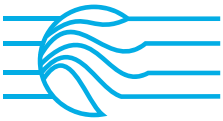

International Strategy for Disaster Reduction

Progress and Challenges in Disaster Risk Reduction

A contribution towards the development of policy indicators for the Post-2015 Framework on Disaster Risk Reduction

2014

United Nations

Progress and Challenges in Disaster Risk Reduction

A contribution towards the development of policy indicators for the Post-2015 Framework on Disaster Risk Reduction

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Foreword

In many parts of our increasingly globalised world, processes such as badly planned and managed urban development, environmental degradation, poverty and inequality and weak governance, are driving levels of disaster risk to new heights. Given that our current approach to both public and private investment tends to discount disaster risk, the potential for future loss is enormous. This poses a critical threat to economic development, social welfare and environmental health.

Since 2005, countries have been addressing this challenge through the Hyogo Framework for Action (HFA), which aims to achieve a substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of countries and communities by 2015. This publication aims at broadening the understanding of how governments have been managing their disaster risks in the context of the HFA. It does so by analyzing Progress Reports prepared using the HFA Monitor, a multi-tier online tool for progress review, facilitated by UNISDR and led by country governments.

The publication, therefore, increases our knowledge and understanding of how countries are addressing the HFA, the challenges and issues that governments face and also the opportunities that present themselves.

Disaster risk management reduces uncertainty, builds confidence, cuts costs and creates value. The growing recognition of the value proposition of disaster risk management needs now to be translated into a more systematic approach in the new Post 2015 Framework for Disaster Risk Reduction that will be adopted by UN Member States in Sendai, Japan in March 2015.

This publication presents timely guidance for the development of an enhanced set of policy indicators for disaster risk management to underpin the Post 2015 Framework for Disaster Risk Reduction. The lessons learned in implementing the HFA are vital to inform the collective efforts of governments, the private sector, civil society and other stakeholders to build the disaster resilient communities and nations of the future.

Margareta Wahlström
Special Representative of the Secretary-General
for Disaster Risk Reduction

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Acronyms and Abbreviations

BCP	Business continuity plan
CBA	Cost benefit analysis
CCA	Climate change adaptation
DM	Disaster management
DRM	Disaster risk management
DRR	Disaster risk reduction
EIA	Environmental impact assessment
EOC	Emergency operation center
EWS	Early warning system
GAR	Global Assessment Reports
HFA	Hyogo Framework for Action
ISDR	International Strategy for Disaster Reduction
INGO	International non-governmental organization
ICT	Information and communications technology
MOU	Memorandum of understanding
NGO	Non-governmental organization
NPO	Non-profit organization
PPP	Public-private partnership
SAR	Search and rescue
SIA	Social impact analysis
SME	Small and medium enterprises
SOP	Standard operating procedures
UN	United Nations
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNISDR	United Nations Office for Disaster Risk Reduction
WB	World Bank

Introduction

Background

In 2005, 168 UN Member States adopted the Hyogo Framework for Action (HFA), a comprehensive set of three strategic goals and five Priorities for Action designed to achieve as outcome a *substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries.*

Since 2007, governments have been assessing their progress towards the implementation of the HFA using the on-line HFA Monitor. Over three biennial reporting cycles (2007-2009; 2009-2011 and 2011-2013) governments have benchmarked their performance in each Priority for Action against 22 Core Indicators and have provided supporting documentation and means of verification. The accumulated collection of over four hundred HFA Progress Reports since 2007 now represents the largest public archive for understanding how countries are addressing the HFA and the challenges, issues and opportunities that they face.

The Third World Conference on Disaster Risk Reduction will be held in Sendai City, Japan in March 2015. During this conference countries will adopt a new Post 2015 Framework for Disaster Risk Reduction, as successor to the HFA. In 2013, the Chair's Summary of the Global Platform for Disaster Risk Reduction called for UNISDR to initiate and lead work to develop targets and indicators to monitor the reduction of risk and the implementation of' the post-2015 framework for disaster risk reduction.

As a first step towards the design of a new progress monitoring system, UNISDR conducted an in-depth analysis of the HFA Progress Reports presented by countries to date. An analysis of progress has been presented in each of the biennial UN Global Assessment Reports on Disaster Risk Reduction (UNISDR, 2009, 2011, 2013a), as well as in a stand-alone 2013 publication, the report Implementation of the Hyogo Framework for Action - Summary of reports 2007-2013 (UNISDR, 2013b).

The present publication differs from those efforts in a number of ways. It analyzes the majority of HFA Progress Reports from 2011 and 2013 in far greater depth and breadth than has previously been possible. At the same time, rather than focusing on progress *per se*, this analysis identifies the key challenges, issues and opportunities that countries face and that will have to be addressed in the Post 2015 framework for disaster risk reduction. It also examines the suitability of the HFA Core Indicators to measure progress in disaster risk reduction and thus is a key input to the design of a new system of indicators for progress monitoring.

This report is compiled using 22 HFA core indicators (Table A-1) and contains UNISDR's analysis of the qualitative aspect of key policies countries have used to address disaster risk. Furthermore, in order to contribute to discussions on a new indicator system, in each section it lists several challenges and good practices for each HFA core indicator.

The analysis in this report is limited to countries that submitted an HFA progress report in the 2011-13 and 2009-2011 terms. Due to resource constraints, the main thrust of the analysis involves reports written in English, however observations included inputs from 2011/13 reports written in French and Spanish where possible. The list of countries analyzed can be found in Table A-2. All reports that countries have made available in the public domain are available on the web (http://www.preventionweb.net/english/hyogo/progress/reports)

Common challenges: general trends

UNISDR examined HFA progress reports voluntarily submitted by countries in the 2009-11 and 2011-13 cycles. The reports provide an informative and insightful look into the common challenges countries faced in implementing disaster risk management (DRM) policies and activities as well as into good practices that can be used by other countries in future planning. In the analysis, common challenges come up time and again cutting across regions and affecting countries that are oceans apart. A number of these common challenges are described below.

The first common challenge reported was the insufficient levels of implementation for each monitored activity. For example, although DRM plans or risk sensitive building codes exist they are not enforced because of a lack of government capacity or public awareness or because so much development takes place in the informal sector. Risk information acquired through assessments is often not translated into policy partly because policy makers are not aware of how to use such information. Staging public awareness raising campaigns, while useful, run the risk of being a one-time event and may not bring any real change in people's behaviour or actions. In other words, it is not sufficient to have risk assessment data and institutional arrangements in place; it is important to consider how these elements actually lead to changes in behavior at all levels in a way that leads to an improved management of risks.

A second common challenge highlighted by many countries is the need to strengthen local capacities to implement disaster risk management, including through establishing local level mechanisms and risk assessments. Weak capacity at the local level undermines the implementation of building codes and land use plans. National policies also need to be adapted to the local context (e.g. the national school curricula on DRR that can be tailored to local risks and needs). Small-scale events that many countries struggle with are local in scope.

A third challenge refers to how climate change issues are integrated into DRM (e.g. risk assessment, research, building codes, and land use planning) given that climate change will lead to shifts in risk patterns. Some countries have already combined DRM and climate change adaptation policies and created a common platform to discuss how both need to be mainstreamed into national and local-level policies. While steps have been taken, there is still long way to go before effective policy coordination on climate change and DRM is the norm.

Fourth, DRM policymakers have difficulty in obtaining political and economic commitment due to other competing needs and priorities. While many agree that reducing disaster risks is important for saving lives and property, few countries have appropriate measures in place because other issues (e.g. poverty reduction, economic growth, social welfare and education) require greater attention and funding. This has resulted in the insufficient earmarking of financial resources for DRM policies. Land use planners also face difficulty in balancing DRR needs with economic ones. DRM policy makers are in need of clear evidence, including cost-benefit analysis, to convince public and politicians that commitment to DRM is as practical and necessary as any other priority.

Another common challenge refers to poor coordination between stakeholders, and a lack of information sharing, including with respect to risk assessment, monitoring and evaluation, early warning, disaster response and other DRM activities. Mainstreaming DRR in all policy areas and ensuring the commitment of sector agencies is important in preventing new risks from arising and also helps stakeholders address existing risks and strengthen the resiliency of society.

Finally, while many countries are still engaged in moving from a response based emergency management paradigm towards the disaster risk reduction paradigm embodied by the HFA, yet others are already pushing the boundaries beyond the HFA towards a new paradigm in which disaster risk management becomes a hallmark of good development. Table 1 shows schematically elements of this ongoing paradigm shift.

Table 1: Paradigm shift in Disaster Risk Management policies

	Old paradigm	HFA	New paradigm
Risk Perception	Exogenous	Exogenous	Endogenous
Problem Recognition	Need for effective response and recovery	Need for disaster risk reduction	Risk is embedded in development processes (with a focus on underlying factors)
Main policy tools (examples)	Contingency plan, emergency drill	early warning system, DRR investment such as levee construction	Land use planning, risk proof investment, Eco-system management
Required knowledge		Risk and loss assessment	Risk, loss and socio-economic impact assessments
Actors	DM agency	DRM agencies within different levels of government, various stakeholders (public, private, NGOs)	More involvement of other stakeholders, especially private sector and local level actors
Link		Millennium Development Goal	Sustainable Development Goal, Climate Change Policy

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United Nations
International Strategy for Disaster Reduction

SUMMARY of the Hyogo Framework for Action 2005-2015:
Building the Resilience of Nations and Communities to Disasters

Expected outcome, strategic goals and priorities for action 2005-2015

Expected Outcome
The substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries.

Strategic Goals

- The integration of disaster risk reduction into sustainable development policies and planning.
- The development and strengthening of institutions, mechanisms and capacities to build resilience to hazards.
- The systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes.

Priorities for Action

	1. Ensure that disaster risk reduction (DRR) 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.
Key Activities	• DRR institutional mechanisms (national platforms); designated responsibilities; • DRR part of development policies and planning, sector wise and multisector; • Legislation to support DRR; • Decentralisation of responsibilities and resources; • Assessment of human resources and capacities; • Foster political commitment; • Community participation.	• Risk assessments and maps, multi-risk: elaboration and dissemination; • Indicators on DRR and vulnerability; • Data and statistical loss information; • Early warning: people centered; information systems; public policy; • Scientific and technological development; data sharing, space-based earth observation, climate modeling and forecasting; early warning; • Regional and emerging risks.	• Information sharing and cooperation; • Networks across disciplines and regions; dialogue; • Use of standard DRR terminology; • Inclusion of DRR into school curricula, formal and informal education; • Training and learning on DRR: community level, local authorities, targeted sectors; equal access; • Research capacity: multi-risk; socio-economic; application; • Public awareness and media.	• Sustainable ecosystems and environmental management; • DRR strategies integrated with climate change adaptation; • Food security for resilience; • DRR integrated into health sector and safe hospitals; • Protection of critical public facilities; • Recovery schemes and social safety-nets; • Vulnerability reduction with diversified income options; • Financial risk-sharing mechanisms; • Public-private partnership; • Land use planning and building codes; • Rural development plans and DRR.	• Disaster management capacities: policy, technical and institutional capacities; • Dialogue, coordination and information exchange between disaster managers and development sectors; • Regional approaches to disaster response, with risk reduction focus; • Review and exercise preparedness and contingency plans; • Emergency funds; • Voluntarism and participation.

Cross Cutting Issues

- Multi-hazard approach
- Gender perspective and cultural diversity
- Community and volunteers participation
- Capacity building & technology transfer

Contributing to the achievements of the internationally agreed development goals (including the MDGs).

DRR= disaster risk reduction

Table A-1b: Hyogo Framework of Action: HFA Core Indicators

Priority area	Core indicators	Policies discussed in the publication
Priority 1 **Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.**	**1.1** National policy and legal framework for disaster risk reduction exists with decentralized responsibilities and capacities at all levels. **1.2** Dedicated and adequate resources are available to implement disaster risk reduction plans and activities at all administrative levels. **1.3** Community Participation and decentralization is ensured through the delegation of authority and resources to local levels. **1.4** A national multi sectoral platform for disaster risk reduction is functioning.	**1.1** DRM Law, DRM Plan, Economic Development Plan, sectoral plan **1.2** DRM Budget **1.3** Local DRM policy, Civil sector involvement **1.4** DRM Platform
Priority 2 **Identify, assess and monitor disaster risks and enhance early warning.**	**2.1** National and local risk assessments based on hazard data and vulnerability information are available and include risk assessments for key sectors. **2.2** Systems are in place to monitor, archive and disseminate data on key hazards and vulnerabilities. **2.3** Early warning systems are in place for all major hazards, with outreach to communities. **2.4** National and local risk assessments take account of regional / trans boundary risks, with a view to regional cooperation on risk reduction.	**2.1** Risk Assessment, hazard mapping, vulnerability assessment **2.2** Information management, monitoring **2.3** EWS **2.4** Regional cooperation
Priority 3 **Use knowledge, innovation and education to build a culture of safety and resilience at all levels.**	**3.1** Relevant information on disasters is available and accessible at all levels, to all stakeholders (through networks, development of information sharing systems etc.). **3.2** School curricula, education material and relevant trainings include disaster risk reduction and recovery concepts and practices. **3.3** Research methods and tools for multi-risk assessments and cost benefit analysis are developed and strengthened. **3.4** Countrywide public awareness strategy exists to stimulate a culture of disaster resilience, with outreach to urban and rural communities.	**3.1** Web-portal **3.2** School curriculum, University, training institute **3.3** Research, CBA, economic analysis **3.4** Awareness raising

Table A-1b cont.

Priority area	Core indicators	Policies discussed in the publication
Priority 4 **Reduce the underlying risk factors.**	**4.1** Disaster risk reduction is an integral objective of environment related policies and plans, including for land use natural resource management and adaptation to climate change. **4.2** Social development policies and plans are being implemented to reduce the vulnerability of populations most at risk. **4.3** Economic and productive sectorial policies and plans have been implemented to reduce the vulnerability of economic activities. **4.4** Planning and management of human settlements incorporate disaster risk reduction elements, including enforcement of building codes. **4.5** Disaster risk reduction measures are integrated into post disaster recovery and rehabilitation processes. **4.6** Procedures are in place to assess the disaster risk impacts of major development projects, especially infrastructure.	**4.1** CCA, environment, water, forest and coastal management **4.2** Social policy **4.3** Critical infrastructure, BCP **4.4** Building code, land use planning **4.5** Recovery and reconstruction planning **4.6** Risk-proof public investment
Priority 5 **Strengthen disaster preparedness for effective response at all levels.**	**5.1** Strong policy, technical and institutional capacities and mechanisms for disaster risk management, with a disaster risk reduction perspective are in place. **5.2** Disaster preparedness plans and contingency plans are in place at all administrative levels, and regular training drills and rehearsals are held to test and develop disaster response programmes. **5.3** Financial reserves and contingency mechanisms are in place to support effective response and recovery when required. **5.4** Procedures are in place to exchange relevant information during hazard events and disasters, and to undertake post-event reviews.	**5.1** Infrastructure, school and hospital **5.2** Contingency planning, training **5.3** Contingency finance **5.4** Post-disaster assessment, disaster loss database

Table A-2a: HFA report records

Key

HFA cycle report (2007-2009, 2009-2011, 2011-2013): Submitted: 1, Not submitted: 0

Country income class: High income: 1, Upper Middle Income: 2, Lower Middle Income: 3, Low Income: 4

Regions: Africa: 1, Americas: 2, Asia: 3, Europe: 4, Oceania: 5

Language of report: English: 1, Spanish: 2, French: 3, Arabic: 4, Russian: 5, Others: 6

Country	2007-2009	2009-2011	2011-2013	Income class	Region	Language
Afghanistan	0	0	1	4	3	1
Albania	0	0	1	2	4	1
Algeria	1	1	1	2	1	3
Angola	1	0	0	2	1	6
Anguilla	0	1	1	-	2	1
Antigua and Barbuda	0	1	0	1	2	1
Argentina	1	1	1	2	2	2
Armenia	1	1	1	3	4	1
Australia	1	1	1	1	5	1
Bahrain	1	1	1	1	3	1
Bangladesh	1	1	1	4	3	1
Barbados	0	1	1	1	2	1
Belarus	0	0	1	2	4	5
Bhutan	0	1	1	3	3	1
Bolivia	1	1	1	3	2	2
Botswana	0	1	0	2	1	1
Brazil	0	1	1	2	2	6
British Virgin Islands	1	1	1	-	2	1
Brunei Darussalam	0	1	0	1	3	1
Bulgaria	1	1	1	2	4	1
Burkina Faso	1	1	1	4	1	3
Burundi	1	1	0	4	1	3
Cambodia	1	0	0	4	3	1
Canada	0	1	0	1	2	1

Table A-2a cont.

Country	2007-2009	2009-2011	2011-2013	Income class	Region	Language
Cabo Verde	1	1	0	3	1	6
Cayman Islands	1	1	0	1	2	1
Chile	0	1	1	1	2	2
China	0	0	1	2	3	1
Colombia	1	1	1	2	2	2
Comoros	0	1	1	4	1	3
Cook Islands	0	1	1	-	5	1
Costa Rica	1	1	1	2	2	2
Côte d'Ivoire	1	1	1	3	1	3
Croatia	1	1	1	1	4	1
Cuba	0	1	1	2	2	2
Czech Rep.	1	1	1	1	4	1
Djibouti	0	0	1	3	1	3
Dominican Republic	1	1	1	2	2	2
Ecuador	1	1	1	2	2	2
Egypt, Arab Rep.	1	1	1	3	1	1
El Salvador	1	1	0	3	2	2
Ethiopia	0	0	1	4	1	1
Fiji	0	1	1	2	5	1
Finland	0	1	1	1	4	1
France	1	1	1	1	4	3
Georgia	0	1	1	3	3	1
Germany	1	1	1	1	4	1
Ghana	1	1	0	3	1	1
Greece	0	0	1	1	4	1
Grenada	0	0	1	2	2	1
Guatemala	0	1	1	3	2	2
Guinea	0	0	1	4	1	3

Table A-2a cont.

Country	2007-2009	2009-2011	2011-2013	Income class	Region	Language
Guinea-Bissau	0	1	0	4	1	3
Haiti	0	0	1	4	2	3
Honduras	0	1	1	3	2	2
Hungary	0	1	1	2	4	1
India	1	1	1	3	3	1
Indonesia	1	1	1	3	3	1
Iran, Islamic Rep.	1	0	1	2	3	1
Italy	1	1	1	1	4	1
Jamaica	1	1	1	2	2	1
Japan	1	1	1	1	3	1
Jordan	0	0	1	2	3	1
Kazakhstan	1	1	1	2	3	1
Kenya	1	1	1	4	1	1
Korea, Rep.	1	0	1	1	3	1
Kyrgyz Repp.	1	1	0	1	3	1
Lao PDR	1	1	1	3	3	1
Lebanon	0	1	1	2	3	1
Lesotho	0	1	0	3	1	1
Macedonia, FYR	1	1	1	2	4	1
Madagascar	1	1	0	4	1	3
Malawi	1	1	1	4	1	3
Malaysia	0	1	1	2	3	1
Maldives	1	1	1	3	3	1
Mali	0	1	0	4	1	3
Marshall Islands	1	1	1	2	5	1
Mauritania	0	0	1	3	1	3
Mauritius	1	1	1	2	1	1
Mexico	0	1	1	2	2	2

Table A-2a cont.

Country	2007-2009	2009-2011	2011-2013	Income class	Region	Language
Moldova	0	1	0	3	4	1
Monaco	0	1	1	1	4	3
Mongolia	0	1	0	3	3	1
Montenegro	1	0	0	2	4	1
Morocco	0	1	1	3	1	3
Mozambique	1	1	1	4	1	1
Myanmar	0	1	0	4	3	1
Namibia	0	1	0	2	1	1
Nauru	0	0	1	-	5	1
Nepal	1	1	0	4	3	1
Netherlands	0	0	1	1	4	1
New Zealand	1	1	1	1	5	1
Nicaragua	0	1	0	3	2	2
Niger	0	0	1	4	1	3
Nigeria	0	1	0	3	1	1
Niue	0	0	1	-	5	1
Norway	1	1	1	1	4	1
Pakistan	1	1	1	3	3	1
Palau	0	0	1	2	5	1
Palestine, State of	0	1	1	-	3	1
Panama	1	1	1	2	2	2
Papua New Guinea	0	0	1	3	5	1
Paraguay	0	1	0	3	2	2
Peru	1	1	1	2	2	2
Philippines	1	1	0	3	3	1
Poland	0	1	1	1	4	1
Portugal	0	1	1	1	4	1
Romania	0	1	1	2	4	1

Table A-2a cont.

Country	2007-2009	2009-2011	2011-2013	Income class	Region	Language
Rwanda	0	0	1	4	1	1
Saint Kitts and Nevis	0	1	1	1	2	1
St. Lucia	1	1	0	2	2	1
Samoa	0	1	1	3	5	1
Senegal	1	1	1	3	1	3
Serbia	1	0	1	2	4	1
Seychelles	0	1	1	2	1	1
Sierra Leone	1	1	0	4	1	1
Singapore	1	0	0	1	3	1
Slovenia	1	0	1	1	4	1
Solomon Islands	0	1	0	3	5	1
Sri Lanka	1	1	1	3	3	1
Sudan	0	0	1	3	1	1
Swaziland	1	0	0	3	1	1
Sweden	1	1	1	1	4	1
Switzerland	1	1	1	1	4	1
Syrian Arab Republic	1	1	0	3	3	1
Tajikistan	1	1	0	4	3	1
Tanzania	1	1	1	4	1	1
Thailand	0	1	0	2	3	1
Timor-Leste	0	1	0	3	3	1
Togo	1	1	1	4	1	3
Tonga	0	0	1	2	5	1
Trinidad and Tobago	0	0	1	1	2	1
Tunisia	0	0	1	2	1	3
Turkey	1	1	1	2	4	1
Turks and Caicos Islands	0	1	1	1	2	1

Table A-2a cont.

Country	2007-2009	2009-2011	2011-2013	Income class	Region	Language
United Kingdom	1	0	1	1	4	1
United States of America	1	1	1	1	2	1
Uruguay	0	1	1	1	2	2
Uzbekistan	1	0	0	3	3	1
Vanuatu	1	1	1	3	5	1
Venezela (Bolivarian Republic of)	1	1	0	2	2	2
Vietnam	1	1	0	3	3	1
Yemen	1	1	1	3	3	4
Zambia	1	1	0	3	1	1

Note: Income level category is based on the World Bank definition.

Table A-2b: HFA 2011-2013

	High income	Higher middle income	Lower middle income	Low income	Total
Africa	0	1	9	12	22
Asia	3	8	9	4	25
Europe	16	8	1	0	25
Latin America	8	12	3	1	26
Oceania	2	5	6	0	16
Total	**29**	**34**	**28**	**17**	**114**

Note: Income level category is based on the World Bank definition. No data on income levels was available for the State of Palestine, Anguilla, British Virgin Islands, Cook Islands, Nauru and Niue in the World Bank database.

Table A-2c: HFA 2009-2011

	High income	Higher middle income	Lower middle income	Low income	Total
Africa	0	5	9	12	26
Asia	3	7	13	5	29
Europe	12	6	1	0	19
Latin America	9	13	6	0	30
Oceania	2	2	4	0	9
Total	**26**	**33**	**33**	**17**	**113**

Note: Income level category is based on the World Bank definition. No data on income levels was available for the State of Palestine, Anguilla, British Virgin Islands, Cook Islands, Nauru and Niue in the World Bank database.

Challenges and progress regarding HFA core indicators

Priority 1

Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

Core indicator 1.1

National policy and legal framework for disaster risk reduction exists with decentralized responsibilities and capacities at all levels

1 Legislative and institutional DRM arrangements

Most countries have outlined their legislation and institutional arrangements (see **Table 1.1a**). Legislative frameworks are important in defining roles of organizations and stakeholders, and avoiding duplication of responsibilities. Some countries report that the lack, or insufficient level, of such frameworks is a challenge. In several cases, legal frameworks are outdated and have a limited focus on DRR, which hinders the promotion of a comprehensive DRM plan. Shifting the paradigm from a "reactive" approach, with a focus on disaster relief and response, to a "proactive" one, highlighting disaster risk prevention and reduction, must be reflected properly in a country's legal framework.

- **Bangladesh:** Introducing a disaster and climate risk reduction culture and practice takes time; especially when replacing an embedded culture of emergency management and relief. Revising existing legal frameworks and changing the practice requires finding common ground and shifting mindsets.
- **Jamaica:** The Disaster Preparedness and Emergency Management Act was passed in 1993. While it provided the legal framework for disaster management, it is felt that the provisions are not sufficient to deal with the shift in focus from disaster management to disaster risk management.
- **Trinidad and Tobago:** There is a need to integrate all existing legislation and fill critical gaps in regulatory frameworks, including lifting existing building codes to a compulsory standard. Current legislation is outdated and does not mandate relevant authorities to ensure public awareness and resilience.

The insufficient development of national legal frameworks also stem from limited financial and human resources. Legal expertise is limited in many developing countries and needs to be mobilized to facilitate the process.

- **Lesotho:** Development and review of legal frameworks (DRR Policy and Review of Disaster Management Act) is still in progress. The process has taken a long time due to a shortage of both financial and human resources and expertise.
- **Lao PDR:** Scaling up the national legal framework has moved at a slow pace due to limited resources and the time consuming process of mainstreaming and converting presidential ordinances and decrees into law.

In some countries, acts and plans have been developed for each category of hazard and/or agency (Box 1). Consistency and coordination between different laws and plans should be ensured so that DRM activities are implemented in a more efficient and comprehensive way.

- **Romania:** While there are medium and long-term strategies in place that cover flood risk, dangerous weather phenomena and earthquakes there is a need to bring together these separate efforts.
- **Czech Republic:** Complex plans that cover all types of disaster risk reduction do not exist because ministerial responsibilities are not clear and the capacity of the government to coordinate and unify such activities is weak.
- **Indonesia:** Disaster-related laws and regulations need to be synchronized and harmonized between sectoral agencies and at different government levels.
- **Kenya:** The lack of a unified and comprehensive disaster management policy has affected

coordination on disaster management within government and amongst other stakeholders. However, the expected approval of the DRM policy will lead to the implementation of an umbrella coordination mechanism that will harmonize all existing ad hoc policies around DRM.

Even if a country has sound legal framework for DRM, the enforcement of such a strategy can be a challenge. Laws cannot be enforced if there are faults within the laws themselves (e.g. if they are outdated or do not include regulatory power), if there is a lack of financial and human capacity to enforce the law or if no monitoring systems are in place. Similarly, as in the law making stage, a lack of awareness and coordination across sectors, and with different levels of government, hinders DRR activities in the implementation stage (Box 2).

- **Barbados:** The Emergency Management Act of 2006 Cap 20 has no regulations, which means key elements of the Act have no legislative authority for policy implementation. The Act does not name the agencies of the National Emergency Management System, nor does it articulate roles and responsibilities for specific members.
- **Bangladesh:** While the country has developed sound policies and frameworks, it lacks the capacity to implement all aspects of these policies and frameworks. Capacity challenges include: inadequate staffing, financial bottlenecks and a lack of technical resources such as space-based technology.
- **China:** The implementation of disaster reduction plans runs up against several problems including the numerous government departments involved, convoluted coordination processes, long construc-

Box 1: China's legal system for DRM

The existing legal system is guided by the traditional principle of "one law for one event" and each law or regulation targets one disaster event, signaling a lack of comprehensive disaster reduction laws and regulations. This also highlights the shortage of relevant supporting policies, the insignificant implementation of relevant laws on disaster prevention and control, and the overall failure in eliminating disaster risks. Despite its advantage of targeted countermeasures, the "one law for one event" model leads to problems of repetition and wastes legislative resources while also contradicting different laws. This makes it difficult to coordinate and unify them. Most important is that the "one law for one event" model goes against the idea of integrating response platforms for disasters and results in redundant activities and a serious waste of disaster prevention and reduction resources.

Box 2: Lack of awareness on the paradigm shift of DRM hinders implementation of DRR

- ✓ **Indonesia:** Since the shift of paradigm from response to DRR has not been well socialized, the need for risk management is often not understood. The key challenge in the implementation of DRR in hazard prone districts and cities is the lack of understanding of the risk reduction concept. The understanding of DRR amongst key government stakeholders has not been balanced and comprehensive. The central government has not comprehensively engaged local communities and disseminated and/or socialized key DRR policies within all districts/cities. Many policies are formulated in the context of disaster response and thus convey the wrong signals to the regions. Many critical decision makers, including members of national and local legislatures, still think that disaster programmes only consist of emergency response and post-disaster rehabilitation and reconstruction activities.
- ✓ **Pakistan:** Institutional mindsets based on conventional emergency management approaches are the main stumbling block in the implementation of national policies and strategies under the new DRM paradigm. Another major constraint is that institutions and communities are not sensitized to treat DRR as an integral part of sustainable development.

tion cycles and difficulties in fund raising.

- **Cook Islands:** In general, monitoring and reporting systems remain weak and require strengthening through technical assistance and mentoring.

Some countries reported organizational issues, and institutional alignment, as major challenges. Lack of a central (focal point) agency responsible for taking the lead in DRM activities and coordinating the activity of sectoral organizations has led to the duplication of efforts and resulted in a waste of resources and, in some cases, overlooking the priority area entirely.

- **Romania:** The shortcoming in implementing DRR at all levels is that the responsibility for risk management is divided between 8 central authorities. This separation leads to overlapping efforts or in areas not covered by any specific authority.
- **Mauritius:** Various committees at the ministerial and departmental levels are responsible for covering hazards such as oil spills and landslides. Disaster management in Mauritius does not yet have a well-defined DRR component as responsibility is currently scattered throughout various ministries.

Even in countries where focal-point agencies exist, the organizational structure of the entire government affects how effectively agencies can work on DRM. To strengthen the capability of focal-point agencies, upgrading the positioning of a focal unit within the organizational structure has proven to be effective (e.g. Samoa). Placing a disaster risk management agency within a high-ranking office (say the President or Prime Minister) will drastically improve an organization's decision-making and coordination abilities (see the case of Colombia). Organizational restructuring through amalgamation can also be an appropriate solution in some cases (as in Vanuatu). Institutional capacity especially needs to be strengthened when a "disaster management" agency transforms into a "disaster risk management" agency, inclusive of jurisdictional coverage for risk management (e.g. risk prevention, reduction, response and recovery). Sustainability of DRM activities cannot be assured if there is a lack of sufficient organizational commitment.

- **Barbados:** The Department of Emergency Management has inadequate technical human resources to provide a coordinating role and take on responsibilities beyond preparedness, response and aspects of recovery.
- **Tonga:** National Emergency Management Office (NEMO)'s primary role is to build capacity in disaster management but it has inherited the DRR capacity building framework. To foster change, NEMO requires additional resources and institutional strengthening.
- **Samoa:** Upgrading the Disaster Management

Table 1.1a: DRM Governance framework

Country	Law	Plan/Policy/Strategy
Anguilla	Disaster Management Act (2007)	Comprehensive Disaster Management Strategy
Antigua and Barbuda		Comprehensive Disaster Management
Algeria	Law 04-20 2004	
Argentina		
Australia		National Strategy for Disaster Resilience (2011) National Catastrophic Disaster Plan (2010)
Bangladesh	National Disaster Management Act (draft)	National Disaster Management Policy (draft), National Disaster Management Plan (2010-15), Standing Orders on Disaster

Office (from a section to a division) has resulted in a significant increase in staff budget and five new staff positions.

- **Colombia:** The National Unit for Disaster Risk Management is now part of the President's Office, which allows for stronger political, technical and administrative positioning conductive to optimizing risk management processes.
- **Vanuatu:** The primary agencies responsible for DRR/DM (Meteorology, Geo-Hazards and National Disaster Risk Management Office (NDRMO)) were located under different ministries and departments, with differing lines of accountability and reporting. This caused challenges in implementing a coordinated and seamless approach to DRR/DM. The recent amalgamation of Meteorology and Geo-Hazards under a new department within the Ministry of Infrastructure and Public Utilities is a promising development. The government has also taken positive steps with its plan to co-locate all key agencies under one roof, including the NDRMO.

The importance of governance cannot be overemphasized. Vertical governance between national and local governments, as well as horizontal governance across sectors, should be improved. At the same time, the involvement of the private and civil sectors (such as NGOs) should be guaranteed for effective DRM implementation.

- **Indonesia:** The enhancement of disaster risk management has mostly occurred at the national and provincial levels and its implementation at the district/city levels has yet to be strengthened, in terms of both regulatory and institutional settings. At the same time, when implementing DRR activities ministries and agencies tend to work in an uncoordinated manner. There needs to be further harmonization and synchronization of cross-sectoral DRR policies.
- **Germany:** The federal government, federal states and local communities are attempting to develop a future organization of DRR that contains all the benefits of such a decentralized organization without sacrificing comprehensive approaches. The plurality of actors in this area has been emphasized as the main challenge.
- **Papua New Guinea:** Cooperation with various sectors, development partners, INGOs and NGOs is critical for strengthening the country's overall capacities for disaster risk management. The government recognizes that DRM is a shared responsibility and the establishment of public/private sector partnerships is essential for making DRR a priority.

Lead organization	Constraints	Country
	Limited human resources	**Anguilla**
	Limited financial resources	**Antigua and Barbuda**
National Delegation for Major Risks (Ministry of the Interior)		**Algeria**
Commissión de Cascos Blancos (Ministry of Foreign Affairs)		**Argentina**
Attorney General's Department		**Australia**
Ministry of Food and Disaster Management	Limited awareness Limited human resources Limited financial resources	**Bangladesh**

Table 1.1a cont.

Country	Law	Plan/Policy/Strategy
Barbados	Emergency Management Act (2006)	
Bolivia	Autonomies Framework Act National System for Risk Reduction (2010)	
Botswana		National Disaster Risk Management Plan, National Comprehensive DRR Strategic Plan (draft)
British Virgin Islands	Disaster Management Act (2003)	Comprehensive Disaster Management (CDM) Strategy and Planning Framework (2009-13) CDM Policy
Brunei Darussalam	Disaster Management Order (2006)	
Bulgaria	Disaster Protection Law	National Plan for Disaster Protection and National Action Plan National Program for Protection in Disasters
Burkina Faso		Strategy of Accelerated Growth and Sustainable Development
Canada	Emergency Management Act	Federal Emergency Response Plan, Federal Policy for Emergency Management, National Disaster Mitigation Strategy
Cayman Islands		National Hurricane Plan
China		Comprehensive Disaster Prevention and Reduction Plan (2011-15)
Chile	National Emergency System (draft)	National Policy for Disaster Risk Management
Colombia	Law 1523 of 2012	National System for Disaster Risk Management
Comoros		National Adaptation Action Plan
Cook Islands	Disaster Risk Management Act (2007)	National Action Plan (NAP) for Disaster Risk Management (2009-15)
Costa Rica	National Law for Emergencies and Risk Prevention	
Côte d'Ivoire		
Croatia		National Protection and Rescue Plan
Cuba	Act-Law No. 262	

Lead organization	Constraints	Country
Department of Emergency Management, DEM Standing Committee	Limited human resources Limited legal framework	Barbados
Vice-Ministry of Civil Defence	Limited financial resources	Bolivia
National Disaster Management Office in the Office of the President National Committee on Disaster Risk Management	Limited resources Limited awareness	Botswana
National Disaster Management Council Department of Disaster Management	Limited financial resources	British Virgin Islands
		Brunei Darussalam
	Limited financial resources Limited engagement of stakeholders	Bulgaria
The National Council for Emergency and Rehabilitation under the Ministry of Social Action and National Solidarity		Burkina Faso
Public Safety Canada		Canada
National Disaster Agency	Limited legal framework	Cayman Islands
National Committee for Disaster Reduction	Limited financial resources Limited coordination of legal system	China
National Emergency Office		Chile
National Unit for Disaster Risk Management under President's Office		Colombia
General Directorate of Civil Security	Limited financial resources	Comoros
Emergency Management Cook Islands (2006) under the Office of Prime Minister National Disaster Risk Management Committee	Limited financial resources Limited law enforcement	Cook Islands
National Commission of Risk Prevention and Emergency Attention		Costa Rica
Ministry of Environment, Urban Sanitation and Sustainable Development		Côte d'Ivoire
		Croatia
Civil Defence Department		Cuba

Table 1.1a cont.

Country	Law	Plan/Policy/Strategy
Czech Republic	Crisis Management Act	
Djibouti		National Strategy for DRM
Dominican Republic		
Ecuador	DRM Law (draft)	National Strategy for DRR
Ethiopia		National Policy on Disaster Prevention and Management (1993) DRM Strategic Programme and Investment Framework (draft)
Fiji		National Disaster Risk Management Arrangements (2006)
Finland	Readiness Act Rescue Act Act and Degree on Flood Risk Management (2010)	Finnish Action Plan Government Resolution on Security Strategy for Society
France		
Georgia	Law on Protection of Population and Territories from National and Technological Emergency Situations (2007)	
Germany	Law for Civil Protection (2004) Water Management Act (2009)	Security Policy New Strategy for the Protection of German Population
Ghana		National Disaster Management Policy National Disaster Management Plan
Guatemala	Integral Disaster Risk Management Law (draft)	National Strategy for DRR
Grenada		Hazard Mitigation Policy (2003) Hazard Mitigation Plan (2006)
Honduras	Law for National System of DRM	National Plan for Integral Risk Management.
India	Disaster Management Act (2005)	National Disaster Management Policy National Disaster Response, Mitigation and Capacity Development Plans (draft) National Disaster Management Plan (draft)

Lead organization	Constraints	Country
	Limited financial resources Weak coordination	Czech Republic
Ministry of Interior and Decentralization	Limited financial resources	Djibouti
National Commission for Emergencies		Dominican Republic
National System for Disaster Risk Management		Ecuador
		Ethiopia
National Disaster Risk Management Council National Disaster Management Office	Limited legal framework	Fiji
	Limited awareness	Finland
National Council of Orientation for Prevention of Major Natural Risk		France
National Environment Agency	Limited financial resources Limited legal framework	Georgia
Federal Office of Civil Protection and Disaster Assistance Federal Agency for Technical Relief	Vertical coordination in federal system	Germany
National Disaster Management Organization National Disaster Management Committee	Limited financial resources Limited enforcement capacity	Ghana
National Coordination for DRR	Limited implementation Weak coordination	Guatemala
National Disaster Management Agency	Limited financial resources Limited human resources Limited coordination Limited awareness	Grenada
Permanent Commission of Contingencies	Limited financial resources Limited human resources	Honduras
National Disaster Management Authority		India

Table 1.1a cont.

Country	Law	Plan/Policy/Strategy
Indonesia	Law on Disaster Management (2007)	National Disaster Management Plan (2010-14) National Action Plan for Disaster Risk Reduction 2010-2012
Italy		Comprehensive National Policy for Disaster Risk Management
Jamaica	Disaster Preparedness and Emergency Management Act (1993)	National Hazard Risk Reduction Policy (2005) National Disaster Plan
Japan	Disaster Countermeasures Basic Act (1961)	National Basic Disaster Management Plan (with latest revision in 2011)
Kenya		Comprehensive Disaster Management Policy (draft) Disaster Management Strategy
Korea, Republic of	Framework Act on the Management of Disasters Safety Countermeasures against Natural Disasters Act	National Safety Master Plan Comprehensive Disaster Management Plan
Lao DPR		Prime Minister Decree No.158 (1998) National Disaster Management Plan (draft) Prime Minister Order on Severe Weather Response (2010)
Lebanon	Law 22/77	Public Safety Decree (2005)
Lesotho	Disaster Management Act	DRR Policy
Malawi	Disaster Preparedness and Relief Act (1991)	DRR Framework Flood Risk Management Strategy
Malaysia		Directive No 20 on Policy and Mechanism on National Disaster and Relief Management
Maldives	Disaster Management Bill (draft)	Strategic National Action Plan for DRR and CCA
Marshall Islands		National DRM Arrangements (draft) Disaster Risk Management National Action Plan (2008-18)
Mauritania		
Mauritius		Standard Cyclone Procedures

Lead organization	Constraints	Country
	Vertical coordination in decentralized system Limited awareness	Indonesia
National Civil Protection Service		Italy
National Disaster Management Agency	Limited legal framework Limited financial resources Limited awareness	Jamaica
Cabinet Office		Japan
Ministry of State for Special Programs National Drought Management Authority	Limited financial resources Limited human resources Limited awareness Limited policy framework	Kenya
Office of Prime Minister		Korea, Republic of
National Disaster Management Committee National Disaster Management Office under the Ministry of Labor and Social Welfare	Limited financial resources Limited human resources Vertical coordination with local government level Limited policy framework	Lao DPR
High Relief Committee	Limited policy framework Limited financial resources Limited enforcement	Lebanon
	Limited financial resources Limited human resources Limited awareness	Lesotho
		Malawi
National Security Council of the Prime Minister's Department	Limited policy framework	Malaysia
National Disaster Management Center	Limited financial resources	Maldives
National Disaster Committee National Emergency Management Coordination Office	Limited financial resources Limited human resources Limited awareness	Marshall Islands
Ministry of Environment and Sustainable Development	Limited legal framework	Mauritania
Cyclone and Other Natural Hazard Disaster Committee under the Prime Minister's Office	Limited legal framework	Mauritius

Table 1.1a cont.

Country	Law	Plan/Policy/Strategy
Mexico	General Act for Civil Protection	National Strategy for DRR (to be implemented in 2013). Civil Protection National Program.
Mongolia		State Policy on Disaster Protection (draft), National Program for Strengthening Disaster Resilience (draft), National Program for Climate Change Induced Risk Management (draft), Government Action Plan
Morocco		National Strategy for DRR (draft)
Mozambique	Law of Disaster Management (draft)	Master Plan for Disaster Prevention and Mitigation (2006-09)
Nepal	Natural Calamity Relief Act (1982) Disaster Management Act (draft)	National Strategy for Disaster Risk Management (2009)
New Zealand	Resource Management Act (1991) Civil Defense Emergency Management Act (2002)	
Niger		
Nigeria		
Norway	Act on Local Emergency Planning, Civil Protection and Civil Defense	
Pakistan	National Disaster Management Act (draft)	National Disaster Management Ordinance (2006) National DRM Framework (2007-12) National Disaster Management Plan (2012-22) National Disaster Risk Reduction Policy
Palau		National Disaster Risk Management Framework (2010)
Panama	Law 7, Civil Protection and Disaster Risk Management.	National Policy on Comprehensive DRM Risk Reduction and Prevention Plan (2011)
Papua New Guinea	Disaster Management Act (1987)	Disaster Management Plan (1987) DRR Framework for Action (2005) Disaster Protocols (2008)
Peru	Law 29664	National Policy 32: Disaster Risk Management.
Poland		DRR operation plan
Rwanda		National Disaster Management Policy (2009) National Disaster Management Plan National Risk Reduction Policy
Saint Lucia	Disaster management Act (2009)	
Samoa	Disaster and Emergency Management Act (2007)	National Disaster Management Plan (2013) National Action Plan for DRM (2011-16)

Lead organization	Constraints	Country
Civil Protection National System		Mexico
National Emergency Management Agency		Mongolia
Ministry of Interior and Ministry of Environment (among others)	Lack of a leading institution Limited legal framework.	Morocco
	Limited legal framework	Mozambique
Disaster Management Committee	Limited human resources Limited legal framework Limited enforcement	Nepal
Earthquake Commission Ministry of Civil Defense and Emergency Management		New Zealand
Coordination Unit of Early Warning System and Disaster Prevention	Limited legal framework Limited financial resources	Niger
National Emergency Management Agency (Vice President is the chair of the Governing Council)		Nigeria
		Norway
National Disaster Management Commission (headed by the Prime Minister) National Disaster Management Authority	Limited human resources Limited financial resources Limited awareness	Pakistan
National Emergency Management Office	Limited implementation	Palau
Civil Protection National System Department of Risk Reduction and Prevention	Limited financial resources	Panama
National Disaster Centre	Limited implementation	Papua New Guinea
National Centre of Estimation, Prevention and DRR		Peru
	Limited financial resources	Poland
Ministry of Disaster Management and Refugee Affairs	Limited financial resources	Rwanda
National Emergency Management Organization	Limited awareness	Saint Lucia
Disaster Management Office	Limited awareness Limited implementation	Samoa

Table 1.1a cont.

