAMEWORK

Panama has improved its legal and institutional framework for disaster risk management

⁷ Panama Canal Authority (2006).

⁸ World Bank (2010).

⁹ 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).

¹⁰ Giannini et al. (2002).

(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.

In 2011, the Government of Panama achieved several DRM milestones, including: i) enacting the Disaster Risk Management National Policy; updating the Risk Management National Plan, aligned with the new Policy; and enhancing the functions of the Ministry of Economy and Finance's Directorate of Investment, Concessions, and Risks (DICRE) to facilitate the fulfillment of MEF's responsibility of developing and mainstreaming a risk transferring strategy and risk reduction considerations into the public planning processes.

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 ICTs¹¹ 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.

ACTIVITIES UNDER THE HYOGO FRAMEWORK FOR 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 (COE¹²). 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.

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.

¹¹ Information and Communication Technologies.

¹² http://www.sinaproc.gob.pa/index.php?option=com_content&view=article&id=80&Itemid=56.

Panama's progress towards achieving the goals of the Hyogo Framework for Action¹³ includes the following:

**Hyogo Framework for Action (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 developed, under the guidance of SINAPROC, with participation of a multidisciplinary team of governmental and nongovernmental stakeholders, and approved by the Government of Panama. The leadership role played by SINAPROC during its preparation ensured that the Government's DRM goals and perspective were incorporated in the Policy.
- SINAPROC, working closely with relevant DRM stakeholders, who were also involved in the drafting of the PNGR, concluded the process for updating 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 created the Directorate of Investment, Concessions, and Risks (DICRE). DICRE is responsible for integrating natural disaster risk considerations 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.

¹³ 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 (OSOP¹⁴) and the National Seismological Network (RSN¹⁵).

Earthquake hazard has been probabilistically assessed in Panama through the RESIS II Project (NORSAR 2008). Volcanic hazards have been preliminarily assessed in the western region, near the Barú volcano.¹⁶ 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-ETESA¹⁷) 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 #2¹³:

- 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 Mamoní, 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.

¹⁴ <http://www.osop.com.pa/index.html>.

¹⁵ <http://www.igc.up.ac.pa/>.

¹⁶ *Instituto de Geociencias* (2010).

¹⁷ <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 #3¹³:

- 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 #4¹³:

- 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 #5¹³:

- 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.
- Several 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 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.

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/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
Disaster Risk Management Development Policy Loan with a Catastrophe Deferred Drawdown Option (DPL with a CAT DDO)	World Bank	66 million 2011-2014	1,3,4,5
Central American Probabilistic Risk Assessment (CAPRA)	GFDRR	\$500,000 2011-2012	2,3

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.

Panama needs to develop a robust and diversified risk financing strategy. Having a risk financing strategy in place will allow the country to be better prepared for financing—in case of a catastrophic event—the immediate emergency response, and the rehabilitation and reconstruction phases. Experience shows that when immediate liquidity is not available to respond to external shocks, including those caused by natural hazards, the result can be expensive debt instruments, diversion of resources from ongoing development programs, or slow and insufficient reconstruction financing. A well-capitalized DRM fund is perceived as a key component of a robust national risk financing strategy.

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).¹⁸ 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

¹⁸ <http://ecapra.org>.

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.

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)¹⁹
Support for the development of a Risk Assessment Platform (CAPRA) for Panama	SINAPROC, Universities, Ministry of Finance	500,000 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	Ministry 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
Initial Budget Proposal:			US\$4.78 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.

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.

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