Country	Law	Plan/Policy/Strategy
Senegal		Civil Defense Policy and Emergency Strategy
Sierra Leone		National Disaster Preparedness and Response Plan (draft), Disaster Management Policy (draft)
Solomon Islands	National DRM Act (1989)	National DRM Arrangements and Plan (draft)
Sri Lanka	National Disaster Management Act (2005)	Disaster Management Policy (draft) Comprehensive Disaster Management Plan
Sweden	Civil Protection Act (2003)	
Switzerland		National Strategy Protection against Natural Hazards
Tanzania	Disaster Relief Coordination Act (1990)	National Disaster Management Policy (2004) National Operational Guideline for Disaster Management (2004) Tanzania Emergency Preparedness Plan
Thailand	Disaster Prevention and Mitigation Act (2007)	National Disaster Prevention and Mitigation Plan (2010-14) Strategic National Action Plan for DRR (2010-19) National Preparedness Policy
Togo		
Trinidad and Tobago	Disaster Management Act (1978) Comprehensive Disaster Management Legislation (draft)	Hazard Mitigation Policy Comprehensive Disaster Management Policy Framework
Turkey	Act 5902 (2009)	National Earthquake Strategy and Action Plan (2012-23)
United States of America	Disaster Mitigation Act (2000)	Presidential Policy Directive 8: National Preparedness
Uruguay	National Emergency System Act (2009)	
Vanuatu	Disaster Management Act (draft)	National Disaster Risk Management Arrangements Disaster Risk Reduction and Disaster Management National Action Plan (2006-16)
Yemen		National Plan for Disaster management (2007)
Macedonia, FYR	Law on Crisis Management (2005)	National Security and Defense Conception (2003) National Security Strategy (2008)
Zambia	Disaster Management Act (2010)	

Note: The examination of the name of the law, policy and organization is not enough to determine if the established laws, policies and organizations and plans are for disaster management or disaster risk management inclusive of DRR. Selection was made on the basis of laws, policies and organizations that appeared to include a DRR component, as described by each country.
Source: HFA Progress Report for each country.

Lead organization	Constraints	Country
Civil Protection (Ministry of the Interior)	Lack of political stability Limited financial resources	Senegal
National Disaster Management Department	Limited legal framework Limited awareness	Sierra Leone
National Disaster Management Office, Ministry of Home Affairs	Limited policy framework	Solomon Islands
Ministry of Disaster Management National Disaster Center	Limited legal framework	Sri Lanka
		Sweden
		Switzerland
Disaster Management Committee Disaster Management Department of Zanzibar	Limited human resources Limited financial resources Limited awareness	Tanzania
Department of Disaster Prevention and Mitigation	Limited awareness	Thailand
Ministry of Environment and Forest Resources	Limited financial resources	Togo
Office of Disaster Preparedness and Management	Limited human resources Limited awareness Limited legal framework	Trinidad and Tobago
Disaster and Emergency Management Agency of Prime Ministry (AFAD)		Turkey
Federal Emergency Management Agency		United States of America
National System of Emergencies		Uruguay
National Disaster Management Office, Ministry of Infrastructure and Public Utilities	Limited human resources Limited financial resources	Vanuatu
Prime Minister's Office Ministry of Water and Environment National Disaster Management Unit of Civil Defense Authority	Limited financial resources Limited human resources	Yemen
		Macedonia, FYR
		Zambia

2 DRR mainstreaming into national economic development planning

More than 40 countries addressed whether DRR is integrated into their national development plans. Though some examples have been reported (**Table 1.1b**) few countries acknowledge that DRR is well integrated into their national development plans. More countries addressed the need for integrating DRR into development decision-making in the 2011 – 2013 term as compared to the 2009 – 2011 period.

Even if DRR and DRM are integrated into a country's national economic development plan, implementation is sometimes hindered due to the lack of financial means, absent authority and poor coordination between sectors. Balancing development pressures and DRR considerations can be a greater challenge for developing countries.

- Malawi: The government has developed sectoral policies and strategies including the Malawi Growth and Development Strategy (2006-11). As it stands, DRR is not an integral part of development planning although social protection and disaster risk management have been recognized under Theme 2 of the Strategy.
- Cayman Islands: Environmental and DRR considerations are sometimes considered too "restrictive" (not including the development aspect), overly bureaucratic, and short-term in outlook. Medium to long term strategic planning that includes sustainability, disaster risk reduction and climate change considerations have not been put into practice.

3 DRR mainstreaming into sectoral planning

Many countries commented on sectoral plans for this particular indicator, as well as for 5.1 and 4.3. No country reported the systematic integration of DRR into sectoral planning, however health, education, agriculture and infrastructure sectors are often reported as the most advanced areas in terms of DRR mainstreaming. This reflects the level of DRR awareness in such sectors. Not every sector has high levels of awareness and capacity for DRM mainstreaming. Furthermore, sectoral plans can be inconsistent if not well coordinated with the national DRM or other sectoral plans. DRM focal points need to provide assistance to sectoral agencies to facilitate DRM mainstreaming and coordination in sectoral plans.

- Indonesia: Shifting the DRR paradigm and embedding it in the social fabric has not fully occurred in sectors at the central and local levels.
- Mozambique: DRR sectoral goals and targets are still not defined. Consequently, sectors and local governments continue to implement DRR activities according to the availability of human and financial resources.
- Papua New Guinea: DRR has yet to be fully mainstreamed into sectoral plans and strategies. Through the use of a DRM mainstreaming programme the government is advocating the inclusion of DRR into sectoral polices.
- Bangladesh: Ministry of Disaster Management and Relief has taken the initiative to incorporate disaster and environmental risk issues in a number of sectoral plans (e.g. agriculture, water management, education, livestock, fisheries, water and sanitation, health and small cottage industries). Sector specific DRR guidelines are being developed through Ministry's programmes that will address the changing environmental, topographic, population and demographic contexts.

Table 1.1b: Examples of DRR mainstreaming in national economic development plans

Country	DRR integrated in National economic development plan
Barbados	National Strategic Plan 2010-25
Bolivia	National Development Plan
Brunei Darussalam	Wawasan Brunei 2035
Burkina Faso	Strategy of Accelerated Growth and Sustainable Development
Colombia	National Development Plan
Cook Islands	National Sustainable Development Plan 2011-15
Costa Rica	National Development Plan 2010-14
Côte d'Ivoire	National Development Plan 2012-15
Dominican Republic	National Development Strategy 2030
Ecuador	National Development Plan for Living Well
Ethiopia	Five year Growth and Transformation Plan
France	Sustainable Development Plan 2014-15
Georgia	State Strategy on Regional Development of Georgia (2010-17)
Grenada	Grenada Growth and Poverty Reduction Strategy 2012-15
India	The 11th Five-Year Plan
Indonesia	Middle Term National Development Plan 2010-14
Jamaica	Vision 2030 Plan
Kenya	Vision 2030
Lao PDR	The 7th Five Year National Socio Economic Development Plan 2011-15
Malaysia	10th Five Year Malaysia Plan 2011-15
Mauritania	Strategic Framework against Poverty and the National Strategy for Sustainable Development
Mauritius	Five Year Government plan 2010-14
Mexico	National Development Plan 2013-18
Mongolia	Comprehensive Policy on National Development (Vision for 2021) Strategic Plan for National Development
Nepal	10th National Plan document (2002-08), 3-year interim plan (2008-10)
Papua New Guinea	Vision 2050, PNG Development Strategic Plan 2030, Medium Term Development Strategy 2011-15
Peru	Sustainable Development Plan
Romania	National Strategy for Sustainable Development
Samoa	Samoa Development Strategy 2008-12

Table 1.1b cont.

Country	DRR integrated in National economic development plan
Solomon Islands	National Development Strategy
Sweden	Vision Sweden 2025
Thailand	10th National Economic and Social Development Plan
Vanuatu	Priorities and Action Agenda and the Planning Long Acting Short Plan
Zambia	6th National development Plan

Source: HFA Progress Report for each country.

Core indicator 1.2

Dedicated and adequate resources are available to implement disaster risk reduction plans and activities at all administrative levels

1 Lack of DRM budget monitoring system

Very few countries reported their budget for DRM (**Table 1.2a**)[i] and it must be noted that even if countries reported their DRM budget, the methodology to calculate the budget and track fund usage differs from country to country. For example, what constitutes DRR or reconstruction in a country, and how to count DRR funds embedded in sectoral investment (e.g. risk-proof road structures), is not known. Some countries only provided information regarding the percentage allocated to DRR/prevention and relief/reconstruction. This is seen in **Table 1.2b**.

There were instances where reported values reflected the budget for disaster management agencies, which is only a part of overall DRR/DRM budgets. In such cases, it is assumed that the disaster management agency budget covers recurrent expenditures (e.g. personnel expenses) and means little remains for investment purposes.

- **Chile:** 0.04% of the national budget is channelled to National Emergency Office every year.
- **Cook Islands:** The combined budget allocation for the country's four main DRM entities – Emergency Management Cook Islands, Cook Islands Climate Change, Renewable Energy Division and Cook Islands Meteorological Service – for the 2012/13 fiscal year is NZD 588,000, the majority of which will be spent on staffing costs. This amount represents approximately 0.6% of the ministries' total budgets (NZD 94 million).

Many countries explained that they do not have a system to measure and monitor their budgets for disaster risk management and DRR because resources are allocated to several ministries/agencies and DRR activities are often funded through sectoral investments. In many cases, it is difficult to track sectoral investment, and DRR investments cannot be counted separately from entire project or budget reports. Not having a DRM budget monitoring system reflects a lack of coordination amongst ministries and results in the inefficient use of resources and inadequate funds. Without knowing their current budget status, countries cannot properly evaluate the current level of DRM and estimate how much funding is required for further DRM activities.

- **Romania:** The present context makes it impossible for authorities to have a realistic overview and correctly evaluate the required funding for further development. The main constraints are that funds are not specifically allocated for DRR, there are shortcomings in institutional cooperation, and there is a lack of long-term development plans.
- **Italy:** Resources are managed by a number of different institutions and bodies that aim to reduce the risk of both natural and man-made disasters according to their mandates. Aggregated data regarding budget allocations are not available at the moment. There is a need for improved coordination and resource rationalization, both of which will be met in the National Platform for DRR.
- **Nepal:** Budget allocations for disaster preparedness and mitigation are spread between different programmes and projects, thereby rendering such allocations ineffective. There is a need to develop and implement a financial tracking system to monitor all DRR related expenditures for mitigation, preparedness and emergency response.

Table 1.2a: Budget allocation for DRM compared to the national budget

Country	Report (Year)	DRR and prevention (%)	Relief and reconstruction (%)	Total (%)
Antigua and Barbuda	2011			0.040
Bangladesh	2011			4.500
Belarus	2013	0.16	0.16	0.320
Bolivia	2011			0.150
British Virgin Islands	2011			7.000
Chile	2011			0.030
Chile	2013			0.040
Colombia	2011			0.115
Colombia	2013			0.520
Cook Islands	2012	0.600		
Dominican Republic	2013	0.050	1.000	1.050
Ecuador	2013	0.300	1.600	1.900
El Salvador	2011			0.001
Haiti	2013			~15.300
Indonesia	2013	0.286	0.413	0.699
Iran (Islamic. Rep. of)	2013	2.000	3.000	5.000
Japan	2011			1.200
Lesotho	2011			0.005
Malawi	2011			0.016
Marshall Islands	2011			1.090
Mexico	2013	0.100	3.100	3.200
Mozambique	2011	2.490	2.710	5.200
Mozambique	2013	4.610	0.350	4.960
Nepal	2011		5.000	
Nigeria	2011			1.000
Palau	2012	0.300		
Palestine (State of.)	2010			2.260
Palestine (State of.)	2013	0.850	1.060	1.910
Papua New Guinea	2012	0.100	1.000	1.100
Peru	2011			0.180
Peru	2012			1.100
Romania	2013	0.002		0.002

Table 1.2a cont.

Country	Report (Year)	DRR and prevention (%)	Relief and reconstruction (%)	Total (%)
Samoa	2013	0.500	3.000	3.500
Slovenia	2009			0.400
Slovenia	2013			0.340
Sri Lanka	2011			2.580
Sri Lanka	2013	3.000	6.000	9.000
Tanzania	2013	1.000	2.000	3.000
Timor-Leste	2010			>1.000
Turks and Caicos Islands	2011			0.700
Vanuatu	2011			0.160
Zambia	2011			5.000

Source: HFA Progress Report for each country.

With regards to absent monitoring systems, some countries have already made efforts to remedy the situation. Consideration should be given to the development of a monitoring system that enables better tracking of DRR spending and investments across all agencies. Such a system should be relatively easy to design and is dependent upon a) the determination the activities by ministry and agency that will be tagged as DRR and b) the consistent use of this template to conduct regular reviews of relevant budget expenditures. The resulting information would enable stakeholders to analyze trends in DRR spending and contribute to strengthened strategic decision making for DRR investments and programming. It would also assist in measuring progress with respect to DRR mainstreaming. The Cook Islands uses budget tagging in the field of climate change budgeting, which shows that designing and employing tracking systems is relatively easy once all stakeholders agree what constitutes DRM and DRR within each framework.

- **Sri Lanka:** The government has invested a considerable amount of money to implement DRM projects in various sectors. Most support DRR directly and indirectly but the National Budget Department does not have a mechanism in place to account for investments in the DRR sector. Therefore, the Disaster Management Centre has taken the initiative to establish a DRR project monitoring web portal to fill the gap.
- **Pakistan:** Efforts have included introducing a dedicated budget line for disaster management in the budgeting system for regular annual allocations at national, provincial and district levels. This will feed into the implementation of a public sector development programme on DRR. The National DRR Policy recommends that a separate and dedicated budget line for DRR be created at federal, provincial and district levels.
- **Korea, Republic of:** The country has tried to minimize disaster-related damage by shifting from restoration programming to prevention-focused investment. Korea's planning includes mid and long-term disaster investments in the national financial plan to ensure consistency in DRR investment. In addition, this has allowed the Ministry of Strategy and Finance to organize the Investment Coordination Committee for efficient inter-agency investment.
- **Fiji:** Though there is no specific DRR allocation in the budget, each ministry undertakes a range of DRR activities under other budget headings. To compile a better monetary picture, and as an outcome of this HFA review, a request will be initiated

to the Ministry of National Planning for each ministry to report on planned DRR activities in every quarterly progress report.

- **Cook Islands:** There is no mechanism or standard methodology for tracking DRR spending within the Cook Islands. One advancement however, is that a climate change programme category has been developed for infrastructure projects and a similar system for tagging DRR spending would enable improved monitoring of government and donor spending.

The lack of DRR financial monitoring stems from an inadequate understanding of *what DRR is* and *what constitutes DRR*. Creating a comprehensive DRM plan and/or clearly placing DRR in an economic development framework would help national stakeholders understand the concept and by default define what represents DRR and how much funding is allocated.

- **Samoa:** There is presently no specific budget line for DRR. Moreover, many stakeholders still do not grasp the DRR concept despite the fact that many agencies are already implementing DRR related projects/activities. This highlights the need for sector-wide awareness of DRR, as well as making it compulsory that all ministries identify DRR activities within their own budgets. The upcoming development of the National Disaster Management Plan (NDMP) Implementation Plan will contribute considerably towards rectifying this problem.
- **Malaysia:** In the Ninth Malaysia Plan from 2006 to 2010, the government spent about USD 2 billion (RM 6 billion) to deal with multiple hazards including flood mitigation, multi-hazard monitoring and early warning systems. The government will continue its efforts during the Tenth Malaysia Plan (2011-215). Approximately USD 1.7 billion (RM5 billion) has been allocated for programmes for flood mitigation, forecasting and warning facilities, as well as the development of disaster preparedness, community awareness programmes and flood hazard maps.

Creating a DRM single purpose fund or programme that covers various projects also helps stakeholders create budget estimations because it generates a specific budget line for DRM. Latin American countries often utilize this method and some now have the capacity to track their DRM investments (Box 3).

Table 1.2b: DRR/prevention and relief/reconstruction allocations

Country	Report (Year)	DRR and prevention (%)	Relief and reconstruction (%)
Afghanistan	2013	30	70
Armenia	2013	80	20
Costa Rica	2013	30	70
Grenada	2013	80	20
Honduras	2013	31.37	65.78
Kenya	2013	25	75
Niger	2012	40	60
Niue	2012	70	30
Rwanda	2012	25	75
Sudan	2013	20	80

Source: HFA Progress Report for each country.

Box 3: Exceptional Cases – Detailed budget reports from Japan and Mozambique

✓ **Japan:** The national budget for disaster management stood at approximately JPY 1.1 trillion in the 2010 fiscal year and JPY 3.8 trillion in the 2012 fiscal year. The budget was allocated in 2010 and 2012 respectively to the following fields: scientific technology research (JPY 7.7 billion and JPY 29.5 billion), disaster prevention and preparedness (JPY 216.5 billion in 2010) and disaster prevention management (JPY 530.4 billion in 2012), national land conservation (JPY 646.4 billion and JPY 790.5 billion) and disaster recovery and reconstruction (JPY 219.3 billion and JPY 2.37 trillion).

✓ **Mozambique:** Though the country experienced difficulties in tracking DRR sectoral budget allocations before 2009, data shows that USD 592.9 million has been allocated to DRR between 2009 and 2011. This represents around 5.2% of the national budget. Resources have been used to strengthen early warning systems and for monitoring and assessment purposes. The amount committed rose from 2.3% in 2009 to 6.5% in 2011. Over 90% of DRR resources have been allocated to development activities (dams, ponds, irrigation schemes and conservation agriculture) and 2% to post-disaster reconstruction in the Zambezi Valley and along the Save River.

- **Colombia:** The Adaptation Fund was created in 2010 by the Ministry of Finance and is responsible for the budgetary analysis of disaster prevention and reconstruction. The Fund promotes mitigation and DRR measures and the Colombian government is now aware about how much money must be spent in each phase of the disaster risk management cycle.
- **Mexico:** According to the Federal Budget and Fiscal Responsibility Law, the proposed annual expenditure budget of the federation has to include budget lines for the Natural Disaster Prevention Fund (FOPREDEN), the Natural Disaster Fund (FONDEN) and the Fund for Assistance of the Affected Rural Populations by Climate Contingencies (FAPRAC).
- **Peru:** A National Budgetary Programme for Vulnerability Reduction and Emergency Response was created where roughly 1.1% of Peru's national budget is dedicated to DRM; an increase of 64% since 2009.

Even if budget-monitoring systems are in place, gaps remain if the results are not analyzed. After a financial monitoring system is developed a sound analysis must be made to estimate the required investment and help inform decision making on prioritized policies.

- **Guatemala:** Despite the existence of a financial tracking system, gaps still remain. Analytical information is not followed and/or shared making it difficult to know how money was spent on DRR.

2 Competing priorities

Several countries were confronted with competing priorities which resulted in insufficient financing for DRR. In many countries DRR is not a high priority and policymakers tend to allocate much greater financial resources under budgetary constraint to other urgent needs such as poverty reduction, education and public health. It is also difficult to provide a persuasive argument why there is a sense of urgency surrounding DRR when the threat is not perceived as immediate. Challenges often leads to problems securing financial resources and severe budget constraints.

- **Cook Islands:** DRM has yet to be widely accepted as a national priority in order to secure adequate budget allocations, the reality being that there are other pressing priorities (infrastructure, education, health, water and sanitation) competing for the same pool of government funding.
- **Guatemala:** The national budget is normally designed to cater to the immediate demands of the

utmost importance (priorities), and initiatives related to disaster prevention tend to be postponed.

- **Sierra Leone:** DRR is not given the same attention as other daily issues. Sierra Leone is faced with budgetary constraints and there are many other development areas that require urgent government intervention.

In the DRM cycle, response, recovery and reconstruction also places pressure on the allocation of DRR budgets. Immediate reconstruction and compensation for victims is common in the majority of cases. In such situations, budget restructuring following a disaster often prioritises reconstruction at the expense of DRR.

- **Ethiopia:** Due to an increasing number of disasters, response measures have placed pressure on available resources. More resources and long term funding are needed as emergency relief operations are prioritized despite the paradigm shift.
- **Kenya:** The frequency and severity of the disasters mean that most of the available funds are channeled towards response, leaving little or none for DRR. Priority for response and poverty eradication has continued to supersede DRR.
- **Honduras:** Investment in DRR is minimal compared to the investment in emergency response and reconstruction. Furthermore, the vicious cycle of using development funds for rehabilitation and reconstruction prevents Honduras from moving out of under-development.

Absent or mixed priorities is often a function of the difficulty in explaining the benefits of DRR investment and estimating the necessary costs. As seen in the case of Romania, a lack of a cost benefit analysis for DRR programming gives stakeholders the impression that spending on DRR is an "unjustified expense" rather than "profitable investment." The progress on cost benefit analyses is explained under section 3.3.

- **Ghana:** At present DRR cannot be considered a priority at all levels of government. Many institutions executing development projects do not see the immediate benefit in DRR, while others are not prepared to shoulder the extra costs associated with DRR activities. Unaware of the potential benefits of DRR, many institutions fail to pay attention to it.
- **Mozambique:** DRR costing is not undertaken and difficulties remain in estimating the resources required for DRR that consider climate change impacts.
- **Romania:** Some preventive measures have been labeled as "unjustified expenses" instead of "profitable investments."

3 Dependence on external/donor resources

Several countries reported being dependent on donor assistance. Considering the heavy dependence of some countries, analyzing the national budget alone may overlook several important details.

- **Djibouti:** The lack of financial capacity at the national level dictates that the country is dependent on external funding. Financial resources that come from the international community therefore play an important role in DRR.
- **Marshall Islands:** Domestic DRM and CCA financing accounts for only 46% of allocations in 2011. Donors provide the remainder of funds.
- **Mozambique:** International donors have committed more resources (USD 317.2 million) than the government (USD 275.8 million), with 53.5% of total resources allocated to DRR between 2009 and 2011.

Though external financial resources are extremely helpful for countries with constrained budgets, this could create new challenges. Aligning donor support with national priorities and operational capacities remains problematic. Greater coherence, sustainability and efficiency would result from strengthening a country driven approach to DRM and climate change programming.

- **Cook Islands:** Donor funding is not always coordinated and aligned with government priorities, which increases the national coordination and reporting burden.
- **Grenada:** In most cases, DRR programming has largely been linked to external funding and not to a human resource and financial strategy that has been adopted at national and sectoral levels.
- **Samoa:** The increase in large donor funded projects for climate change and DRM has led to operational, coordination, monitoring and management challenges. DRR projects can have long time horizons and are operationally complex. In the context of escalating donor support, there is the danger that relevant administrations will become swamped by increasingly complex and competing project management demands.
- **Tanzania:** Funding and resources provided by the donor community are bound to specific activities and timeframes and are not sustainable in the longer term. The challenge with all support to disaster risk management is that it is project based and once projects are finalized resources are no longer available.

Core indicator 1.3

Community participation and decentralization is ensured through the delegation of authority and resources to local levels

1 Legislative and institutional decentralization

Countries identified the legislative and institutional arrangements – including laws, guidelines, plans and organizations – that can support local level DRM (**Table 1.3a**). Many countries addressed the institutional role of local governments in emergency response and preparedness while some referred to the role of local government in comprehensive DRM. Reflecting on the increasing awareness that risk is embedded in development processes, many countries highlighted in 2011-13 the role of local governments in development planning and policies. Delays in the integration of DRM in development planning at the national level only hinders the process at the local level.

- **Indonesia:** Not all districts and cities have included DRR in their development programmes and budgets. DRR needs to be mainstreamed in a more consistent manner into the medium term development plans, as well as in the strategic and annual plans of various local government offices.
- **Ecuador:** The country has a decentralized structure for DRR that has worked effectively since 2011 (with the creation of the Committees of Disaster Management at the national, regional and municipal levels). The National System for Disaster Risk Management created guidelines to help municipalities include DRR in their development and land use plans.
- **Nepal:** Most small-scale development initiatives are carried out through local user groups. Development of decision-making, impact evaluation and monitoring tools for local user groups will be an effective way to incorporate DRR in development initiatives.
- **Fiji:** The National Disaster Management Office currently carries out its DM responsibilities through the local disaster management committees and village/settlement councils, while DRR responsibilities are entrusted to development communities. Unclear policies in terms of responsibility for DRR at the sectoral and local levels are problematic and need to be addressed in the National Disaster Risk Management review. Planning institutions and sector ministries need to fully internalize the need for DRR at the national level in order for commitment to feed through to provincial and local levels. The disconnect between DRM, development and climate change activities initially clouded the judgment of local government and communities on their DRM roles, particularly with regards to coordination during disasters.

Common problems under this indicator involve the flow of information and coordination responsibilities. The role of the national government in providing local governments with an enabling environment is vital for facilitating local level DRM policies. Effective DRM needs both national and local support and a clear exchange of information and lessons learned. Vertical coordination between national and local level governments must therefore be improved with each role and responsibility clarified. Especially important is coordinating the flow of information, which is not only vital in emergency management but also critical in every phase of DRM.

- **Indonesia:** Distribution of roles and responsibilities between national and local DM agencies needs to be clarified and harmonized. The challenges to decentralized disaster risk governance lay with the country's unclear legal and regulatory frameworks as they are still under development

Table 1.3a: Examples of local institutional frameworks

Country	DRM Organization	Plan
Botswana	District Commissioner's Office District Disaster Management Committee	
Bulgaria		Municipality and community emergency plans
Chile	Regional Directorates of the National Disaster Management Office Local Offices of Civil Protection and Emergencies	
Colombia	Local and Regional Committees for DRM	
Cook Islands	DRM Committee (including Disaster Coordinator)	Disaster Management Plan
Djibouti	Permanent Regional Offices for DRM	
Dominican Republic	Municipal Committees for Risk Management and Prevention (CMPMR)	Manuals of Functioning for the CMPMR Risk Management and Emergency Plans
Ecuador	Committees of Disaster Management at regional and municipality levels.	
Haiti	Communal and Departmental Committees for DRM	
India	Disaster Management Authority at the state and district levels	State Disaster Management Policy
Indonesia	Local DM Agency at the provincial and district/city levels	Province DM Plan
Jamaica	Parish Disaster Coordinator	
Japan		Local Disaster Prevention Plan at prefecture and municipal levels
Kenya	Disaster Management Committee at the district, divisional and locational levels	
Korea, Republic of		Comprehensive plan (every 5 years) Implementation plan (annual)
Lao PDR	Disaster Management Committee at province, district and village levels	
Malawi	Civil Protection Committee at district, area and village levels	
Mexico	Local Civil Protection Systems	
Morocco	Prefectural and Provincial Cells for Prevention and Management of Risks	
Nepal	Local Disaster Management Committee	District Preparedness Plan

Table 1.3a cont.

Country	DRM Organization	Plan
New Zealand	Civil Defense Emergency Management Groups at the regional level	Civil Defense Emergency Management Plan for the regional level
Nigeria	State Emergency Management Agency Local Emergency Management Committee	
Pakistan	Disaster Management Authority at the provincial, regional and district levels	Disaster Management Plan at the provincial and district levels
Palau	State DRM Coordinator State Disaster Management Committee	DRM Plan at the state level
Sierra Leone	District Disaster Management Committee	
Solomon Islands	Provincial Disaster Office	
Sweden		Local Acton Plan
Tanzania	Disaster Management Committee at regional, district and Shehia levels	Zanzibar DRR Policy (draft) Zanzibar Emergency Preparedness and Response Plan (draft)
Thailand		Provincial Disaster Prevention and Mitigation Plan
Turkey	Provincial Disaster and Emergency Directorate	
Vanuatu	Provincial Disaster Committee	
Zambia	District Disaster Management Committee	

Note: The examination of the name of the organization and plan is not enough to determine if the established organizations and plans are for disaster management or disaster risk management *inclusive of DRR*. Selection was made on the basis of organizations and plans that appeared to include a DRR component, as described by each country.
Source: HFA Progress Report for each country.

(and have been since the early 2000s). This has made it somewhat difficult to establish a coordinated and integrated working arrangement in DRR between the National Agency for Disaster Management, local government sectoral offices and local DM agencies. DRR programme planning needs to be synchronized between central and local level governments.

- Cook Islands: In the past, there have been challenges with respect to coordination between national and Outer Island levels. This relates mostly to the role of the police and officials from line ministries stationed in the Outer Islands. For coordination purposes, all communication from Outer Island to the national level is supposed to go through the Island Council, yet police and line ministry officials tended to report directly to their national counterparts rather than using the Island Council to reach the Emergency Management Cook Island (EMCI). EMCI recognizes the Island Council as the central channel for information and that DRR material, including initial damage assessments, needs to be communicated through them.

Another challenge is with regards to the legal aspect. As the authority of government stems from law, legal backing is needed for local government to implement any activities, and this includes DRR and DRM. Some countries still lack the legal backup

(such as a DRM Act) that could provide local governments with the authority to act. In cases where decentralization is defined in a DRM Act, some local statutes do not include DRM in the responsibilities of the local government. The lack of coordination and legal inconsistencies between local government decrees and specific DRM acts makes the role of local government unclear, and local level implementation and enforcement of DRM policy difficult or close to impossible. The discrepancy or lack of mutual understanding between DRM and general decentralization policies at the national level contributes to this situation, which can be replicated at the local level.

- **Palau:** The National Disaster Risk Management Framework does not make adequate provisions for linkages between state and national level DRM planning. The framework also does not document the roles and responsibilities of the state and community level organizations and invest them with any authority.
- **Solomon Islands:** Legal authority has been given to the provincial government for DRM as per the National Disaster Council Act. However, this is not specifically mentioned in the Provincial Government Act – making implementation of DRR at the provincial level challenging. Misalignment of policies in terms of responsibility for DRR at the provincial level suggests the need to rectify this oversight.
- **Lesotho:** Disaster risk management has been institutionalized in the Prime Minister's Office but not in the Ministry of Local Government and Chieftainship Affairs – where authority of local government guidance is located. At the local level, disaster risk management is the responsibility of the Ministry of Local Government. The Local Government Act does not cover disaster risk management functions and there is no DRR budget at the local level. There are also no disaster risk management functions set aside for local government employees.

A third challenge is that financial, human and technical constraints at the local level are often addressed as singular challenges. Decentralization processes are relatively new in many countries and local governments still do not have the capacities to implement and enforce DRM policies.

- **Indonesia:** Challenges in Indonesia include lack of capacity, commitment and consistency in developing strong DRR regulatory frameworks and policy environments in the regions. Many local DM Agencies have only been recently established and are encountering difficulties in maintaining qualified staff members due to local politics and lack of local resources for DRR.
- **Mozambique:** Current decentralization processes, including participatory decision making, is partly limited by financial resources and the lack of local technical capacity to absorb resources decentralized to districts. More on-the-job training and human resources are needed for the creation of a technically skilled workforce that can ensure the comprehensive implementation of DRR and environmental aspects at local level.

The final barrier under this section is that some countries report that lack of awareness at the local level serves as a major constraint. A paradigm shift from discarding a reactive approach in favour of a proactive one – with a DRR focus – has not materialized in some countries at the local level. The ways in which local governments are dependent on upper administrative tiers has contributed to the low prioritization of DRM nationwide. Awareness should be raised especially amongst decision makers and civil servants at the local level.

- **Pakistan:** Lack of awareness amongst local communities and departments about the importance of investing in preparedness, prevention and DRR is another challenge. By tradition, local communities have dealt with disaster by using reactionary approaches with little focus on the mitigation and prevention aspects of disaster management.
- **Colombia:** Even if DRR is decentralized in a legal/political sense, municipalities do not necessarily place DRR on their agendas. As a consequence, when disasters occur, municipalities are dependent on the regional and the national levels and forget their commitment to DRR, emergency and recovery.

- **Indonesia:** The lack of capacity in the regions has become an obstacle because many civil servants undergo frequent rotation, so knowledge is lost with each rotation and one may not have a full understanding of their duties and responsibilities. Along with this the understanding of DRR of a head of region and/or members of the local parliament can be limited; DRR is consequently not a priority issue.

2 Financial decentralization

There are two main sources of financing for local governments: financial transfers from national to local governments (e.g. subsidies) and locally produced financial resources (e.g. local taxes, bonds or fees). Compared to the number of countries where institutional arrangements are explained, fewer have reported their fiscal decentralization procedures (Box 4). Legal arrangements for financial decentralization are inadequate in many countries, which prevents sufficient allocation of funds from the national to local levels.

- **Fiji:** Resources are not delegated to the local levels. The Disaster Management Committee exists at the district level while budget allocation for DM is centralized within National Disaster Management Office and allocated to the local level as necessary.
- **Papua New Guinea:** The delegation of authority and resources for DRM is not explicit in existing DRM policies and regulations. There are no legal provisions that make it mandatory for local level governments to allocate budgets for DRM on a regular/systematic basis. Hence, resources available for DRM at the local level remain insignificant.
- **Sri Lanka:** Disaster management is not a subject decentralized to provincial governments. Therefore there is very little allocation of funds for disaster management activities. Local authorities in disaster vulnerable areas are financially weak and need outside assistance to implement DRR activities to improve citizen's resilience.

The financial allocation for DRR or DRM at the level of local government is not satisfactory in many countries. Only Turkey reported having specific rules for local public financing. Local governments in most countries depend on financial transfers from upper tiers of government and face similar challenges to those of national governments (e.g. competing priorities) (Box 5).

- **China:** Civil Affairs departments at the municipal and county levels are inadequately funded with regards to disaster reduction and relief. Local governments depend heavily on financial investments handed out by central government, and disaster reduction and relief budgets are low at all levels.
- **Pakistan:** District governments have limited capacities to generate local resources for finance development schemes, including disaster management. They are solely dependent on budgetary allocations/grants from provincial

Box 4: National government subsidies tailored to the local context in Australia

The National Partnership Agreement on Natural Disaster Resilience is an agreement between the federal and state governments. It establishes the mechanism through which the federal government provides states with approximately USD 27 million a year to invest in disaster mitigation projects which are prioritized in accordance with respective state-wide natural disaster risk assessments. Through the agreement, states have increased their flexibility to effectively meet the requirements of local communities threatened by disasters in the context of risk priorities. This recognizes the fact that jurisdictions have different priorities that may change over time.

governments. Provincial governments are faced with the challenge of budgetary deficits and find it hard to spare enough resources for the district governments to implement development activities in the field of disaster management.

- **Turkey:** Provincial governorships have to transfer a minimum of 1% of their budgets to the Provincial Disaster and Emergency Directorates.

As seen in Section 1.2, many countries do not have budget tracking systems for DRM, which leads to difficulties in tracking and estimating DRM allocations from the national to local levels. Local governments rarely have budget tracking systems for DRM. Monitoring mechanisms are needed to identify how governments finance DRM activities at all levels of government, especially considering the increasing role of local government. A very small number of countries (Ecuador, Indonesia, Mozambique and Romania) reported concrete numbers for DRR activities at the local level.

- **Ecuador:** Between 2006 and 2012, Ecuador increased the transfer of resources to the Decentralized Autonomous Governments (GAD) by 140%. In 2012, the Central Government transferred USD 2.45 billion so that the GAD is responsible for investing in risk management in the various municipalities. Guayaquil and Quito, home to approximately 25% of the national population, spent between 1% and 5% respectively on their Centers of Public Safety, which implement risk management activities.
- **Mozambique:** Local governments allocate part of the state budget to DRR activities as long as they are in line with priorities agreed upon with local communities (though they are often not explicitly labeled as DRR activities). Close to USD 193.3 million from the state has been allocated to local governments (provinces and districts) for DRR activities in 2009-2011. On average, 32.6% of total DRR resources were allocated to local levels.

3 Community participation and volunteer sector

Also explained in the country reports were policies for community participation and mobilization of volunteers. The community and civil society sector play a vital role in DRM in many countries, as their activities are rooted in a local context and address local risks. NPOs/NGOs are active in many countries in the field of DRM. Volunteers are also an integral human resource especially in the response phase. In Germany, more than 1.2 million citizens work in voluntary fire brigades. In Australia, some 500,000 people volunteer their time and services to enhance

Box 5: Financial arrangements at the local level

- ✓ **China:** Up to 23 provinces, 176 cities and 932 counties have special funds in place for geological disaster prevention and control. However, some cities and counties have not integrated the disaster reduction and relief fund into their financial budgets. Those that do may not allocate funds or do so insufficiently to DRR and DRM budget lines.
- ✓ **Pakistan:** Although provincial governments have made allocations to dedicated DRM institutions, there is still a need for enhanced provisions and dedicated budget lines for the effective implementation of DRR plans at the local level.
- ✓ **Romania:** Commonly, local authorities face many challenges with a limited amount of money. Emergency situation funds are sometimes used to cover more urgent needs. If the community is not facing a disaster at a particular moment funds are often redirected to other areas. The absence of legal pressure for DRR investments and the lack of interest from local authorities often results in the reallocation of funds initially earmarked for DRR.

local capacity in preparing for, responding to and recovering from emergencies and disasters. In Japan, the volunteer fire corps enlists semi-government employees in case of disaster. Nigeria has 6,408 registered volunteers thereby enabling the national government to extend disaster management services to the grassroots level. In Haiti, more than 10,000 volunteers are part of a network of 13 regional committees.

One of the biggest challenges in effectively utilizing community and voluntary capabilities involves the sporadic and scattered nature of NPO/NGO activities, which fosters unsustainability and poor coordination. National and local governments should institute better coordination measures, that encompass the assortment of activities and the spectrum of NGOs and volunteers, so as to avoid duplication and utilize limited resources effectively. The alignment of the activities of the government and the civil sector is desirable, with a common prioritization of target areas and the integration of good practices developed by NGOs within national and local policies.

- **Vanuatu:** NGOs are using a variety of different tools, systems and approaches, which has led to mixed messages on the ground. Due to resource constraints National Disaster Risk Management Office (NDRMO) is currently unable to play a leading role in overseeing, prioritizing and coordinating the efforts of the many NGOs engaged in delivering community based programmes. At present, the NDRMO's community awareness activities are largely opportunistic (e.g. conducted when on assessment missions) rather than strategic in targeting the most vulnerable communities. Concerns have also been raised over the sustainability of some of these activities (e.g. where community based DRR programmes have been implemented as a one-off intervention with no follow up). Sustaining links between NPO efforts and formal government DRR processes is a little more problematic, especially in the absence of sub-national government support. A number of community disaster committees have been established that provide effective points of entry for DRR.
- **Fiji:** In the last decade, NGOs and Faith Based Organizations (FBOs) have grown in capacity and have resources (human, data and financial) that can be leveraged in preparedness and response situations. NGOs/FBOs have extensive community outreach, however in new National Disaster Management arrangements it is not clear how NGOs/FBOs are integrated into the national arrangement. Negotiations and consultations are needed for better coordination, particularly as procedures involving NGOs and FBOs in national preparedness and response activities vary across sectors. As an immediate priority, NGOs and FBOs have identified that a national coordination forum is needed to share information and consult on how they can be better integrated into national response arrangements.

A secondary challenge is that the capacity of the community and voluntary sector in many countries must be enhanced for which more resources need to be set aside for volunteer and NGO training.

Samoa: Implementation of DRM activities at the community level has been hampered because few NGOs have the capacity to design, develop, implement and evaluate DRM programmes. This has created a backlog in the implementation of crucial Community Disaster and Climate Risk Management programme.

- **India:** To harness the potential of youth organizations and support community based DM initiatives; a comprehensive programme has been launched to boost the awareness, sensitization and training of each organization. A total of 61,000 cadets have been trained at their regular training camps and National Integration Camps.

Third, citizen awareness is inherently important in facilitating community participation. A lack of awareness comes from a lack of information, dependent mindsets, reactive approaches that focus on response, and low hazard profiles. Raising local awareness, as explained in Section 3.4, is important in this regard.

- **Indonesia:** Community participation needs to be enhanced by building a sense of ownership for DRR activities (amongst stakeholders). Lack of access to information concerning DRR may hinder community participation in disaster risk reduction. Because of this, the community outreach capacity of local government needs to be enhanced.
- **Romania:** Public participation in DRR or disaster response is often limited because of the belief that it is the authority's responsibility to ensure their safety. With insufficient information regarding ongoing situations and required actions, the public is not motivated to collaborate with the authorities.
- **Malawi:** Community participation is encumbered by communities' mindset that mainly focus on disaster response as opposed to DRR.
- **Palau:** Perceived limited hazard profile in Palau impedes community based interest and activism in DRM; a situation that is exacerbated by high levels of community dependency on the national government.

Fourth, some countries have witnessed a decrease in volunteers due to social factors such as the change in residential patterns brought on by urban migration, depopulation and aging. This is a concern as the result is depopulated cities and villages (mainly in rural areas) wherein a great deal of elderly reside. This has increased the vulnerability of such areas and forces local and national governments to ask how they can maintain resiliency in such communities.

- **Germany:** With changes in demography and a more mobile population, the voluntary services have seen fewer new recruits in recent years. The inability to recruit young people into emergency services or rural volunteer fire brigades has reduced national capability to respond in a timely and efficient fashion to wildfires.
- **Japan:** Changes in social structure, living environments and lifestyles has led to an increased number of elderly people living alone and in sparsely settled areas, hampering the provision of mutual support systems for these residents.
- **China:** Many provinces send large numbers of migrant workers to urban centers while senior citizens and children remain at home. This makes it difficult to drive community disaster reduction in rural areas, especially in western and central regions. This has led to an uneven development of community disaster reduction between rural and urban areas.

Core indicator 1.4

A national multi sectoral platform for DRR is functioning

In more than eighty of the country reports it was outlined that governments have established a National Platform for DRR and DRM (see Table 1.4b at the end of this section). However, many countries do not have National Platforms as of yet and several countries reported having a platform to coordinate activities for emergency management.

1 National platform

There are common challenges for the effective implementation of national multi-sectoral platforms. First, the roles and functions of national platforms should be clarified. Many countries report having a national platform for DRM and DRR in place, with diverse objectives: from information sharing to coordination and decision making (Box 6). Additionally, the structure of the sub-committees under the national platform shows a regard for diversity depending on a country's needs and institutional structure (Box7).

For the sake of effectively coordinating multiple members, the platform needs to clarify the overall objectives and role of each member. The definition of roles and functions of the platform and its members is important in avoiding duplicative efforts in countries that already have similar, and sometimes, overlapping schemes. It is also important for raising awareness and the commitment of national platform members, as well as society on the whole. Rulemaking, including legalization, is required for countries that lack the necessary level of institutionalization. Integrating CCA issues in DRM platforms is another emerging challenge (Box 8).

- **Australia:** Challenges for the future include ensuring the effective management of government decision making and consultative forums to ensure a continued clarity of roles, responsibilities and work plan. There is also a need to ensure representation in the platform so that the programme remains relevant and evolves with changing priorities and agency responsibilities. Other challenges include bringing together competing priorities for emergency management and disaster resilience across federal, state and local levels and more proactive engagement of the private sector and non-government agencies.
- **Indonesia:** The public is largely unaware of the achievements of the National DRR Platform. In addition, its roles and responsibilities need to be redefined. The existence of the National DRR

Box 6: Diverse types of national platforms

- ✓ **Germany:** The German Committee for Disaster Reduction (DKKV) is a registered association under private law and not a government authority. The DKKV's core funding for its activities is obtained through a membership fee. The DKKV is entitled to accept tax-deductible donations, as it is a certified non-profit organization. Because it is a non-government association, it is not directly involved in decision-making processes at the government level. The challenge that remains is to convince decision makers and politicians to reach risk sensitive decisions by providing sound inputs.
- ✓ **Poland:** The Polish National Platform for DRR and HFA is focused on information exchange and improving existing solutions. It is not a coordination body for DRR. Discussions about area of common activities, functioning and sources of financing are therefore crucial.

Box 7: Diverse sub-committees

- ✓ **Trinidad and Tobago:** The platform consists of five sub-committees – one representing each HFA priority. It meets on a monthly basis to share information, identify gaps and collaborate on interventions to improve disaster management capacities across the country.
- ✓ **Tanzania:** There are two technical committees under the platform; one is for slow onset disasters (e.g. drought, food security, environmental issue, pest infestation and epidemics) and the other covering rapid onset disasters such as fires, earthquakes, cyclones and floods.

Box 8: National platform for climate change and DRM in the Cook Islands

While developing the Joint National Action Plan, it was decided that the Climate Change Country Team (CCCT) and the DRM NAP Advisory Committee should join forces and be rebranded as the Cook Islands National Platform for CC and DRM. Since its establishment in 1998, the CCCT has proven to be a diverse and well-functioning forum where climate change stakeholders can share information. The National Platform builds on the strength of the pre-existing CCCT and aligns itself with the International Strategy for Disaster Reduction (ISDR) model for national DRM platforms. It is expected that this will secure continued financial support for the forum, which was a concern following the termination of previous climate change funding.

Though progress has been made, members from different camps are hesitant to work together. From the DRM side, this relates in part to the open consultation style of the CCCT, whereas DRM authorities favored a more direct implementation approach. For their part, some CCCT members are reluctant to acknowledge the strong links between climate change and DRM, preferring to see DRM as an emergency management issue and climate change as an environmental issue.

The different meaning of the word *mitigation* in DRM and climate change language complicates discussions and mutual understanding. There is a need to promote greater understanding amongst members regarding the terminologies involved and the nature of the conceptual linkages between the two. Joint programming promoted by Emergency Management Cook Islands and CCCI through the Joint National Action Plan already sets the stage, and it is anticipated that harmonizing approaches, using the national platform as a marker, will increase with the experience gained from these joint initiatives.

Platform has not been made clear for government institutions at the central and local levels. Opening up better channels of information will help to clarify the existence of the DRR platform and its overall role in society.

- Sweden: Awareness of the national platform, its responsibilities and activities should be promoted in society and amongst the individual agencies that make up the platform. Better dialogue with the upper management of each agency must ensue and a consensus needs to be reached at the managerial level about the goals and activities of the platform.

A second challenge stems from the lack of institutionalization, and several countries have noted that sustainability and continuity can be assured through the institutionalization of membership and continuous involvement of representatives in the national platform.

- Indonesia: The representation of government ministries/agencies in the National DRR Platform has not been consistent. Government officials have not officially been assigned to represent their offices within the platform and members currently sitting on the platform are prominent individuals who tend to be very busy. It is therefore a challenge for government and non-government actors to conduct regular meetings.
- Pakistan: There is a need for a forum with formalized membership across all sectors, with defined

terms of reference, to provide policy inputs on various aspects of disaster management.

- **Jamaica:** Participation by some agencies has not been mainstreamed and is aligned with a specific person as opposed to a post. This affects overall quality and continuity of participation.

The third challenge is that sustainable funding schemes should be arranged to ensure platform members meet regularly and activities are carried out. A lack of capacity in the national platform secretariat, especially in terms of financial and human resources, has been mentioned as an additional barrier by some countries.

- **Indonesia:** One of the constraints is that prevailing regulations have yet to allow the multi-sectoral DRR platform to receive funding directly from the government. The National DRR Platform is also not supported by an executive office that is staffed by full time and dedicated personnel.
- **Kenya:** The platform is not legitimate, which means no guidelines have been set (within relevant ministries) on the allocation of funds and other resources to run activities at the national and local levels. Lack of budgetary allocations affects the frequency of consultative meetings, training sessions and implementation of DRR and DRM programmes.
- **Lao PDR:** National Disaster Management Office's capacity in terms of financial and human resources is a major constraint in the establishment and further engagement of a multi sectoral National Platform on DRR.

Fourth, all stakeholders should be included in the platform. Involvement of the private sector and civil society organizations is low and financial and personnel constraints hinder the addition of new members. Even when all related members are included, platform management in such cases might operate beyond the capacity of the lead agency and hinder effective coordination.

- **Dominican Republic:** More engagement of civil society, women's groups and the private sector is needed to improve the integration of all stakeholders in DRR.
- **Botswana:** The national platform needs to include members from private sector organizations. Insufficient resources within the National Disaster Management Office, which acts as a secretariat for the National Platform, restricts optimal functionality.

A fifth bottleneck is the scarcity of multi-sectoral platforms for DRR/DRM at the sub-national level. Some countries have already established such platforms (**Table 1.4a**). Vertical coordination between national and local levels is often difficult even with the establishment of an overarching platform. In the event that the establishment of a local platform is problematic, representatives of local government interests should be at least included in the National Platform.

- **Macedonia, FYR:** At the municipal level, the multi-stakeholder Local Council of NPDRR was formed to assess local risks and threats, coordinate resources and activities, organize rural and urban communities and cooperate with neighboring municipalities. When the situation exceeds municipal boundaries, Regional Councils of the NPDRR are set up to cover geographically close municipalities. These are tasked with organizing risk and threat assessments when local resources for response are depleted. They are also responsible for coordinating municipal resources and activities in a regional context and providing coordination with competent government bodies at the national level.
- **Nepal:** Multi-sectoral forums need to be developed so that networks of similar institutions are established at the local level. Such mechanisms will ensure the effective coordination of central level activities and turn them into local realities. A network of platforms should be developed at the regional level within the next two years, and at the District and Village Development Committees levels in the next five years.

Table 1.4a: Examples of sub-national and multi-sectoral platforms

Country	Name	Notes
Czech Republic	Regional platform	Moravian-Silesian region
Ghana	Regional Platform	Seven out of ten regions
Korea, Republic of	City/Province Disaster Safety Headquarters City/Province Safety Countermeasures Headquarters	
Tanzania	Regional Platform (established in 2011)	Zanzibar
Macedonia, FYR	Local Council of NPDRR	

Source: HFA Progress Report for each country.

2 Lack of national platform for DRR

At least fifteen countries clearly reported that they do not have a national platform for DRR. The reasons for not establishing a national platform were generally not provided but where an explanation was provided, this was often ambiguous. Antigua and Barbuda, for example, describe inertia in the absence of disaster management laws, while Mongolia's legislative process is described as too long and arduous. Several countries, including the United Kingdom, declare that existing institutional arrangements adequately perform the functions of a platform. However, other countries, such as Sierra Leone, find it difficult to ensure the continuous commitment of all stakeholders without having a formal national platform structure in place.

- **Antigua and Barbuda:** Until disaster management legislation, policy, strategy, plans and a review of roles and functions is completed, it is not practical to consider CDM/HFA implementation.
- **Mongolia:** With a view to establishing a national platform for DRR, a draft law is currently being developed that would amend Mongolia's Disaster Protection Law. The process is taking time because the process of introducing amendments is lengthy and bureaucratic.
- **United Kingdom:** In the UK the Civil Contingency Secretariat and the National Security Council perform many of the functions that the UN requires of a National Platform. For that reason, the UK has not developed a new multi-sectoral meeting platform.
- **Sierra Leone:** A key challenge in Sierra Leone is that assuring consistent commitment is problematic for many organizations. The establishment of a national platform is seen as a possible solution.

Some countries reported the existence of a multi-sectoral national platform for emergency response, which are considered to have the potential to be expanded and transformed into multi-sectoral platforms for DRR/DRM.

- **Lebanon:** The National Platform was established during the Lebanese Civil War in 1977 and mandated to deal with issues pertaining to relief and recovery. As such, its mandate and membership structure has become outdated and in need of overhaul. Membership must be expanded to include the Ministry of Environment, Ministry of Agriculture and Ministry of Information and Education, as well as all other relevant research and planning institutes. The National Platform must be modified in a way that encompasses preparedness and mitigation, relief, response, recovery, rehabilitation and reconstruction.

Table 1.4b: Examples of national multi-sectoral platforms for DRR/DRM

Country	Name of platform	Chair	Secret.	Finance & plan.	Sect.	Civil	Privt.	Acad.	Notes
Afghanistan	National Disaster Management Commission	National Disaster Management Authority		2	19	1	1	1	
Anguilla	Platform for DRR								
Argentina	National Platform for DRR	Ministry of Foreign Affairs and Ministry of Interior							
Armenia	DRR National Platform		DRR National Disaster Observatory	13	8	0	0	0	Other 9 organizations
Bahrain		Prime Minister Office		1	0	2	3	2	
Bangladesh	National Platform for DRR National Disaster Management Advisory Committee		Disaster Management and Relief Division		12	4			
Barbados	National Mitigation Council			2	15	10	10	2	
Bolivia	National Platform for DRR	Ministry of Defense		2	11	17	1	7	
Botswana					15	1			
Bulgaria	National Platform for DRR	Ministry of Interior		1	0	3	1	1	
Burkina Faso	National Council for Emergency and Rehabilitation	Prime Minister	Permanent Secretariat	1	31	2			Meet annually

Table 1.4b cont.

Country	Name of platform	Chair	Secret.	Finance & plan.	Sect.	Civil	Privt.	Acad.	Notes
Canada	National Platform for DRR (established in 2010)								
Chile	National Platform for DRR	Ministry of the Interior and Public Security							
China				2	34	2	0	2	
Colombia	National System for Disaster Risk Management (SNGRD)	President	National Unity for Disaster Risk Management	3	1	2	3	6	
Comoros	National Platform for the Prevention and Reduction of Disaster Risks	Ministry of the Interior		1	1	1	1	1	
Cook Islands	National Platform for Climate Change and DRM								
Costa Rica	National System for Risk Management	President	National Commission for Risk Prevention and Emergency Response	8	13	70,000*		20	
Croatia	National Platform for DRR (established in 2009)			1	20	4	0	1	
Cuba	National Staff of Civil Defense	President		24	187	1,200,000*	25	86	

Table 1.4b cont.

Country	Name of platform	Chair	Secret.	Finance & plan.	Sect.	Civil	Privt.	Acad.	Notes
Czech Republic	National Security Council, National Committee for Natural Disaster Reduction								
Djibouti	National Platform for DRR	Ministry of the Interior	Executive Secretariat of Risk Management and Disasters	2	10	6	2	2	
Dominican Republic	National Platform for DRM	National Emergency Commission		1	18	2	0	3	
Ecuador	Decentralized National System for DRM	State Department		2	43	2,100*	10	11	
Egypt	National Committee for Crisis/ Disaster Management and DRR			0	0	3	0	0	
Ethiopia	DRM Technical Working Group			2	6	45	0	4	
Finland	National Platform for DRR (establ. in 2010)			0	10	5	0	1	
Georgia	Inter-Agency Commission for Coordinating the Establishment of the United System of Crisis Management	Secretariat of the National Security Council		0	12	9	5	30	

Table 1.4b cont.

Country	Name of platform	Chair	Secret.	Finance & plan.	Sect.	Civil	Privt.	Acad.	Notes
Germany	Committee for Disaster Reduction		Federal Foreign Office	2	20	60	9	24	
Ghana	National Platform for DRR and CCA								
Greece	Hellenic National Platform for DRR	General Secretariat of Civil Protection		0	15	1	0	2	
Grenada	National Disaster Management Advisory Council	Prime Minister	National Disaster Management Agency						Meet once a month
Guatemala	National Dialogue Table for Management of Disaster Risk Reduction	Planning and Coordination Unit		2	20	5	2	8	
Haiti	National System for DRM	Civil Protection Department	Permanent Secretariat for DRM		15	15	1		
Honduras	National System for Risk Management	Ministry of Interior		2	5	6	1	1	
Hungary	National Platform for Disaster Reduction			2	6	6	4	4	
India	National Platform for DRR								
Indonesia	National Platform for DRR (established in 2008)				22	16			

Table 1.4b cont.

Country	Name of platform	Chair	Secret.	Finance & plan.	Sect.	Civil	Privt.	Acad.	Notes
Iran (Islamic. Rep. of)	National Platform for DRR	Ministry of Interior	National Disaster Management Organization						
Italy	National Platform for DRR (established in 2008)		Civil Protection Department						
Côte d'Ivoire	National Strategy for Disaster Risk Reduction	Prime Minister	Executive Secretariat	5	25	1	3	11	
Jamaica	National Disaster Committee	Prime Minister							
Japan	Central Disaster Management Council	Prime Minister	Cabinet Office	2	20	1	1	2	Meet three times per year
Kenya	National Platform for Disaster Reduction		Ministry of State for Special Programs	2	46	15	0	6	
Korea, Republic of	Central Safety Control Committee	Prime Minister		1	14				
Lao PDR	National Disaster Management Committee		National Disaster Management Office		13	0			Meet annually
Lesotho	National Platform		Disaster Management Authority		74	0			

Table 1.4b cont.

Country	Name of platform	Chair	Secret.	Finance & plan.	Sect.	Civil	Privt.	Acad.	Notes
Macedonia, FYR	National Platform for DRR			Ministries and Governmental agencies (32) Inspectorates (21) municipalities (85) Public enterprises and services, NGO's (42), Institutes, research centers and observatories (79), laboratories (173), Humanitarian Organizations (9) stress and trauma treatment organizations (11) Trading organizations relevant for DRR (21), the business community and religious communities					
Marshall Islands	National Disaster Committee, National Climate Change Committee			1	15	0	1	0	
Mauritania	National Platform for Risk Management		Ministry of Environmental Planning	5	15	7	4	3	
Mexico	National System of Civil Protection	Ministry of the Interior	National Civil Protection Council						
Mozambique	Technical Council for Disaster Management	National Institute for Disaster Management			17	22			
Nepal	National Platform		Ministry of Home Affairs						
Netherlands	National Steering Committee for National Safety and Security								
Niger	National Platform for DRR	Prime Minister		35	16	6	1	4	
Nigeria	National Platform for DRR		National Emergency Management Agency		27	50			

Table 1.4b cont.

Country	Name of platform	Chair	Secret.	Finance & plan.	Sect.	Civil	Privt.	Acad.	Notes
Niue	National Disaster Executive Council	Chief of Police		0	4	0	0	0	
Norway	National Platform for DRR			9	0	1	0	0	
Pakistan	National Disaster Management Commission		National Disaster Management Authority	2	2	1	1	0	
Palau	National Emergency Committee								
Panama	National Platform for DRR	Civil Protection Department	National System for Civil Protection						
Peru	National Platform for DRR	President		3	21	45	1		
Poland	National ISDR Committee		Institute of Meteorology and Water Management		13				Scientific
Portugal	National Platform			0	20	0	0	1	
Romania	National Committee for Emergency Situations								
Rwanda	National Platform for DRR	Minister of MIDIMAR	Ministry of Disaster Management and Refugee Affairs (MIDIMAR)	1	20	1	1	1	

Table 1.4b cont.

Country	Name of platform	Chair	Secret.	Finance & plan.	Sect.	Civil	Privt.	Acad.	Notes
Saint Kitts and Nevis	National Disaster Mitigation Council	Deputy Prime Minister							Meet quarterly
Samoa	National Platform for Disaster Risk Management Disaster Advisory Committee								
Senegal	National Platform for DRR	Prime Minister	Civil Protection Directorate	0	4	10	1	1	
Sri Lanka	National Disaster Management Coordinating Committee (established in 2007)	Ministry of Disaster Management	Ministry of Disaster Management	4	35	14	15	7	
Sweden	National Platform for DRR (established in 2007)			0	19	0	0	0	
Switzerland	Swiss National Platform for Natural Hazards (PLANAT) (established in 1997)			4	7	0	2	3	
Tanzania	National Platform for DRR (established in 2005)	Director of Disaster Management Department	Disaster Management Department of the Prime Minister's Office	2	25	4	6	3	Meet twice a year

Table 1.4b cont.

Country	Name of platform	Chair	Secret.	Finance & plan.	Sect.	Civil	Privt.	Acad.	Notes
Thailand	National Disaster Prevention and Mitigation Committee	Prime Minister							
Togo	National Platform for DRR	Ministry of Environment and Forest Resources		40	3	8	5	2	
Tonga	National Emergency Management Committee			0	2	1	0	0	
Trinidad and Tobago	National Disaster Reduction Committee (established in 2011)		Office of Disaster Preparedness and Management under Ministry of National Security	3	30	24	2	5	
Turkey	National Platform	Prime Ministry, Disaster and Emergency Management Presidency	Prime Ministry, Disaster and Emergency Management Presidency	1	14	9	3	7	
Turks and Caicos Islands					7	5			
United States of America	National Science and Technology Council's Interagency Subcommittee on Disaster Reduction				20+				Scientific information exchange

Table 1.4b cont.

Country	Name of platform	Chair	Secret.	Finance & plan.	Sect.	Civil	Privt.	Acad.	Notes
Uruguay	Coordination and Planning System of Integrated Risk Management in Uruguay	President							
Vanuatu	National Advisory Board on DRR and CCA		National Disaster Management Office	1	7	1	0	0	
Macedonia, FYR	National Platform for DRR				53	42			
Zambia	Disaster Management Consultative Forum				25	21			

Note: The examination of the name of the platform is not enough to determine if the established platform is for disaster management or disaster risk management inclusive of DRR. Selection was made on the basis of platforms that appeared to include a DRR component, as described by each country.
Note (2): Countries with an asterisk(*) might have provided an estimated summation for the number of participants who attended each meeting.
Source: HFA Progress Report from each country.

Notes

i The report for the 2009 – 2011 period requested total DRM budgets only. It was not asked how allocations were divided between DRR/prevention and relief/reconstruction.

Priority 2

Identify, assess and monitor disaster risks and enhance early warning

Core indicator 2.1

National and local risk assessments based on hazard data and vulnerability information are available and include risk assessments for key sectors

1 Multi-risk assessment

Many countries reported progress in carrying out risk assessments. Although few countries have multi-hazard risk assessments, the development and implementation of risk assessments for specific hazards is progressing well (see **Table 2.1b** at the end of this section). The terminology and definition of risk assessment can differ from country to country. For example, some countries talk about "probabilistic risk assessment" while others put risk assessment in a context based on past trend analyses or the risk assessments of public facilities/structures. Because there are limitations in knowing exactly how each country interprets risk assessment, all risk assessments (regardless of methodology or depth of assessment) have been listed and analyzed below. A definition or criteria of "risk assessment" should therefore be agreed upon for a more thorough and representative comparison.

Several challenges for promoting more widespread risk assessment were reported. The most pressing is the need for setting a national standard or framework for risk assessment. The lack of an existing standard is related to poor coordination and the implementation of multiple risk assessments by numerous organizations (often sectoral ministries and institutes). National governments need to play a stronger role in guiding data sharing and standardizing future risk assessments (Boxes 9 and 10).

- United Kingdom: A range of tools for multi-risk assessments exist in the UK although there is no overarching body that looks at all available resources or undertakes any quality control over them.
- Kenya: Assessments are disaggregated and scattered across different sectors and institutions. These institutions need to be coordinated so information can be shared with other stakeholders.
- Cook Islands: The current situation is fragmented with different government agencies carrying out their own assessments. No single agency is tasked with the collation of risk assessment information or for developing a central database that can be used to assess the social, economic and environmental impacts before and after a disaster.

Another challenge under this indicator is that most, mainly developing, countries reported that financial and human resource capacities are insufficient for

Box 9: China's challenges of transformation, from single to multi-risk assessments

China has only recently started to conduct disaster risk assessment; as a result, its system is immature and only now moving from assessing a single disaster risk to a multi-disaster risk. China also faces challenges in establishing normative and unified disaster risk management data, which means analysts face the arduous task of building standardized stores of information. Secondly, China lacks an efficient and comprehensive data-sharing platform at the national level; consequently, data resources from various departments have yet to be integrated and optimized. Thirdly, China needs to improve the accuracy of its natural disaster, environmental, economic and social data.

implementing or updating multi-risk assessments (Box 11). Risk assessment requires a high level of technical skill and intensive financial resources. In many cases, international funding has filled resource gaps in developing countries. Hydro-meteorological and geological monitoring systems, explained in Section 2.2, are a precondition for carrying out risk assessments. Insufficient development of such monitoring systems also prevents the implementation of a well-rounded risk assessment.

- Cook Islands: The technical skills and resources needed to conduct in depth hazard assessments are limited.
- Germany: An exhaustive examination and compilation of all available information has not taken place due to a scarcity of resources.
- Kenya: There is a lack of appropriate equipment for monitoring as well as a lack of adequately trained personnel.
- Honduras: Because of financial constraints, risk assessments are mainly carried out by international organizations.

Box 10: Leadership of national government in the standardization of risk assessments at different levels of government in Australia, Germany, Indonesia and Italy

✓ **Australia:** The National Partnership Agreement on Natural Disaster Resilience includes a requirement for all states to produce a state-wide natural disaster risk assessment in accordance with Australian standards. The risk assessment component of the partnership agreement was included because allocating funding to the highest risk areas was the most effective and efficient use of federal funding. Australian state and territory governments, as well as officials at the local government level, have endorsed and agreed to apply the National Emergency Risk Assessment Guidelines for the preparation of risk assessments in a consistent way.

✓ **Germany:** Since the Federal States (Länder) are responsible for disaster management, such assessments are organized and developed independently of each other. This has resulted in barriers to completing an extensive analysis at both the local and national levels. The Federal Office of Civil Protection and Disaster Assistance published the Method for Risk Assessment for Civil Protection in 2012 and communicated findings to the Länder. This method provides scenario-based risk assessments based on area of interest, hazard, occurrence probability and damage magnitude. The method requires the cooperation of federal agencies like the Federal Statistical Office and the regional statistical offices of the Länder. The Joint Hazard Estimation of the Federal States and the Federal Government aims to generate a list of hazards and identify risk hotspots, as well as identify additional/specialized capabilities and means/actions to decrease vulnerability and increase coping capability.

✓ **Indonesia:** There has been one comprehensive multi-hazard risk assessment conducted by the National Agency for Disaster Management (BNPB) and the National Planning Board (Bappenas). The assessment used a simple methodology that resulted in the development of a comparative risk index for the district/city level, which was later used in the formulation of the National Disaster Management Plan 2010-2014 and National Action Plan for DRR. Multi-hazard risk assessments have since been made in all provinces and similar efforts have been initiated at the district/city level.

✓ **Italy:** Comprehensive risk assessments concerning main hazards have been performed at municipal, provincial and regional levels, with strong support from the national level. The National Civil Protection Department has the responsibility to provide the whole system with guidelines and directives concerning how risk assessments should be conducted, made available and circulated. These measures are provided through National Forecasting and Prevention Programmes. The Regional Administrations are then responsible for translating the national guidelines into regional programmes, where roles and responsibilities of lower level administrations are defined together with information exchange procedures. Provincial and municipal risk assessments are strongly related, since risks commonly fall across the boundaries of two or more municipalities. In these cases, the coordination role played by the provinces or inter-municipal cooperation bodies is critical. The responsibility of ensuring that risk maps and risk assessments are up to date falls upon the lower level of the system as local and regional authorities have better knowledge of the territory.

A third challenge is the need for building local capacity in terms of resources (financial, human and technical). Local governments often face restrictive resource constraints. Pakistan and Samoa provide perfect examples of the negative relationship that emerges from the lack of local capacities and a dependence on international resources. Support from national governments, through the provision of risk modelling software for example, can help overcome the structural barriers at the local level, as seen in the case of the US and Australia (Boxes 12 and 13).

- **Indonesia:** The key challenges include a lack of technical capacity in most Local Disaster Management Agencies for conducting risk analysis, lack of financial resources and a limited availability of detailed data at the district/city level, particularly in Eastern Indonesia.
- **Honduras:** There are large discrepancies in the availability of professional skillsets, information and communication technologies, access to equipment across the 298 municipalities in the country. This makes it difficult to effectively implement risk assessments. In addition, due to the high cost, the development of risk assessments is only possible with the assistance of the international financing organizations. The World Bank and the Inter-American Development Bank have undertaken risk assessments in 101 of the 298 municipalities.
- **Pakistan:** The foremost challenge is the scarcity of local expertise and professionals in the field of risk assessment. Scarce resources are consumed in procurement of professional services from international markets that adversely impacts the implementation of risk assessment initiative.
- **Samoa:** The government is still reliant on regional/international development agencies to assist in the funding and implementation of multi-risk assessments. Although Samoa receives research/study/analysis products, the capacity to continue similar work are low because the focus is on the end product rather than the process or methodologies used to get there.

Another challenge some countries have experienced is the technical challenge of insufficient baseline information, uncoordinated GIS mapping scales, lack of metadata, and poor data quality. The development and sharing of necessary data for risk assessment is a coordination issue that exists between specific agencies.

Box 11: Training programmes for developing risk assessment capacities in Honduras

There number of trained personnel in areas such as geology, hydrology, meteorology and seismology is inadequate in Honduras. This despite it being a requirement under the Law of the National System for Risk Management. In order to fill this gap, a new qualification has been developed – the Prevention Official. These officials will represent institutions from the Government, municipal entities and private sector, and will be trained on the effective management of respective Risk Management Units.

Box 12: Software development for multi-risk assessments in the United States of America

The federal government has made substantial investments in assessments of multiple hazards, including the development of loss-estimation capabilities such as the Hazards US-Multi Hazard (HAZUS-MH) software package. Developed by the Federal Emergency Management Agency, this software incorporates nationally applicable, standardized models for estimating potential loss from flood, wind and earthquake hazards with inventories of structures and other data to estimate the physical, economic and social impact of disasters. The software is available to government planners, GIS specialists and emergency managers in the US.

Box 13: Development of open source risk models in Australia

Systems currently used or under development include open source natural hazard risk models and information for stakeholders (government, research agencies and the public) in support of disaster prevention, mitigation, preparedness and vulnerability reduction; an open source hydrodynamic modeling tool for tsunami hazard assessments; local storm surge/flood assessments; an open source earthquake risk model that fed into the 2012 Australian earthquake hazard map and local earthquake impact assessments; an open source tropical cyclone risk model, and an open source modelling tool for local onshore tsunami hazard assessments in Australia, Indonesia and Papua New Guinea.

- **Anguilla:** Baseline information is old and was developed as a part of larger regional initiatives not applicable to local study. Present data is incorrect on a custom spheroid in the GIS and not open to editing or extension of the data features.
- **Mozambique:** Results from the Global Circulation Models were affected by modelling uncertainties (such as the spatial resolution of topographic data, detailed elevation model) and physical data like soil characteristics. Additional field data is needed for modelling calibration. However, the rain-gauged network is poorly established, which makes model results difficult to calibrate.
- **Armenia:** The difficulties experienced by national structures and partner organizations include ununiformed mapping scale and modeling of conditions.
- **Pakistan:** Availability of reliable data is another challenge in carrying out the accurate assessment of hazard risks. Available data is scattered, most often inaccessible and is sometimes unreliable.

The fifth concern is that some countries have regarded climate change and other social risks as "emerging," to be integrated into risk assessments and a DRR framework. In order to integrate socio-economic risks into scientific risk assessments more socio-economic impact studies are required. This will be discussed in Section 3.3.

- **Italy:** The main challenge is the growing magnitude of disasters occurring nationwide. Climate change has modified the relationship between communities and their territories. The problem is exacerbated by the presence of human settlements and activities, even in remote and/or dangerous areas.
- **Barbados:** The financial expense involved in conducting risk and vulnerability assessments has been prohibitive; however the necessity for such assessments and analysis has been brought to the attention of policy makers simply because of projected losses and damage from climate change impacts.
- **Japan:** Efforts to enhance research methods and tools for multi-risk assessments that reflect social and environmental change (and include cost benefit analyses) are currently underway.
- **Colombia:** One main challenge involves embedding socio-economic and environmental considerations into risk analyses that shed light on the relationship between them.

In addition to the above barriers, some countries have highlighted the lack of risk assessment in key sectors as a challenge. This is due to the absence of an overall framework for risk assessment. Standardized methodologies would help mitigate the burden of risk assessment in certain sectors. Detailed sectoral risk assessment is required to define prioritization against projected investments (Box 14). Schools and hospitals often reported having such assessments in place. Risk assessment of schools and hospitals are discussed in Section 5.1.

- **Jamaica:** No risk assessments have been undertaken for key sectors as resources to undertake such assessments are limited. Priorities for the national disaster office and sectors sometimes differ and getting the support and buy-in needed is sometimes difficult. There is little ownership of disaster management responsibility at the sector level.

- **Nepal:** Sector specific risk assessments and analyses are needed to develop plans that address climate change and food insecurity. The absence of a standard risk assessment and analysis approach has been the most limiting factor.
- **Bangladesh:** Sector specific risk assessment and reduction guidelines are being developed and various stakeholders led by government organizations have carried out studies in selected hospitals, schools and cyclone shelters. Risk assessment in critical sectors such as health, water and sanitation, shelter, agriculture, livestock and food security is of the utmost priority.

Seventh, one of the more fundamental constraints, as seen in countries like Indonesia and Samoa, is the lack of awareness regarding the importance and usefulness of risk assessments in DRR policies and decision-making.

- **Indonesia:** One particular constraint in developing methods and tools for multi- risk assessments is the absence of political commitment in the use of science and technology in policy setting and decision making, exacerbated by the lack of inter-agency coordination.
- **Samoa:** Stakeholders have not fully recognized the benefits of conducting multi-risk assessments and the need to promote and advocate for the development and use of such tools.
- **Sri Lanka:** Waning interest in information and data sharing systems is a huge challenge to completing the country's risk profile. Awareness of the availability and applicability of risk profiles should be promoted at the local and regional levels.

Last, but not least, many country reports highlighted that the risk assessment has not been used for DRR policy planning. Comments from the Cook Islands state that available data is not visible to policy makers due to high turnover rates and the lack of coordination between agencies that implement risk assessments. In India and Saint Lucia, policy makers emphasized the need for a detailed risk assessment to support concrete decision-making processes and the importance of increasing the capacity of policy makers to understand risk information and use it accordingly. Commentary from Papua New Guinea outlines the need for enforcement mechanisms to better integrate risk information in decision-making practices. In Samoa, officials noted the need for reporting risk assessment in a manner easily comprehensible to practitioners (Box 15).

- **Cook Islands:** A key constraint is that information generated through the risk assessment is rarely used to inform planning. Part of the problem is that the information is distributed across different agencies and few people are aware of what is available. The high turnover of staff also results in officials not always being aware of what is available or where to find information.
- **India:** Although macro-scale vulnerability analyses were attempted in past, there are very few states that have carried out micro-level risk analyses. This calls for a detailed risk assessment and cost benefit analysis that incorporates DRR features. Such an exercise will help local and national governments in adopting appropriate strategies for integrating DRR into ongoing programmes and sectoral development plans. It is also

Box 14: Detailed and participatory sectoral risk assessment in Guatemala

> The analysis of past impacts in different sectors (particularly health, education, infrastructure, food supply and environment) served as a basis for developing criteria in order to analyse and identify different vulnerabilities related to social processes and the main hazards. Based on those criteria, the technical tools for conducting risk and vulnerability assessments in prioritized sectors were developed and assessments were disaggregated by gender, age, ethnic group, and people with disabilities. Moreover, a segment of each assessment was completed using participatory methodologies in order to assess the public's perceptions of hazards and vulnerabilities.

important to enhance the capacity of policy makers and development planners to formulate appropriate mitigation measures based on risk assessments.

- Saint Lucia: The resolution (currently 1:25,000) of available maps does not currently enable stakeholders to make the most of decision-making processes. Development planners need to utilize developed risk assessments to inform their decision-making and there is also a need to sensitize policy makers and middle managers about the importance of, and need for, DRR.

Box 15: The need for linking research and practice in Samoa

Very few ministries are making use of the data, information and practical recommendations generated from these studies. This signifies the need to strengthen links between research and practice. In most cases, end users have limited knowledge in the application of research/study results and most often lead to information misuse or misinterpretation. In addition, concrete actions outlined in different studies creates confusion and presents difficulties for decision makers regarding the allocation of scarce resources. Undoubtedly, the greatest challenge is translating the data from these studies into a format that is comprehensible to planners and end users. What is required is a mechanism to ensure all research/study information reaches the relevant planning and regulatory bodies for further DRR mainstreaming. Risk assessments carried out by technical consultants need to be collated and reviewed to determine how findings and recommendations can feed into on-going risk reduction initiatives.

Box 16: Cross sector risk matrix for prioritizing resources in Norway

At the national level the Norwegian Directorate for Civil Protection and Emergency Planning conducts and publicizes a national vulnerability and preparedness analysis every year. Analyses and investigation studies are vital activities for stakeholders to gain an overview of the preventive measures that should be given priority. Norwegian authorities are currently working on developing a national risk assessment. The aim is to create a cross-sector approach to risk assessments and enabling national authorities to compare different types of hazards and risks. The Norwegian methodology is inspired by the Dutch and British approaches where different events are measured according to their likelihood and consequences and placed into a matrix. A cross-sector risk matrix will give Norwegian authorities a better understanding of national risks and vulnerabilities and hence a better basis for prioritizing preparedness resources.

Box 17: The use of risk assessments in United States policy making

A key finding of the 2012 National Preparedness Report is that decision makers in the public and private sectors are increasingly using risk analyses to shape and prioritize preparedness activities across areas. For example, individual states are required to conduct threat and hazard identification and risk assessments as a condition for receiving preparedness grant funding. State and local health departments must use jurisdictional risk assessments to prioritize capability enhancements. Such risk analyses inform the eligibility criteria for preparedness assistance.

- **Papua New Guinea:** There is a corresponding challenge to ensure that risk data and information is packaged and disseminated in a way that planners can use to better frame development interventions. There are no systems in place to ensure that sectors include disaster risk concerns in development interventions. This means systematic approaches should be established that ensure national, sector and local agencies are aware of the existence of hazard and risk information and can integrate know-how in future development interventions. It is also important to put in place regulations and systems that ensure sectors incorporate hazard risk information in their development interventions.
- Norway and the United States of America report progress in utilizing risk information for policy decision processes (Boxes 16 and 17). In Norway, risk information is important not only in promoting DRR policy but also in deciding prioritized areas of intervention, this is because scientific risk information is provided with information on preparedness that helps analysts identify gaps and priorities. In the United States of America, risk information is integrated with eligibility criteria for funding.

2 Hazard mapping

Many countries indicated progress in the area of hazard mapping, which is a popular tool for professional analysis and disseminating information to the public (**Table 2.1a**). Hazard mapping is most useful when applied at the local level and it has the potential to be utilized in spatial and land use planning. Because hazard mapping is often based on risk assessments, the challenges that arise tend to be the same as those seen in the section on risk assessments. Japan and Switzerland provided examples of institutionalizing hazard mapping at the local level (Box 18) while Argentina outlined multi-sectoral participation for multi-hazard mapping (Box 19).

- **Indonesia:** The use of risk mapping in actual development planning has yet to advance. Risk maps need to be detailed on a greater scale so that all hazard prone districts and cities have operational maps that can be used to conduct development planning based on disaster risk considerations. Existing risk maps need to be detailed and integrated into spatial planning to guide local development planning with risk reduction considerations.

Box 18: Legal requirement for flood hazard mapping at the local level in Japan and Switzerland

✓ **Japan:** The 2005 revised Flood Management Act obligates municipalities within possible flood zones to detail a flood hazard map including evacuation routes and distribute copies to each household. As of March 2012, 1,265 of 1,500 municipalities with major flood zones published and disclosed their flood hazard maps. In addition, 161 municipalities completed inland water hazard maps. In 2007, the Ministry of Land, Infrastructure, Transport and Tourism launched an online portal that allows users to search for, and view, various hazard maps as compiled by municipalities. Most of the maps have now been made available to the general public via the Internet.

✓ **Switzerland:** Cantons and municipalities are legally obliged to prepare and use hazard maps for floods, avalanches, rock falls and mass movements. As of 2012, 80% of Switzerland is accounted for by way of avalanche maps. The development of hazard maps follows state of the art methodologies and most cantons offer Internet-based access to hazard maps in each territory. The hazard maps, available to the majority of Swiss municipalities, are available to the public and at the federal level there is a system in place that allows policy makers and researchers to elaborate a nationwide and comprehensive overview on hazard maps and protection measures. Comprehensive hazard index maps (providing a national overview) are available for potential floods and mass movements, which help stakeholders determine cumulative risks and damage potential. The Federal Office for the Environment was responsible for the elaboration of all Swiss hazard maps as at the end of 2013.

3 Vulnerability assessment at community level

Many countries commented on the implementation of vulnerability assessments, and most were reported at the community level. Some countries rolled out "Vulnerability and Capacity Assessments," which are often implemented with the support of NGOs. The assessments are often sporadic, isolated activities that lack standardized methodologies. Climate change is integrated into vulnerability assessments conducted in certain countries (Box 20).

Fiji: Different actors carry out vulnerability assessments on a "per-project basis" and use different tools for their scientific calculations and assessments. Most work in isolation with indications of closer collaborating as of late.

Vanuatu: Community based assessments are multi-hazard in nature, however links between communities (e.g. provincial and area administrations) are not particularly strong.

Box 19: Multi-hazard mapping in Argentina

The Secretariat for the Environment and Sustainable Development established a multi-hazard map taking into consideration the climate change variable. Members from different sectors (government at all levels, civil society, private and academic sectors) have participated in its elaboration. Data is commonly shared through a digital platform for early warning called "CRISIS" that is run by the Centre of Technical and Scientific Research for Defence.

Box 20: Integration of climate change adaptation in community based vulnerability assessments in the Cook Islands

A number of community-based vulnerability and adaptation assessments have taken place in the village of Rarotonga and on the Outer Islands. Some of these, such as the Asian Development Bank funded Community Based Climate Vulnerability Assessment and Adaptation Planning, have included the GIS mapping of spatial risk zones associated with different hazards. Additional vulnerability and adaption assessments are currently underway and seek to build upon work already done. They are closely aligned to the development of a DRM and CCA National Policy, as well as a community level project associated with the Adaptation Fund project. Although rigorous scientific inputs on vulnerability and adaptation assessments may be lacking (they are largely based on anecdotal evidence and the opinions of sector officials), they are useful in that local knowledge has become an important factor in understanding risks. A multi-hazard approach has been taken, wherein potential impacts are investigated across sectors, and potential solutions are sought based on a combination of sector specialist and community inputs.

Table 2.1a: Examples of hazard mapping

Country	National	Sub-national
Anguilla	1:500,000 scale seismic hazard map	
Bangladesh		Risk assessment mapping for earthquakes and tsunamis in three major cities
Barbados		Hazard map for 1/7 of landmass that is prone to landslides and soil erosion
China		Flood risk map for 56 pilot areas
Egypt	Multi hazard maps	
Fiji	Earthquake hazard map	Flood risk map for Nadi, Ba and Navua
Georgia	Seismic hazard map	
Ghana	Hazard map for hydro-meteorological, fires, pests and insects and geological hazards	
Greece	Hazard mapping for major hazards	
Grenada	Coastal erosion, flood and landslide map	
Indonesia		Risk map in 33 provinces
Iran	Earthquake hazard map	
Jamaica	Flood hazard maps (100 years return period)	Landslide hazard map for St. Catherine and St. Thomas
Japan		Municipalities are legally obliged to create flood hazard maps
Malaysia	Hazard maps for flood prone areas	
Mauritius	Coastal inundation map	
Mozambique		Flood risk mapping in major river basins
Nepal		Water induced disaster hazard map of 10 major river basins
Romania		Earthquake and landslide hazard maps for regions and some major cities
Saint Lucia		Landslide hazard maps for 4 districts Community level hazard maps for 100 communities
Samoa		Village tsunami mapping
Switzerland		Cantons and municipalities have the legal obligation to create hazard maps for floods, avalanches, rock falls and mass movements

Source: HFA Progress Report for each country.

Table 2.1b: Examples of risk assessment progress

Country	National Guidelines	Multi-hazard	Specific Risk/sector	Sub-national
Albania			flood risk assessment (2012)	
Algeria		Yes		
Anguilla		No		
Argentina	"CRISIS" System	Yes	Sector specific risk assessment.	
Armenia				seismic risk assessment plan of Yerevan City
Australia	National Emergency Risk Assessment Guideline			Risk assessments are conducted at state, area and industry or facility levels. States are required to implement risk assessment.
Bangladesh	No		Sector specific risk assessment.	More than 800 Unions' risk profile
Bolivia	ECLAC	Yes		
British Virgin Islands		No		No
Brunei Darussalam		No		
Bulgaria		No		
Burkina Faso		Yes	Schools.	
Canada				Provincial and territorial governments, as well as municipal governments are responsible for carrying out risk assessments.
Chile	Natural Hazards Analysis Guide for Territorial Planning	No	No	
Colombia		Yes		The technical entities that are part of the National System develop assessments and share the information at different levels.
Comoros		No	Education sector.	
Cook Islands			Organization specific risk assessment.	
Costa Rica		Yes	Schools.	

Table 2.1b cont.

Country	National Guidelines	Multi-hazard	Specific Risk/sector	Sub-national
Côte d'Ivoire		No		
Cuba		Yes	26 sectors.	
Czech Republic		No		
Djibouti		Yes (but not yet effective)		
Dominican Republic		Yes	Health sector.	
Ecuador		No	Schools and hospitals.	Risk Management Unit in 48 cantons.
Ethiopia	Standard risk assessment methodology			Comprehensive risk profile for 200 districts.
Fiji	No	No	Earthquake hazard assessment.	Tsunami risk assessment for Suva. Some urban centers have completed risk assessments.
Finland			National level authorities are commissioned to perform risk assessments.	Regional and local level risk assessments.
Germany	Method for Risk Assessment for Civil Protection		Center for Disaster Management and Risk Reduction Technology's Synopsis of Natural Hazards.	
Greece			Preliminary Flood Risk Assessment has been completed for all River Basin Districts	
Grenada	No	No	Coastal vulnerability and risk assessment.	
Guatemala		Yes	More than 8 sectors.	
Haiti		Yes		Most municipalities have risk assessments, particularly for hydro-meteorological hazards.
Honduras	Manuals for Risk Assessment for Floods, Landslides and Buildings	No	4 sectors.	The municipal level is developing risk assessments.
India	No	No		Several states conduct risk assessments.

Table 2.1b cont.

Country	National Guidelines	Multi-hazard	Specific Risk/sector	Sub-national
Indonesia	No	Yes	Sector/organization specific risk assessments.	Multi-hazard risk assessments in all provinces.
Iran			Flood risk assessment	
Italy	National Forecasting and Prevention Programmes			Multi-hazard risk assessments in municipalities, provinces and region levels.
Jamaica	national standards for multi hazard risk assessment (draft)		Risk assessments for key sectors.	
Kenya	No		Risk assessment for key sectors.	
Lao PDR		National hazard and risk profile (2010)		
Lesotho				Risk assessment at the village level.
Malaysia			Risk assessment for earthquake and tsunami	
Malawi	No	No		
Maldives		Disaster Risk Profile (2006)		
Mauritania		No		
Mexico	System for Analysis and Visualization of Risk Scenarios	Yes	10 sectors (water, education, electricity, oil, agriculture, livestock, fisheries, health, national security, roads infrastructure).	
Morocco		Yes	Drought, earthquakes, tsunamis and landslides.	
Mozambique				Multi hazards assessment conducted for the Limpopo River basin (2003), Multi hazards assessment in the Zambezi River basin multi risk assessment at district level

Table 2.1b cont.

Country	National Guidelines	Multi-hazard	Specific Risk/sector	Sub-national
Nauru		Multi hazard catastrophe risk profile	ICT, Women Affairs, Health, Education, DCA, USP and Fire	
New Zealand		National Hazardscape Report (2007)		Local authorities undertake hazard and risk assessments.
Niger		No		
Niue		Yes		It is the responsibility of the Village Council to undertake a Disaster Risk Assessment
Norway		Yes (updated annually)		96% of communities have conducted local risk and vulnerability analyses.
Pakistan		Multi-Hazard and Risk Assessment		Earthquake hazard and risk assessments in four areas.
Panama		Yes		Risk and vulnerability assessments for floods and landslides in different river basins.
Poland		No		
Rwanda		No		
Saint Lucia		No		
Samoa	No			
Senegal		No		
Sierra Leone		National Hazard Profile		District hazard profile.
Slovenia	Instruction for Conducting Risk Assessment			
Solomon Islands	No			

Table 2.1b cont.

Country	National Guidelines	Multi-hazard	Specific Risk/sector	Sub-national
Sri Lanka	Yes		Drought, flood, landslide and Cyclone Hazard Profiles. Coastal Hazard Profile (tsunami, sea surge, sea level rise and coastal erosion).	
Sweden				Municipality has legal obligation to carry out risk assessments.
Tanzania			Biannual Food Security and Nutrition Assessment.	Disaster Risk and Capacity Needs Assessment in Zanzibar (2008).
Thailand			Geo-hazards (Department of Mineral Resources). Water related hazards (Royal Irrigation Department and Department of Water Resource).	
Togo		No	Education, agriculture, sanitation, health and transports.	
Tonga	No			
United Kingdom	No	Annual National Risk Register		Community Risk Register.
United States of America	Federal Emergency Management Agency's Comprehensive Preparedness Guidance 201: Threat and Hazard Identification and Risk Assessment (2012) Hazards US-Multi Hazard (HAZUS-MH) software package		Flood (Federal Emergency Management Agency).	
Uruguay		No		Flood Assessments for urban areas.
Vanuatu		No		
Yemen		Yes		
Macedonia, FYR			Seismic activities, water pollution and heat waves.	

Source: HFA Progress Report for each country.

Note: The meaning of risk assessment is different for all countries, however the information provided by governments has been used to present a simplified overview.

Core indicator 2.2

Systems are in place to monitor, archive and disseminate data on key hazards and vulnerabilities

Reflecting on the commentary surrounding this indicator, the focus in this section will be on the integrated information management system for DRM, followed by a short section on monitoring systems.

The title of this indicator is similar to 3.1, which means that similar information will also be found in that section. Because of the similarities, UNISDR has integrated a lot of the information from indicator 3.1 in this section. Under indicator 2.2 many countries addressed the issues of the disaster database, disaster loss assessment and post-disaster review, all of which overlap with information and commentary found under indicator 5.4. Due to this overlap the authors have excluded analogous comments from the analysis in this section and integrated them in the analysis of section 5.4. Country commentary on hazard maps and vulnerability analyses have been excluded from this section and assimilated in the analysis of Section 2.1. Dissemination of data and awareness raising, especially amongst the public, is directly related to information sharing during disasters and also "normal" times. Such issues will be explained in Sections 5.4 and 3.4.

1 Integrated information management system for DRM

More than sixty countries addressed the issue of integrated information management systems. Though some successful policies have been reported (Box 21), many countries explained the challenges in developing integrated information management systems to monitor, archive and disseminate data on key hazards and vulnerabilities. Almost all countries identified the challenge in collecting and sharing data between ministries, agencies and organizations. Consequently, there is a lack of coordination, and information is scattered across these various entities. Approaches to remedy this issue vary from country to country and include new platforms/networks, institutional and legal arrangements for information sharing, and the establishment of integrated data management systems and/or data management centers.

- **Fiji:** Information is not readily accessible because there is no centralized database where hazard/risk information is archived and monitored. DRM data sets are spread across departments and NGOs without a centralised national inventory. The absence of a national information network/system has limited progress in cross-sectoral coordination, the sharing of information and generating knowledge for common DRM activities.
- **Syrian Arab Republic:** Current efforts focus on improving coordination and cooperation between various stakeholders to unify and develop databases that reflect the requirements of all parties.
- **Cook Islands:** A significant challenge exists in terms of ensuring coordinated data management. Although considerable data is collected on DRM issues, it is not always appropriately reviewed, analyzed or shared with relevant agencies and communities in a timely fashion. There is currently no disaster database / information system, data is frequently gathered in incompatible formats and sharing this information with those who need it most is inconsistent. This stems from the fact that no particular agency was fully responsible for DRM and there was often confusion regarding which agency was in charge.

Box 21: Examples of integrated information management systems

- ✓ **Mexico:** A national risk atlas is being updated and information will be catalogued with national, federal state and municipal data. This atlas will be accessible digitally and will consist of databases, GIS, tools for analysis and the simulation of scenarios, and estimations for disaster losses. These instruments will provide the framework for policies and programmes related to integrated risk management.
- ✓ **Korea, Republic of:** The Framework Act on the Management of Disasters and Safety specifies the sharing of collected disaster management information with other agencies and emergency organizations. The Countermeasures against Natural Disaster Act requires the establishment of a disaster information system to facilitate the common usage of disaster data and natural disaster management.
- ✓ **Germany:** The German Emergency Planning Information System (deNIS IIplus) provides a centralized and extensive collection of Internet links on institutions involved in disaster reduction, steps for prevention, management structures and potential advances. The Federal Office of Civil Protection and Disaster Assistance has shared information with the public in this manner. Although it does not entail creation of new data, it does entail the compilation, organization, and centralization of official, pre-existing information that can be more readily accessed and navigated.
- ✓ **United Kingdom:** The UK has developed the National Hazards Partnership (NHP) that consists of 20 agencies and organizations including the Met Office and provides information, research and analysis on natural hazards for the development and provision of effective communications and services for civil contingencies, governments and the emergency responder community across the UK. This is achieved by providing advice through a daily hazard assessment that is disseminated at 14.00 every day. This Natural Hazards Daily Assessment (a timely, common and consistent source of data) has been developed and piloted since 2011 and will be shared with Category 1 and Category 2 responders when agreement and registration for the initiative rolls out. The initial reluctance of departments to work together has gradually been overcome and cooperative working arrangements have now been formed.

There are several reasons for the lack of information sharing between institutions within a country. One is the prevalence of the protective mindsets of people in certain sectors, which often leads to poor institutional coordination, hinders data sharing and also prevents the integration of data and information.

- Trinidad and Tobago: While multiple sectors are using risk and vulnerability information in planning decisions, agencies often work in silos and engage each other with varying levels of commitment. Some agencies/sectors do not clearly see how they fit into DRR/DRM strategies and may not actively utilize hazard/disaster data because of it.
- Barbados: Data and information sharing remains a top priority as information flow is severely limited. Agencies that develop data information systems are reluctant to share information because of competition between agencies and a lack of control about how the information is used and the inability to recoup the financial expenditures of producing the information in the first place.

Second, a lack of financing and technical expertise obstructs the establishment and maintenance of such information management systems. DRM agency capacity constraints are seen at both national and local levels. For coordinated information management and exchange, capacity building is necessary at all levels of government. Improved integrated information management at the local level, and better reporting coordination between local and national institutions, is a necessity (Box 22).

- Croatia: The process of linking separate databases into a single database and their transfer to GIS are challenges. The process is time-consuming, requires financial means and appropriate information technology equipment, as well as well-trained personnel.

- **Samoa:** The major challenge is the lack of local capacity in terms of expert human resources and the application of modern technology to develop a comprehensive system for monitoring and archiving data and disseminating information at the community level.

Third, GIS is expected to play a central role in information management and sharing. GIS and mapping technology improve risk communication thanks to their visualization capability. Advancements in GIS technology have been significant over the last decade; yet, more coordination is required in terms of systems and data formats. The application of GIS is therefore dependent on the level of coordination across related sectors and organizations (Box 23).

- **Macedonia, FYR:** The implementation of a national GIS network is underway and will enable spatial positioning and the prediction of possible hazard scenarios. Once completed, GIS will be available online.
- **Vanuatu:** Many of the DRR/DM related GIS systems have been developed with support from a number of different technical agencies and donors. This has resulted in a patchwork of systems that are not always integrated at the national level. Because the Ministry of Lands manages the government's GIS it is reportedly difficult for other government agencies to access this information. National Action Plan proposes establishing a GIS user group that will help address some of these issues, but this is yet to be established.

Fourth, some data includes sensitive information related to individuals, private entities and even national security. Information management systems need to strike a balance between defending citizens and property from disasters and protecting the individual's fundamental right to privacy and public security. While they usually do not conflict in times of emergency they may very well do so in times of peace.

Box 22: Coordination of national and local level information management systems

- ✓ **Australia:** Australian States gather, assess and maintain data on key hazards and vulnerabilities within their jurisdictions. Because information is gathered for various state specific purposes it can be challenging to correlate this data at the national level when needed (e.g. to inform national policy development).
- ✓ **Peru:** The biggest challenge in Peru is to obtain technical, scientific, academic and social information scattered across the country and to generate reactive, corrective and prospective actions, especially at the local level. There are several hazard, vulnerability and risk studies that have not been centralized and/or documented. However, the process of collecting these studies has already started. Additional training for local actors is required in order to generate information about hazards and vulnerabilities.

Box 23: Geo-data portal in Sweden

The Mapping, Cadastral and Land Registration Authority in Sweden developed, and maintains, a geo-data portal that is used as a gateway for web based geo-information and services. The geo-data portal contains metadata that makes it easy for users to search for, analyze and download geographical data from different sources and is physically stored in different places. The portal also supports users when data needs to be transferred between coordinate systems or data models. In 2012, 100 Swedish central agencies, county administrations and local authorities signed an agreement on cooperation regarding the geo-data portal. This means that they have the license to use relevant geographic information within their organizations and set up services on the Internet.

- **Korea, Republic of:** In order to prevent information leakage or usage for individual interest, disaster management acts provide definitions for disaster information management and ways to share information, thereby ensuring data is used properly.
- **United Kingdom:** The issues touch on a variety of types of sharing: personal data; emergency plans; commercial and sensitive data, all of which are used for a variety of planning, response and recovery purposes. Various types of information may be suitable for some audiences but not others. The information spectrum runs from limited access information (even within organizations) to information that should be disseminated to, and understood by, the public.

Even if centralized information management systems exist, it is possible they may not be used in decision-making processes. Citizens and policy makers need to know what the information means and how to best respond to any given hazard.

- **Barbados:** The issue of limited capacity to effectively utilize information management platform by key stakeholders will prevent its optimal use in decision-making. Capacity must be built to ensure that all stakeholders are able to utilize available resources for decision-making purposes.
- **Nepal:** Data needs to be turned into useful information and to be disseminated to communities at risk so that they can make assessments regarding ways to reduce underlying risks.

2 Monitoring systems

Many countries reported on the progress of their monitoring systems, along with the system's technical and/or engineering structure. Monitoring systems are often managed by a technical agency with a responsibility for monitoring a single hazard. For example, a meteorological agency is usually responsible for monitoring hydro-meteorological hazards.

In addition, a growing number of countries addressed the use of satellite technology in the 2011-13 cycle. Because monitoring equipment is often costly, some countries addressed the need for additional financing under this area. As monitoring systems are a precursor to early warning systems (EWS), observations focusing on EWS are explained under indicator 2.3.

Comments from the Cook Islands report are relevant to this section because of financial concerns linked to EWS, as well as the vulnerability of monitoring systems in times of disaster or emergency. It is imperative that monitoring facilities are resilient to hazards so that data can be gleaned for future research. Furthermore, when the monitored value is a trigger to compensation or insurance scheme, the disruption of monitoring would prevent the payment of compensation and insurance.

- **Cook Islands:** The Cook Islands Meteorological Service is in the process of installing Automatic Weather Stations (AWS) on all of its islands, subject to funding. The problem is that AWS have a wind tolerance of 200km/h rendering them unusable and unserviceable during category 3 (and above) cyclones. Additionally, the location of the Meteorology Office and AWS (on Rarotonga) are in hazard prone areas, making it vulnerable to tsunamis and sea surges.

Several countries also commented on the need for regional monitoring systems for geological hazards such as seismic and tsunami monitoring. These comments are integrated under Section 2.4.

Core indicator 2.3

Early warning systems are in place for all major hazards, with outreach to communities

Countries reported progress in the development of EWS (Table 2.3a). Most early warning systems are for floods, cyclones, earthquakes, tsunamis and drought. An effective EWS consists of four components: risk identification, continuous monitoring, timely information delivery and citizen response. In this sense, EWS works most effectively when combining science and technology to assess, monitor and disseminate risk information, with social and regulatory aspects, to reach vulnerable segments of communities and ensure an appropriate response. In this section, the main challenges of EWS are analyzed.1 Integrated information management system for DRM

Table 2.3a: Examples of early warning systems

Country	EWS
Afghanistan	Ministry of Public Health: epidemics
Australia	Bureau of Meteorology: weather (flood, cyclone, thunderstorm, high seas) Geoscience Australia: Australian Tsunami Warning System
Bangladesh	Department of Agriculture and Extension: drought
Barbados	Barbados Meteorological Services: flood, coastal hazard
Canada	Environment Canada's Meteorological Services: weather and environmental hazards
Chile	National Center for Early Warning: multi-hazards
Colombia	National Seismological Network: earthquake and tsunami Institute of Hydrology, Meteorology and Environmental Studies: hydro-meteorological hazards
Cook Islands	Emergency Management Cook Islands: Emergency Management Weather Information Network
Costa Rica	National Meteorological Institute: heavy rain, tropical cyclone, coastal events, earthquake, landslide, volcanic activity
Cuba	National Staff of Civil Defense: multi hazards
Djibouti	National Meteorological Agency: hydro-meteorological hazards
Dominican Republic	National Bureau of Meteorology, Tsunami Early Warning Advisory Team: hurricane, tropical storm
Ecuador	Geophysical Institute: volcanic activity Natural Institute of Meteorology and Hydrology: hydro-meteorological hazards
Egypt	Ministry of Water Resources and Irrigation: flash flood in Red Sea coast and desert areas
Greece	National Hellenic Meteorological Service: severe weather forecasts, Ministry of Environment and Climate Change: air pollution, Greek Atomic Energy Commission: nuclear accidents, Public Power Corporation: dam failures, National Center for Tsunami Warnings: tsunamis

Table 2.3a cont.

Country	EWS
India	India Meteorological Department: cyclone Central Water Commission: flood India National Center for Oceanic Information Services: tsunami and storm surge
Italy	National Civil Protection Department: National Warning System for multi hazards
Iran	Islamic Republic of Iran Meteorological Organization: weather, flood
Jamaica	Water Resource Authority: flood
Japan	Japan Meteorological Agency: weather (rain, flood, tidal waves, heavy snow, tornado)
Kenya	Kenya Meteorology Department: weather Ministry of Agriculture and the Arid Lands Programme: draught and food security Ministry of Health and Livestock: epidemics
Lao PDR	Department of Meteorology and Hydrology: flood
Malaysia	Malaysian Meteorological Department: weather, earthquake, sea level change, haze, drought, tsunami Public Works Department: landslide
Marshall Islands	National Weather Service: typhoon, drought, high sea
Mauritius	Mauritius Meteorological Services: cyclone, torrential rain, landslide, tsunami, high wave, strong winds
New Zealand	Regional Councils and the National Institute of Water and Atmosphere: flood, droughts, storm surge, sea level rise
Nigeria	Ministry of Environment: flood, epidemic
Pakistan	Pakistan Meteorological Department: flood, drought; Cabinet Division : epidemics
Samoa	Meteorology Office: weather and climate
Sweden	Swedish Meteorological and Hydrological institute: weather (excessive rain, snow, flood, wind storm, thunder, fire, sea level change, heat wave)
Tanzania	Tanzania Meteorological Agency: rain, cyclone, hurricane Ministry of Energy and Minerals: earthquake Ministry of Health and Social Welfare: epidemics Ministry of Agriculture and Food Security: food security
Tonga	Tonga Met Service: hydro-meteorological hazards and tsunamis
Turkey	DG Meteorology: strong rain, storm, hail, avalanche etc. DG Meteorology Forestry Operation Center: forest fires
United Kingdom	UK Met Office: storms, cold, snow, blizzard, heat wave etc. Public Weather Service: weather
United States of America	U.S. Geological Survey: earthquake, volcanic activity National Weather Service: storm, tornado, hurricane, flood, extreme heat, fire, tsunami.
Uruguay	National Meteorology Agency: hydro-meteorological hazards

Table 2.3a cont.

Country	EWS
Yemen	The Yemen National Seismic Network: geological hazard National Desert Locust Combating Center: desert locust Environment Protection Authority: climate and meteorological hazards
Zambia	Zambia Meteorological Department: drought, flood Ministry of Energy and Water Development: flood Ministry of Agriculture and FEWSNET: food security

Source: HFA Progress Report for each country.

1 Financial and human capacity

Many countries addressed financial constraints and limited human capacity as the most pressing challenges and also outlined a dependency on donors for EWS financing. Some countries specifically addressed their incapacity to maintain and upgrade EWS equipment due to financial constraints. As a result, old systems are still in use, which may decrease the effectiveness of the entire early warning system.

- **Pakistan:** The lack of resources (both financial and human) acts as a barrier in developing and updating early warning systems that cover hazard prone areas and communities.
- **Comoros:** The government does not have a budget to maintain EWS, so it remains dependent on financial support from the UN and France.
- **Sri Lanka:** The high maintenance and operational costs of sophisticated communication systems (e.g. satellite based networks) are making EWS unsustainable.
- **British Virgin Islands:** Training and equipment upgrades are continuously required, which are contingent on reliable sources of funding.
- **Bulgaria:** Roughly 70% of the population (and 90% of the country's territory) continues to use outdated EWS.

Concerns have also been raised about securing resources so that the EWS covers the required territory. Because EWS often relies on expensive monitoring equipment it hinders the expansion of territorial coverage.

- **Mozambique:** The limited territorial coverage of meteorological stations is the major challenge in carrying out rapid flood risk assessment in small river basins. The lack of expertise in the Regional Administration for water coupled with financial setbacks have also prevented the rapid expansion of territorial coverage of hydrological stations over the river basins.

Along with resource and capacity issues, many countries cited a lack of multi-hazard early warning systems as a major constraint. In several cases EWS for certain risks are not present, while in others, diverse early warning systems are poorly coordinated.

- **Barbados:** Limited access to financial resources and technical capacity has prevented the implementation of a Comprehensive Multi-hazard Early Warning System.
- **Pakistan:** The country still lacks an integrated multi-hazard early warning system. The current EWS covers only a few hazard risks while institutional capacities need to be developed to cover other hazards such as landslides, droughts and forest fires.

2 Governance issues

Early warning systems rely on expertise from various ministries including disaster risk management,

meteorological, water resources management (**Table 2.3a**), as well as the private sector (e.g. media and mobile phone providers) and NGOs. Because of the number of stakeholders involved, information must be shared between them. Identifying the roles and responsibilities of each stakeholder is essential for ensuring cooperation and strengthening early warning systems.

- **Australia:** Contextual issues include respecting the role and authority of jurisdictional governments and agencies, and involving all relevant levels of government, as well as NGOs.
- **Georgia:** There are challenges in delineating areas of responsibility and promoting cooperation and communication amongst stakeholders. There is also a need to include community members in EWS response planning.
- **Yemen:** Poor coordination between relevant agencies and local authorities is one of the biggest constraints. Improving the functionality of any early warning system is dependent on improved coordination and information sharing amongst DRM agencies.

In situations where diverse early warning systems co-exist, these systems should be coordinated to deliver consistent warnings to the public, and ideally integrated to establish multi-hazard warning systems.

- **Kenya:** Kenya's early warning systems are "hazard based." The existence of early warning systems for major hazards lack a coordinated approach and are issued with little consultation because of the absence of a legal coordination framework.
- **Norway:** There are many early warning systems in place, both at the national and local levels, which need to be streamlined and simplified.
- **Italy:** The national warning system provides an extensive coverage of risks. In spite of this a number of independent systems and networks still exist. Resources and data are managed at the regional and sub-regional levels by various actors and need to be fully integrated into the national EWS.

Creating a comprehensive strategy and/or standard that is agreed upon by all relevant stakeholders is one way to ensure effective governance. The establishment of a central emergency management operation center is also useful for the efficient and comprehensive delivery of early warnings.

- **Australia:** A new standard for emergency messaging is now available for use around the country with the release of the Australian Government standard for the Common Alerting Protocol: Australia Profile (CAP-AU-STD). The new CAP standard will improve interaction between existing networks of Australian alert and warning systems.
- **Nepal:** The Department of Hydrology and Meteorology has prepared an Early Warning Strategy that will be approved in the near future. The strategy will be effective in guiding the development and sustainability of effective EWS.
- **Trinidad and Tobago:** It is recommended that National Disaster Office formalize its stance on EWS including the identification of standard operating procedures, protocols and plans. It is also recommended to review/update the Crisis Communications Plan, particularly the section on EWS and public interaction, and leverage the National Disaster Risk Reduction Committee platform to develop and formalize a national early warning strategy.
- **Korea, Republic of:** To efficiently respond to unexpected weather deviations due to climate change, the National Disaster and Safety Center was established under the Prime Minister's Office to provide disaster alerts via smart phones. It was also responsible for securing a disaster broadcasting channel for emergencies to strengthen the dissemination of messages via telecommunications media.

Some countries emphasized the importance of cross-border arrangements for EWS (e.g. tsunami early warning system) that will be discussed under indicator 2.4.

3 Local level Early Warning Systems

Because hazards are distributed unevenly across territories and communities, early warning systems should be tailored to reflect local contexts and needs. Some countries already take this into account and allow for the flexible customization of EWS by regional and local authorities.

- **Australia:** Every state and territory has the ability to tailor core EWS messages to fit local conditions and methods.
- **United States of America:** Federal, state and local governments can use the Integrated Public Alert and Warning System infrastructure, which offers a broader range of messages and methods of communication for delivering alert and warning information to citizens.

There is a need for local level EWS because it is tailored to local needs and contexts. Local level EWS is important because it saves time in delivering emergency messages, which is helpful in the face of rapid-onset hazards. Tailoring early warning systems is also important for improving outreach. If the local level EWS is embedded in a community social structure that encourages the participation of civil society, the system will drastically improve overall outreach and response (Box 24).

- **Nepal:** EWS do not function well unless they are institutionalized at the community level. In order to increase their effectiveness, the EWS has to be integrated with the social system of communities (e.g. involvement of schools in spreading messages).
- **Indonesia:** Civil society needs to be empowered to participate in risk information dissemination and the development of community-based EWS.
- **Maldives:** Communication and message dissemination is ineffective. Outreach to wider communities has not been established, as no early warning system exists in local communities.

4 "Outreach to the last mile"

Some governments reported difficulties in delivering early warnings to every single individual, which resulted in the creation of the phrase "outreach to the last mile." Challenges are often due to distance and physical or topographical accessibility, social and institutional factors (e.g. the lack of EWS that take into

Box 24: Good practices related to local level early warning systems

- ✓ **Germany:** Flood management centers at the communal level are responsible for local forecasting and providing warnings to community members, while the Federal states are legally responsible for the construction, preservation, operation and planning of such centers in their respective communities/ municipalities. These flood centers have different early warning systems in place because of no central regulation and greater outreach at the community level.
- ✓ **Jamaica:** Community-Based Flood Early Warning Teams have been established along major river basins and waterways and have been granted the capacity to communicate within networks to relay information at the local and national levels. Three communities were trained to interpret radar data using online sources as a means of enhancing EWS.
- ✓ **Sri Lanka:** An effective people-centered early warning system was established with the participation of early warning teams (volunteers) using local communication methods (e.g. bells and horns). This local hazard monitoring system is now being scaled up in other communities.
- ✓ **Thailand:** At the village level, Civil Defense Volunteers and local volunteers have been trained on EWS monitoring and message delivery. The name of "Mr. Disaster Warning" is given to emergency volunteers and trainees. As for warning messages, local communities are installing rain gauges and sirens.

consideration the special needs of the disabled), as well as technical issues (e.g. a disaster happens at a time when media is not broadcasting or in places where media do not exist). Such problems can be partly mitigated by communication and transportation infrastructure development, the introduction of media in underserved communities and raising public awareness on disaster risk and EWS. Subject to the characteristics of the community, combining multiple delivery tools will also widen EWS coverage (Box 25) and reviewing existing early warning systems is important for their improvement (Box 26).

i) Physical and topographical accessibility

- Solomon Islands: No appropriate procedures for end-to-end EWS are in place. Challenges remain in terms of getting warnings to remote communities in a timely and appropriate manner.
- Mexico: One of the challenges is to reach marginalized and remote populations. It is important to increase the availability of broadband services to underserved communities and sensitize people on how to use new technologies.
- Lao PDR: Dissemination of EWS is a challenge due to poor ICT/transportation infrastructure; it is compounded for those population settlements in inaccessible areas.

ii) Social and institutional factors

- Tanzania: EWS are not widespread and people rarely listen to broadcasts of weather warnings, especially in poor and vulnerable communities. Lack of community awareness remains a challenge and the limited investment in EWS mean that warnings can fail to reach local communities in a timely manner.
- Samoa: Future warnings need to reach every member of the community including vulnerable groups and those with special needs.
- India: Continuous efforts are being made to strengthen connectivity and outreach (to "the last mile") through training of community volunteers, community service orgnisations and local authorities, as well as upgrading technical infrastructure for more accurate prediction and warning dissemination.

iii) Technical factors

- Solomon Islands: Insufficient radios and availability of batteries affect communities' ability to

Box 25: Good practices regarding the combination of warning delivery tools

✓ **Finland:** An outdoor siren system reaches more than 80% of the population and is enhanced by mobile loudspeakers, TV and a radio broadcasting system, all of which make it possible to warn large numbers of people simultaneously.

✓ **Grenada:** The dissemination and communication of early warning information is well administered. This is facilitated through enhanced Internet access points for the general population, including those in remote rural areas, increased number of radio and television stations and the use of telecommunications.

Box 26: Early warning system assessment in Palau

According to the Tsunami National Capacity Assessment of 2009, the process of receiving an international tsunami message is too lengthy and convoluted to effectively warn the public. Some of the problems that have been reported include the fact that the National Emergency Management Office (responsible for issuing national warning) does not work 24/7; the cessation of radio broadcasts after midnight; delays resulting from National Emergency Management Office having to consult with the National Emergency Committee Chair; the inability of the communication systems of outlying islands to receive messages 24/7; not incorporating bulk SMS to disseminate warnings, and the absence of tsunami evacuation plans for communities.

receive warnings. The provision of clockwork radios in inaccessible communities could prove useful, but government funding to facilitate this is currently not available. Additionally, radio broadcast times (06:00 – 23:00) is problematic if warnings are needed at other times.

- **Samoa:** Early warning through media requires the population to listen at the required time. However, as with most radio and television transmissions, broadcasting ceases at midnight. SMS dissemination of messages has also encountered technical problems due to line congestion, phones turned off, low battery, no reception, and warning focal point absent from their designated locality.

5 Accurate and easily understandable early warning messages

Early warning messages should be as accurate as possible. The level of accuracy depends on the development of monitoring systems and risk assessments. Early warning needs to be easily understandable to stimulate the appropriate actions by the affected population. Sources of early warning should be authorized and messages should be given with care to avoid causing confusion or panic amongst the public. To this end, effective risk communication should be researched and developed.

i) Accurate early warning

- **Solomon Islands:** Accurate rainfall forecasts are needed to improve warning messages related to potential flood risks.
- **Mauritius:** Capacity building is required to assess the risk associated with hazards, provide precise and necessary actions, and avoid false warnings.

ii) Understandable early warning communications

- **Nepal:** One of the challenges for early warning systems is establishing communication protocols between technical authorities (for example, the Department of Hydrology and Meteorology) and communities.
- **United States of America:** The U.S Geological Service has formed partnerships with risk communication professionals to improve public statements and warnings.

iii) Authorizing sensitive early warnings to avoid confusion

- **Australia:** Challenges remain with regards to assessing who should be warned and how to express the urgency of the situation to citizens.
- **Solomon Islands:** There is an issue in urban areas of people receiving inaccurate information from unofficial sources, which causes panic amongst the population. Access to data from official sources is critical.
- **Japan:** An overflow of information in a society like Japan (which is already saturated with information) can lead to excessive social anxiety. Delivering accurate information in a comprehensible and timely manner should be the aim of policy makers and DRR/DRM stakeholders. Technological limitations and forecasting errors of earthquake EWS have to be shared with the public.
- **Sri Lanka:** Communities that have experienced devastating tsunamis overreact to early warning messages without giving them due consideration. This leads to confusion and has the potential to inconvenience the general public.

6 Ensuring the participation of media and the telecommunication sector

Many countries emphasized the role media and telecommunications providers can play in delivering EWS related services. Because these sectors are usually private, formal procedures (such as Memorandum of Understanding) are required (Box 27). In some countries, awareness of the media and telecom sector on disaster risk, and how they can play a role, are nonexistent; therefore, governments must

support capacity building in these sectors. Media and telecommunications should be seen as critical infrastructures and made resilient to disasters.

- **Fiji:** Better partnerships with the media, agreed guidelines and reporting frameworks should be developed, and the National Disaster Management Office requires additional staff to initiate and drive this through to completion.
- **Nepal:** The involvement of the media in EWS should be improved through awareness raising and capacity building measures.
- **Cook Islands:** Early warning systems are heavily dependent on the Internet and telephone communications, both of which are vulnerable to disasters as the main office of the telecoms provider is located along the shoreline.

In addition to television and radio, the prevalence of mobile and Internet services expands the opportunity for wider emergency outreach in a timely fashion. More and more countries are looking to social media and SMS as tools for delivering early warning messages. Taking advantage of technological progress is important for widening outreach.

- **British Virgin Islands:** There is a need for procedures/legislation to mandate radio and television stations to provide early warnings. This also includes mobile telephone service providers who have the capability to provide public notifications through SMS and cellular broadcasting. Cellular networks should be utilized to the fullest extent and will require changes in the Telecommunication Act, as well as an investment and commitment from providers.
- **Trinidad and Tobago:** Social media is being used increasingly to facilitate EWS, though its reach is limited to those with access to the technology.

7 From warning to action: the public response

Even if governments are successful in delivering early warning messages to the public there is no added value if people do not respond in an appropriate manner to these warnings. Efforts need to be made to translate warnings into concrete actions in order to reduce losses.

- **Kenya:** Low literacy levels at the community level, cultural taboos and a lack of capacity to take action early on have been cited as key challenges in Kenya. Even after receiving warnings, especially with reference to floods, people in western Kenya are so attached to their ancestral land that they are often not willing to move to higher grounds.

Box 27: Formal procedures for involving the media and telecommunication sectors

- ✓ **Japan:** National and local governments have made agreements with the Japan Broadcasting Corporation and other private broadcasters to take on a role in EWS by running special programming or telops (texts superimposed on a screen) at the time of a disaster.
- ✓ **New Zealand:** An MoU has been signed with major radio and TV broadcast companies to provide emergency warnings to the public. Following an improved understanding of agencies' needs, advances in technology and recent events (tsunami threats), these arrangements have been revised and strengthened.
- ✓ **Guatemala:** The Guatemala Broadcasting Authority has to fulfill the agreements made under the Radio and Communication Act. The Act specifies that the media have an obligation to broadcast warnings.
- ✓ **Samoa:** The National Disaster Management Plan requires that the media give priority to airing and broadcasting public information related to disaster or emergency events. Several media organizations have developed response plans to help coordinate the issuance of public warnings through radio, TV and print media.

- **Solomon Islands:** Generally speaking, warnings are acted upon when received, but this is not always the case. Concerns about economic survival have affected how people act after receiving warnings, pointing to the need for enhancing people's awareness regarding warning signs and how to best respond.

To raise awareness on how to respond to a specific warning, a government can provide public education programmes, conduct drills, prepare Standard Operating Procedures and generate strategies that inform the public how to act when warnings reach. Consulting with vulnerable groups is also important for facilitating their evacuation.

- **Sri Lanka:** People have a tendency to ignore early messages and so a toolkit to assess community preparedness is being developed. Also being drafted is a training manual for agencies.
- **Indonesia:** There have only been a handful of provinces and districts/cities that have developed and implemented Standard Operating Procedures for EWS.
- **Cook Islands:** Communities, particularly in the Outer Islands, lack knowledge of warning codes, hazard areas and evacuation points. Early warning drills have focused on cyclones and tsunamis, but it is essential to strengthen community preparedness for other hazards.
- **Fiji:** Community awareness on warning signs and how to respond need to be continuously raised. There has been little effort to consult with women's organizations or identify high-risk groups that require special care.

8 Other technical issues: energy, redundancy and traditional knowledge

Some countries are concerned about the energy requirements of EWS equipment. To ensure warning dissemination before an imminent hazard, equipment needs to be fully charged and maintained. Redundant lines or facilities serve as back up in preparation for the unexpected disruption of EWS. In countries where hazard levels are very high, consideration of redundancy is important though it is understood that redundancy is often regarded as inefficient in times of peace.

- **Yemen:** There is an inability to deliver warnings to all parts of the country 24 hours a day. This is due to a lack of electricity in rural areas and power outages in cities that paralyze the entire country.
- **Botswana:** Most early warning messaging is done with the use of electronic equipment. The country needs to employ more sophisticated and unconventional energy saving equipment.
- **Marshall Islands:** If radios are relied upon, far more are needed and back-up energy supplies need to be better resourced.
- **Maldives:** Redundant links have been established for communicating with local, regional and international centers by using 256kbps VSAT, a 10mbps Internet connection and satellite phone.

In certain reports, traditional knowledge was highlighted as a useful method for sharing early warning messages; this is particularly true for urban dwellers estranged from traditional settings. It is important that traditional knowledge be systematically stored and shared with the public to complement modern EWS.

- **Solomon Islands:** People use and often rely on traditional emergency warning information and local knowledge based on past experience (e.g. running to the hills, observing animal behavior, changes in flora and fauna). Traditional knowledge on EWS and disaster preparedness should be documented and shared, especially with urban centers. That said, changes in weather patterns can challenge the effectiveness of traditional knowledge.
- **Vanuatu:** Traditional early warning methods are actively used in rural areas and stakeholders feel that the better use of these techniques can effectively supplement the tech-based solutions currently promoted by government.

Core indicator 2.4

National and local risk assessments take account of regional/trans-boundary risks, with a view to regional cooperation on risk reduction

1 Regional arrangements

Regional cooperation mechanisms have been developed for DRM and DRR. These mechanisms include a wide variety of activities: from regional level DRM planning to joint emergency drills and the common storage of relief supplies. There are two streams of focus with regards to regional cooperation, the first being the implementation of disaster preparedness including contingency planning and a regional level rescue system and the other, a scientific knowledge management system that includes risk assessment, monitoring, early warning and information sharing (**Table 2.4a** and **Table 2.4b**).[i] Some hazards, such as tsunamis, earthquakes and cyclones, tend to occur on a regional scale and financing facilities requires large-scale investment. To this end, it is reasonable to establish regional mechanisms and share costs and knowledge between participating countries.

- **Grenada:** On-going collaborations with regional counterparts and agencies mean that Grenada has benefitted substantially from regional DRM initiatives. This is true in relation to equipment, capacity building and institutional strengthening.
- **Cook Islands and Vanuatu:** Regional programmes and information exchange mechanisms provide excellent opportunities to increase efficiency in technical and specialized areas like weather forecasting. It is worth noting that it would be difficult, if not impossible, to replicate such programmes at the national level in small counties with limited capacities.

Table 2.4a: Examples of regional DRM cooperation mechanisms

Region	Regional Mechanism	Activities
Africa	African Union (AU)	African Risk Capacity (response to drought)
East Africa	East African Community (EAC)	East Africa DRR Initiative Regional Disaster Management Center of Excellence
West Africa	Economic Community of West African States (ECOWAS)	DRR Action Plan for the West African Countries DRR Frameworks and Strategies for West African Region ECOWAS Emergency Response Team
Africa Sahel	Permanent Interstates Committee for Drought Control in the Sahel (CILSS)	
America	Organization of American States (OAS)	Inter-American Network for Disaster Mitigation
Latin America	Coordination and Cooperation Forum of Regional Mechanisms for Disaster Risk Management	CDEMA, CEPREDENAC, CAPRADE, and Special Meeting on Risk Reduction of Socio-Natural Disasters, the Civil Defence, Civil Protection and Humanitarian Assistance(REHU)
Latin America	Southern Common Market (MERCOSUR)	Intergovernmental Commission for Risk Management and Vulnerability Reduction

Table 2.4a cont.

Region	Regional Mechanism	Activities
Central America	Center for Coordination and Prevention of Natural Disasters in Central America (CEPREDENAC)	6 member countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama)
South America (Andean Countries)	Andean Committee for Disaster Prevention and Reponses (CAPRADE)	4 member countries (Bolivia, Colombia, Ecuador, Peru)
Caribbean	The Caribbean Disaster and Emergency Management Agency (CDEMA)	18 member countries Comprehensive Disaster Management Strategy and Framework, Regional Security System, Annual Simulation Exercise Regional emergency telecommunication network Internet-based website, Caribbean Catastrophe Risk Insurance Facility (CCRIF), Emergency Assistance Fund
Asia	Association of Southeast Asian Nations (ASEAN)	ASEAN Agreement on Disaster Management and Emergency Response (2009) ASEAN Coordination Center for Humanitarian Assistance on Disaster Management ASEAN Disaster Emergency Response Simulation Exercise, including regional civil-military cooperation for disaster relief Regional Emergency Action Plan
Asia	Asian Disaster Reduction Center (ADRC)	27 member states
South Asia	South Asian Association for Regional Cooperation (SAARC)	8 member states SAARC Disaster Management Center (SDMC) (since 2007) South Asia Disaster Knowledge Network SAARC Comprehensive Framework on Disaster Management SAARC Agreement on Rapid Response to Natural Disasters Establishment of a regional food reserve
Arab States	Arab League	Arab Center for the Prevention of Seismic Risk and Other Natural Disasters
Europe	EU	EU directives (e.g. EU Directive on Floods in 2007)
Europe	European Network for National Platform for DRR	
North Europe		Nordic Rescue Agreement International Barents Resque drill (every two years)
South Eastern Europe	Disaster Preparedness and Prevention Initiative for South Eastern Europe (DPPI SEE),	
Mediterranean	5+5 Agreement (Maghreb and Southern Europe)	Cooperation and technical knowledge sharing
Pacific	The Pacific Regional DM and DRR Framework of Action 2005-15	Pacific Catastrophe Risk Financing Mechanism (under development) Regional Tsunami Exercise Pacific Disaster Net (online virtual center of excellence)

Source: HFA Progress Report for each country.

Table 2.4b: Examples of regional cooperation mechanisms for scientific knowledge management of DRM

Region	Activities
Africa	Intergovernmental Authority on Development (IGAD) Climate Prevention and Application Center
America	Early Warning System for Central America (SATCA)
Asia	Indian Ocean Tsunami Warning and Mitigation System ASEAN Earthquake Information Center South Asian Association for Regional Cooperation (SAARC) Meteorological Research Center South Asian Knowledge Development Network (SAKDN)
Caribbean	Tsunami and Coastal Hazards Warning System for the Caribbean and Adjacent Regions COSMIC program (50 GPS stations for hurricane monitoring) Caribbean Risk Atlas
Europe	Network of European Meteorological Services Seismic Early Warning for Europe (SAFER) Nordic Network for Geo-data for Risk and Crisis Management including creating digital maps available for geographic area within 100 kilometers of the border. SEERisk (started in 2012 in central Europe): common risk assessment methodology
Pacific	The Pacific Risk Exposure Database Regional Specialized Meteorological Center for Tropical Cyclone in Nadi Pacific Tsunami Warning Center Melanesian Volcanological Network

Source: HFA Progress Report for each country.

The challenges often highlighted are insufficient resources (financial and human) that prevented increased participation in regional activities and the absorption of regional initiatives. Additionally, limited resources threaten regional programme sustainability.

- **Turks and Caicos:** Though being able to solicit support with its regional programming, the country has a limited capacity to sustain programmes at the national level.
- **Barbados:** Severe capacity limitations thwart efforts to fulfill the obligations of all regional and international DM and DRR programmes. As a consequence, the maximum benefits are not realized unless the regional organization itself has a strong human resource base and can render significant levels of hands-on assistance when necessary.
- **Grenada:** Collaboration in risk identification initiatives is hampered by Grenada's inability to pay fees and dues to partnership institutions. This means Grenada does not receive benefits for certain programmes and projects.

Aside from insufficient resources, there is a lack of awareness amongst the public and policy makers particularly with regard to: the existence of "trans-border risks" and the need for "regional cooperation mechanisms" to reduce the impact of disaster.

- **Fiji:** The public at large has little knowledge of trans-boundary risks other than tsunamis, rising sea levels, climate change, El Niño-Southern Oscillation cyclones and tropical storms. More regional information sharing is needed to facilitate information dissemination of regional activities between DRM/DRR stakeholders in the country.
- **Solomon Islands:** Though regional information sharing exists, stakeholders feel more could be done to facilitate the dissemination of information regarding regional activities amongst country actors.

Countries expect improved coordination of regional activities and a strong regional office that has programming aligned with national resources. To not do so would place too much stress on already limited resources. Where regional programmes are

aligned with national priorities, small islands countries have reported improved coordination with regional mechanisms (Box 28).

- **Samoa:** Knowledge and skills transfer from the regional level to the national level remains weak. If efforts and activities are to be aligned to national priorities, the challenges that still exist in ensuring better articulation and harmonization of priority area programmes passed down from regional frameworks must be addressed.
- **Cook Islands and Vanuatu:** While regional initiatives highlight new issues, they often do not include sufficient follow up measures and technical assistance to ensure long term sustainability. For small and under-resourced Emergency Management Offices, it is a challenge to provide the necessary in-country support so that countries can take full advantage of what is offered from regional programmes. In addition, the weak coordination of regional initiatives at the national level has resulted in high demands on staff.

It is important to note that in every region there are countries with different capabilities and needs. The priority areas will differ from country to country, which can prolong and hamper the coordination process.

- **Australia:** There is a lack of cooperation between regional stakeholders because of a lack of resources; an unwillingness by some stakeholders to realign existing programmes; poor knowledge about global and regional policy reforms, and an insufficient understanding about the priorities and programmes of other stakeholders. This results in the duplication of efforts between regional and national networks with regards to knowledge management, capacity building, training, risk assessment and hazard mapping activities.
- **Mozambique:** The main constraints to the implementation of regional projects include the existence of several management units and institutional structures in each country, difficulties in implementing a multi-tiered approach that optimizes local resource needs, and a lack of financial resources to ensure long-term sustainability.
- **Sierra Leone:** One key challenge is that not all of Sierra Leone's neighbors have conducted national hazard/risk/vulnerability profiles. In this respect, a major challenge in transnational DRR cooperation is that countries are not at the same level when it comes to policy formulation and implementation.

Box 28: Progress made in the harmonization of regional and national level DRM programmes

- ✓ **Samoa:** The Division of the Secretariat of the Pacific Community formed the Pacific Disaster Risk Management Partnership Network, which is comprised of more than 30 regional and international organizations.[ii] The objectives of this network are to provide regional support for the development and implementation of Strategic National Action Plans (SNAPs), and to sustain a regional network of development partners that work in the different areas of DRR/DRM to improve regional cooperation, coordination and collaboration; strengthen thematic areas identified in the 2005-15 Pacific Framework for Action; monitor and evaluate national progress; reduce duplication of efforts and ensure assistance is built on the efforts and experiences of each other.
- ✓ **British Virgin Islands:** The Virgin Islands Comprehensive Disaster Management (CDM) Strategy was aligned with the regional CDM Framework. There is a growing consensus amongst development partners and financial institutions on the need to harmonize CDM programming in the Caribbean. Stakeholders have agreed to use the CDM Framework as a key tool in this process and in developing a Regional Programme Based Approach (PBA) for CDM programming in the region. Aligning the country's CDM Strategy to the regional strategy has the dual benefit of being well coordinated with regional initiatives and also programmatically linked to the most critical aspects of CDM, which may generate future funding opportunities.

To boost regional cooperation efforts in risk assessment, monitoring and EWS, it is important to ensure the smooth flow of information across borders and standardize the current methodology. Institutional and technical coordination is necessary in this regard. Another necessity is the development of an underlying ICT infrastructure that can boost the development of a regional mechanism.

- **Germany:** Accessing data across national borders is complicated, time consuming and sometimes impossible as individual data owners must be contact in each country; new international agreements need to be reached.
- **Ethiopia:** The standardization of methodologies between countries is a major issue.
- **Pakistan:** South Asia is one of the lesser-developed regions because of weak technology and communication infrastructures, and because EWS are not at desirable levels. Governments in the region ought to take practical steps to ensure the free flow of information on mutually agreed DM mechanisms.

Along with technical and financial setbacks, political factors sometimes hinder regional mechanism development. Lack of coordination due to political conflict can worsen the impact of disasters and, in turn, further aggravate political strife.

- **Armenia:** Because of an absence of diplomatic relations with Turkey and Azerbaijan, regional and trans-boundary solutions for DRR are presently impossible.
- **Pakistan:** The regional geopolitical situation does not permit the free flow of information between countries in South Asia.

The involvement of the private sector, especially critical infrastructure providers, is an emerging issue in regional cooperation. Critical infrastructure, such as transport and energy, often transcends national boundaries and the mobilization of the private sector is essential for decreasing disaster impacts.

- **Germany:** The vulnerability of the German economy has lessened in recent years, though challenges remain because of the complex interdependency of cross-border activities, especially in the energy sector. There is strong regional coordination with respect to disaster response and protective systems, while cooperation is less pronounced when it comes to critical infrastructure as the industry is largely controlled by the private sector. Private actors too often react only when damage occurs and do not focus on disaster reduction and prevention.
- **Sweden:** Despite strong interest in collaboration in emergency management by water producers and providers in Sweden, Norway and Denmark, there is no cross-border cooperation in the field of emergency drinking water. A lack of resources/support and differences in water management systems make it difficult for the Scandinavian countries to collaborate.

2 Cooperation with neighbouring countries

Cooperation with neighboring countries is generally task focused and needs-based instead of focused on a comprehensive regional framework. The greatest areas of cooperation that neighbouring countries engage in are: river management, wildfire and health epidemics, rescue and response, and risk monitoring and assessment. Such cooperation often faces the same challenges described in the section above on regional cooperation and include: socio-political difficulties, differences in DRR policies and institutional arrangements between countries, and a lack of financial resources.

Cross-border cooperation in river management to ensure the equitable management of trans-boundary water resources and reduce the hazard risk of flood and drought, is a politically sensitive challenge. This is however one of the areas where cross-border cooperation is the most developed and institutionalized (**Table 2.4c**).

Table 2.4c: Examples of cross-border cooperation regarding river management

Region	Cooperation mechanism	Activities
Africa	PRIMA (Inco-Maputo river system across Mozambique, South Africa and Swaziland)	Flood risk management study.
Africa	ARA North, ARA South, ARA Center and ARA Zambezi	Regional water authority
Africa	Flood management of the Mono River between Benin and Togo	Draft projects for flood management on the Mono River valley.
America	DINAGUA Coordination Program for La Plata River	5 year project by four countries (Argentina, Brazil, Paraguay, Uruguay) for studying climate variability from a cross-border perspective.
America	Sixaloa River basin coordination between Panama and Costa Rica	Vulnerability assessment during rainy season.
Asia	Mekong River Commission	Flood Management and Mitigation Strategy. Flood Management and Mitigation Programme. Flood Vulnerability Assessment and Mapping.
Europe	International River Commission (e.g. River Rhine)	Action plan regarding flood control and management. Flood risk assessment and mapping.
Europe	DRAVIS project (River Drava region between Hungary and Croatia)	Disaster management information system with web-interface for information exchange.
Europe	The Danube Flood risk project	9 countries Hazard and risk maps for the entire river

Source: HFA Progress Report for each country.

Rescue and response arrangements are also an area of cross-border cooperation though institutional coordination, such as standardized systems of command and visa arrangements, need to be in place before the onset of a disaster to ensure speedy and efficient response, especially if the disaster/emergency is in a border region. It is also important to determine how to provide security to displaced people during such events.

- **Germany:** In the case of wildfires, there is no common terminology, training, protocols or incident command system in place for standardized and cooperative wildfire response action. The Global Fire Monitoring Center has developed templates for protocols/agreements related to border crossing assistance in wildfire situations. The use of the Incident Command System as a management tool is proposed if two or more nations are working together on a wildfire emergency situation.
- **Finland:** The country has a long lasting and close cooperation with Sweden and Norway in several areas of DRM. Rescue services function across borders and it is understood that the closest unit handles the emergency regardless of nationality. While there is frequent emergency training between Nordic countries, visa requirements complicate cooperation between Finland and Russia.
- **Nepal:** In 2008 the Koshi Flood affected Nepal and India and many victims in India crossed the border to take refuge in shelters in Nepal. In the absence of a trans-boundary disaster framework, the response was poorly coordinated. Inter-governmental cooperation for common trans-boundary issues and the mobility of people during disasters needs to be strengthened.

The need for involving local governments and stakeholders is clearly outlined. The global trend of decentralization has led to many authorities giving local governments greater political responsibility in

land use and local development, environmental and water management. This means that local government participation in cross-border issues has become indispensable. The example of Italy is of particular interest as the central government has granted regions the legal right to set up international agreements in relation to civil protection (Box 29).

- **Croatia:** Strengthening the system at the local level is a precondition for joint operations where neighboring countries respond to disasters and major accidents in border areas.
- **Nepal:** Policy makers have recommended that hotlines are established in border areas so authorities at all levels (national, regional and district level) can communicate directly when disasters require cross-border efforts.
- **Switzerland:** A tri-national earthquake drill (involving Switzerland, Germany and France) took place in 2012 that included staff/task forces from the municipal and national levels.

3 Global cooperation mechanisms

Many countries reported having some form of global cooperation activity, usually with the United Nations system including the World Health Organization and World Meteorological Organization. In their reports, some countries outlined their commitment to the HFA and participation in DRR regional platforms. Linked to these platforms are scientific networks that have been developed at the global level to monitor and assess risks (**Table 2.4d**).

4 Domestic cooperation mechanisms across local governments

In countries like Italy, Sweden and the United Kingdom, local governments provide inputs to disaster risk programmes that go beyond their basic administrative territories. Water management is addressed as

Box 29: Local level involvement and cross-border cooperation in Italy

> The reform of Constitutional Law N.2 of 2001 granted regional authorities in Italy the power to sign international agreements concerning civil protection so long as they are in compliance with national policies. This means regional authorities (with international boundaries) can set up cross-border agreements with foreign civil protection agencies.

Table 2.4d: Examples of global scientific networks

Activity	Global network or mechanism
Monitoring	• Global Earth Observation Systems • International Charter for Space and Major Disasters • UN-SPIDER project (Space information)
Earthquake risk assessment and monitoring	• Global Seismic Network • Global Earthquake Model (led by Organization of Economic Co-operation and Development)

Source: HFA Progress Report for each country.

a common concern of several municipalities, often requiring the cooperation of neighboring local governments.

- **Italy:** Stakeholders in the regions, provinces and municipalities collaborate for carrying out joint comprehensive risk assessments. Internal transboundary issues are taken into consideration according to directives and guidelines issued by the National Civil Protection Department. Specialized agencies have been set up in order to deal with risks typically involving more than one region, such as the hydrological risk linked to rivers and to major basins.
- **Sweden:** County administrative boards work towards regional cooperation on risk reduction through regular meetings between different counties, as well as sector specific cooperation. Administrative boards collaborate with municipalities in innovative ways such as through the multi-sector river group, a unit that was established to assure effective river basin water management.
- **United Kingdom:** All 14 Thames Valley local authorities have come together to produce a database that identifies a range of resources that may be used in responding to an emergency.

Notes

i Regional insurance mechanisms, such as the Caribbean Catastrophe Risk Insurance Facility, are explained in Section 5.3 and excluded from this section.

ii Including the Division of the Secretariat of the Pacific Community, Pacific Islands Forum Secretariat, United Nations Development Programme and the World Bank.

Priority 3

Use knowledge, innovation and education to build a culture of safety and resilience at all levels

Core indicator 3.1

Relevant information on disasters is available and accessible at all levels, to all stakeholders (through networks, development of information sharing system etc.)

The title of this indicator is similar to indicators 2.2 and 3.4. This means there will be a duplication of information between these indicators. Information has been reorganized and data related to coordinated information management has been merged under indicator 2.2, while providing information to the public falls under indicator 3.4. In this section, the focus is on the need for a central web portal to channel information.

Considering the usefulness of the Internet for information dissemination, many countries have reported setting up and maintaining a web portal. Most web portals are managed by disaster risk management agencies and provide information on risks and risk management measures, including DRR. Limited resources (technical and financial) on the part of service providers and lack of Internet access in vulnerable communities are key challenges. It is imperative to improve the usability of such services by strengthening technological infrastructure in all locations and providing information in a clear and concise way.

- Marshall Islands: Limited resources (technical and financial) hamper the establishment of a "one-stop resource center" for information on DRM.
- Pakistan: The effective dissemination of information requires a robust ICT infrastructure. The development of a countrywide ICT infrastructure for rural areas, where the majority of the most vulnerable live, requires a massive allocation of resources.
- Zambia: The challenge is to have information in a useable format that is readily available to all stakeholders. Poor technological infrastructure at the community level also continues to hamper progress in the community.

Technological progress provides users with unlimited potential for DRR/DRM programming. For example, interactive functions, such as web based map viewers, can have a positive impact on civil participation in DRM activities.

- Finland: During a crisis event, the website would have interactive sections where citizens and NGOs could supply authorities with additional information and receive official information.
- Germany: The Center for Disaster Management and Risk Reduction Technology's Risk Explorer Germany is a web-based map viewer that interactively presents Germany's risk map and allows users to retrieve maps of disasters, vulnerability, potential risk and assets (elements at risk).

Core indicator 3.2

School curricula, education material and relevant trainings include disaster risk reduction and recovery concepts and practices

With reference to indicator 3.2, countries addressed issues regarding the curricula of primary and secondary schools, and also those of university and professional training institutes.

1 Primary and secondary school curriculums

A comment that attracted a fair bit of attention is the lack of awareness in the Ministries of Education, as suggested in the reports of Thailand and Pakistan. This appears to be linked to a lack of capacity in the education sector.

- **Thailand:** School curricula, education material and training are not widely promoted and several factors are responsible for ineffective disaster education. Policy makers in the Ministry of Education do not make disaster education a priority and as a result, departmental organizations and schools do not integrate disaster education into their programming. Practitioners also do not promote DRR in school curricula/trainings due to limited budgets and untrained personnel.
- **Pakistan:** There is an awareness gap in the departments of education. This lack of awareness is coupled with a lack of expertise, which has impeded the implementation of a national plan and strategy for integrating DRR into school curricula within the defined timeline. To overcome this problem, the National Disaster Management Authority is extending technical assistance to the Ministry of Education for developing required curricula.

Secondly, regardless of whether DRR and DRM issues are integrated into a school's curriculum, there is a need to build the capacity of teachers through the provision of training and materials. The lack of financing for training and providing materials is a challenge. ICT infrastructure and capacity in schools is also important for DRR education.

- **Bangladesh:** Though steps have been taken to develop resource materials and train teachers, the resources are inadequate considering the size of the sector.
- **Samoa:** The major setback for integrating DRM into schools is that a module has been provided to schools in CD format but only 38% of schools have computers that can be used for teaching purposes. This problem is exacerbated by the fact that many teachers possess little or no computer knowledge or skills.

The third point is that the type of DRR material included in the curriculum is of the utmost importance. While Georgia has demonstrated a coordinated approach to disaster issues (Box 30) only the physical characteristics of hazards are taught in countries like Finland and Mozambique, leaving out DRR and response measures. DRR education should be provided in a comprehensive way, and for it to be truly effective children must be taught about the causes and the impacts to society. They should also be aware of the mitigation and preparedness strategy in place.

- **Finland:** Natural hazards are not systematically included in the national education curriculum. The focus is on how hazards are created and not so much on what could be done to prevent and reduce losses.
- **Mozambique:** Only the physical aspects of hazards are presented in primary and secondary schools textbooks. There is no reference to the human, economic and social impacts or the methods/techniques to prevent or reduce the negative impacts of disaster.

Box 30: Comprehensive integration of DRR education in Georgia

Components of DRR are taught at the primary, basic and secondary levels and take into account the age-related features and capabilities of each student. Within the framework of the *Natural Science Curriculum*, students are taught how to identify safe and hazardous environments and understand the steps to take in case of emergency. Within the framework of the *Social Science Curriculum*, geography classes provide students with information on the need to protect the environment and the significance of sustainable development for the advancement of society. The main emphasis is on the knowledge students should possess about natural and manmade hazards, their causes and effects, and developing the right attitude towards the environment. *Civil Defense and Safety* is a new subject and is taught for one semester in the 4th, 8th, and 12th grades. For 4th graders, the idea is for students to learn how to behave in an unfamiliar environment. In the 8th grade they learn how to prepare for and respond to disasters, while in the 12th grade students learn about evacuation conduct in case of an emergency and how to provide first aid.

In relation to the preceding points, many schools have an overload of classes and there is resistance towards adding DRR in school curricula. In such cases, specific arrangements are essential so that DRR can be effectively streamlined into existing curricula. This can be done by incorporating DRR in existing classes instead of adopting DRR as stand-alone subject.

- **Croatia:** Initiatives for streamlining DRR in school curricula have often failed, as teachers claim children are already overloaded with their current course load and there is no room for new material in the existing curricula.
- **Saint Kitts and Nevis:** The current structure of primary and secondary school curricula does not permit the inclusion of DRR and other non-traditional subjects/themes as 'stand alone' subjects.
- **Saint Lucia:** DRR can be used in the classes of English and mathematics to supplement current content.

Another point is the need for adjusting national curricula so they cater to the local context. As recognized in Georgia, "[…] reforming school curricula in accordance with disaster risk management and protection is very important for the defense of disaster prone communities." Considering that hazards are often local phenomena, DRR education within a local context is an important aspect to be promoted. China and Indonesia, large counties with diverse natural and societal conditions, have both emphasized the need for regions to commit to developing a DRR curriculum. Locally contextualized DRM education has the potential to strengthen community level knowledge and awareness even amongst the most disadvantaged members of society.

- **Nepal:** The curriculum designed at the central level is often unable to reflect the realities of disaster prone areas. There are different hazards in different parts of the country and diverse resources are needed to cope with disasters. To contextualize DRR content in schools, teachers need orientation, training and hands-on experience.
- **China:** In Implementing the Comprehensive Disaster Prevention and Reduction Plan (2011-15) the Ministry of Education has outlined requirements for the development of a local disaster prevention and reduction curriculum for schools (according to laws and local context).
- **Indonesia:** One of the challenges is the need to build commitment in the regions to develop a curriculum that contains DRR. A critical challenge is the lack of coordination amongst concerned agencies at the national and local levels. The government needs to advocate for the integration of DRR and recovery concepts in schools and the inclusion of DM training for district/city government officials.

Sixth, the coverage of DRR education is not universal in a number of countries. It will be challenging to

reach marginalized regions and populations.

- **Colombia:** Measuring the size of the country against the number of hazards and vulnerable communities, the number of people who have received DRR education is limited. It is imperative to increase DRR access, particularly in vulnerable communities.
- **Thailand:** The education system is divided into two distinct segments: schools that are situated in urban areas and underdeveloped schools that are situated in rural areas. These two types differ in that the first is not at all interested in the inclusion of disaster education in schools, while the latter understands the importance of offering such education to its students.

Seventh, children can play a role in raising risk awareness and preparedness in their households. The United States and Australia have developed educational materials that foster the leadership of school children in disaster preparedness and teach them how to share this information with others. Looking at children as "active agents" of change instead of objects that need to be protected can broaden the scope of DRM education and its future impact.

- **United States of America:** Recent focus on educating youth and families about emergency preparedness has led to the expansion of the Federal Emergency Management Agency's Student Tools for Emergency Planning programme, which educates and energizes students in school to go home and act as leaders in implementing key preparedness strategies with their families. The programme is currently in its pilot phase in several 4th grade classes in six New England states.

The last point under this section, seen in the reports of Bangladesh and India, is the need to cater to those who are outside the formal education system. This is especially important considering the state of education and social development in many developing countries.

- **Bangladesh:** Adolescents, women who marry young and people with disabilities who never received a formal education system or dropped out early, need to have access to a specialized education on DRR survival and safety measures.
- **India:** Targeted interventions for children with special needs (as well as children covered by informal systems) are necessary.

2 University curriculum

Under indicator 3.2, many countries addressed the state of the curriculum and higher education courses, including universities. Universities and graduate schools have different institutional structures and perspectives compared to those seen in mandatory education programmes. An elementary education in most countries is mandatory and public school based, so DRR integration in the public school curricula has the ability to reach larger numbers of people. Higher education, on the other hand, is provided by both public and private institutions and integrating DRR into higher education curricula leads to the graduation of professionals looking to play a leading role in DRM.

More than twenty countries offer disaster management courses in their universities. Judging by the name of courses and/or title of degrees, most focus on disaster management instead of DRM or DRR. The challenge is to not only create DRM and DRR courses but also systematically integrate these issues into a variety of academic fields in the natural and social sciences.

- **Germany:** There is still no exclusive study programme for disaster medicine in Germany and disaster protection/management is not integrated enough in the study of spatial and land use planning. There is also no systematic approach for incorporating relevant, disaster-related curricula into existing study programmes and many fields – like architecture, engineering, chemistry, economics and others – do not incorporate disaster specific elements.
- **Switzerland:** The integration of DRR in various

subjects (e.g. engineering, architecture, agriculture) has occurred but it is not systematically carried out. Efforts have to be made to incorporate DRR into social science theories and approaches in university courses and research.

Another point worth noting is that on-the-job education can improve capacity building and facilitate knowledge exchange between academics and policy makers. Germany and New Zealand (Box 31) are good examples of this. For this to be successful however, professional training is required for university professors. There is a need to increase the number of domestic experts as seen in Samoa and Ethiopia.

- **Samoa:** Current mechanisms for knowledge and skills transfer between researchers and end users are weak, and knowledge is limited to a select individuals. This gap needs to be closed and resource support should be provided to local education institutions to develop professional short courses and full time programmes that cater to the DRM needs of Samoa.
- **Ethiopia:** Specialized academic departments for disaster risk management and sustainable development in major national universities provide undergraduate and graduate degrees in DRM. This has enabled the professionalization of a DRM workforce in the national government.

Third, the involvement of national government is necessary for mainstreaming DRM and DRR into higher education programmes. As in the case of Honduras, even if DRM courses exist, programmes are expensive or not well known. This calls for additional support and promotion from government. Germany and Sweden utilize their national platforms for conducting an inventory on DRR related courses to increase the visibility of such programmes.

- **India:** The Government of India advised universities to integrate and institutionalize disaster management within the formal systems of higher education. The University Grant Commission issued a circular to all accredited universities to introduce courses on disaster management. Several universities have already started to do so.
- **Honduras:** Even if some higher education studies related to DRM exist, they are expensive and lack effective publicity mechanisms for their promotion. This has become a problem, as the country does not have a pool of qualified professionals to work in the field of DRR.

3 Professional training institutes

Fifteen countries highlighted the presence of professional training institutes for government officials, especially those engaging in disaster management. These institutes serve as centers of excellence (**Table 3.2a**).

Several countries have integrated DRM and DRR

Box 31: Work-based learning in professional higher education

- ✓ **Germany:** The Federal Office of Civil Protection and Disaster Assistance (BBK) and The University of Bonn established a masters degree programme in Disaster Prevention and Management in 2006. The programme is designed as an on-the-job correspondence course with monthly classes taking place in the Academy for Crisis Management, Emergency Planning and Civil Protection of the BBK.
- ✓ **New Zealand:** A key finding in the development of the Civil Defence and Emergency Management Competency Framework is the lack of attention paid to risk management in relation to emergency management, particularly in work-based learning programmes. The framework will also inform the development and review of standards that support practitioner work-based learning.

components into the curriculum of institutes that train all public officials.[i] Considering that DRM and DRR are cross-cutting issues, the involvement and capacity of all government officials should be raised further. Special care has to be taken however, as training provided by multiple organizations has the ability to cause inefficiency, confusion and contradictions during emergency situations. Training is discussed further in the section 5.2.

- **Nepal:** All government officials (including new officers and senior executives) need to go through a rigorous training designed by the Nepal Administrative Staff College. These trainings can be effective entry point for the government to develop a deeper understanding of DRR.
- **Vanuatu:** The National Disaster Risk Management Office has successfully incorporated DRR training in the Public Service Commission's annual schedule. This will help improve the level of awareness of DRR/DM issues within government.
- **Korea, Republic of:** Disaster and safety education programmes carried out by each agency and ministry will be integrated into one mandatory disaster and safety education training programme.

Table 3.2a: Examples of national training institutes for disaster management

Country	Name of institution
Armenia	Crisis Management State Academy
Australia	Emergency Management Institute
Canada	Emergency Management College
Cuba	Preparation and Training Center for DRM
Dominican Republic	National School of Risk Management under the National Emergency Commission
Germany	Global Fire Monitoring Center
Hungary	Education Center for Disaster Management
India	National Institute of Disaster Management
Norway	National Emergency Planning College
Pakistan	National Institute of Disaster Management
Poland	Center for Hydrological and Meteorological Education
Slovenia	Training Center for Civil Protection and Disaster Relief
Tanzania	National Disaster Management Training Center
Thailand	Disaster Prevention and Mitigation Academy
United Kingdom	Emergency Planning College

Source: HFA Progress Report for each country.

Core indicator 3.3

Research methods and tools for multi-risk assessments and cost benefit analysis are developed and strengthened

1 Institutional/financial arrangement of research

Countries reported how they plan to finance and implement research programmes on DRM and DRR. Government agencies, public research institutes and universities often take the lead on research initiatives. While there are good practices that can be scaled up and replicated, there are still countless challenges that need to be overcome. These are outlined below.

First, most countries report the need for improved coordination between research institutions, as well as projects. This is necessary to increase efficiency and improve knowledge transfer across institutions. In many instances, research programmes are implemented by different organizations with little consultation and results are scattered across organizations. Without a coordinated framework, countries waste valuable resources by duplicating activities and have difficulty in identifying knowledge gaps and/or developing strategies to prioritize weak areas of research.

- Costa Rica: The National Commission for Emergencies gives resources to universities to promote the development of research, but the challenge is creating a mechanism for sharing results and avoiding overlapping efforts.
- Mozambique: There is lack of systematic collection, publication and dissemination of existing DRR studies. Most are scattered across government departments and research institutions – this hinders the engagement of academia and institutions in DRR research.
- Sweden: One limitation is the lack of a common, joint, cross-sectoral approach to comprehensive research on natural hazards and DRR. Today, there are individual projects that result in fragmented research. The Swedish National Platform for DRR needs to identify areas within DRR where there are gaps in the knowledge base.

Second, Disaster Management Agencies or National Platforms are expected to play a role in coordination; all good practices show the commitment and leadership of such organizations. Some countries have created comprehensive research plans and/or strategies to clarify priorities and ensure continuity of research. Others have established a network of research institutions to facilitate information exchange (**Table 3.3a**). Building the capacity of such agencies and platforms is crucial for resolving the coordination issue.

- Panama: Some universities are conducting research on DRM and DRR issues, but no coordinated research networks exist. This is being discussed in the National Platform.
- Jamaica: There is a need for strengthening the capacity of human resources within the National Disaster Organization so that information can be gathered from participating agencies and meaningful work can ensue.
- India: A core group of experts from scientific and technical institutions has been set up by the National Disaster Management Agency to establish links, identify research needs and opportunities for collaboration between various knowledge / resource institutes.

Third, some countries placed a low priority on research, especially if it was linked to DRR. This has led to decreased budgets for scientific research, as well as ad-hoc and unsustainable investigations. Donor dependence in this regard prevents institutions

from securing research budgets themselves. It is necessary to raise awareness amongst policy makers of the need to kick-start research for effective DRM policy making.

- **Marshall Islands:** Research is not a priority in the Joint National Action Plan for DRM and Climate Change and is seen by many government representatives as a "luxury" in the face of more urgent matters. Donors are often responsible for most research initiatives.
- **Saint Lucia:** A number of initiatives are donor driven and though they may be of value, they are often not synchronized with national priorities and available capacity. A transition needs to be made from donor driven projects to sustainable activities in the area of DRR.

Fourth, some countries have pointed out the difficulty in applying knowledge gained from research and putting it into practice. To bridge this gap New Zealand and Germany set up a platform for strategic cooperation between scientists and end-users. These examples show how multi-stakeholder platforms can facilitate needs-based and implementation-oriented research (Box 32). Strengthening the link between researchers and practitioners, and implementing needs-based research can contribute to addressing research funding gaps as outlined above.

- **Chile:** Results from DRR research projects have either not been publicized or are limited to scientific papers, and are therefore beyond the reach of most of the population. There is a lack of communication between the scientific community and governmental organizations.
- **Mozambique:** Although DRR experts understand the physical mechanism of specific hazards, they lack knowledge on how to link specific hazards

Table 3.3a: Examples of DRR related research strategies and networks

Country	Name of strategy or network
Australia	The National Security Science and Innovation Strategy Australian Emergency Management Knowledge Hub
Bangladesh	Bangladesh Disaster Management Education Research and Training Bangladesh Disaster Knowledge Network
Canada	The Canadian Risk and Hazards Network (established in 2005)
Egypt	Advisory Committee for Crises/Disaster Management and DRR
Germany	Research Forum on Public Safety and Security (established in 2009) High-Tech Strategy of the Federal Government The Helmholtz Research Network
India	India Disaster Knowledge Network
Japan	The Basic Plan for Research and Development in Disaster Reduction (revised in 2003)
Kazakhstan	Interagency Scientific and Technical Council on Problems of Emergency Situations and Civil Defense
Korea, Republic of	Comprehensive Plan on Disaster and Safety Management Technology Development
Slovenia	Technology for Security and Peace 2006-12
Macedonia, FYR	National Laboratory Network

Source: HFA Progress Report for each country.

with their root causes (vulnerabilities) and provide solutions that address multi-hazard impacts. Furthermore, there are few multi-disciplinary DRR research teams that link academia, DRR institutions, and officials in social and economic sectors.

- **Nepal:** Research activities are sporadic and seldom originate from needs based issues. The research agenda is neither implementation oriented nor is it a part of a comprehensive DRR framework. This is due to the absence of institutional dialogue between academic institutes, professionals and practitioners. The first step in scaling up implementation-oriented research is to invest in multi-stakeholder forums like the National Platform.

2 Cost benefit analysis on DRR

Many countries commented on cost benefit analysis (CBA) of DRR. CBA is an important tool for stakeholders to integrate DRR into development and public investment planning. The use of CBA is also expected to raise the awareness of policy makers, including financial officers. However, existing CBA research is often sporadic or inadequate and most countries cited a strong and urgent need for enhanced, integrated CBA.

- **Fiji:** A fundamental deficiency is the absence of a specific articulation on DRM policy in the use of DRR cost benefit analysis. Analytical studies on the cost and benefits are urgently required in order to support the case for incorporating DRR into development planning and especially the case for DRR investment now (versus disaster response expenditure later).
- **British Virgin Islands:** There is a need for greater focus on the incorporation of CBA to illustrate the benefits of DRR. The cost benefit analysis of mitigation measures and risk reduction incentive schemes could be established at the policy level.
- **Saint Lucia:** Policy makers' apparent lack of appreciation for DRR considerations at all levels is a challenge that may be overcome by presenting DRR cost-benefit arguments.

A major reason for the insufficient level of CBA is the lack of awareness and technical capacity to perform CBA (in terms of methodology and tools) at the macro and micro levels. Financial constraints are also addressed as challenges in some countries.

- **Solomon Islands:** A lack of understanding of these kinds of studies, in terms of potential benefits, as well as a lack of human resource capacity to conduct such an analysis, currently limits the implementation of this kind of work.

Box 32: Research platforms that link researchers and practitioners

✓ **New Zealand:** Since 2010, the Government of New Zealand has moved towards negotiating longer term funding for hazard and disaster research through the establishment of a multi-agency, trans-disciplinary Natural Hazards Research Platform. The self-managed platform enhances collaboration between researchers from different organizations and promotes effective engagement between researchers and end-users. Funding is contingent on the ways the research directly contributes to the society's ability to enhance its economic, infrastructural and social resilience to natural hazards. Platform participants will be able to better align funding streams, promote strategic integration across research organizations and engage research users in the development of research programmes that include information transfer and uptake into practice.

✓ **Germany:** The High-Tech Strategy of the federal government aims at ensuring that innovative technologies are used in social and technical infrastructure in managing disasters (both man-made and natural). It is a platform for strategic cooperation between economic, administrative scientific and societal end-users. This initiative facilitates networking between different fields of research as well as exchange between researchers, users and operators of critical infrastructure.

- **Fiji:** Cost benefit analysis is not practiced at the sector level due to lack of awareness, knowledge and tools. While there are tools for assessing the national level macro-economic costs of disasters, those available to assess the sector level micro-economic impacts and socio-economic costs of disasters are inadequate.
- **Dominican Republic:** There is lack of financial resources for developing research and analysis regarding the cost and benefit of implementing DRR measures.

In implementing a CBA for DRR policies, the most difficult methodological issue to deal with is how to estimate the benefits of DRR investment. In probabilistic CBA, avoided damage is assumed to be a "benefit" of DRR policies – as seen in the case of France. The dearth of basic socio-economic data hinders stakeholders' ability to estimate "benefits." This is especially true when tracking past damage (outlined in Section 5.4) in order to estimate future losses, as seen in the cases of Colombia and Nepal.

- **France:** Calculating the cost-benefit analysis is based on determining the damages avoided. This practice is not uniform over the territory and a multitude of development projects have been implemented without economic and cost-benefit evaluations.
- **Vanuatu:** Cost benefit analysis is not a systematically utilized tool. This is due to a lack of comprehensive risk and hazard information and to lack of cost benefit tools. There is a little scope for capturing the social cost/benefit of DRR actions. The fact that disaster damage information is not systematically tracked, further undermines the possibility for effective CBA.
- **Colombia:** CBAs provide useful information for the estimation of the viability and the prioritization of risk reduction projects. However, the challenge is to standardize methodological considerations so that CBAs are comparable and enable the inclusion of cost-benefit criteria in decision-making processes. One important constraint is that there is no information available regarding the losses and damages avoided after risk reduction measures have been taken.
- **Nepal:** There has been little macro-economic and financial analysis of the impact of disasters, which hinders the cost benefit analysis of DRR investment.

The sharing of research results will improve the quality and standardization of the CBA, however, Algeria and Costa Rica have identified that information sharing is a challenge. Beyond information sharing, Switzerland established a standardized CBA methodology and an e-tool to extend the tool's wider application (Box 33).

- **Algeria:** One of the remaining challenges is to improve information and knowledge sharing, particularly in the industrial sector where many risk assessments and CBAs have been developed.
- **Costa Rica:** Not all information resulting from CBA research is accessible. Thus mechanisms and tools are required that consolidate research and make it available to both population and institutions.

Other examples – such as Barbados and the Solomon Islands – highlight the missing link between scientists and financial officials. Strengthening the link between natural science research and the

Box 33: Good practices regarding the standardization of the CBA methodology in Switzerland

EconoMe is a tool developed by the Federal Office for the Environment (FOEN) to assess the cost efficiency of protection measures. It supports the federal administration in prioritizing mitigation projects in the face of limited financial resources. The Federal Office for Civil Protection and FOEN developed an e-learning platform and calculation tool that allows for a simplified multi-risk and cost benefit analysis (LearnRisk and RiskPlan). Tools can still be improved upon and investigations should be made into broader applications.

economic elements of the CBA will help facilitate DRR policy implementation.

- **Barbados:** One constraint continues to be the weak link between research outputs generated by scientists and the cost benefit analyses produced by finance officers, so as to support planning and development policy decision making.
- **Solomon Islands:** Even if hazard assessment data is available, budget constraints limit the consideration of the findings if the implementation of the recommendations incur increased project costs. Promoting cost benefit analysis is necessary in order to counteract this.

3 Economic and social impact analysis

Fewer country reports provided comments on economic impact analysis. While the cost benefit analysis tends to take place at the micro-level, the economic impact analysis is generally macro in scope. Assessing the economic impact of disasters is important for mid to long term economic planning. This analysis however, presents several methodological challenges. These include how to define the impact (not only direct losses, but also indirect losses and macro-economic impacts) and how to deal with inter-sectoral linkages. Little research has been carried out in this field and more methodological courses of action should be pursued. Inputs from the private sector are also required to have good quality economic impact analyses.

- **New Zealand:** The Canterbury earthquakes offered a strong reminder about seismic risk within the built environment, especially in regard to the secondary economic and social impacts of the event and uncertainties involved in an extended recovery process; uncertainties that are often overlooked in costing hazard risk reduction strategies. Challenges include improving the ability to assess the full range of consequences and vulnerabilities, especially in regard to secondary impacts, undertaking comparative economic analyses and assessing the social and environmental costs and inter-dependencies. Other challenges include overcoming commercial sensitivities that may limit information sharing by private entities.
- **Nepal:** The options for incorporating potential disaster events into economic forecasting and other econometric models should be explored and feed into economic planning and decision-making processes.

Fewer countries addressed the need for a social impact analysis (SIA) even though SIA is important because the scale of disasters differ depending on the vulnerability of the community. Poor people, children, the elderly and the disabled are more vulnerable to hazards. SIA is an important tool for supporting social policy planning and requires disaggregated data (e.g. age and gender) to identify the vulnerable segments of society that need support.

- **Colombia:** Indicators need to be developed for assessing the effectiveness of risk reduction and disaster management; this includes the socio-economic impact of measures, strategies, plans and policies.
- **Fiji:** The availability of disaggregated data (age, gender, diversity) and social impact assessments is limited, which highlights the need for better social impact assessments to understand the impacts and needs for different groups/persons.

Core indicator 3.4

Countrywide public awareness strategy exists to stimulate a culture of disaster resilience, with outreach to urban and rural communities

Reflecting on the importance of improving public awareness, governments have looked to activities for sharing information and raising public awareness through TV, radio, newspapers and other forms of media. The comments under section 3.1 and 2.2 also deal with public awareness activities and have been integrated into the analysis of this section. Many countries utilize International Disaster Reduction Day and/or designate a specific day or week for campaigns. National Disaster Reduction Day is often used to commemorate victims of past disasters and inspire the public. NGOs also play a role in raising citizen awareness, especially at the local level.

- **Ethiopia:** The International Day for Disaster Reduction has been used to build momentum and raise awareness in urban and rural communities. Such days have proven to be useful in catalyzing activities around awareness raising and access to information.
- **Canada:** Emergency Preparedness Week is coordinated by Public Safety Canada and involves all provinces and territories, first responders, organizations like the Red Cross and the private sector. It is a collaborative event with hundreds of activities across the country, all aimed at raising public awareness and the need to be prepared for emergencies.
- **Nepal:** Earthquake day is observed in February and used to commemorate the catastrophic 1934 earthquake. Events have now been extended to many districts and International Day for Disaster Reduction is also observed at the national level.

1 Institutional and strategic approaches

Developing a strategic approach involving all stakeholders is important for coordination and the sustainability of public awareness raising activities. Without a strong strategy, awareness raising activities tend to be sporadic and inefficient. Some countries, though not many, already have systematic strategies in place (**Table 3.4a**). Implementation however, remains a challenge.

- **Macedonia, FYR:** In spite of achievements, there is a need for sustained commitment and capacities at all levels. For this purpose, a public

Table 3.4a: Examples of public awareness raising strategies

County	Plan or Strategy
Australia	Disaster Resilience Strategic Communications Plan
Egypt	National Communication Strategy for Raising Societal Awareness in the Area of Risk Reduction and Crisis Management
Japan	Basic Framework for Promoting a Nationwide Movement for Disaster Reductions: Actions with Added Value to Security and Safety
Romania	National Strategy for Emergency Situations Communication and Public Information (2008-10) National Strategy for Emergency Situations Public Information and Education
Samoa	Community Disaster Awareness Strategy

Source: HFA Progress Report for each country.

awareness strategy on DRR issues is needed. This would be developed with the involvement of all relevant stakeholders, especially local communities.

- **Indonesia:** Coordination amongst government agencies is particularly weak and there is no systematic strategy in place. This has led to an inability to raise public awareness in a systematic and comprehensive way.
- **Mozambique:** The lack of a national DRR awareness and communication strategy with defined institutional roles and targets hinders the full assessment of the achievements and the identification of future needs. An inability to harmonize general DRR messages and specific local hazard information, agree upon long term development priorities and adapt plans to local contexts, remain big challenges to current DRR and resilience efforts.

Along with public awareness raising strategies, an institutional arrangement for coordination must be established at the national and local levels. Awareness raising and creating a common understanding of risks and responses amongst sectoral institutions is important in delivering harmonized messages to the public.

Pakistan: Public Awareness Plans and strategies are to be implemented by the public institutions. However, most of the institutions themselves suffer from lack of awareness about DRR. Thus the National Disaster Management Authority (NDMA) faces the challenge of overcoming the lack of awareness of implementing partners. This can be done through a comprehensive awareness raising programme for government institutions that will coordinate efforts with the NDMA for developing similar programmes for the general public.

- **Macedonia, FYR:** The Council of State Secretaries has established a working group on info-networking, a resource register and public relations and public awareness platforms. One of the planned thematic working groups within National Platform for DRR is a thematic working group on media and public awareness.
- **Indonesia:** The government needs to build the capacity of Local Disaster Management Agencies and local government institutions in improving coordination between central and district/city level institutions and managing risk related information and communication tools/methods.

In ensuring a strategic approach to implementing, expanding and maintaining public awareness, the biggest challenge is the availability of financial and human resources. Inadequate financial resources leads to weak programme coverage in vulnerable communities, a lack of awareness-raising materials and unsystematic and unsustainable advocacy activities. Awareness raising amongst politicians could elevate DRR issues on the national political agenda and also increase resources (Box 34).

- **Malawi:** As a result of inadequate resources (financial, human and material), most awareness raising campaigns and training are limited to a few targeted rural districts and central level officials.
- **Syrian Arab Republic:** There is a need to allocate

Box 34: Strategic targeting and awareness raising amongst politicians

✓ **Nepal:** The substantial progress made in awareness raising campaigns has resulted in attracting the attention of parliamentarians. More than 100 parliamentarians (out of 600) were approached and advocated for mainstreaming DRR into the national agenda. A DRR toolkit has also been developed with a focus on sensitizing policy makers and parliamentarians.

✓ **Pakistan:** The National Disaster Management Authority has organized special awareness raising workshops for parliamentarians, provincial legislators, female legislators, the media, federal ministry officials, district administrators and private sector stakeholders.

funding for awareness campaigns that include producing and distributing materials through the media and using specialized expertise to deliver information to local communities, especially those in rural areas. More institutional commitment to DRR is needed.

- **Lao PDR:** Although the National Disaster Management Office (NDMO) and other international organizations/NGOs (operating in country) deliver regular public awareness campaigns on DRR/DRM, limited financial and human resources of the NDMO means weak coordination and ineffective awareness raising activities.

The second challenge is that national level public awareness strategies must be tailored to the local context while remaining consistent with national level policies and guidelines. The focus on local needs and contexts improves the effectiveness of DRM awareness raising activities. Financial resources and expertise are required at the local level.

- **Australia:** A culture of disaster resilience in the community is supported by public awareness projects and programmes tailored to the needs of the region/state. It is important to ensure that national campaigns, advocating for existing and new disaster resilience capabilities, are nationally consistent and can be tailored to address the context of each state.
- **Bangladesh:** Awareness raising initiatives often assume the audience is a homogeneous group, which impedes action by users. A greater investment in developing systematic knowledge and updating key disaster messages for various agro-ecological and settlement contexts is required.
- **Thailand:** To translate disaster awareness into the local context, additional funding is required, as are experts that create, monitor and evaluate disaster awareness raising programmes at all levels.

Third, public awareness strategies and programmes should reflect the paradigm shift from a reactive to a proactive approach with a focus on DRR (Box 35). The strategy should promote the options of self and collaborative help in communities and it is important to highlight that risk reduction can be embedded in a country's development process. Key messages should be clear and consistent, especially between governments and stakeholders.

- **United States of America:** The Citizen Corps calls upon citizens to embrace the personal responsibility of preparation and to be trained in first aid, emergency skills and volunteer with local emergency responders, disaster relief agencies and community safety groups.
- **Marshall Islands:** The main challenge is changing mindsets so risk reduction is seen as a development issue that must be taken seriously across all sectors. This is particularly true for traditional land owners, to ensure impact at the local level. A dedicated awareness strategy, in Marshallese, is

Box 35: Systematic public awareness programmes in the United States of America

In 2003, a national public service advertising campaign by the name of Ready was launched. This campaign educated and empowered Americans to prepare for, and respond to, emergencies (including natural disasters). The goal of the campaign was to get the public involved and increase their level of basic preparedness. *Ready*, and its Spanish language version *Listo*, asked individuals to do three key things: have an emergency supply kit on hand, make a family emergency plan, and be informed about the different types of emergencies that could occur and their appropriate responses.

The Ad Council declared *Ready* one of the most successful campaigns in its 60-year history. *Ready* information is available in the thirteen languages and includes *Ready Business* and *Ready Kids* spin-offs. *Ready Business* is an extension of the *Ready* campaign that focuses on business preparedness, while *Ready Kids* is a tool to help parents and teachers educate children ages 8-12 about emergencies and how they can help get their family prepared.

required to overcome this challenge, as ignoring this will result in lack of progress in local communities for years to come.

Fourth, countries need to pay attention to the use of common terminology in government institutions. Having a common understanding across sectors is important for delivering consistent messages. Risk communication techniques should be researched and applied, and DRM terminology must be easy for the public to understand.

- **Fiji:** There are many agencies conducting public education training, awareness raising and DRM campaigns with varied interpretations of DRM terminology (e.g. storm surges and tsunami waves use the same word "ualoka"). Some standards are needed on translation of technical terms and information on disaster risks as they are disseminated to all communities.
- **Vanuatu:** A major concern raised by many stakeholders is the lack of a common understanding of disaster and hazard related terminology. This has led to inconsistencies in messaging.
- **United States of America:** The National Science Foundation and other agencies support social science research to improve methods of effectively communicating with vulnerable populations to achieve effective results.

The fifth challenge is to overcome the human tendency to forget past disasters and maintain public awareness. As stated in the New Zealand report, large-scale disasters (both internal and external) must be exploited for increasing public attention on DRR issues. While attention to disaster increases after an event people tend to forget the lessons learned as time passes. This human characteristic also makes it difficult to retain public awareness of low frequency events. Raising the public's awareness should be ongoing and sustainable if the public's interest is to be maintained in the long-term.

- **New Zealand:** One approach to risk mitigation has been taking advantage of community willingness to act on local hazard risks following an event. A common example is supporting additional flood control works. Relevant events overseas can also be used to raise general awareness of similar risks in New Zealand. For example, tsunami risk management in New Zealand has greatly increased since the 2004 Indian Ocean and 2009 Samoa events. Looking ahead, the 2010 and 2011 earthquakes in Canterbury have raised public awareness and created opportunities for earthquake risk reduction nationally, especially with regards to buildings and infrastructure at high risk. These events have also highlighted the broader social and economic implications following a large scale event.
- **Marshall Islands:** The fact that there has not been a major disaster for some time is a challenge in raising the profile of DRR and DRM. If a disaster is not in the living memory of most of the population, it remains a challenge for disaster managers to highlight the importance of DRR/DRM amongst the public and the importance of understanding the procedures for emergency communications and response.

Sixth, and most importantly, beyond increasing public awareness, transforming awareness into action is regarded as the ultimate challenge in many countries. Public awareness raising strategies and programmes should be evaluated in terms of their ability to change people's behavior. Evaluation results should feed back into the public awareness strategy, however few countries have evaluated their awareness raising programmes. Without having a sound evaluation in place, awareness raising programmes tend to be a one-time occurrence making it difficult to ensure continued provision of financial and human resources for DRM/DRR activities.

- **New Zealand:** The major challenge is changing the behaviour of individuals and organizations. Behaviour changes can result from sustained education campaigns over the long term, for which the maintenance and revision of programmes are an ongoing requirement.
- **Saint Lucia:** There is a need to engage in more educational activities where a change in people's behavior is the goal. Continued use of the formal

educational system needs is essential and media practitioners need to see behavioral change as the ultimate goal (as opposed to information sharing).

- **Samoa:** Most community awareness raising programmes do not normally have follow up actions (impact assessments), so it is difficult to assess its impacts on vulnerable groups and the community as a whole. More needs to be done to evaluate the effectiveness of public awareness strategies for DRM.
- **British Virgin Islands:** A Knowledge, Attitude and Practices study is currently being undertaken to identify successes and gaps within public information and education programmes, and to better guide the implementation of programme activities to be included 2014-18 strategic framework of the DM Programme.

2 Outreach to all communities

First, outreach to all communities, including the most vulnerable, is regarded as a challenge and tailored approaches for specific segments of people has been adopted in many countries. Disabled and socially disadvantaged people are especially vulnerable to disasters; therefore, countries should take special care to reach out to these groups.

- **Barbados:** The public awareness strategy targets specific segments of the population (children, the elderly, the disabled and tourists).
- **Cook Islands:** During the response of Tropical Cyclone Pat in 2010, it was identified that vulnerable groups had lower levels of information and preparedness than the general population and that they should receive greater attention in the future through community consultations and disaggregated monitoring and evaluation.
- **Fiji:** More can still be done for remote and vulnerable communities, and disadvantaged groups. An emerging need is to consider standards for gender and rights inclusive awareness programmes.

Second, difficulties are also experienced in reaching small communities in remote and isolated areas. The development of transportation and communication infrastructure is one solution for improving outreach levels. Such infrastructure also contributes to early warning system delivery and speedy response after a disaster.

- **Maldives:** Outreach activities have improved due to a better setup of transport systems between provinces, atolls and islands.
- **Pakistan:** Effective dissemination of information requires supportive ICT infrastructure at all levels and must include rural areas, where majority of the most vulnerable people live. This will require a huge allocation of resources.
- **Solomon Islands:** There are several challenges in making hazard information available to the public. These include limited ownership of high frequency radio and TVs in rural communities; limited access to the Internet throughout the country except in urban areas; pamphlets that are not translated into Pidgin and provincial dialects, and low levels of literacy. Community access to radio technology needs to be improved, particularly in remote parts of the country.

Third, special attention to diverse communities is often addressed in the provision of public awareness programmes, especially in multi-lingual countries. Programme resources should be provided not only in the official language but local languages as well. The rapid movement of people, especially across borders, has increased the need to reach persons who speak different languages. Furthermore, new and temporary residents (the displaced and tourists included) often have little awareness of the existing disaster risks or past disasters specific to certain areas.

- **Rwanda:** Publicity messages and announcements are aired on a weekly basis in disaster prone districts. Messages are in the local language to ensure information reaches its target audience.
- **Cayman Islands:** The Cayman Islands has a significant transient labor pool and new residents

may not be aware of hazards, especially those in the vicinity of their residence or workplace.

- **New Zealand:** DRR information is now available in nine languages online so that ethnic communities have access to the information they need. Resources have also been developed for people with hearing disabilities.

3 Mass media involvement

Strategic mobilization of mass media and coordination with providers is important for raising public awareness on DRR/DRM. TV and radio are some of the most significant mass media tools due to their outreach capacity.

- **Barbados:** Disaster management and DRR specialists make regular appearances on popular TV and radio talk shows.
- **British Virgin Islands:** The Department of Disaster Management produces monthly radio and television programmes that focus on disaster management. These programmes are broadcast on all local radio and television stations.
- **Cayman Islands:** Traditional forms of preparedness information, such as brochures and display boards, appear to be less impactful and effective than the delivery of information through visual media such as video and television.

Globally, mass media is not fully equipped and/or used to increase public awareness on disaster risk and reduction. Considering the importance of what is aired, governments and the media need to have a mass communication policy in place (Box 36). Journalists should be trained on how to improve their own DRM/DRR knowledge as well as methodologies to share this knowledge with the public.

- **Malaysia:** There is a need for the government to cooperate closely with national TV networks, in order to build greater awareness and strengthen response capabilities for a more resilient community. To fully capitalize on the potential of mass media as an effective platform for relaying disaster preparedness information to the public, the Ministry of Information, Communication and Culture has established a Disaster Unit in the Malaysian Department of Broadcasting.
- **Barbados:** There are few dedicated mass communications specialists within the Department of Emergency Management who can conceptualize multimedia programmes in a systematic way and liaise with private sector entities for programme sponsorship and delivery.
- **Anguilla:** The National Media Network for DRR has been created to increase awareness and bridge the gap between available technical information and the information disseminated to the public. It

Box 36: Need for a comprehensive media mobilization strategy in Nepal

Once the emergency phase is over the attention of frontline media disappears and disaster affected people are left to live on their own. This not only makes the affected people more vulnerable but it also leads to a lack of investment in infrastructure, which increases citizens' vulnerability.

Media management is an effective tool for collecting hazard and vulnerability information and disseminating this information to communities at risk. That said, media involvement is limited to disseminating information of the event alone. It is important for the government to develop a policy, in collaboration with the media, for information collection, sharing and dissemination to communities at risk.

Efforts are required to enhance the capacity of media personnel to report disaster issues effectively. Providing the media with orientation sessions, and awareness and capacity building training on a systematic basis will help sensitize and build capacity; a necessary step for getting the media to effectively share DRR messages with society.

is anticipated that the network will serve as a vehicle for developing a team of prominent goodwill ambassadors to deliver the message of DRR to the community.

4 Technological progress and traditional knowledge

Technological progress should be fully utilized for raising public awareness. Internet and ICT development have the potential for increasing and expanding outreach. Social media is increasingly addressed in 2011 – 2013 HFA reports, reflecting the expectations that result from improving access to prompt information delivery and exchange.

- **Australia:** A community engagement framework will consider sources of information and methods of dissemination, and give particular attention to the emerging role of social media.
- **Colombia:** The country is examining new ways to communicate messages and is trying to diversify the traditional means of communications beyond radio and TV. Social media networks and other technological means are included in the communication strategy.
- **Saint Lucia:** Technological advances, including web based information systems, need to be utilized to ensure that the information is properly accessed and the intended public are aware of its existence and motivated to use it.

On the other hand, several countries addressed the importance of using traditional knowledge, as it can play a role in mitigation efforts and improving resiliency – especially at the community level. Some countries recommended that traditional practices be integrated in education and awareness raising activities. Because traditional knowledge includes local wisdom that is often eroded due to social mobility and urbanization, it is important to document and record these practices.

- **Tanzania:** A proactive approach for reconciling indigenous and scientific sources of knowledge on hazard and risks in ways that make sense to local communities is an ongoing challenge.
- **Nepal:** Indigenous knowledge has proved effective in mitigating disaster risk. Therefore, documenting such practices, disseminating it to wider audiences and institutionalizing the knowledge in formal and informal education systems should be prioritized.

Notes

i Not only disaster management officials.

Priority 4

Reduce the underlying risk factors

Core indicator 4.1

Disaster risk reduction is an integral objective of environment related policies and plans, including for land use natural resource management and adaptation to climate change

1 Climate change adaptation

More than sixty countries have seen developments in their climate change adaptation (CCA) policies and most report having a general institutional and/or legal framework for CCA policies in addition to, or in lieu of, singular projects or programmes. This implies that countries have taken a systematic approach to CCA due to its cross-sectoral characteristics. Integration of DRR and CCA is an emerging issue and not many countries have completed the process with only a few countries reporting joint strategies for CCA and DRM (**Table 4.1a**). However, some reports detail how countries have integrated DRR and CCA strategies. Joint approaches should be promoted to secure resources, avoid duplication and create synergy between stakeholders (Box 37).

- Mauritania: Highly vulnerable to the consequences of climate change, Mauritania frequently experiences drought, coastal erosion and floods. There is no explicit mention of the CCA Plan, but the country is conscious of the need to include CCA considerations in all DRR policies, programmes and plans.
- Botswana: The national committee on CCA and DRR is managed by two separate government entities. There is a need for better coordination between these entities.

Some countries provided examples of the organizational structures used to facilitate collaboration between DRR and CCA policy makers. Harmonization can be achieved through the participation of DRM agencies in the CCA committees or through organizational restructuring. Regardless of the degree of organizational arrangement, collaboration contributes to the coherence of joint strategies for DRR and CCA.

- Barbados: A National Climate Change Steering Committee, chaired by the Ministry of Environment, Water Resources and Drainage, includes members of key sectors such as the energy, coastal zone management, tourism and private sectors, as well as training institutions. The Department of Emergency Management Director sits on this committee. The disaster management agency is working with the national Climate Change and Adaptation Focal Point and Steering Committee to prescribe climate-related DRR solutions to a myriad of economic and social sectors. The completion of the draft Climate Change Adaptation Policy is necessary to advance the DRR agenda in relation to climate change impacts.

Table 4.1a: Examples of how countries integrate DRM and CCA strategies

Pattern A: Joint strategies	
Cook Islands	Joint National Action Plan for DRM and CCA (JNAP)
Maldives	Strategic National Action Plan (SNAP)
Niue	Joint National Action Plan for DRM and CCA (JNAP)

Table 4.1a cont.

Pattern B: Integration of DRR in CCA strategies	
Barbados	National Climate Change Adaptation Policy and Strategy (draft)
Bhutan	The National Adaptation Program of Action
Bolivia	National Program for Climate Change
Burkina Faso	National Action Plan for Adaptation to Climate Change and Variability
Chile	National Action Plan for Climate Change
Colombia	National Plan for Climate Change Adaptation
Comoros	National Action Plan for Adaptation to Climate Change and Variability
Costa Rica	National Climate Change Strategy
Cuba	Environment and Climate Change, including the Prevention of Disaster Risks
Ecuador	National Plan for Climate Change Adaptation
Egypt	National Strategy for Adaptation to Climate Change (draft)
Georgia	National Climate Change Policy (2009)
Germany	German Strategy on Adaptation to Climate Change (2008)
Haiti	National Program for Climate Change Adaptation
Honduras	Climate Change Strategy
India	National Acton Plan for Climate Change
Indonesia	National Action Plan for Climate Change
Malaysia	National Policy on Climate Change
Mexico	Special Program for Climate Change 2009-2012
Mozambique	National Climate Strategy (2012-25)
Niger	National Action Plan for Adaptation to Climate Change and Variability
Panama	Integrated Management Strategy for Climate Change
Samoa	National Adaptation Programme of Action (2005), National Policy on Combating Climate Change (2005)
Thailand	National Strategy for Climate Change Management 2008-12
Togo	National Plan for Climate Change Adaptation
Turks and Caicos Islands	Climate Change Policy (draft, 2011)
Uruguay	System for Response to Climate Change

Source: HFA Progress Report for each country.

- **Malaysia:** Efforts are underway through the Working Committee on Adaptation under the National Council on Green Technology and Climate Change to encourage knowledge-based decision-making in support of climate resilient growth strategies. Several key DRR players, including the National Security Council, Drainage and Irrigation Department and Southeast Asia Disaster Prevention Research Institute are collaborating in the Committee.
- **Pakistan:** The National Disaster Management Authority has been placed under the Ministry of Climate Change to create stronger links between CCA and DRR.

Research on climate change will contribute to more effective CCA (**Table 4.1b**). The cross-disciplinary

Box 37: Joint approach to CCA and DRR

✓ **Cook Islands:** The Cook Islands Joint National Action Plan for DRM and CCA (JNAP) is being seen by sector stakeholders as the main planning document for DRM and CCA and is serving as an important coordination mechanism for programme and fund alignment. A JNAP Programme Management Unit has been established to facilitate joint planning and coordination of CCA and DRM programmes taking place in the Cook Islands.

✓ **Vanuatu:** Bringing together the task force for National Adaptation Plan of Action (NAPA for climate change) and a disaster management national action plan (NAP for DRR-DM) may help strengthen coordination and adaptation of a multi hazard approach to reducing vulnerability. Such a move may help government and donors to make informed and balanced decisions regarding the most pressing DRR priorities based on a holistic assessment of all hazards. It would also enable the DRR-DM NAP to benefit from the successes already achieved under the Climate Change NAPA and reduce duplication of activities (especially given that the NAPA and NAP task forces are comprised of the same people).

Table 4.1b: Examples of climate change adaptation research

Country	Strategy, programme, facility
Australia	National Climate Change Adaptation Research Facility National Climate Change Adaptation Research Plan Emergency Management Adaptation Research Network
Bangladesh	Climate Change Knowledge Network
Canada	Climate Change Impacts and Adaptation Program
China	Climate Change Adaptation Strategy 2010-11 Climate Change Adaptation Project 2009-12
Finland	Climate Change Adaptation Research Programme
Germany	Competence Center on Global Warming and Adaptation (KomPass) Climate Service Center RELKIM (a consortium of eight Helmholtz Research Centers) KLIMZUG KLIMAZWEI
Maldives	National Climate Change Research Strategy
Norway	Norwegian Climate Adaptation Programme

Source: HFA Progress Report for each country.

characteristics of climate change means that the research field will naturally extend from scientific risk assessment to economic impact estimate.

There are three challenges regarding integration and joint efforts of DRR and CCA. First is the lack of awareness on the part of both DRR and CCA policy stakeholders, which hinders effective coordination. Second, broader interaction with land use and building policies is necessary due to their close relationship with DRR and CCA. Though addressed in Section 4.4, CCA and disaster risk should be considered through a territorial development lens. Third, local level implementation is often reported as a challenge for CCA. This implies that local level collaboration of DRR and CCA is difficult.

- **Barbados:** The various climate change issues have not been well understood by the majority of stakeholders within the disaster management system.
- **Thailand:** The view of the organization principally responsible for CCA, the Office of Natural Resources and Environmental Policy and Planning, is that CCA is not directly equal to DDR. The Office mainly focuses on carbon dioxide emissions.
- **Maldives:** The Strategic National Action Plan lacks a proper framework of how to mainstream climate change and disaster risks in areas of land use planning, coastal development and protection.
- **Nepal:** Challenges include translating policies into practice; limited community based projects in terms of technical quality, resource availability, operation and maintenance; inconsistency in data; high cost in acquiring data; wider areas and issues (hazards) to cover within limited resources, and reaching out to the poorest communities in spite of cost.

2 Traditional environmental policies

Many countries report general environmental policy frameworks (such as environmental laws) and regulations. The challenge most countries face is an inability to put policy into practice and/or enforce those that have been passed into law. Reasons for the lack of enforcement are different depending on the country.

The first challenge cited by several countries was that laws were unclear and outdated, and few offered avenues of reprieve/sanctions in the case of violation.

- **Barbados:** The Environmental Management Act has been in draft form for more than 10 years. The enactment and enforcement of environmental legislation continues to plague the implementation process. The draft Environmental Management Act must become a reality for the institutionalization of joint DRR and environmental initiatives.
- **Sierra Leone:** The government has established structures/systems to address protection and regulatory issues. But as with many other policies, it is the translation of such policy into practice that serves as the real challenge. In some instances, the penalties for violating environmental laws are so ridiculous that they hardly serve as deterrents. In addition, many policies need to be updated as they have become obsolete over the course of time and have lost their relevance.

Second, socio-economic conditions hinder the enforcement of environmental laws and regulations. Conservation of ecosystems often conflicts with the economic interests of the private sector and in some countries people need to exploit natural resources because they are impoverished. In this regard, there is a lack of awareness regarding environmental vulnerabilities, concerns and policies.

- **Mozambique:** High poverty levels coupled with dependent local communities (on natural resources for subsistence) has increased pressure on natural resources (e.g. deforestation induced by bush fires and firewood extractions) and resulted in the weak implementation of forest management plans. Unplanned coastal land use

practices of the private sector have played a role in increasing environmental risks associated with soil degradation and coastal erosion.

- **India:** Stakeholders need to understand the various facets of environmental vulnerabilities especially in the context of hazard risks and how they can affect natural ecosystems and environmental resources.

Third, a shortage of human and financial resources has prevented governments from monitoring the enforcement of laws and regulations. In some cases, corruption is part of the issue. Furthermore, the lack of coordination between sectors and levels of governments sends inconsistent messages and acts as a barrier to the implementation of law. As environmental and DRM issues are cross-sectoral and rather new, coordination across sectors is generally inadequate, especially with regards to environmental and DRR policy. Creating a systematic and comprehensive strategy contributes to strengthening the coordination of stakeholders.

- **Kenya:** The main challenge is the enforcement and implementation of available strategies and policies to curb environment degradation. This is partly due to a lack of resources (e.g. human resources, equipment and facilities), but also to corruption. It is hoped that the new constitution and the ongoing strengthening of key institutions, like the judiciary, will help in curbing corruption and similar practices.

3 Water management, forest management, coastal management and protection of conservation areas

Water and coastal management are often addressed given their importance in reducing hydrometeorological losses (See **Table 4.1c**, **Table 4.1d**, Box 38). Many countries mentioned issues relating to water management infrastructure, such

Table 4.1c: Examples of water management policies

Country	Law, policy, plan or strategy
Bulgaria	The Water Act, Flood risk management plan
Burkina Faso	Integrated Water Resources Management Action Plan
Colombia	Watershed Management Plan
Croatia	National Policy in Water Management
Fiji	Water Standard Plan
Finland	Dam Safety Act, Flood Risk Management Act, Water Service Act, National Land Use Guidelines
Greece	Flood Risk Management Plans
Mozambique	National Policy for Waters
Nauru	The Integrated Water Resource Management
Niue	Niue Water Act (2012)
Panama	National Plan for Integrated Water Resources Management 2010-2030
Tanzania	National Water Sector Development Strategy and Water Sector Development Programme

Source: HFA Progress Report for each country.

as sea walls, river dykes and drainage – unsurprising considering that flooding is one of the most frequent disasters. Flood management is increasingly recognized as a combination of hard (e.g. levees, dams, drainage) and soft measures (e.g. awareness raising through hazard mapping, land use planning, improved building codes and evacuation planning). The United States of America tries to mitigate flood impacts by controlling floodplain development. When it comes to water infrastructure, standards and criteria should be reviewed to reflect hazards linked to climate change.

- Sri Lanka: Inadequate maintenance of irrigation canals increases the incidence of localized floods, especially in urban areas. Illegal construction and unauthorized landfills can also trigger localized flood. The government has given paddy cultivation low priority in the last decade, especially in western provinces, which has led to inadequate maintenance of the canal system, which in turn has resulted in major local floods. Intense rainfall in the last few years has also caused flash floods in urban centers. The conflict between northern and eastern provinces has affected the maintenance of drainage systems and resulted in massive floods in both provinces.
- United Kingdom: The Environment Agency and Natural England need to work with local partners to establish a programme using catchment flood and shoreline management plans. It has been recognized that the country cannot continue to build more hard defenses (e.g. sea walls) and instead must consider the use of soft defenses (e.g. ecosystem management and land use).

Table 4.1d: Examples of coastal management policies

Country	Law, policy, plan or strategy
Algeria	Coastal Area Management Plan
Barbados	Coastal Zone Management Act Coastal Zone Management Plan Coastal Zone Management Policy Coastal Risk Assessment and Management Programme
Chile	National Policy for Coastal Management
Cook Islands	Marine Resource Act (2005)
Costa Rica	Coastal Zone Regulatory Plans (municipal level initiatives)
Marshall Islands	Coastal Management Framework (2008)
Mexico	Interministerial Commission for Sustainable Sea and Costal Management
New Zealand	National Coastal Policy Statement 2010
Niue	The Sustainable Coastal Development Policy (2009)
Saint Lucia	Coastal Zone Management Plan
Samoa	Coastal Infrastructure Management Plan
Sri Lanka	Coastal Conservation and Coastal Resources Management Department Act Coastal Zone Management Plan
United States of America	Coastal Zone Management Act

Source: HFA Progress Report for each country.

Box 38: Coastal infrastructure management plan in Samoa

The Coastal Infrastructure Management (CIM) Strategy 2001-2006 has led to the development of 41 District CIM Plans that promote better management of coastal infrastructure and the greater hazard resilience of Samoan communities. The Strategy outlined impacts on infrastructure and vulnerabilities to coastal communities and also highlighted the impacts exacerbated by climate change.

The CIM plans, managed by the Planning and Urban Management Agency and the Disaster Management Office of the Ministry of Natural Resources and Environment, provide a baseline information on coastline locations that form the basis of CIM hazard mapping. The CIM plans provide an overview of the existing environment, identify and assess the resilience of existing infrastructure against coastal hazards, and provide potential solutions and ways to reduce susceptibility to such hazards. Plans were completed in all districts where flooding and coastal erosion was at risk, which allowed for the creation of Coastal Erosion Hazard Zones and Coastal Flooding Hazard Zones. They also list and map community physical infrastructure vulnerable to flooding and/or coastal erosion and propose a number of adaptation strategies.

The CIM plan consultations need to include inland infrastructure and communities, and be extended to cover a range of other hazards like river/inland flooding and landslides. The implementation of CIM plans has been delayed due to budgetary constraints and needs to be made into a statutory requirement to ensure compliance.

Forest management is also often raised due to the positive impact it can play in reducing disaster loss (**Table 4.1e**).

Table 4.1e: Examples of forest management policies

Country	Law, policy, plan or strategy
Algeria	Forestry Development Policy
Bangladesh	Forestry Protection Plan and Policy
Bolivia	Forestry Act
Burkina Faso	National Forest Management Policy
Chile	Recovery of Native Forests and Forestry Promotion Act
Costa Rica	National Forestry Financing Fund
Dominican Republic	National Strategy for Reducing Emissions and Addressing Deforestation and Forest Degradation
Honduras	Forestry Strategy
Japan	The Forest Improvement and Conservation Works Master Plan (2009-14)
Niue	National Forestry Management Plan
Panama	Forest Reforestation Program XXI Century
Samoa	Forest Management Act (2011)

Source: HFA Progress Report for each country.

The conservation of environmentally vulnerable areas is done through national regulation (e.g. the designation of national parks). Such national area designation tends to have a limited coverage of sensitive areas, making community involvement an important issue. In the Solomon Islands, for example, communities are demarcating areas for protection and conservation. Aside from regulation, some countries have introduced economic incentives to protect at-risk areas. The United States of America has used economic incentives to protect wetlands and given tax deductions to citizens for selling or donating wetlands to a qualified organization (Box 39). Latin American countries are using policies that entail an environmental payment system to protect vulnerable natural resources and ecosystems from exploitation. The challenges to such measures are the costs and the need to raise public awareness.

- **Costa Rica:** Twenty years ago the National Forestry Financing Fund was created as the government authority for the payment of environmental services, making the country a pioneer in this regard.
- **Côte d'Ivoire:** Environmental payment services are not effective. Financial problems prevent turning ideas and policy into practice.
- **Trinidad and Tobago:** Payments for ecosystem services remain a challenge. Many citizens are unaware of monetary incentives for conservation so utilization remains low.

Box 39: Wetland protection in the United States of America

The federal government protects wetlands through regulations (e.g. section 404 of the Clean Water Act), economic incentives and disincentives (such as tax deductions for selling or donating wetlands to a qualified organization and the Swampbuster provisions under the Food Security Act) and cooperative programmes and acquisition (such as establishing national wildlife refuges). A number of states have enacted laws to regulate wetland activities, and some counties and towns have adopted local wetlands protection regulations and/or have changed the way development is permitted.

Core indicator 4.2

Social development policies and plans are being implemented to reduce the vulnerability of populations most at risk

1 Social policies targeting vulnerable people

Women, children, the elderly, the disabled and the poor are often addressed as a country's "vulnerable people." Social policies to cater to these groups include poverty reduction, employment policies, and micro-finance and micro-insurance measures. While micro-insurance is analyzed under indicator 5.3 as a part of the contingency finance mechanism, information regarding social development is not as detailed as other core indicators. This is due in part to the perception that social development policy does not constitute DRM policy.

- **New Zealand:** Because broader strategies addressing the needs of socially and economically disadvantaged people and communities support broad social outcomes, they are not necessarily evaluated as a hazard risk reduction measure per se.

Poverty is seen as an important underlying factor that makes people more vulnerable in times of disaster. Poverty hinders the implementation of DRM activities even though DRM can contribute to reducing disaster losses and avoiding the poverty trap. Social policies should be reviewed using a DRM perspective and agencies pursuing DRM should work in close cooperation with policymakers to elevate DRM issues on the social policy agenda. Some of the issues regarding the promotion of social policies are detailed below.

- **Sierra Leone:** Factoring DRR into everyday life can hardly be practical when there is abject poverty.

Saint Lucia: There is a need to target the more immediate issues of poverty, food security and employability in an effort to elevate DRR issues.

The most addressed challenge under this indicator is financial. Developing countries that suffer from budgetary constraints often have a large percentage of poor people (who tend to be vulnerable to the impact of disaster).

- **Barbados:** Access to financial and human resources to ease the burden that vulnerable communities feel, limits the direct and programmatic contribution DRR can have in these areas. It is necessary to harness the expertise and resources of the private sector, community-based organizations and NGOs to further complement the efforts of government.
- **Burkina Faso:** The Accelerated Growth and Development Strategy is the framework that coordinates all social policies in the country and leads to the development of initiatives that reduce vulnerability. However a lack of financial and human resources prevent the further development of such policies.

Second, some countries address the need for assessing vulnerability and identifying whom the vulnerable are and how vulnerable they are. Database development, containing disaggregated data, is necessary in helping define vulnerable people and communities. Such assessments are important in terms of providing efficient and effective social safety nets and also ensuring a sense of fairness, providing accountability and curbing corruption. Implementing such a database will improve disaster preparedness and response by storing information on social vulnerability and allowing for social impact analyses[i]. Lists of vulnerable sections of the population have been promoted in Samoa and compiled in the United Kingdom for example (Box 40).

- **Indonesia:** One of the constraints is that the groups considered most at risk have not been clearly identified. The database that contains information about poor communities is not comprehensive, is potentially inaccurate, and monitoring and evaluation measures are lacking.
- **British Virgin Islands:** Plans are in place for the creation of community profiles that involve documenting vulnerable groups and community resources, defining community risks and developing community risk maps. There is a need for a comprehensive social assessment that will include human vulnerability factors. This will serve to guide the DM programme in the area of community preparedness.

Third, informal social safety nets based on family, religious or traditional social structures can improve the resiliency of people. Countries like the Solomon Islands and Tanzania report the existence of such informal social networks even though they have been on the decline due to urbanization. Urbanization detaches the urban population from traditional social safety nets observed in rural environments. While urban vulnerability is an important facet of DRM, the impact of urbanization on rural areas is equally important.

- **Solomon Islands:** The Wantok System, where extended families support one another is a feature of Solomon Island culture and provides people with an informal social safety net. It is highly efficient and reliable but operates entirely at the community level with little involvement from external sources.
- **Tanzania:** Informal social security schemes easily accessible by the vulnerable include tribal associations; associations concerned with death and burial affairs; religious groups formed by people who belong to the same denomination; community based organizations and UMASIA (mutual health insurance schemes in Dar es Salaam).
- **Marshall Islands:** In urban areas, traditional social safety nets have given way to the adoption of a Western lifestyle, which has led to higher levels of vulnerability for some. This is the case for some women in urban areas, who remain without traditional forms of protection (e.g. from male family members). As the urban population continues to rise, the erosion of traditional social support may persist.
- **Vanuatu:** Extended family networks are typically relied upon for social protection and these networks are strong in rural areas, however urbanization has caused families to "stretch" between their villages and urban centers.

Fourth, communities in remote locations tend to experience slow economic growth and have little

Box 40: Compiling lists of vulnerable people for increased resiliency

- ✓ **Samoa:** Large numbers of people reside on the fringe of the village system and include ostracized families, households on freehold land (normally within new settlements) and those living in squatter type settlements (many of which are located in the Apia urban area). The Ministry of Health and the Samoa Red Cross society need to regularly update the List of Vulnerable Families and include citizens who may be living in fringe societies. There is a need to ensure that continued efforts are made in developing a comprehensive system of collecting disaggregated data that pays particular attention to vulnerable populations (women, children, people with disabilities, the poor and the elderly). There is also a need for the government to use these indicators and data sets in the formulation of future laws, programmes and design policies.
- ✓ **United Kingdom:** Utility companies, the National Health Service and Category 2 groups/networks are creating and sharing lists of vulnerable people. The UK continues to ensure that vulnerable people can be catered for, irrespective of the risk involved. Lists of vulnerable people vary across companies and public bodies; the determination of how best to link all these lists is underway.

access to formal social safety nets. Remote regions tend to be some of the most disadvantaged and vulnerable.

- **Papua New Guinea:** Government outreach services have failed to reach the most vulnerable populations because of difficult terrain, and poor communication and infrastructure facilities.
- **Cook Islands:** Capacity building to incorporate DRR in livelihood security has been tied to economic development, particularly in the outer islands.

Several countries wrote about the use of emergency response policies for targeting the special needs of vulnerable people (e.g. Policy on Child Based Disaster Management in Sri Lanka) and at least five countries commented how DRR is integrated into the national United Nations Development Assistance Framework (UNDAF).

2 Gender Issues

Gender issues cut across several core indicators including 5.2. In many cases, women are regarded as both a vulnerable group that requires protection, and active agents for change that have a role to play in reducing disaster losses. The consideration of gender issues is especially important in the disaster response and reconstruction phases. In the disaster response phase, special care should be given to responding to the specific needs of women; while their participation should be expected in reconstruction phases in order to achieve more resilient societies.

While policies addressing gender in DRM policy have been reported in some countries (e.g. national guidelines have been drafted in Rwanda) they are often described within the wider framework of societal gender equalization policies. It is important that DRR issues are integrated into these gender equalization policies.

- **Rwanda:** The Ministry of Disaster Management and Refugee Affairs has developed guidelines on gender in disaster management with the aim of mainstreaming gender within disaster management strategies, plans and programmes.
- **Guatemala:** The National Policy for the Integral Promotion of Women and the Equity Plan 2008 – 2023 includes a pillar regarding the security and humanitarian assistance available for women from different ethnic groups in the case of disasters and emergencies.

3 Food Security

More than ten countries listed food security activities in the context of DRM. Some highlighted the use of advanced technologies such as early maturing and drought resistance seeds, while others spoke of traditional farming practices like food preservation. The combination of technological progress and traditional knowledge is important in ensuring food security, especially with regards to drought risk. Both supply side support (e.g. risk proof crops) and market policies are important for improving food security and protecting the agricultural sector (see Section 4.3).

- **Ghana:** The Ministry of Food and Agriculture has introduced early maturing and drought resistant seeds to ensure food security.
- **Cook Islands:** The Cook Islands has promoted traditional food preservation practices to strengthen resilience and ensure adequate food supplies ahead of cyclone season.
- **Togo:** The National Agency for Food Security helps to stabilize grain prices, which represent the basic nutrition of the population, granting all households access to food.

Core indicator 4.3

Economic and productive sectoral policies and plans have been implemented to reduce the vulnerability of economic activities

1 Protection of economically productive and/or important sectors

Many countries addressed the protection of economically productive and/or important sectors. Lack of awareness amongst relevant ministries and private stakeholders regarding risk-proofing economic activities is perhaps the biggest challenge in planning and implementing DRR policies to protect such sectors from the impact of disasters. Agriculture and tourism were the most frequently referenced sectors, possibly because they are among the most vulnerable in times of disaster, and because commonly they are the most important to the macro-economy (Box 41).

- **Pakistan:** A major challenge is that relevant stakeholders lack the awareness and capacities to develop and implement policies to protect economies and sectors from the impact of disasters.
- **Colombia:** The country has emphasized the need to make DRR a priority, particularly in the business sector, which rarely takes into account risk prevention and reduction as part of the general business plan. Businesses tend to invest in recovery, because risk reduction is not seen as a priority.

2 Critical infrastructure protection

Many countries emphasized the importance of critical infrastructure protection as it ensures the business continuity of government and the private sector. Critical infrastructure is important for the

Box 41: DRR activities and policies in the agriculture and tourism sectors

- ✓ **Grenada:** The Ministry of Agriculture established a Disaster Management Coordinator and Disaster Management Sub-Committee to provide strategic direction for the development of an Agriculture Disaster Risk Management Policy.
- ✓ **New Zealand:** The On-farm Adverse Events Recovery Framework is building primary sector resilience by clarifying the roles and responsibilities of central government, local government and the private sector in preparing for, and recovering from, adverse events.
- ✓ **Peru:** The Program for Sustainable Rural Development has been implemented in coordination with other institutions to incorporate DRR in public investment projects as a means of protecting both environmental and rural sectors.
- ✓ **Fiji:** Hotels have linked communication and network systems (under umbrella associations) and carried out self-assessments on their vulnerabilities.
- ✓ **Samoa:** The tourism sector has conducted an assessment of hazard risk and their impact on tourists and tourism infrastructure.
- ✓ **Vanuatu:** Vanuatu Hotel and Resorts Association members have a keen interest in improving tsunami warnings given that many hotels are located in coastal areas. According to the association, some hotels have developed their own individual emergency plans but there is currently no industry-wide approach.

speedy roll-out of emergency activities and contributes to improving resiliency in society. Sectors like energy, transport, communication and water are seen as critical infrastructure. Often network based, a disruption in one part of the infrastructure raises the possibility for damage across entire networks. Countries like Australia, Canada and Germany show a high level of institutionalization and have established strategic documents for the protection of critical infrastructure (**Table 4.3a**). Public and private partnerships have been observed in such initiatives reflecting the increasing share of infrastructure that is privately owned (Box 42).

Critical infrastructure protection is a relatively new policy area that has attracted more attention following the September 11th attacks in 2001 in the United States of America, and in the wake of recent disasters such as the Great East Japan Earthquake and Thai Floods of 2011. It has been recognized that damage to key infrastructure, such as energy and transport, will prolong deleterious economic impacts. Developing countries can learn a lot from critical infrastructure planning to identify what constitutes critical infrastructure and improve their own resilience.

- Canada: The National Strategy for Critical Infrastructure has established a collaborative, federal-provincial-territorial and private sector approach built on partnerships, risk management and information sharing and protection. The Action Plan for Critical Infrastructure is the blueprint for how the National Strategy will be implemented to enhance the resiliency of Canada's ten critical infrastructure sectors.
- Germany: The Federal Office of Civil Protection and Disaster Assistance has developed a guide (Critical Infrastructure Protection: Risk and Crisis Management) in cooperation with the private sector, government authorities and research institutes. The guide offers methods for implementing risk and crisis management tools in the form of examples and checklists and outlines five phases in the process: planning, risk assessment, preventive strategies, crisis management and evaluation. They also provide KritisKAT, which is an applicable set of criteria for identifying and assessing critical infrastructure.
- United Kingdom: The National Security Strategy commits the government to improve "security and resilience of the infrastructure most critical to keeping the country running (including nuclear facilities) against attack, damage or destruction." Sector Resilience Plans act as a mechanism to present ministers in lead government departments with an annual assessment of the resilience of their sector's critical infrastructure as outlined in the National Risk Assessment and programme of measures.

Table 4.3a: Examples of critical infrastructure protection strategies

Country	Strategy
Australia	Critical Infrastructure Resilience Strategy (2010)
Canada	National Strategy for Critical Infrastructure
Germany	Guide "Critical Infrastructure Protection: Risk and Crisis Management"
New Zealand	Civil Defense Emergency Management Act (2002) Lifeline Engineering Project
United Kingdom	National Security Strategy Sectoral Resilience Plan
United States of America	National Infrastructure Protection Plan (2009)

Source: HFA Progress Report for each country.

- **United States of America:** The cornerstone of the 2009 National Infrastructure Protection Plan, and its 18 supporting sector-specific plans, is its risk analysis and management framework that outlines the process for combining consequence, vulnerability and threat information to produce assessments of national or sector risk.

In promoting critical infrastructure protection, some points should be considered. First, several countries commented on privately owned infrastructure protection. The privatization of government infrastructure and services has progressed since the 1980s and critical infrastructure providing public goods are increasingly owned and/or managed by private sector. Protection of private infrastructure should be also improved. All initiatives listed in the **Table 4.3a** include public private partnerships.

- **New Zealand:** The country moved towards a more market driven economy during the 1980s and 1990s with increasing private ownership of lifeline infrastructure. Capital investment over this period varied, with low investment in some sectors that led to an increase in vulnerability. Following developments in the USA, the New Zealand Center for Advanced Engineering initiated a "lifeline" engineering project in the Wellington area in the 1980s. Looking at its success, additional lifeline groups have popped up across most of New Zealand. All involve public and private lifeline utility operators and have resulted in significant improvements to the resilience of infrastructure. All projects are recognized by, and integrated with, the planning of their respective local Civil Defense Emergency Management groups.

Second, the interdependence of critical infrastructure should be analyzed. Discussions need to take place across all related sectors for critical infrastructure protection. For example, the disruption of the energy sector affects all other sectors. Links between sectors should be considered to prevent cascading effects from occurring.

- **Australia:** The Federal Government has brought critical infrastructure sectors together to discuss and address cross-sectoral vulnerabilities within supply chains on a national and cross-jurisdictional basis. This cross-sectoral work has made a significant contribution to critical infrastructure

Box 42: Strategic approaches for critical infrastructure protection in Australia

In 2010, the Attorney General launched the Australian Government Critical Infrastructure Resilience (CIR) Strategy, which aims to achieve the continued operation of critical infrastructure in the face of hazards. This critical infrastructure supports Australia's national defense and security and underpins the country's economic prosperity, and social and community wellbeing.

The Trusted Information Sharing Network for CIR is one avenue of engagement for the business-government partnership and is a forum in which the owners and operators of critical infrastructure can work together by sharing information on security and resilience issues. The network is made up of groups representing different critical infrastructure sectors including energy, water, transport, health, food chain, communications, banking and finance.

The Australian Government's Critical Infrastructure Program for Modeling and Analysis Capability (CIPMA) examines the impacts of extreme weather events and provides strategic analysis on disruptions to essential services. CIMPA has completed a range of scenarios on natural disasters to help enhance Australia's emergency management planning, preparedness, recovery and resilience in a range of locations. For example, if infrastructure were damaged due to a natural disaster within an area that falls under CIPMA, the programme would run a scenario and determine the estimated recovery time of the infrastructure damaged or destroyed, the estimated recovery cost and the flow-on effects of a critical infrastructure service disruption within/across sectors.

resilience by recognizing and addressing the cascading impacts that can spread from one sector to another.

Third, information on critical infrastructures is often sensitive for security reasons (e.g. exact location of nuclear storage sites). However, for response purposes, certain pieces of information must be shared between responders. Countries need to design information management processes for protecting critical infrastructures, not only from disasters but also from man-made events such as terrorism.

- United Kingdom: The protection of Critical National Infrastructure (CNI) sites is considered a top priority and while restricting the flow of information is of vital importance in ensuring these sites remain safe, the sharing of certain information with responders during an emergency is vital for protecting these sites. The West Mercia Local Resilience Forum has developed an assessment template for CNI sites. This provides a very useful means of giving increased protection to such sites while still restricting who has knowledge of them.

Fourth, critical infrastructure protection is often focused on risk reduction. However, cooperation of critical infrastructure operators in emergency management and smooth recovery is also important. The role and responsibility of critical infrastructure providers should be considered in all phases of DRM.

- New Zealand: A major challenge is to progress lifeline engineering actions beyond their current focus of reduction (prevention) and readiness (preparedness). A need for lifeline engineering coordination during the response and recovery phases has been recognized and the establishment of a pool of regional lifeline coordinators is underway.

3 Business Continuity Planning (BCP) of private sector

Many countries commented on the importance of BCP and contingency planning for the private sector (Box 43). The resiliency of the private sector is fundamental for societies to recover smoothly from disasters, and yet the private sector has little incentive, or has yet to identify the incentive, to invest in BCP and/or contingency planning. In such cases the government must facilitate BCP and contingency planning in the private sector through the enforcement of law and regulation and by providing technical guidance or financial incentives. This is especially important for small and medium enterprises (SME) that often lack expertise and financial resources to prepare such plans.

- British Virgin Islands: The inadequate level of preparedness within the private sector continues

Box 43: Policies to facilitate private BCP and contingency planning

- ✓ **Japan:** The Business Continuity Guideline to promote the development of BCP for enterprises was developed in 2005. The amendment of the Basic Disaster Management Plan (2008) clarified the role of national and local governments in supporting the development of corporate BCP. Efforts have been started and more supportive activities, especially for SMEs are expected.
- ✓ **Korea, Republic of:** A legislative measure for business continuity planning exists to ensure that companies continue business operations with minimum interruption when disasters occur. The minimum standard has been provided for companies to carry out business based on this act. Basically, the act provides a legislative framework to support the DRM activities of SMEs.
- ✓ **Jamaica:** Contingency plans are a component of the approval process for large scale developments. The National Disaster Office provides guidance in the preparation of Emergency Response Plans for businesses and institutions.

to be a concern. The integration of BCP and recovery management into daily decision making within the private sector is insufficient. However, there are no laws mandating private companies to develop plans.

- **Samoa:** Contingency plans, scheduled simulations and evaluations need to be a component of the development consent process for large scale developments and the reissuing of business licenses for all new and existing business development.
- **United Kingdom:** About 52% of SMEs are reported to have BCPs, so there is still a ways to go in encouraging the business community to ensure both preparedness and resilience in times of emergency.

4 Incentives for private sector

Several countries made remarks about the need to provide incentives for private sector entities so that they implement DRR activities; very few countries have such policies in place. Incentives include subsidies, tax deductions, low interest loans and discounts for insurance premiums to implement DRR activities. The incentive schemes of Korea and Japan are proactive because they promote advanced disaster management in the private sector (Box 44).

- **Barbados:** The government has put in place a series of incentives to boost DRR actions taken by individual households and commercial entities. These include the provision of hurricane shutters, the use of hurricane straps in new construction, retrofitting to reduce vulnerability to houses and the built environment, and water collection systems. The constraint is the lack of economic incentives and the need to provide coverage to the wider population.

Box 44: Proactive incentive schemes in Korea and Japan

- ✓ **Korea, Republic of:** To protect property from various natural disasters and promote the activities of SMEs, insurance fees, taxes and disaster mitigation facility installation fees are discounted for some companies. Though it is difficult for the public sector to support disaster management in the private sector, the promotion of advanced disaster management technologies are being supported in various markets. There have also been efforts to provide companies with the latest disaster management technologies incentives, which indirectly supports the development of the industry developing new DRM technology.
- ✓ **Japan:** The Development Bank of Japan launched a lending mechanism (disaster reduction rating system) as an incentive for corporate disaster reduction activities.

Core indicator 4.4

Planning and management of human settlements incorporate disaster risk reduction elements, including enforcement of building codes

1 Building code

Many countries addressed the importance of building codes, which points to the relevance of such tools in achieving HFA indicator 4.4. Several countries reported deficiencies in building codes. In many cases the building codes are not legally binding and sometimes the codes remain in draft form for a long time. A lack of legal obligation weakens code enforcement, as outlined in the remarks of Barbados and India. In some cases, the coverage of building codes is restricted in certain areas, in others there are questions as to whether building codes are up to date or appropriate.

- **Barbados:** The Barbados building code has been completed but has yet to be adopted by Parliament. Without formal adoption of the building code, developers' adherence to recommendations is on a voluntary basis. The enactment of the code would make legislative demands mandatory and the Barbados Building Authority would provide policing mechanisms.
- **India:** The National Building Code is advisory in nature. The implementation of provisions in the building codes and compliance to building bylaws are areas of concern.
- **Cayman Islands:** Property elevation is a requirement and set at five feet above mean sea level; but this is often inadequate for mitigating the effects of storm surges in coastal areas. Furthermore, the building code mandates that new properties should be able to withstand category 3 hurricanes, despite the Cayman Islands being hit periodically with category 4 and 5 cyclones. It is currently considered cost prohibitive and is a disincentive to future developments seeking a more rigorous code.

Second, many countries cited weak building code enforcement as a challenge. The most common reasons for weak enforcement include governments lacking technical and financial capacity to monitor and enforce the codes, and resistance of both the private business and the general public in adhering to the law. Because real estate development is a profitable private initiative, the enforcement of building codes can sometimes be a political issue.
Burkina Faso: Poor financial, personal and institutional capacities hinder the implementation of building codes and land use plans.

- **Bangladesh:** Although the building code is implemented in all urban areas, a lack of skilled human resources to monitor, and the authority to enforce the code by the relevant departments, have remained the main constraints.
- **Argentina:** Even if building codes exist, real estate speculation, corruption, unskilled personnel and misunderstandings between different actors in construction and infrastructure development are obstacles in implementing the codes.

With regards to enforcement, boosting the capacity of local government to enforce legalities surrounding building codes is a challenge. In many countries building codes are often applied and enforced by local governments because regulations should be in alignment with local context. In order to develop and implement building codes that reflect local risks, it is important to strengthen the human and financial resources of local governments. National governments must support and complement the capacity of their local counterparts.

- **Australia:** While an "all hazards" approach is needed, the risks specific to a particular hazard or area need to be considered. Building construction standards vary at the State and Territory

levels and it is important they take into account local conditions and potential vulnerabilities like fires or cyclones.

- **Nepal:** It is mandatory for the building code to be implemented in all municipalities and applied to public buildings. However, only four municipalities have adopted the building code thus far.
- **United States of America:** Implementation of both hazard conscious building codes and land use planning is uneven at the local level as limited resources and lack of hazard awareness act as obstacles.
- **Pakistan:** One challenge is the lack of capacity the local authorities have to develop, update and enforce building codes in their respective areas.

Fourth, raising awareness in the private sector and amongst citizens is important (Box 45). Observing building codes entails an additional cost; private developers trying to maximize profit, and poor people attempting to save money, resist complying with strong regulation. Raising awareness of building codes and zoning, and why these practices are important is key. Economic interests should be balanced with safety concerns. Risk assessments of buildings will contribute to increasing owner and resident awareness of risk. Adequate training will create awareness amongst engineers, architects and masons of disaster resistant technology and will help cost efficient resilient building methodologies (Box 46).

- **Pakistan:** Rampant poverty is a challenge. Poor segments of society do not have the financial capacity to build hazard resilient housing as adhering to building codes entails additional construction costs.
- **Ghana:** Existing building regulations are not strictly adhered to. Private developers and individuals break building regulations by putting up buildings with little awareness of published hazards and poor engineering practices. Real estate developers believe that natural disasters are unlikely in the country.
- **Marshall Islands:** Some stakeholders were unaware of the existence of building codes, while others see them as general guidelines for development. Raising awareness of what building codes and zoning mean and why they are impor-

Box 45: Raising awareness for safe housing in the United States of America

For more than a decade, Federal Emergency Management Agency has partnered with the Federal Alliance for Safe Homes (FLASH) on building disaster resiliency outreach. Founded 12 years ago, FLASH serves a critical tool for educating Americans about the ways they can safeguard their homes against hurricanes, floods, fires, earthquakes and other natural hazards. Throughout its history, FLASH has built a unique coalition of over 100 organizations ranging from local governments to private sector enterprises, insurance companies and the federal government, all of which are committed to reducing the damage caused by natural hazards.

Box 46: Mason training in Guatemala and mason licensing for safe housing in Nepal

- ✓ **Guatemala:** The National Institute of Technical Training provided 620 hours training to masons. During this training all aspects of building protection were addressed. More efforts have to be made in terms of creating synergies between the training institute and other public and private sectors in order to implement building codes with DRR considerations.
- ✓ **Nepal:** Local municipalities, the Department of Urban Development and Building Construction, NGOs and professional societies have initiated the process of training masons to construct earthquake safe buildings and providing them with licenses. Efforts have only reached a few hundred masons, which is insignificant compared to the hundreds of thousands of masons involved in the construction industry.

tant is desperately needed.

- **Samoa:** Although national building codes exist, there is no valid mechanism to ensure compliance and code enforcement. Such a process requires leadership, time, funding and buy-in from end users in order to overcome resistance from the construction sector and building owners. This may be assisted by the provision of adequate training for engineers, architects, construction companies and local builders on building standards, disaster resistant technology and its benefits.

A fifth challenge is retrofitting existing buildings so they comply with the most recent building code (Box 47). Because retrofitting is costly, some governments provide financial incentives in the form of subsidies and tax reductions. Historic buildings require additional attention and care in terms of retrofitting (Box 48).

- **Nepal:** More than 85% of buildings in the country are non-engineered constructions. Even engineered buildings are seldom designed according to seismic building code standards. Because Nepal is located in an earthquake risk zone, the quality of these existing buildings is of serious concern. There is limited technical capacity for retrofitting and almost 90% of public-private buildings require seismic strengthening.
- **Romania:** Most of the high-risk buildings are at least 70 years old and were not designed to withstand major earthquakes. Owners (including owners associations) are legally obliged to take measures in order to reduce the seismic risk of their buildings. A rehabilitation programme for high earthquake risk buildings has been put in place. Authorities pay subsidies to owners in order to partially cover expenses (expertise fee, project costs and long-term interest on loans); however, owners are not aware of the importance of the rehabilitation.
- **France:** The Government of France, through the Barnier Fund, gives financial aid to people interested in improving the building code implementation. This financing is only given to municipalities that have a DRR plan in place.

Box 47: Setting targets for retrofitting buildings in Japan

There are two building-related laws in Japan: the Building Standard Act (enacted in 1950) and the Act on Promotion of Seismic Retrofitting of Buildings (enacted in 1995). Buildings constructed under the revised Building Standard Act of 1981 are adequately resistant to earthquakes, however many buildings in Japan (roughly one third of the total) have inadequate earthquake resistance because they were built before the relevant standards were revised. It has been pointed out that little progress has been made in improving the earthquake resistance of these old buildings. The Act on Promotion of Seismic Retrofitting of Buildings was revised in 2005 and set the national goal to raise the rate of seismic resistant houses and public-use building from 75% to 90% within 10 years. To reduce the cost of seismic retrofitting, especially for privately owned housings, subsidies and tax incentive provisions have been promoted.

Box 48: Challenges for retrofitting of historical building

- ✓ **Italy:** Implementing building codes is a difficult task as there are a large number of historical buildings that do not comply with contemporary building standards.
- ✓ **Switzerland:** Building codes exist and are applied, however due consideration has only recently been given to the seismic hazard and there are gaps in seismic resilience for buildings built before modern construction standards came into effect in 1989. Remedying the poor earthquake resistance of existing buildings will be a major challenge, especially for the country's historic buildings that are important to national heritage.

Sixth, an emerging issue is that building codes should integrate risk from climate change where possible, as seen in the case of Canada (Box 49). As addressed above, because retrofitting is costly and challenging, proactive building codes should be crafted.

- **Cayman Islands:** The plan shows that the existing building codes do not respond to threats posed by climate change. Adaptation options proposed include elevating habitable space above expected storm surge/flood levels.
- **United Kingdom:** As reviews of the building regulations take place, the UK will consider the standards that need to be applied to meet current and future climate change challenges including flooding, temperature, wind, rain, and ground conditions.

2 Land use planning

Many countries expounded on the need for land use planning and regulations, underlying their importance, over and above the existence of building codes, for the achievement of indicator 4.4. While building codes are applied to buildings and physical structures based on safety standards and engineering analysis, land use planning and regulations are applied not only to the buildings but also to certain areas based on an analysis of social, economic and environmental considerations and the coordination of diverse interests and concerns. Though there are differences between building codes and land use planning, the challenges they face regarding DRR are similar.

First, many countries reported a lack of legally binding land use regulations that integrate DRR considerations. While land use planning acts define basic guidelines on land use, because regulations should be specific to the local context, land use planning and regulations are often the responsibility of local governments.

- **Botswana:** In the absence of specific laws that deter the public from building their houses on flood plains, people ignore recommendations from the Land Boards of the Ministry of Lands and Housing and build their structures in zones at risk from flooding.
- **Mozambique:** The Urban Expansion Guide was issued in 2009 by the Ministry of Public Works and Housing to ensure all municipalities and small towns undertake a risk assessment as part of their land use plans for new settlements and key infrastructure. The guidelines have not been officially adopted for compulsory application by all

Box 49: Climate change variables integrated into building codes in Canada

Climate change has the potential to impact the safety of existing structures, increase the frequency of weather related disasters, change climatic design criteria for codes and standards and alter engineering practices. With Canadian buildings and infrastructure assets valued at more than CAD5.5 trillion and the construction sector accounting for a significant component of Canada's economy, impacts from our changing climate will be significant and require adaptation solutions. Research and development is zeroing in on new guidelines (related to climate conditions) that can be incorporated into engineering practices and codes and standards.

Since current infrastructure has been designed using climatic design values derived from historic climate data, changes in the future will require modifications to the engineering, maintenance and operation of structures. Since infrastructure built today will be in use for decades to come, it is important that adaptation options (taking changing climate into account) are developed and that future changes be incorporated into design where possible. In support of these adaptive approaches, Environment Canada and the Canadian Commission on Building and Fire Codes are upgrading and improving more than 6,000 specific climate change values used in the National Building Code of Canada and by many Canadian Standards Associations.

developers and institutions, and remain technical documents that do not force local authorities and developers to intervene in areas subject to multi-risk hazards.

- **Trinidad and Tobago:** Current legal and regulatory frameworks for land use and planning lack comprehensive disaster risk sensitivities. This lack of risk sensitivity extends to land zoning and real estate development activities and has contributed to the trend of increasing settlements on marginal lands.
- **Honduras:** DRR has been included in land use plans at the regional and municipal levels. Nevertheless, some municipalities still lack the legal frameworks required for land use planning.

Second, several countries commented on the weak enforcement of land use regulations. One reason for this is the lack of human resources available to the government for monitoring and enforcing land use regulation. The lack of knowledge of land use planning and its relation to risk, also contributes to weak enforcement (Box 50). Institutional structures should be improved to enforce regulation (Box 51).

- **Tanzania:** The lack of human resources in the land and construction sectors means that the respect of land use planning and building codes is not assured. Poverty and the lack of knowledge on land laws has also led to misconduct and breach of regulations, as surveyed land is generally inaccessible to the poor.
- **Marshall Islands:** The importance of the links between zoning and vulnerability to disasters must be successfully conveyed at the community level; this is especially important for landowners since they determine how development proceeds at the local level. An ongoing awareness campaign in Marshallese is desperately needed to overcome this challenge. Also required are collaborative efforts between national and local level decision makers on the issue of building practices, not least to promote a consistent message.

Third, as with weak enforcement measures, significant challenges in land use planning emerge as a function of development pressures and coordinating diverse interests and concerns in the face of limited land availability. The conflict of interest can be strong and may entail political intervention at the highest level; an increase in vulnerability to hazards in the long term can be the result. Population growth and urbanization puts pressure on developing more land even in areas prone to hazards. Technological innovation can contribute to solutions by strengthening building structures in risk prone areas.

- **Barbados:** Some individual applications have

Box 50: An educational kit for developers in Anguilla

The Department of Disaster Management has produced a kit with models of impacts from storms and wind hazards to educate developers about possible risks. This information has been successful in allowing developers to redesign projects to mitigate hazards. Both large and small developers have welcomed the opportunity to show their concern for risk management and for the safety of employees, resources and property.

Box 51: Good practices in institutional arrangements for improving the enforcement of land use planning

- ✓ **Tanzania:** The re-establishment of Land Rangers has seen some success in the monitoring and auditing of proper land use and ensuring that all open spaces and reserved lands are maintained for their planned purposes.
- ✓ **Macedonia, FYR:** In order to improve the process of planning and managing human settlements by incorporating DRR elements, an inter-sectoral network of state inspectorates, headed by the Inspection Council of the National Platform on Disaster Risk Reduction, was established.

been approved in vulnerable zones because the development control process and Town Planning Act permits ministerial overruling of planning decisions. While reasons for this provision are clear (economic, social, environmental, land use and DRR issues are all considered at the ministerial level), decisions tend to inadvertently increase the vulnerability to natural hazards.

- **Kenya:** Competing land uses and population pressures coupled with rapid rural urban migration have challenged measures intended to improve land use planning and management.
- **Turks and Caicos Islands:** With limited land resources, the island nation faces challenges in providing inhabitants with safe land upon which low income households can be build. The technology used in building homes must take into consideration the location where they are constructed.

Fourth, weak enforcement is also related to a lack of capacity in local government. Similar to the building code, land use planning is often implemented and enforced by local governments. Even if the national level government creates risk-proof land use planning acts or frameworks, without application at the local level, positive impact is unattainable. Raising awareness and capacity building at the local level is required for improving the enforcement of land use plans.

- **Ecuador:** There is a need to develop mechanisms and tools to ensure that land use plans created by the Autonomous Decentralized Governments are consistent and complementary.
- **Mexico:** An important challenge is to provide training on informal settlements in risk prone areas to the municipal governments. Another challenge is assessing the compliance of building code implementation.

Fifth, there is a need for legal and organizational coordination amongst DRM agencies, town and country planning bodies, public works groups and environmental organizations. Land use planning reflects economic, social and environmental priorities in the country and improved coordination will lead to the creation of frameworks for risk sensitive land use planning.

- **Indonesia:** The main obstacles in mainstreaming DRR into human settlement planning and management are the inconsistencies in implementing policies and regulations on spatial and infrastructure planning; the overlapping discrepancies of policies between national and local levels; weak monitoring and evaluation systems, and ineffective law enforcement.
- **Sweden:** It is imperative to find links and organize better coordination between the Planning and Building Act and environmental legislation.

Sixth, another issue that attracts attention are the problems that precede the establishment of regulation. In many legal systems, regulation of a new law does not need to be applied to pre-existing situations. Unless a government provides incentives to remedy existing problems, the pre-regulation state can remain for a very long time.

- **Barbados:** A number of vulnerable settlements exist in flood prone areas, because they were built prior to modern planning laws and policies.
- **Colombia:** Each municipality must have a land use plan that includes a risk analysis. However, in some cases the de facto land use ignores the law. This is particularly the case of informal settlements in urban centres.

3 Development permits

Some countries addressed the development permit process in great detail. Development permits are given if the request adheres to building codes, land use regulations and other laws. If a request does not comply with laws and regulations a government can stop a private sector development project in its tracks. Involving DRM agencies in the development control process can strengthen DRM mainstreaming. However, handling development requests needs more human resources of the DRM agency.

- **Jamaica:** The timeframe of the approval process is 90 days and assessing development applications is not a core function of the Office of Disaster Preparedness and Emergency Management. Although the skills exist, the necessary human resources are not always available to undertake such assessments. The volume of applications to be assessed is quite large and beyond the capacity of the organization. Data to assess risk is not captured in a systematized process.
- **Anguilla:** The Mitigation Risk Reduction Framework works with the Land Development Control Committee by withholding planning approval until agreements are revised to adhere to mitigation and risk reduction requirements. The addition of a Director of Disaster Management on the committee has greatly enhanced stakeholder understanding of settlement and location issues pertaining to DRM.

4 Informal settlements

Many countries raised concerns about informal settlements and unplanned urban growth. Unplanned urban growth is caused by social and economic pressures for development and is accompanied by under-developed urban infrastructure. The poor often live in informal settlements in hazard-prone areas, which increases their exposure and vulnerability to disasters. Unsafe informal settlements require urgent measures; unplanned informal settlements require mid to long-term strategies to reduce overall vulnerabilities (Box 52).

- **Mozambique:** More than 70% of urban homes are self-built often on unplanned and illegal settlements, without basic infrastructure such as roads, electricity, water and sanitation. Even when risk awareness is high amongst urban dwellers, poverty levels limit citizens' ability to purchase land or build homes in safe zones.
- **Pakistan:** The continuous increase in population and urbanization will push more people to move to hazard prone locations; thereby increasing year on year the proportion of society that is vulnerable. To overcome this challenge, vulnerable areas have to be identified through the national disaster risk assessment and hazard analysis exercises.

The lack of land use planning and inadequate enforcement have contributed to the development of informal settlements. The expansion of informal settlements in hazard prone areas increases both exposure and vulnerability to hazards. Balanced development between urban and rural regions will decrease the pressure for urban migration, contributing to improved resilience in both urban and rural areas. In this regard, spatial planning (which tends to have a wider geographic coverage than local plans) can contribute to the shared spatial development vision held by diverse urban and rural stakeholders.

- **Djibouti:** The planning and management of human settlements with DRR considerations are rarely controlled. Human settlements in risk-prone areas flourish without restriction. A big problem is the lack of respect for land use and urban plans.

Box 52: The Egyptian approach to informal settlements

The Egyptian approach developed by the Informal Settlements Development Facility, has replaced former "slums" or "informal settlements" with "unplanned" and "unsafe areas," and classified the latter according to the degree of risk to life and property. The facility's approach is useful in identifying priorities for intervention based on the distinction between unsafe and unplanned areas. The former requires immediate action while the latter requires a medium or long-term strategy. The national map of unsafe / vulnerable areas had identified unsafe/vulnerable areas in all urban centers of Egypt, including 401 unsafe urban areas with about 850,000 inhabitants.

- **Ecuador:** One of the main sources of pressure in urban areas is rural-urban migration. Strong public investment in roads, education, health and flood prevention works are mechanisms that can improve the quality of life in rural areas and encourage population to remain in rural areas, small and medium sized towns.

5 Spatial planning

Several comments on spatial and physical planning were made in the HFA reports. Unlike building codes and land use planning, not all countries have a tradition of spatial or physical planning. Because such plans identify the vision of territorial development and also guide land use planning, it is important to integrate DRR into spatial planning.

- **Germany:** The national parliament adopted a new version of the Regional Planning Act in 2008 in which the protection of critical infrastructure and civil protection of citizens play a more important role. In 2010, mitigation and adaptation to climate change were integrated into the Regional Planning Act – this is currently being amended.
- **Japan:** One of the strategic goals identified in the National Spatial Planning Act and National Strategy is to design a disaster resilient nation that promotes comprehensive disaster risk reduction measures.

6 Development of the information base

To support risk sensitive planning and the management of human settlements, governments need risk information (e.g. hazard maps) and information on existing building and land use patterns. Without this information a government cannot be aware of gaps in current programming and how much funding is required for policy interventions. Having access to land use and building data can also contribute to the generation of more detailed exposure data that enables high quality risk assessments.

Furthermore, integrating risk information in legal title documents or land valuation systems is effective for boosting private market interests. If risk information is integrated in legal title documents before the land is purchased, buyers can be aware of potential risks. When risk information is integrated in land price evaluation systems, this will also attract the attention of the private sector and real estate markets (Box 53).

- **Turkey:** Local authorities have initiated the establishment of building inventories in provinces throughout Turkey.
- **Trinidad and Tobago:** It is recommended that the Ministry of Planning (Town and Country Planning Division) and other stakeholders are engaged to develop a database for existing structures and new building projects.

Box 53: Information for real estate markets – legal title documents in New Zealand and the valuation database in Tanzania

✓ **New Zealand:** Information on hazards associated with a particular property may be linked to its legal title documents. Land and Project Information Memorandums are available from the local council upon request for a fee. This information may have a bearing on people's decisions to purchase a property and indicate restrictions on further development or land use change.

✓ **Tanzania:** The Ministry of Lands, Housing and Human Settlements Development facilitated the establishment of the valuation database to ensure proper land information was included. The progression of the Valuation Act will give the private sector the opportunity to participate in property valuation, survey and land use planning.

Core indicator 4.5

Disaster risk reduction measures are integrated into post disaster recovery and rehabilitation process

1 Institutional arrangements (plans or frameworks)

When addressing the need to integrate DRR into recovery and rehabilitation processes, many countries identified the need for institutionalizing recovery plans or frameworks; several countries reported having such plans or frameworks in place (**Table 4.5a**). Without systematic institutionalization, DRR integration in recovery and reconstruction is ad-hoc at best.

- Nepal: The lack of an institutional arrangement for DRM at the central and local levels has led to the inefficient use of resources in recovery and rehabilitation efforts. Decisions are made on an ad-hoc basis and often exacerbate an already disastrous situation.
- Jamaica: There is an absence of a Comprehensive Recovery Plan. Current recovery mechanisms are not streamlined and there is inconsistency in the incorporation of risk reduction measures in local and national infrastructure.

Such institutionalization can ease coordination across sectors, especially between disaster management and development agencies (e.g. Ministry of Planning, Ministry of Public Works). A good practice comes from the British Virgin Islands where the comprehensive framework has linked the National Integrated Development Strategy and the National Recovery Plan, and has improved the engagement of development sectors (Box 54).

- Indonesia: Weak coordination between sectors is the main constraint in integrating DRR into post-disaster recovery and rehabilitation processes. The National Agency for Disaster Management is responsible for disaster management and needs to collaborate with the Ministry of Public Works, amongst other institutions, in integrating DRR in post-disaster recovery.
- Chile: Following the last earthquake, the President created the Inter-Ministerial Committee for Reconstruction, which was an effective institutional organization for reviewing the consequences of the disaster and promoting decision-making and establishing priorities for reconstruction.

Box 54: Linking development and mitigation strategies in the British Virgin Islands

Disaster mitigation and recovery is the responsibility of the Development Planning Unit (DPU) and Town and Country Planning Unit (TCPU). The National Disaster Recovery Framework focuses on change and improvement rather than repair and replacement, and aims to balance urgent needs against the long-term requirements of sustainable development and capacity building within the framework of the National Integrated Development Strategy (NIDS).

When the implementation of NIDS is interrupted by a national emergency, the National Recovery Plan and Mitigation Strategy is used for recovery efforts and ensures that previous vulnerabilities are not reintroduced. The specifics of recovery will trigger a review or modification to NIDS, which take into account natural hazard mitigation measures. The formalization of the linkages between recovery and mitigation activities in national development planning places the DPU and TCPU at the core of the new structure.

There are no unique tools for integrating DRR into reconstruction process. Tools for risk sensitive investment are also relevant for the reconstruction process – for example risk assessments and

Table 4.5a: Examples of recovery and reconstruction frameworks

Country	Organization	Plan or framework
Afghanistan		National Disaster Response and Recovery Plan (2010)
Australia	Disaster Recovery Committee	National Disaster Relief and Recovery Arrangements
Bangladesh	National Disaster Response coordination Group	Early Recovery Acton Plan
Barbados	Welfare and Relief Department of Emergency Management Standing Committee	
Botswana		National Disaster Risk Management Plan
British Virgin Islands		National Disaster Recovery Framework
Ecuador		Recovery Plans (draft)
Fiji	Rehabilitation Committee	
Honduras		Early Recovery Framework (draft)
Malawi		Early Recovery Framework
Mozambique		Post disaster reconstruction plan
New Zealand		Recovery Guideline
Papua New Guinea	Recovery Subcommittee	
Slovenia		The Act on the Recovery from the Consequences of Natural Disasters
Solomon Islands	Recovery and Rehabilitation Arrangement Committee	
Tanzania	Disaster Relief Committee	
United Kingdom		National Recovery Guidance
United States of America		National Disaster Recovery Framework
Uruguay		Recovery and Reconstruction Plans
Vanuatu	National Recovery Committee	Vanuatu Risk Reduction and Disaster Management Arrangement

Source: HFA Progress Report for each country.

economic assessment (e.g. cost benefit analyses), which are explained under indicator 4.6 (Box 55). The process of carrying out loss and needs assessments, as explained in section 5.4, can be utilized for integrating DRR into reconstruction efforts.

- **Bulgaria:** The criteria adopted for rating funding requests for emergency recovery works include a risk assessment.
- **Zambia:** The programmes developed for recovery, especially those involving infrastructure, require Environmental Impact Assessments that include environmental and climate change components.
- **Bangladesh:** In the revised standard operating procedures, disaster and climate risk information has been placed in the Damage, Loss and Needs assessment forms and formats. The joint needs assessment process, following cyclone Sidr in 2007, incorporated DRR requirements in assessment procedures.

There are many challenges in implementing risk sensitive recovery and rehabilitation activities; the first being the financial cost. Even if disaster risk assessments are integrated into the design process of reconstruction projects, inadequate allocation of funds will result in a shortsighted recovery approach that does not take into consideration long-term DRR impacts.

- **Niger:** Despite the inclusion of DRR in existing recovery programmes, the lack of financial resources impedes their continuity.
- **Pakistan:** At the implementation stage, the DRR aspect of these programmes and processes faced random neglect due to the financial incapacities of the end beneficiaries (e.g. the affected).

The second challenge is the lack of capacity at the local level. Local governments are often in charge of long-term recovery and rehabilitation efforts. This means the involvement of the local government and community is necessary.

- **Nepal:** Involvement of communities, with regards to response, recovery and rehabilitation planning and implementation, can ensure effective results in disaster resilient recovery.
- **Kenya:** Most recovery projects initiated at the community level are not sustainable due to inadequate human resource capacity and lack of funds.
- **Indonesia:** Assistance needs to be in harmony with local conditions. The interests of the local communities, particularly minority and vulnerable groups, need to be accommodated in post disaster rehabilitation and reconstruction.

Third, a lack of awareness on the importance of DRR in reconstruction efforts hinders the effective implementation of programming. Shifting the paradigm from reactive to proactive programming should be emphasized in the reconstruction phase.
Indonesia: A lack of awareness hinders the integration of DRR into post-disaster recovery and rehabilitation processes.

- **Kenya:** The main challenge involves altering the

Box 55: Institutionalization of risk assessments and cost benefit analyses in reconstruction efforts in Sri Lanka and Korea

- ✓ **Sri Lanka:** Integrated Strategic Environmental Assessments conducted in the northern, central and Uva provinces have assisted development agencies in identifying suitable projects based on disaster risks. This is to ensure that DRR is taken into consideration in the post-war rehabilitation process. DRR components are included in the approval process of the development plan for house construction in urban areas.
- ✓ **Korea, Republic of:** Disaster investigation is critical in developing a disaster restoration plan and it is therefore important that government officials responsible for restoration planning are trained on disaster investigation methods. Moreover, disaster investigations carried out by local governments need to include a cost benefit analysis. Outcomes of this analysis can be reflected in the comprehensive disaster management plan and pave the way for integrating disaster risk mitigation and restoration activities.

relief mindset where little thought, if any, is given to long-term risk reduction or recovery.

- **Vanuatu:** There is a view amongst many national stakeholders (whose core work is not DRM) that DRR is primarily, if not solely, an effort to anticipate and prepare for disaster events. This narrow approach to preparedness leads to the impression held by many that anything related to disasters is the responsibility of National Disaster Management Office. This attitude is slowly changing but changed perception must be solidified through providing non-disaster agencies with tools on how to incorporate DRR into their annual planning, including the integration of DRR into post disaster recovery and rehabilitation processes.

Fourth, governments are often pushed to ramp up recovery efforts in the reconstruction stage even though DRR integration requires additional funds *and* time. Speed is an important factor for carrying out reconstruction efforts in the wake of a disaster; however, consensus building regarding reconstruction (e.g. identifying new locations for infrastructure) takes a long time. Governments need to find ways to establish a dialogue with communities on risk sensitive development in times of peace / calm to speed up consensus making processes after disaster.

- **Lebanon:** Risk reduction measures are often extensive and require a considerable amount of time to implement.
- **Bangladesh:** In many cases, disaster managers prioritize the implementation of time bound projects rather than taking more time and investing it in innovative DRR tools and programmes.
- **Samoa:** The post-tsunami reconstruction project utilizes previously established Coastal Infrastructure Management Plans, which were drafted in close consultation with local communities before the tsunami. These plans contemplated cyclone and tsunami risks and outlined the desired mitigation options of communities and the location of relocated infrastructure.

2 Financial arrangements

Few countries have addressed financial arrangements for integrating DRR into recovery and rehabilitation processes. As explained in Section 1.2, many governments cannot account for what portion of the national budget is spent on DRM. This makes it difficult to track how much is allocated and spent on response and reconstruction efforts, let alone the DRR component in response/reconstruction programmes. Only Trinidad and Tobago clearly outlines the percentage spent on DRR in recovery and reconstruction, though it is assumed this is only a part of the wider reconstruction budget.

- **Fiji:** There are no explicit budgetary provisions for DRR in post recovery programmes.
- **Trinidad and Tobago:** The percentage of recovery and reconstruction funds allocated to the Office of Disaster Preparedness and Management and assigned to risk reduction is approximately 0.032% of the national budget.

Many developed countries gave examples of how the national government financially supported sub-national institutions in the wake of a large disaster. Canada requires a certain percentage of the national budget to be allocated for DRR in assistance programmes. The federal government in Australia supports their state counterparts in implementing mitigation strategies in reconstruction efforts (Box 56).

- **Sweden:** According to the Civil Protection Act, if a disaster operation in the municipality has resulted in substantial costs the municipality has the right to receive compensation from the national government for the portion of the costs that exceed the deductible. The purpose of the municipality's right to reimbursement for emergency expenses is to protect the municipality from expenses that may result from a large long-term emergency that could affect the local economy.
- **New Zealand:** The level of funding received is contingent on the ability of local authorities to

raise recovery costs (this is based on a threshold where the central government pays ~60% of costs above the threshold).

3 Physical reconstruction (housing, building and infrastructure)

Many country reports highlighted the need for improving physical structures, with most countries highlighting the strengthening of housing and building structures and several addressing the importance of infrastructure reconstruction. This reveals the importance of accorded disaster risk reduction for the strengthening of physical structures. In addition, some countries raised the concern of environmental improvement (Box 57).

4 Relocation from hazard prone areas to safe zones

Many countries reported having housing relocation policies in place (Boxes 58 and 59). The immediate aftermath of a disaster is the time when most citizens want to move from hazard prone areas to safe zones. Though this relocation may seem reactive, it is in fact proactive as it helps to prevent future losses.

Relocation plans are slow to catch on in many countries due to insufficient funds, weak political will and because people do not want to migrate to new areas far away from their current homes. Limited safe areas, due to topography and land tenure systems, also make relocation difficult. Relocation policies often combine land use regulation and building strengthening; they should also include social components that acknowledge the need to keep communities together.

Box 56: Financial arrangement for integrating DRR into recovery efforts in Australia and Canada

- ✓ The Australian government works to facilitate the early provision of assistance to disaster affected communities through long-standing Natural Disaster Relief and Recovery Arrangements. Should a state exceed certain thresholds in any given financial year, the government reimburses up to 75% of eligible state expenditure for all natural disaster relief and recovery measures. In order to receive assistance in restoring or replacing essential public assets, states must develop and implement mitigation strategies to address likely or recurring disasters, and encourage local governments to do the same. Outlined within the relief and recovery arrangements are a series of provisions for the "betterment" of an asset following a disaster; that is the restoration or replacement of essential public assets to make them more disaster resilient than they were prior to the disaster.
- ✓ **Canada:** The Disaster Financial Assistance Arrangements programme includes a provision for 15% of the estimated cost of repair to be allocated for mitigative enhancements.

Box 57: Tree planting in Macedonia, FYR

Following the wildfires of 2007, a reforestation project was initiated, which was strongly supported by the government and NGOs. Every year, citizens are encouraged to plant a tree on two specific days ("days of the tree") in order to renew the forests, improve the environment and put DRR in practice. Over 20 million trees have been planted in the past 3 years (over the course of six days, two days every year) and it is expected that the forests of Macedonia will expand by additional 100,000 hectares in the next decade. In due course these new forests will absorb at least 250,000 tons of CO2 a year.

- **Barbados:** A number of squatters live in less than acceptable circumstances vulnerable to disasters. Even though planning legislation and policy makes full provisions for dealing with such situations, the political will to remove people from vulnerable areas is not always strong. Relocation has been an option, particularly for houses located in flood plains and landslide locations, but no building decisions have been taken in such zones as of yet.
- **Switzerland:** Until recently, destroyed buildings were often reconstructed in the same place as before because insurers were not willing to incur the cost of relocation. In light of this, public aid mechanisms and regulations have been put in place to facilitate relocation.
- **Ghana:** Constraints include a lack of resources to undertake resettlement and the unwillingness of affected communities to be settled elsewhere for social, historical, cultural and economic reasons.
- **Cook Islands:** Relocation strategies for people living close to potential hazards (e.g. fuel storage facilities) are complicated by the difficulty of acquiring land, given rigid traditional land tenure systems and limited government resources for land purchase.
- **Czech Republic:** High population density and the topography of the country make it very difficult to find land in safe areas for building new houses.

5 Review of regulation

The post-disaster period is a good time to review existing regulations and update them if necessary. Several countries commented on the importance of reviewing and enforcing regulation (especially with reference to building codes, as seen in section 4.4) in this phase.

Box 58: Relocation programmes in Jamaica and Ecuador

- ✓ **Jamaica:** Worth noting was that rehabilitation grants for rebuilding were not issued to families living in high risk areas until they could provide evidence that they could relocate to safer locations; a stance supported by the order of local authorities and facilitated by public education initiatives of community based organizations.
- ✓ **Ecuador:** The Ministry of Housing and Urban Development implemented a programme for Human Resettlement and Securitization of Land for Housing. Commonly, the central government and municipalities implemented resettlement or regulation programmes in rural and urban areas to resettle populations beyond the risk zones. Since 2007, the country has invested approximately USD 57 million in resettlement, benefitting 6,447 families.

Box 59: Combining relocation and disaster resilient construction in Sri Lanka

Resettlement programmes launched in post-war and post-disaster phases introduced construction on safer lands and the incorporation of disaster resilient construction methods. Technical officers have been trained to incorporate building guidelines in rehabilitation schemes in northern and eastern provinces. In selecting land for the construction of housing schemes, the vulnerability of land to landslides and floods is considered. Some locations; however, are in marginal hilly areas because of the scarcity of land in cities. This can be overcome by encouraging communities to follow disaster resilient building construction methods.

6 Support for affected people, businesses and employment

Many countries provided details on the support they gave to affected populations, with several countries explaining how they supported businesses and employment, especially SMEs and small-scale farmers. Public private partnerships and co-operation with the financial sector is a fundamental factor in business support schemes (Box 60).

- **Colombia:** In order to provide support to affected populations during the 2010-2011 La Niña phenomenon, Decree 4691 was issued in 2011 by which the Emergency Employment Programme was created. This initiative was designed to implement emergency employment activities to generate revenue and build capacity amongst affected populations. Under this programme, funds are also available for refinancing loans in rural areas and reducing the vulnerability of rural populations.
- **Chile:** After the 2010 earthquake and tsunami, resilience programmes were created in order to build the capacity of the poor – which had been highlighted as being the most affected by disasters. In this regard, 60,000 jobs were created in the most affected areas. Since which time, and most importantly, the issue of employment is now an integral part of the Reconstruction Plan.
- **Cuba:** There are social protection measures in place to increase the resilience of families and communities at risk. These include crop and property insurance, temporary schemes for ensuring employment, conditional and unconditional transfers of money, and loans and micro-insurance.

Box 60: Public private partnerships for low interest loans to support businesses

- ✓ **Malaysia:** The Special Relief Guarantee Facility is an example of a public private partnership where commercial banks provide the private sector with financing at 2.5% interest, while the Central Bank covers an additional 2.45% of interest and provides an 80% guarantee of the financing obtained.
- ✓ **Samoa:** The Small Business Enterprise Centre of Samoa guarantees 80% of business loans; after a disaster event, loan balances are paid off. The Central Bank and the Development Bank of Samoa provides 46% subsidies on interest rates.

Core indicator 4.6

Procedures are in place to assess the disaster risk impacts of major development projects, especially infrastructure

1 Mainstreaming DRR in public investment planning

Public investment plans are, logically and practically, in alignment with economic development planning, public investments have a more limited focus.[ii] More countries addressed DRR integration, or lack thereof, in their public investment plans in the 2011-2013 period, reflecting the growing attention on this issue. Highlighting the need for DRR in public investment planning is critical for risk-proof public investments (Box 61).

- **Chile:** The country highlights the need for incorporating DRR criteria in the National Plan of Investment with enhanced coordination between the diverse organizations working on DRR.

On a project basis, it is critical to introduce disaster risk and cost benefit analyses in project evaluations. Several countries reported that disaster impacts are a part of their public investment decision-making processes (Boxes 62 and 63).

Public investment is often bankrolled by the Ministry of Finance and implemented by diverse sectoral ministries, meaning that cooperation is needed between the various stakeholders. Strong governance arrangements that include guidance from the focal

Box 61: Good practices of mainstreaming DRR in public investment and infrastructure planning

- ✓ **Sri Lanka:** A National Physical Plan and Policy have been developed that take DRR into consideration and serve as a major policy framework for national and sectoral development. During the last year a process has been initiated to incorporate disaster risk into development projects. Development stakeholders were consulted on the challenges and made aware of the importance of incorporating disaster risk into development planning. More concretely, the Department of National Planning of the Ministry of Finance agreed to consider disaster impacts when recommending projects for funding, if a mechanism is established to certify disaster impact assessments. A simplified tool/checklist is required to assess disaster risks.
- ✓ **Japan:** The purpose of the Infrastructure Improvement Priority Programme is to carry out infrastructure improvement projects in an efficient manner. Revised in 2008 the programme promoted prioritized, effective and efficient infrastructure improvement projects. Some of the aims include "building disaster proof territory against huge earthquakes," supporting activities at the time of disaster, and developing social capital to secure peoples' livelihoods. The priority programme identifies DRR as one of the four key issues to be addressed. The Ministry of Land, Infrastructure, Transport and Tourism conducts an evaluation of public works that includes a disaster risk reduction lens, when projects are initiated, implemented and completed.
- ✓ **New Zealand:** The National Infrastructure Unit, established within the Treasury in 2009, focuses on the performance of the physical assets that underpin the functioning of the economy, such as transport, water, communications, energy and public facilities like schools, hospitals and prisons. The unit prepared the 2011 National Infrastructure Plan with the aim of including resilience as a guiding principle, so that national infrastructure networks are able to deal with significant disruption and can adapt to changing circumstances.

DRM agency, Ministry of Finance and sectoral ministries is imperative for mainstreaming DRR in public investment decision making (Box 64).

- **Honduras:** The Secretary of Finance is in the process of implementing a guide for the inclusion of DRR in public investment policies. The constraint is the lack of understanding shown by the institutions involved.
- **Ecuador:** In order to establish a risk reduction strategy in future projects, the National System for Risk Management contributed recommendations to the Methodological Guide of Works and Infrastructure developed by the Ministry of Transport and Public Works.

Box 62: Systematic approaches to the integration of disaster risk assessments in the decision-making processes of public investment projects

- ✓ **India:** The Government of India has introduced a system of Disaster Resilient Audits on a self-certification basis that will be applicable from the inception and planning stage of all centrally sponsored schemes. The Ministry of Finance has issued instructions to all ministries to include disaster risk reduction features in their projects and include a systematic checking mechanism at the project formulation, appraisal and approval stages. The major challenge lies in ensuring compliance to the certification process.
- ✓ **British Virgin Islands:** Since 2008, the building review/application process has made provisions for hazard assessments within high-risk areas. This enables the public/private sectors to develop appropriate hazard mitigation strategies and measures to prevent or reduce the occurrence of disasters. Further integration of DRR concepts in various sectors continues through the incorporation of Hazard Risk Assessments in the Impact Assessment Process, and the integration of hazard data into the National GIS Database.
- ✓ **Vanuatu:** According to Vanuatu's National Disaster Risk Management Arrangements, all national development programmes and projects are subject to the formal process of risk identification, analysis and evaluation. Appropriate risk treatments must be applied to ensure that identified risks are either eliminated (prevented) or reduced (mitigated).
- ✓ **United States of America:** Public assistance and hazard mitigation grant projects of Federal Emergency Management Agency (FEMA) must meet eligibility requirements (such as positive benefits/cost ratios) and be assessed for potential impacts on citizens and the natural environment under the US 1969 National Environment Policy Act. By Executive Order of the President, federal agencies are required to avoid long and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a feasible alternative. FEMA ensures that projects that have the potential to affect flood plains, wetlands or their inhabitants living in these areas, or which are subject to potential harm by their proximity to wetlands or floodplains are analyzed and assessed prior to implementation. FEMA also provides technical assistance to other federal agencies, guidance on specific actions, and assistance on flood risk identification, flood hazard mitigation techniques and floodplain management.

Box 63: Systematic approaches to the integration of cost benefit analysis in decision-making of public investment project in Trinidad and Tobago

Disaster risk has been considered in public investment decisions through consultations, as well as via the review of plans and policies by the Office of Disaster Preparedness and Management (ODPM). The CBA is taken into account in the design and operation of major development projects by national and sub-national authorities and institutions, as well as international development actors, through technical consultation with ODPM. The problem is that methodologies for the development of these projects differ across the public sector.

The biggest challenge is overcoming capacity issues with regards to skills, methodology and data availability1. Strong leadership and guidance from national governments are required (Box 65).

- **Sri Lanka:** Lack of guidelines, knowledge and expertise in assessing disaster impact challenge the undertaking of adequate assessment.
- **Australia:** The federal government is aiming to provide states with enhanced tools to assist in their assessment of environmental and disaster risk impacts of projects. Carrying out this type of work requires time and involves multiple agencies at the federal and state levels.
- **Samoa:** While risk reduction criteria have been introduced through sectoral development policies, they are in their preliminary stages and need to be revised. Measuring vulnerabilities is a complex and multi-faceted process that requires analysis from social, economic and poverty perspectives.

The second challenge is how to ensure the enforcement of assessment directives. Even if disaster impact assessments are implemented, projects might not comply with recommendations due to financial reasons. Innovative and cost effective approaches for risk proof investment will facilitate implementation (Box 66). Monitoring and evaluation at the implementation and post-implementation stages will also remedy any setbacks, however weak regulation and insufficient resources for monitoring are likely to hamper progress.

- **Mauritius:** General regulations that are taken into consideration, include DRR measures in the development of major infrastructure, though

Box 64: Engagement of DRM agencies in project evaluation committees

- ✓ **Turks and Caicos Islands:** With the inclusion of the Department of Disaster Management and Emergencies on the Physical Planning Board, some aspects of DRR are taken into account when deliberating planning applications.
- ✓ **Sri Lanka:** The Disaster Management Centre is involved as a member of the Technical Evaluation Committee for development projects in disaster prone areas.
- ✓ **Korea, Republic of:** To mainstream DRR in development, a pre-disaster impact analysis is needed to be undertaken by disaster management experts who sit on a development committee, as specified in the Natural Disasters Countermeasures Act.

Box 65: Capacity building for mainstreaming DRR in public investment processes in Panama

The Ministry of Economy and Finance is aware of the importance of cost-benefit analyses and incorporates risk criteria in the evaluation of public investment projects. The National Civil Protection System promoted training courses on the “Inclusion of Risk in Public Investment Projects” where nearly 60 officials from different institutions were trained. Over 50 participants from civil society and institutions received training and manuals that contained information on integrating risk in construction, bridge and road maintenance.

Box 66: Cost effective approaches to risk proof investment in Malaysia

While financial resources will be the main constraint to investment for risk reduction, it remains necessary to stimulate innovative and cost effective options for protecting infrastructure against disaster risks. One such example is the Storm Water Management and Road Tunnel that was constructed as an innovative solution to alleviate the problem of flash floods in Kuala Lumpur. The 9.7 km tunnel serves the dual function of storm water management and motorway, diverting flood water away from the city center during heavy downpours.

enforcement of these regulations is not always stringent. More emphasis must be placed on the enforcement of appropriate regulations with regular inspections done at all levels.

- **Korea, Republic of:** Systematic disaster risk mitigation is undertaken through pre-disaster impact analysis, but there needs to be sufficient human resources and technical capacity to assure continued enforcement, as it is more a consultative assessment mechanism rather than a mandatory provision.

2 Disaster Risk Assessment Considerations in the Environmental Impact Assessment (EIA)

Many countries underscored the importance of disaster risk assessments in relation to environmental impact assessments (EIA). Incorporating disaster risk assessments into EIA is one of the most popular tools for achieving indicator 4.6 (Boxes 67 and 68). Though EIAs are a well-established scheme in many countries, disaster risk assessment is relatively new, and consequently, disaster risk assessment is often inadequately integrated in EIA.

- **Cayman Islands:** EIAs tend to focus primarily on environmental impacts; disaster related risks and impacts are a lesser focus. Disaster Impact Assessments are often not mandated nor required.
- **Antigua and Barbuda:** Only very large projects are required to carry out an EIA. A Hazard Impact Analysis is not usually requested and few projects are referred to the National Office of Disaster Services for assessment. The scope of analysis needs to be wider if the country is to achieve good DRR benefits.
- **Lao PDR:** Environmental and Social Impact Assessment processes currently focus more on environmental degradation caused by investment projects and their direct impacts on local livelihoods and health. The indirect and longer term impacts on ecosystem productivity, environmental resilience and social capacity for disaster risk management are not adequately considered.

Some countries detailed how better governance arrangements can mitigate technical constraints. Cementing the commitment of disaster risk management authorities in the EIA process improves the quality of disaster risk assessments. Cooperation between environment management agencies and DRM institutions will upgrade the effectiveness of EIA by facilitating the smooth exchange of information. Because many investment projects are designed and implemented by sectoral agencies, a better understanding and awareness of DRM by the sectoral agencies is also required.

- **Switzerland:** Providing oversight for DRR and EIA at the federal level, allows for the easy integration of environmental and disaster risk related verifications.

Box 67: Disaster risk assessment integration into EIA in the British Virgin Islands

As part of the environmental review process, the Department of Disaster Management (DDM) reviews and comments on proposed projects where an EIA is required. Hazard and vulnerability assessments are incorporated into the EIA process and developments within designated hazardous areas must undergo a hazard assessment. Additionally, the Director of the DDM sits on the Planning Authority and the Environmental Management Committee. This membership calls for monitoring and inspection of development applications and the revision of EIA reports. The challenges include the incorporation of EIA and hazard and vulnerability assessments in all major development projects and the inclusion of climate change factors in project planning processes. There is also a need for stronger monitoring mechanisms to ensure that appropriate components are addressed, recommendations are fully carried out, and long-term impacts are monitored.

- **Fiji:** The impacts of major development projects on disaster risks are assessed at the sector level using EIA in spite of varied commitments by the sectors to the inclusion of DRR in the early stages of the planning process.
- **Vanuatu:** Although the National Disaster Management Office and the Department of Environmental Protection and Conservation (DEPC) liaise on an ad-hoc basis, an opportunity exists to strengthen DRR elements of EIAs by routinely involving NDMO or granting DEPC access to NDMO risk data and tools. This issue will be overcome when the National Advisory Board project management unit is established to coordinate CCA and DRR projects.

The first challenge in integrating DRR into EIA processes is determining if there are any technical capacity problems. Disaster impact assessments require technical skills and a sound methodology. Capacity building is required not only for environment ministries but also for other related institutions and private sector entities. To ensure consistency in the application of EIA, a standardized methodology is required; this can be developed by related experts and stakeholders. Many countries lack such a standard assessment methodology (Box 69).

- **Mozambique:** Weak technical and scientific capacity within government, environmental organizations and universities is a challenge for future development. Building technical capacity is important in eliminating misunderstanding and speculation, and fostering debate on EIA, so that real risks are prevented or mitigated in a timely manner.
- **Nepal:** Capacity is limited not only at the local level but at the central level. The tools required for impact assessment as well as for the assessment of the contribution of a particular project to the resiliency of communities, are lacking.
- **Sri Lanka:** The lack of knowledge on DRR and risk assessment amongst the consultants working on EIA processes has affected the quality of reports on disaster mitigation. Capacity has to be developed amongst EIA practitioners, enabling them to incorporate DRR in the EIA process. Consultants undertaking EIA studies need to be made aware of disasters and their impact on development. Assessing disaster impacts on development is made even more difficult due to the unavailability of hazard and risk maps for vulnerable areas.

Second, the integration of disaster risk assessments in EIA should be implemented in efficient way. Developers have often criticized the EIA for having long procedures that delay the entire process and

Box 68: Disaster risk assessments and the EIA process in Colombia

The EIA was traditionally used to integrate risk assessments in development projects (mainly infrastructure), although carrying out a risk assessment was an optional component of the EIA process. The National Planning Department made risk analysis an obligation. All projects now have to address the issue of DRR and a new law passed in 2012 (Law 1523) states that all public investment projects that have an impact on the territory – whether at the national, provincial, district or municipal levels – should properly incorporate disaster risk analyses, the details of which are defined according to the complexity and nature of the project. The analysis should be considered from the early stages of development in order to prevent future risk associated with public investment projects.

The National Planning Department is formulating a methodology to analyze the exposure of projects to hazards, as well as the negative impact of projects on the environment and local communities. It is essential to generate guidelines for incorporating risk in project assessment, as well as determine what technical and financial resources are required for improving risk assessment and analysis.

Box 69: Need for standardized methodology

- ✓ **Indonesia:** Experts and DRR practitioners have not reached an agreement on the specific methodology to be used for disaster risk impact assessments for development projects. The National Agency for Disaster Management needs to collaborate with the Ministry of the Environment, the Ministry of Public Works and the Ministry of Energy and Mineral Resources to formulate appropriate risk assessment instruments.
- ✓ **Fiji:** A weakness in the EIA process is the absence of guidelines on accepted standards for impact assessments. A related issue is the non-regulated assessment methodology applied by various agencies carrying out EIA studies. The application of EIA principles for outlining cost benefit analyses in new development proposals must be improved significantly. A framework on the acceptable standards of assessment should be developed following consultations with resource owners, EIA practitioners, scientists and academics. In practice, assessing the impact of disaster risks varies because assessments are not guided by an agreed standard. The lack of information on hazard and the potential economic impacts on projects is preventing agencies from routinely incorporating DRM considerations into their planning processes.
- ✓ **Trinidad and Tobago:** Impacts of disaster risk are a key input in EIAs. However, procedures for the assessment of these disaster risk impacts are not completely aligned with national standards. Every EIA is not vested for DRR due to capacity constraints and because standards for risk assessments are not aligned with international best practices.

decrease project efficiency. EIA also places an administrative burden on government officials, which is a reason for limiting the application of EIA to projects over a certain threshold. Finding a balance between risk concerns and economic and administrative efficiency should be the goal of stakeholders. Streamlining and clarifying the entire process should help mitigate additional requirements.

- Poland: Disaster risk impacts are taken into account in EIA. Sometimes these procedures are long and cause problems within areas of implementation (e.g. construction) and financing.
- Sweden: The Swedish Government is planning to make amendments that will reduce the number of EIAs produced in Sweden each year; one of the highest in the EU at 3,500-5,000 EIAs per year.

Third, many countries mentioned weak enforcement as challenge. Insufficient financial and human resources and poor monitoring procedures in implementation and post-development phases lead to the weak enforcement of EIA recommendations. Sectoral agencies and private sector entities taking part in EIA process often have little awareness and understanding about the risks and are thus disinclined to follow recommendations. EIA reports and recommendations need to be easily understood by developers and the general public. Boosting the capacity and resources of implementation agencies and raising the awareness of developers are necessities (Box 70).

Box 70: Strengthened enforcement of EIA recommendations in Lao PDR

The Water Resources and Environment Administration (WREA) nominated a committee, consisting of WREA staff and officials from concerned ministries, to assess the report submitted by project owners/investors. If the environmental and social impact assessment meets all requirements, the committee will issue an authorization letter for the project to commence. Furthermore, during the construction period, the committee will monitor the project's environmental and social aspects and if the undertaking is found to conflict with the WREA initial assessment, the committee can halt the project.

- **Marshall Islands:** When EIA criteria have not been met, the Environmental Protection Agency (EPA) has banned certain developments. Such cases are rare however, as most developments go ahead because the EPA is unable to enforce regulations. Another challenge mentioned by the EPA involves conflict of interest. Given the country's small population many people are related to each other, making it difficult for the EPA to enforce regulations on family members or close friends.
- **Fiji:** Technical agencies have strong capabilities to design and implement appropriate risk reduction measures. However, enforcement and monitoring are weak due to limited institutional experience, manpower and resources. EIA compliance requires substantial monitoring activities. When risk evaluations are taken and information on hazards and vulnerabilities reach decision makers, insufficient resources can limit the implementation of recommended DRR measures resulting in a high level of accepted risk. Additionally, developers do not fully comply with EIA-DDR requirements. Awareness-raising campaigns amongst stakeholders is required to improve support.
- **Kenya:** Challenges include the level of ignorance amongst the public on EIA, ineffective consultations and poor public participation. Developers sign reports compiled by lead experts without reading the information since they are only interested in the EIA license or do not comprehend the document's contents due to the technical language used in the report. The technical nature of EIA reports also impedes effective public scrutiny.

Lastly, EIA has potential for extended coverage and deeper analysis. The Indonesian government has required more comprehensive Strategic Environmental Analysis (SEA) to complement EIA in areas that have many development projects and where the environment is at risk. Disaster risk considerations, if properly integrated into the SEA, have the potential to be applied to any area at the policy, plan and programme levels (as opposed to the project level alone).

Notes

i Social impact analysis is addressed in Section 3.3.

ii The current challenge of mainstreaming DRR into economic development planning is explained in Section 1.1.

Priority 5

Strengthen disaster preparedness for effective response at all levels

Core indicator 5.1

Strong policy, technical and institutional capacities and mechanisms for disaster risk management, with a disaster risk reduction perspective, are in place

This is one of the most abstract indicators in the HFA. Many country reports detailed the information provided for indicators 1.1 and 5.2. In short, there is not a great deal of new or unique information specific to this indicator. To make up for this shortfall, UNISDR summarized information on public investment in DRR infrastructure (mitigation programmes). Though DRR infrastructure developments – such as levees or dams – are important in many countries (and often the most costly), these procedures are often not fully monitored in the HFA framework. DRR policies for school and hospitals, one of the most important public social infrastructures in reducing risks and strengthening resiliency, are also summarized in this section.

1 DRR Infrastructure (mitigation programmes)

Infrastructure for disaster avoidance and mitigation is one of the main tools for DRR. However, building, maintaining and upgrading infrastructure is costly, which hinders overall improvement. Climate change is another factor increasingly considered in infrastructure planning and development.

- Sweden: The Swedish Government has earmarked financing for prevention measures to be taken in developed areas where the risk of landslides or flooding is high.
- Vanuatu: There are challenges in keeping assets and investments in good condition. Resources are not sufficient for maintenance purposes.
- Mozambique: Upgrades are required for existing protective infrastructure facilities so as to withstand floods with at least 100 years return period. Research and development of cheap and durable building technologies and materials for cyclone and earthquake prone areas, followed by widespread dissemination, is required.
- Korea, Republic of: Many standards and criteria need to be modified as the environment changes due to abnormal weather conditions caused by climate change.

Coordination between the DRM sector and infrastructure investment agencies (e.g. the Ministry of Public Works or the Ministry of Infrastructure) is essential for infrastructure to be made resilient.

- Anguilla: The Department of Physical Planning has been empowered to take the lead on mitigation programmes. The inclusion of the Disaster Management Director in the Land Development Committee has also proven to be a success: additional funding has recently been secured and commitment to the mitigation programme is now attainable.
- Vanuatu: While the Ministry of Infrastructure and Public Works does not have an explicit DRR policy, the ministry is now a regular collaborator with the National Disaster Management Office in assessing risks prior to the implementation of major road contracts. A proposal has been passed to the Ministry of Infrastructure to review its strategy so as to reflect DRR.

Some infrastructure is not erected for the ***sole*** purpose of disaster mitigation, but plays an important role in DRR and DRM regardless. For example, road infrastructure is important for search and rescue activities and delivery of aid during emergencies. In the Great East Japan Earthquake of 2011, elevated road structures acted as a sort of seawall and evacuation site.

- **Vanuatu:** Although most sectors do not directly address DRR, risk reduction pops up under other names/terms and is often addressed by coincidence. For example, most road maintenance in rural areas occurs in zones where flooding or landslides are common. This means that mitigating future damage invariably becomes a part of roadwork maintenance. Poor infrastructure on many of the outer islands (roads, ports, and electricity) and the geography of Vanuatu (with many islands spread over thousands of square kilometers) mean that logistics are a major challenge (particularly with respect to moving goods and people in the event of an emergency).

2 DRR in schools and hospitals

School and hospitals are one of the most important sectors for providing critical public services. Information on DRR policy for schools and hospitals are scattered throughout HFA progress reports and can be found under indicators 2.1, 3.2, 4.3, 4.4, and 5.2. Though it may be less appropriate to summarize the trend under indicator 5.1, the information presented here serves as a typical example of "strong policy, technical and institutional capacities and mechanisms for disaster risk management." Information is divided into hard and soft policies: protecting facilities and building structures by assessment,

Table 5.1a: Examples of national contingency plans in the health sector

Country	Plan or framework
Australia	National Health Emergency Response Arrangements
Bhutan	Health Contingency Plan
Botswana	Health Related Emergency Management Plan
British Virgin Islands	National Health Sector Emergency Management Plan
Brunei Darussalam	Pandemic Preparedness and Response Plan
Chile	National Strategy of the Ministry of Health (2011-2020)
Ecuador	Secure Hospitals Policy
Maldives	National Pandemic Influenza Preparedness Plan
Mexico	Secure Hospitals Programme
Peru	National Policy for Hospitals in case of Disasters
Samoa	Ministry of Health and National Health Service Emergency Contingency Response Plan
Sierra Leone	National Contingency Plans on Health
Sri Lanka	National Pandemic/Epidemic Preparedness Plan Health Disaster Management Plan
Sweden	National Pandemic Plan
Macedonia, FYR	National Strategy for Health Adaptation to Climate Changes (2011) Strategy for Health Sector Adaptation towards Climate Change in the Republic of Macedonia with Action Plan 2011-15

Source: HFA Progress Report for each country.

compliance to regulation and retrofitting, and relocation to safer areas, as well as improving preparedness through contingency planning and drills. With reference to health, besides promoting contingency plans for every hospital, national level contingency plans are often prepared (**Table 5.1a**).

As for the improvement of the physical structure of facilities, some countries prepare national guidelines or issue requirements that structures must be resilient to disaster. Few countries have implemented assessments and retrofitting for all schools and hospitals. Consistent policies, awareness raising and funding is required for retrofitting existing facilities and building new risk-proof facilities. Nepal points out the difficulty in balancing the urgent need for the simultaneous construction of many schools, and factoring in risk, which often entails additional costs and time. Some countries have reported successful practices, such as guidelines, regulation and cost benefit analyses (Boxes 71 and 72).

- **Antigua and Barbuda:** Retrofitting in schools and health care facilities is practiced, however clear policies for retrofitting are absent and as it is not mandatory, it is rarely sustained. The lack of a comprehensive disaster management plan, policy and a framework for the Ministry of Education reduces the impact that retrofitting could have.
- **Mozambique:** Little interest has been paid to assessing the disaster impacts and climate change risks on schools and hospitals. Although there is national and local commitment to involve schools in drill exercises, the vulnerability of those schools and health facilities have not been fully assessed.
- **Nepal:** An additional 10,000 classrooms are required each year to meet the Millennium Development Goal of "education for all" by 2015. Because of the large number of schools being rapidly constructed, new constructions do not meet building safety regulations.

To improve preparedness in schools, the focus is on students, teachers and parents; while in hospitals the

Box 71: Systematic strengthening of schools in the Islamic Republic of Iran

Following the UNISDR biannual campaign of 2008 – 2009 for school safety, and by virtue of an act in the fourth Development Plan Law, the Parliament of Iran approved a USD 4 billion programme to demolish and reconstruct unsafe classrooms and schools (assessed as weak in relation to earthquakes). Stipulated in the act was the reconstruction and retrofitting of 132,000 classrooms. Major achievements of this law include boosting the safety of 55,000 classrooms through the reconstruction and retrofitting of buildings.

Box 72: Good practices for strengthening school and hospital facilities

- ✓ **Lao PDR:** School construction guidelines, approved by the Minister of Education, require dedicated DRR funding for new schools to be built and the enhancement of existing schools. New school construction must factor into approved guidelines and efforts should be made to improve the shortcomings of existing schools.
- ✓ **Haiti:** The last earthquake saw a shift in paradigm regarding the reinforcement of school and health infrastructure. The government has invested USD 5 million for reconstructing schools. A similar program exists for hospitals.
- ✓ **Fiji:** Education, in partnership with school committees, incorporates DRR and cost benefit analysis as a standard practice in building new schools.
- ✓ **New Zealand:** All schools and hospitals are required to meet stringent seismic safety codes. Additionally, key facilities such as regional hospitals and emergency operations centers are expected to have critical systems redundancies.

focus is on patients, doctors and nurses (Boxes 73 and 74). As most countries can boast large numbers of schools and hospitals (both public and private), sharing best practices is important for transferring knowledge from one facility to another (Box 75).

- **Cook Islands:** The Ministry of Education requires all schools to conduct at least two evacuation drills per year and each class should have an evacuation plan.
- **Barbados:** Training for tsunamis has been initiated through the Bajan teacher training institution. This approach will be replicated in other institutions.
- **Maldives:** The Ministry of Health and Family, in collaboration with World Health Organization, has developed a diploma course on DRR and school health issues for school teachers.
- **Solomon Islands:** Evacuation drills have been conducted in hospitals. Following an earthquake in 2009, all patients were evacuated safely.

Improving resiliency in schools and hospitals is important not only because children and patients are vulnerable groups and require special care, but also because they are important facilities where critical services are provided during times of emergency (temporary shelter for the evacuated and injured). The report from Nepal outlines the role schools can

Box 73: Comprehensive preparedness in schools and hospitals

- ✓ **Finland:** Rescue plans are developed for every school and hospital. Local authorities carry out yearly fire inspections to ensure these plans are in place and up to date. In addition, schools are required to have a safety and security folder where all relevant safety and security threats are identified and terms of reference are given for security or safety incidents. Specific training and exercises are arranged each year in schools and hospitals, however training does not take into account natural hazards and instead focus on everyday incidents.
- ✓ **Dominican Republic:** The Ministry of Education has developed guidelines for creating school plans. More and more schools are implementing emergency committees and the number of schools establishing evacuation routes and emergency drills is increasing. The National Office for Seismic Assessment and Infrastructure Vulnerability is assessing the resistance of buildings to earthquakes.
- ✓ **Maldives:** The Ministry of Education, at the regional level, has mandated that all educational institutions produce plans that can be made operational during the initial phase of emergencies. A nationwide guide for school emergency operations planning has been published and is currently being implemented. School teachers and other staff are being trained on emergency preparedness and decentralized management. Regular mock drills are also being conducted within schools and activities raising community awareness of DRR and boosting the participation of parents are being undertaken. Note: the DM Bill has not yet been endorsed by Parliament so the institutionalization of regular evacuation drills in school and hospitals have not taken place.

Box 74: Preparedness in elderly care homes in Australia

Federal legislation requires that providers of subsidized residential care homes comply with accreditation standards; all residential facilities are regularly assessed against this. Legislation also calls for the development and enactment of plans in consultation with local emergency service agencies to protect the health, safety and wellbeing of care recipients. This includes identifying and ensuring compliance with relevant legislation, regulatory requirements, professional standards and guidelines pertaining to the physical environment, emergency management planning and response, and exercising key elements of their emergency management plans. Providers are reminded to update their plans every year and are expected to work closely with local emergency service agencies in developing and carrying out their plans.

play in promoting DRR in local communities (Box 76).

- **Japan:** As schools are where children spend most of their time, in addition to being used as evacuation centres in times of disaster, schools must comply with building regulations (with regard to earthquake resistance).
- **Mozambique:** Training for teachers, including drill exercises for students, have been conducted within schools during annual national, regional and local simulations. They aim to enhance the preparedness of local communities to hazards. Some teachers are members of the Local Committees for Risk Management.

3 Protection of capital cities

In the reports of Iran, Japan and Nepal, concerns were raised about the exposure of their capitals to earthquake risk. Because of the growing linkages between economic, social and political systems, capital cities become strategically important places and must be afforded special care. This issue can be extended to other strategic locales such as economic hubs (e.g. New York and Shanghai) and critical port cities (e.g. Rotterdam and Busan).

- **Iran:** The residents and structures of Tehran are highly vulnerable to natural hazards, particularly earthquakes. Recognizing its strategic function and the importance attached to Tehran, the Disaster Management Coordination Council of Tehran has been formed under the Chairmanship of the Mayor of Tehran.
- **Japan:** The Central Disaster Management Council has estimated that a Tokyo Inland Earthquake could result in 7 million evacuees and up to 7.5 million people stranded without a means of returning home.
- **Nepal:** Should a major earthquake occur, Kathmandu will suffer immense loss of life and property, potentially even causing the collapse of the government.

Box 75: Need for disseminating good practices

- ✓ **Malaysia:** The development of guidelines and tools will be useful for steering progress. The dissemination of information on experiences and good practices is crucial for expediting such efforts.
- ✓ **Sri Lanka:** Training and awareness programmes on DRR currently in use, are not engaging or interesting for school children. Activity based materials are needed, as is the transfer of knowledge through best practices and case studies.
- ✓ **New Zealand:** The Ministry of Civil Defense and Emergency Management and the Ministry of Education have jointly developed a Best Practice Guide to assist early childhood education services in developing emergency plans and putting them into practice.

Box 76: Role of schools in community preparedness in Nepal

Schools can play a vital role in developing mechanisms for sustainable DRR and should be a part of formal and non-formal education. School-based Disaster Management Committees (DMCs) have been formed and school-based DRR/DP activities are carried out in some districts. Schools are some of the most revered and trusted institutions in local communities. Developing safer schools protects the lives of children and, as schools are distributed throughout the country, are an effective medium for disseminating DRM/DRR know-how to communities – this is especially true for schools located in remote areas. As the concept of DRR is relatively new to teachers and school administrators, schools have not been able to play substantial role in DRR. It is recommended to link school DRR initiatives with awareness raising and capacity building efforts in local communities.

Core indicator 5.2

Disaster preparedness plans and contingency plans are in place at all administrative levels, and regular training drills and rehearsals are held to test and develop disaster response programmes

Many countries address response plans (including contingency plans) at the national, sectoral and local levels. Training and capacity monitoring are strongly linked to this indicator. Technical issues such as stockpiles, emergency operation centers, search and rescue and evacuation planning and shelters were also analyzed in this section.

1 Response/contingency planning at national, sectoral and local levels

More than 70 countries outlined having response plans and national institutional frameworks for emergency response (see **Table 5.2a** at the end of this section). Inadequate coordination of contingency plans at the national, sectoral and local levels was raised as a challenge. Improved coordination amongst stakeholders and specific contingency plans is required so as to reduce the risk of overlapping activities (Box 77).

- **Indonesia:** One of the biggest constraints relevant to this indicator is the differences in awareness, of both the government and communities, of the importance of disaster contingency plans in enhancing disaster preparedness. This lack of understanding has led to a lack of political will to provide funds for the formulation of disaster contingency and preparedness planning at the central and local levels.
- **Germany:** Preparedness plans are in place and are decentralized, existing at multiple administrative levels amongst emergency services. A vertical and horizontal diversification is so distinctive that no general/central action plans are in place and every authority, organization and flood management center has dedicated, sophisticated plans of action. These plans have to be adapted in crisis and there is currently no system other than deNIS II to integrate them in a functional way.
- **Macedonia, FYR:** Although many institutions have preparedness plans, legal inconsistencies mean there is an institutional overlapping in the creation of contingency plans.

Box 77: Systematic contingency planning processes in Italy and Pakistan

- ✓ **Italy:** Contingency plans are developed at all levels, coordinated by the National Civil Protection Department. The Department also issues guidelines as to how lower level administrations are to implement these plans. Regions are responsible for translating national guidelines into directives for the provinces (or prefectures depending on local arrangements). Municipal contingency plans must comply with provincial ones.
- ✓ **Pakistan:** The National Disaster Management Authority, in collaboration with all provinces/regions, undertake annual monsoon preparedness and contingency planning using a bottom-up approach. In preparation for the 2012 monsoon season, stakeholders focused on the multi-faceted challenges of climate change and resources available, before launching a vigorous DRR campaign and provincial level consultation process. These consultations aimed at creating an understanding for multi-hazard contingency planning.

Regarding sectoral response plans, many countries address health sector plans and the role they have when a country must respond to disasters, especially pandemics (see **Table 5.1a** in the preceding section). Contingency planning is necessary for a country's strategic sectors, for example, communication, transportation and utilities. Coordination between sectoral plans is important for providing consistent action in emergencies (Box 78). At the local level, countries report the lack of technical and financial resources as a severe impediment.

- Ecuador: Efforts have been made for including different sectors in DRR discussions. The government understands the need for creating contingency plans for strategic sectors such as communications and health, which are particularly vulnerable in times of disaster.
- Ghana: A lack of funding and logistics hamper the implementation of district disaster management and contingency plans across the country. Disaster management and contingency plans do not exist in some districts, communities and institutions, because they do not have the capacity to develop and implement their own plans.
- Mozambique: Financial and technical constraints persist and prevent local stakeholders from responding to complex emergencies, regardless of magnitude. For instance, approximately 80% of the Contingency Plan is still funded by international donors.
- Italy: Small municipalities located in remote areas do not always have access to sufficient technical and/or financial resources for developing effective disaster preparedness and contingency plans. In other cases, plans are in place but due to limitations, they are not regularly updated or properly implemented.

Planning cycles (plan-do-see) are not always executed properly. Exercises and simulations should be considered as an opportunity for reviewing contingency plans by checking the effectiveness of the plan and examining how to fill the gaps.

- Samoa: Some response agencies have developed agency-specific plans, however little data is available as to whether or not these plans have been simulated or tested. Conducting simulations to test agency response is not included in agency annual work plans and an effective monitoring and evaluation system is not in place. There is an urgent need for all agencies and communities to organize simulation exercises to test and refine coordination mechanisms and procedures, and to review coordination and identify roles, challenges and links between government and stakeholders.
- Solomon Islands: Contingency plans require full implementation and practical testing. Sector participation in drills and exercises is crucial if these plans are to be useful in a practical setting. This will require consistent funding support and sustained political will.

Implementation of planned activities during the emergency response phase is a challenge in some countries. Even if contingency plans exist, there impact will be limited if not implemented during the response phase. The lack of finances is often seen

Box 78: Coordination of national and sectoral plans in Samoa

The core response agencies listed in the National Disaster Management Plan all have Agency Business Continuity and Disaster Response plans in place and many of the additional non-core members have similar plans. Some agencies are more proactive in testing and updating their plans than others. The Disaster Management Office keeps an inventory of Agency Response Plans and presents them to the Disaster Advisory Committee for approval. Once approved, they are recognized as part of the arrangements for the implementation of the National Disaster Management Plan. One significant milestone is the National Emergency Telecommunication Plan, which is viewed as a national response plan to address DRM arrangements and action pertaining to a breakdown in telecommunications.

as a challenge to the implementation of activities in such plans. The lack of coordination in the planning process and a lack of awareness both contribute to the poor implementation of contingency plans.

- **Mauritania:** Emergency plans and programmes exist, but in theory. The operationalization and activation of plans and programmes is needed at all levels.
- **Indonesia:** Most contingency plans were not formulated by all stakeholders and instead involved a limited number of government offices and selected members of the community. Contingency plans often stay in document format and are never tested, simulated or used as a reference in emergency response.
- **Nepal:** Due to lack of coordination, technical capability and resources, plans are not effectively implemented and monitored.

The division between policy makers (politicians) and government administrators must be clarified in advance. The chain of command must be clearly outlined in emergency response plans to avoid confusion when disasters occur.

- **Tanzania:** During disasters, response actions are not conducted as outlined in plans. During such incidents, politicians tend to assume command instead of deferring to the expert DM focal point.
- **Thailand:** Organizations are not able to effectively perform their roles and responsibilities during disasters subject to the National Disaster Prevention and Mitigation Plan, the implementation of which is dependent on policy makers.

Additionally, the Cayman Islands and Lao PDR commented on government business continuity plans. It is important to note that government BCPs are different from response or contingency plans. While response or contingency plans define the procedure of response, government BCP lists the critical services for which continuous delivery must be assured by governments during and after emergency situations, and specifies resource allocations for such purposes.

- **Cayman Islands:** All government agencies are required to file their BCP, which are updated on annual basis.
- **Lao PDR:** There are Business Continuity Plans for 10 government agencies under 9 ministries.

Table 5.2a: Examples of contingency plans

Country	National	Sectoral	Local
Afghanistan	5 year DM plan		Provincial DM plan
Albania	National Civil Emergency Plan (2004)		Emergency response plan at regional and local level
Algeria	Emergency Plan		Emergency plans
Anguilla	National Response Plan		
Antigua and Barbuda	National Disaster Plan		
Armenia			Contingency plans at the regional levels
Australia	Commonwealth Government Disaster Response Plan		State and local governments are responsible for having disaster preparedness plan in place
Bahrain	Emergency Service Response Plan		

Table 5.2a cont.

Country	National	Sectoral	Local
Bangladesh	National Earthquake Contingency Plan	Ministry and Sectors' Contingency Plan	Local contingency plan at district, sub-district(upazila), and union levels
Barbados	Disaster Management Plan, SOPs	Key sector contingency plans	
Bhutan	Disaster Management and Contingency Plan		Disaster Management and Contingency Plan at Dzongkhag level
Bolivia	National Contingency Plan	Contingency Plan for Education	
Botswana			All districts have contingency plans
British Virgin Islands	National Disaster Management Plan (2009)		
Bulgaria	National Protection Plan		
Burkina Faso	National Contingency Plan for Disaster Preparation and Response		District and municipality level contingency plans are in development
Chile	National Civil Protection Plan	Sectoral Contingency Plans	
Colombia	National Contingency Plan	Sectoral Contingency Plans (health, energy, water, agroforestry, environment)	All districts and municipalities have contingency plans
Comoros	National Multi-Risk Contingency Plan		
Cook Islands	Disaster preparedness plans and contingency plans		
Côte d'Ivoire	National Contingency Plan		
Croatia	Disaster preparedness plan, contingency plan	SOPs for relevant sectors	
Cuba	Contingency Plans (no mention at which levels)		
Djibouti	National Contingency Plan		
Dominican Republic	National Contingency Plan for Earthquakes		Province and municipal level contingency plans are in process of implementation.
Fiji	National Disaster Management Plan, Cyclone support Plan (1997), Tsunami Response Plan	SOPs for most organizations	

Table 5.2a cont.

Country	National	Sectoral	Local
Finland		Emergency plan required for rescue agencies	
Georgia	Disaster Preparedness Plan, contingency plans	Response plan for all ministries (obligatory)	Legally obliged Local Disaster Preparedness Plan and contingency plans
Ghana	National Disaster Management Plan, National Contingency Plan		Not in some districts
Grenada			In most cases not available
Greece	The General Civil Protection Plan Xenokrates		Emergency and contingency plans at regional and local levels
Guatemala	Contingency Plans (no mention at which levels)		
Haiti	National Contingency Plan		
India	National Response Plan		State Disaster Contingency Plans updated annually
Indonesia	Contingency Plans		
Italy	National Contingency Plan		
Jamaica	A National Disaster Plan comprised of various sub-plans	Not in all agencies	
Kazakhstan	Plan of Kazakhstan on Preparedness to Natural Disasters, Plan of Civil Defense of the Republic of Kazakhstan for Emergency Situations in Peaceful Time		
Korea, Republic of	National Safety Management Plan		
Maldives	Contingency Plans for the Management of Environmental Disasters	SOPs for tourism and education	Risk Management/Contingency Plans have been developed for 3 atolls
Marshall Islands	Emergency Operation Plan for Tropical Cyclone, Tsunami Emergency Plan, Tsunami SOP	Sectoral Emergency Response Plans and SOPs for many sectors	
Mexico	National Contingency and Emergency Plan		Regional Simplified Device for Emergency Response and Contingency

Table 5.2a cont.

Country	National	Sectoral	Local
Mozambique	Contingency Plan		Provincial plans required. Contingency plans not comprehensively prepared at municipal level
Nepal			District Disaster Preparedness and Response Plan
New Zealand	National Civil Defense Emergency Management Plan		
Niger	National Multi-Risk Contingency Plan		
Nigeria	National Disaster Response Plan, National Disaster Management Framework		
Niue	National Emergency Plan (2009)	Each department has disaster plans	Village Disaster (or Emergency) Plans are in place for 14 villages
Pakistan	National Disaster Response Plan		
Palau	Disaster Management Plans	Response Plans for many sectors (including education, health, water)	
Panama	National Emergency Plan (2003)		
Papua New Guinea	National contingency plan		Only a few provinces have developed disaster response and contingency plans Disaster planning at the district and sub-district level is almost non-existent
Peru	National Emergency Operation Plan		
Portugal	Emergency Plan		Emergency plans
Romania	Contingency Plans, Strategy for prevention of the emergency situations, regulations for the management of emergency situations		Contingency plans for each county, emergency situation plans at the town level
Rwanda	Disaster Preparedness and Contingency Plans		Very few at the district level
Saint Lucia	National Emergency Management Plan		
Samoa	National Disaster Management Plan, National Tsunami Plan	Agency response plans are legally required	

Table 5.2a cont.

Country	National	Sectoral	Local
Serbia	National Strategy for DRR and Rescue and Protection in Emergencies		Emergency Action Plans have already been developed in most local governments
Slovenia	Emergency Response Plans for all major disasters		Emergency Response Plans at regional and municipal levels
Sri Lanka			Disaster Response and Preparedness Plans for 19 districts, 109 divisions and 401 villages
Sweden			Contingency and disaster preparedness plans at the county level
Syrian Arab Republic			Contingency plans at the governorate level
Tanzania	Tanzania Emergency Preparedness and Response Plan	Contingency plans in few sectors	Zanzibar Emergency Preparedness and Response Plan, District Emergency Preparedness and Response Plans in three districts
Thailand	National Disaster Prevention and Mitigation Plan		
Togo	National Contingency Plan		
Tonga	National Emergency Plan	Sector and departmental plans	District Emergency Plans required. Village Disaster Management Plans are developed
Trinidad and Tobago	National Response Framework		
Turkey	National Disaster Response Plan		
United Kingdom	Concept of Operations		
United States of America	National Response Framework		
Uruguay	National Contingency Plan		Contingency Plans at district level
Vanuatu	National Disaster Management Plan		Provincial Disaster Management Plan for two provinces
Macedonia, FYR		SOPs for various institutions	
Zambia		Contingency Plans for eight sectors including health, education, water, infrastructure	

Source: HFA Progress Report from each country. Note: SOP means Standard Operating Procedures

2 Emergency drills and training

Many countries addressed emergency drills and exercises under this indicator, as well as indicators 3.2, 3.4 and 5.1. Drills and exercises are important in improving the capacity of participants, raising awareness and testing the effectiveness of response plans. Training would be implemented for government officials with a focus on building professional capacity, while training for the public would be developed with a focus on awareness raising. Training for decision makers, including politicians and mayors, has also been implemented in some countries. Also of interest is the establishment of specialized training institutes, as seen in Section 3.2 (**Table 3.2a**), and the systematic approaches being defined by law or exercise strategy (Boxes 79 and 80). Some countries have also implemented large-scale exercises that mobilize large portions of the population. How good practice policies from one country can be applied and assimilated in another are also described (Box 81).

- British Virgin Islands: Training for operational responses to emergencies should be part of the routine of all emergency response agencies. Heads of departments or agencies should take responsibility for ensuring appropriate introductory training for new staff and specialized training for more experienced staff, based on agency mandate and the hazards that the country is likely to face. The Department of Disaster Management maintains a National Training Database that contains details of training sessions attended by different disaster management stakeholders. Effective emergency response relies on the availability of capable personnel and appropriate equipment being available when required. This means each agency must try to maintain appropriate levels of trained staff and needed equipment.
- Hungary: Roughly 3,600 administrative leaders were trained in disaster management and all newly elected mayors attended training in 2010. In 2011, a new accredited training programme was approved which focused on leadership styles, management, psychological and professional knowledge, and a practical implementation of tasks. In February 2012, a complex training was held for governmental commissioners and chairs of capital and county protection committees. The annual disaster management training for mayors of local governments are often connected with civil protection exercises.

There are challenges in implementing drills and exercises. First, a lack of funding hinders the use of regular drills in many countries, while time and resource constraints of the host agency serve as a secondary challenges. The utilization of the Internet is appropriate for geographically large countries or those that are responsible for remote areas (e.g. island countries) (Box 82).

- New Zealand: Preparing, undertaking and evaluating national exercises are major activities that require significant planning, budgets and lead

Box 79: Institutionalized exercises in Japan

The Disaster Countermeasures Basic Act stipulates the obligations of conducting disaster reduction drills. In order to promote various drills and exercises nationwide, the Central Disaster Management Council sets forth an annual Comprehensive Disaster Reduction Drills Plan which defines the basic principles for executing the drills and outlines the comprehensive disaster reduction drills carried out by the national government in cooperation with local governments and relevant organizations. In recent years, practical disaster reduction drill methods have been introduced, such as role-playing simulation systems, in which participants are not given any information beforehand and are required to make decisions and respond to the situation based upon the information provided at the onset of the drill. For example, in 2010, the disaster reduction drill envisioning the simultaneous occurrence of three major earthquakes (Tokai, Tonankai and Nankai earthquakes) was conducted for the first time in the Prime Minister's Office with participation of all of the Ministers.

Box 80: Systematic national and local exercises

- ✓ **Mongolia:** There are two types of emergency training and drills: Comprehensive Disaster Protection Training for the public; and drills for the Disaster Protection Headquarters and Squad. According to Mongolia's law on disaster protection, five types of disaster protection training are conducted for five different audiences; these consist of disaster managers, search and rescue squads, professional squads, students and civilians. The training and drills are held in five to six provinces every year. In these same provinces, a Comprehensive Disaster Protection Training is conducted every 3 years to engage local government officials, business entities and citizens. During these drills, a hypothetical emergency (that has a high probability of occurring in the province in question) is assumed to have taken place. Local government officials are expected to make appropriate emergency decisions, which are tested for feasibility by having emergency squads (composed of rescuers and civilians) implement their decisions in drill practices.
- ✓ **Thailand:** According to national law, Thailand has to conduct an exercise every year to test, monitor and evaluate the efficiency of the process. At the national level, the Office of National Security, in collaboration with Department of Disaster Prevention and Mitigation will conduct the simulation every year to test and evaluate the efficiency of a specific procedure in accordance with the national plan. At the cluster province level, the Disaster Prevention and Mitigation Center and the Provincial Disaster Prevention and Mitigation Offices (PDPMO) carry out cluster exercises. At provincial level, every province, including the Bangkok Metropolitan Administration, are obliged to conduct the exercise for a minimum of two types of disaster annually. The PDMPO supports the provincial exercise. At the district level, the district office executes joint exercises with local administration organizations and all concerned disaster management agencies.
- ✓ **New Zealand:** A National Exercise Programme provides the means to test response arrangements nationally. The Programme supports a ten year plan for the national level and regional level exercises in alternate years covering different hazards and scenarios. Local exercises are also held within each region. Lessons from exercises and events (including precautionary warnings) are used to improve policies and response arrangements

Box 81: "ShakeOut" exercises in the United States of America, Canada and New Zealand

- ✓ **United States of America:** The United States Geological Survey supports the Science Application for Risk Reduction project and the development of disaster scenarios with partner agencies that engage all segments of society in developing response exercises in order to promote awareness, preparedness and resilience. An offshoot of this project is *ShakeOut*, which is a community-based drill carried out annually in 22 states – with an estimated 15 million participants in 2012. *ShakeOut* earthquake drills help people adopt safety measures for big earthquakes and provide an opportunity for everyone to improve their overall preparedness. Hazard specific public preparedness initiatives in recent years have included the Great California *ShakeOut*, a statewide annual public drill that involved approximately 7 million people in 2009 and 8 million people in 2010. In 2011, a similar *ShakeOut* exercise was implemented in the Central United States in an effort to increase awareness and preparedness for a potential large scale earthquake along the New Madrid Fault. Over 10.9 million people registered to participate in *ShakeOut* drills in 2012.
- ✓ **Canada:** Natural Resource Canada's Public Safety Geoscience Programme is a member of the British Colombia Earthquake alliance, which organized the first province-wide drill held in Canada in 2011 via *ShakeOut* BC. More than 10% of the provincial population participated in this drill. This served as a catalyst for broad-based discussions regarding emergency preparedness. Drills are expected to continue and expand to other provinces and territories in the future.
- ✓ **New Zealand:** In 2012, *ShakeOut* NZ, the first national community earthquake drill, was undertaken in tandem with an associated preparedness campaign, with 1.38 million registrants (approximately 30% of the population). This drill was based on the Californian initiative.

times of more than a year. Getting all agencies to participate at a level where their continuity arrangements can be properly tested is difficult. The exercise programme requires ongoing promotion to ensure appropriate commitment from all participants.

- **Trinidad and Tobago:** Though the National Stakeholder Training Programme meets current national disaster training needs, the programme could be expanded to include a wider range of agencies and cover additional disaster management topics. Improving the coverage and reach of the programme requires increased funding and a greater commitment from institutions to enroll participants. Training, exercises and simulations should be increased to further assess needs and improve disaster management competencies for all DM operators.
- **Barbados:** At least one national exercise is conducted in addition to participation in regional and hemispheric simulation exercises. These exercises usually identify gaps in procedures, resources and training, yet capacity limitations, both in the Department of Emergency Management and the national emergency management system, mean that simulation drills and exercises are not conducted as often as they should be.
- **Indonesia:** A major challenge in enhancing preparedness measures is the lack of resources (human, expertise, budget, equipment and facilities) at the local level. Thus, many local agencies for disaster management still rely on national support for undertaking such activities.

Second, appropriate training must be provided to fill capacity gaps. Training needs analysis can be developed through the evaluation of ongoing training in improving capacity. Considering the turnover rate of government officials, the development of a database for tracking training records of officials would be helpful.

- **Palau:** Considerations need to be given to conducting a training needs analysis and developing a national training framework for DRM. A database to track training progress would also be beneficial.
- **Sweden:** Common to all fields of training at all levels is the need to strengthen the tools available to conduct needs assessments, target the correct audience and strengthen evaluation methods to ensure that quality training is delivered regardless of who delivers the training.
- **Solomon Islands:** Local governments receive training from the National Disaster Management Office and regional and international organizations. Available DRM training modules are not always tailored to specific in-country training needs. Efforts should be made to better align DRM training modules with identified knowledge and gaps in skill sets.

Box 82: Utilization of Internet for training

- ✓ **Germany:** The Federal Office of Civil Protection and Disaster Assistance developed the European Virtual Academy 4 Civil Protection platform on behalf of the EU. The Virtual Academy is an internet-based platform and content management system for target groups working on common areas of interest. The platform allows practitioners to exchange experiences, knowledge and best practices, as well as develop pedagogical and methodological concepts for e-learning modules.
- ✓ **Japan:** The Fire and Disaster Management Agency has introduced the "disaster prevention and crisis management e-college" designed to provide people with opportunities to learn about disaster prevention and crisis management. It offers courses for the general public, local government officials, fire brigade members, volunteer fire fighters and children.

3 Emergency operations centers

Emergency operations centers (EOC) are a central point of coordination and management in the event of a disaster. The EOC has the necessary equipment and infrastructure for disaster management. Accordingly, information is centrally managed in the EOC (this is the subject of indicator 5.4). More than thirty countries reported having an EOC (**Table 5.2b**) and in some cases EOCs have even been established at the local level.

Table 5.2b: Examples of national emergency operation centers

Country	Name of Center
Afghanistan	Emergency Operation Center
Australia	Crisis Coordination Center
Bahrain	National Emergency Control Center
Bangladesh	National Disaster Response Coordination Center
Barbados	Emergency Operation Center
Bhutan	National and District Emergency Operation Centers (EOC)
British Virgin Islands	National Emergency Operation Center
Canada	Government Operation Center
Chile	Central Emergency Operation Center
Cook Islands	National Emergency Operations Center
Czech Republic	Operational and Communication Center
Djibouti	Executive Secretariat for Risk and Disaster Management
Fiji	National Emergency Operation Center
Germany	Crisis Management and Disaster Relief Center
Greece	Operational Center for Civil Protection
India	Emergency Operation Center
Indonesia	Emergency Operation Center
Italy	Network of Operation Room
Kazakhstan	Republican Crisis Center of Ministry of Emergency Situations
Kenya	National Disaster Operation Center
Korea, Rep. of	National Disaster and Safety Center
Marshall Islands	National Emergency Operation Center
Mongolia	Contingency Control Center

Table 5.2b cont.

Country	Name of Center
Nepal	National Emergency Operation Center
New Zealand	National Crisis Management Center
Panama	Emergency Operation Center
Romania	4 mobile command and control centers
Samoa	National Emergency Operation Center
Sri Lanka	Emergency Operation Center
Switzerland	National Emergency Operation Center
Tonga	National Emergency Center
Trinidad and Tobago	National Emergency Operation Center
Vanuatu	National Emergency Operation Center
Zambia	Emergency Operation Center

Source: HFA Progress Report from each country.

4 Monitoring of capacity

Monitoring of capacity was highlighted in many progress reports and most efforts involve monitoring preparedness in general, identifying current capacities and establishing gaps between reality and ideals (Box 83). That said, monitoring of DRR policy is rarely reported and the use of HFA progress reports, a system of self-assessment, have not been fully explored. Monitoring, Evaluating and Reporting (MER) systems promoted by regional level initiatives have been utilized in some Caribbean countries (Box 84).

Box 83: Monitoring of local preparedness in the United Kingdom and Marshall Islands

- ✓ **The United Kingdom:** The National Capabilities Survey is a biennial survey of local responders in England and Wales (including emergency services, local authorities, local resilience forums and hospitals) designed to gather information that will help the central government and local responders identify gaps in local capabilities to respond to a civil emergency. Survey data is held in a database (with 240,000 pieces of data) and can be accessed by both central government and local responders. The survey contains 209 questions and responses can be filtered using around 100 demographic characteristics of organizations (e.g. type of organization, geographic location and risk profile). 839 organizations participated in the 2012 survey (an 80% response rate) and the data shows that 95% of local responders have reviewed their business continuity plans in the last two years.
- ✓ **Marshall Islands:** The Outer Island Profiles collect baseline information on response capacity by stocktaking the number of schools (and their ability to serve as emergency shelters), water catchments, warehouses, radios, Internet access and more. Basic demographic information, such as number of households, people and gender breakdown, is also collected. This database highlights available resources, gaps, needs and challenges, as well as best practices.

- **Barbados:** A cohesive approach to DRR to optimize resources and provide for adequate monitoring and evaluation is lacking. It is recommended to make an inventory of all existing national DRR initiatives to provide a baseline of the country's readiness.
- **Kenya:** No standard tools exist for monitoring and reviewing progress made in the implementation of DRR. What DRR means to one sector may be different to another, making progress difficult to map. This challenge may not be specific to Kenya alone.

5 Other technical issues (stockpiles, evacuation, shelters, and search and rescue)

Some countries reported technical issues (in relation to stockpiles, evacuation planning, shelters and search and rescue) in increasing preparedness, while some cited an absence of such policies. Outlined below are examples of "good practices" in adopting and making available such policies.

i. Stockpiling

- **British Virgin Islands:** In responding to disaster and emergencies, there are benefits to being aware of the type and number of specialized equipment (e.g. bulldozers, graders, fire tenders, trucks and generators) available. The National Resource Inventory is used to store information pertaining to the physical resources available and the capacity for response.
- **Canada:** The Public Health Agency of Canada maintains a CAD 300 million National Emergency Stockpile System to provide emergency supplies to provinces and territories when requested. A 24-hour response capability is maintained.
- **Sweden:** A list of resources has been submitted by municipalities and stored in a database. This shows the items that can be shared with other municipalities during or after a disaster.

ii. Evacuation planning

- **Japan:** To promote the evacuation of citizens who require assistance in case of emergency, a national plan was developed in 2007. The plan called for local governments to develop evacuation support master plans with the view to collect and share information on those who need assistance.
- **Vanuatu:** Contingency planning for a full evacuation of the island has been completed and includes registration of the population and assets and identification of possible relocation sites.

iii. Shelter

- **British Virgin Islands:** A total of 32 emergency shelters were identified in 2010. These shelters were inspected before the beginning of the hurricane season and 40% have been equipped with emergency generators. A contract is in place to clean the structures and maintain the generators. A list of all shelters was issued to the public.
- **Trinidad and Tobago:** Warehouse, shelters and medical facilities were identified as critical facilities for inclusion in the Critical Facilities

Box 84: Monitoring and evaluation systems in the British Virgin Islands

DRR policy instruments are monitored through the use of a Monitoring Evaluating and Reporting (MER) system. The MER is able to generate reports, monitor and highlight the implementation progress of various instruments such as the HFA, and generates national level documents such as annual programme reports, financial reports, report on critical infrastructure mechanisms, and reports on the state of preparedness of the territory (as required by the National Disaster Management Council). All reports are prepared on an annual basis and submitted to the Cabinet for review and approval. The MER mechanism is in its final stages of development and will be used to generate various reports to assess the implementation of policy and legal frameworks.

Protection Project, which assesses the vulnerability and risk exposure of critical infrastructure and provides recommendations to close gaps in disaster preparedness.

iv. Search and rescue

- **Canada:** There are a number of search and rescue (SAR) teams in place. The National SAR Secretariat maintains ground SAR operations, while the Canadian Coast Guard supports maritime SAR. There is also an aeronautical SAR maintained by the Canadian Forces and the urban search and rescue team is overseen by Public Safety Canada. In addition, there are volunteer search and rescue teams such as the Civil Air SAR Association, the Canadian Coast Guard Auxiliary, and the SAR Volunteer Association of Canada.
- **Pakistan:** Overall, 20 people, including women, were trained as "master trainers", while 40 government officials and civil society representatives, were trained as light search and rescue workers.
- **Finland:** Regional rescue services are obliged to assess accident risks in their jurisdictions and to make decisions at the service level based on risk assessments. The regional rescue service ascertains and assesses the threats present in the region and appraises the rescue services and readiness time of the fire brigade. The assessment also covers planning, prevention of accidents, civil defense and support measures for rescue activities.

For stockpiles, a lack of variety, logistical issues and quantity are of the greatest concern. This is followed by strategically located warehouses, which are required for the proper storage and maintenance of stocks. For evacuation planning, care for vulnerable groups is a must. Shelters (including schools, religious structures and government buildings) should be available in sufficient quantities, and regular risk assessments and maintenance are important should these structures be used in an emergency. Training and improved coordination is required for correct shelter management, as well as for search and rescue teams.

Core indicator 5.3

Financial reserves and contingency mechanisms are in place to support effective response and recovery when required[i]

1 Contingency funds

Under indicator 5.3, many countries cited having contingency fund mechanisms in place – including semi-contingency funds that do not carry over to the next fiscal year (see **Table 5.3a**). Contingency funds are the most important tools for achieving the aims of indicator 5.3.

Because of the wording, it was often difficult to differentiate between contingency funds and annual allocations for contingency without carry over; consequently, both schemes are analyzed together in this section. However, differences should be clarified in order to understand which schemes countries should adopt and to understand the implications for public finance programmes and entities.

Aside from the above mechanism, there are countries that decide the percentage of the budget that will be set aside for contingency planning.

- **Chile:** The Ministry of Interior and Public Security has a budget line for emergencies (called the "Emergency Fund"). Furthermore, a legal framework exists granting the President use of 2% of the national budget to cover emergency and recovery costs (known as the "State of Exception").
- **Mozambique:** Almost 10% of all sector budgets, including local governments, are held at the Treasury until the last three months of the year. If no exceptional crisis occurs prior to this time, funds

Table 5.3a: National contingency fund mechanisms

Country	Name of Scheme	Scale
Afghanistan	Emergency Fund	
Algeria	National Fund for Natural Disasters	
Bangladesh	Disaster Response Fund	USD 300 million
Barbados	Catastrophe Fund, Emergency Management Fund	
Bhutan	His Majesty's Relief Fund	
Botswana	National Disaster Relief Fund	
British Virgin Islands	Disaster/Emergency Fund	$0.5-1 million annually
Burkina Faso	National Relief and Rehabilitation Fund	
China	Natural Disaster Life Relief Fund	
Chile	Emergency Fund	
Colombia	National Fund for DRM	
Cook Islands	Disaster Emergency Trust Fund	NZD 200,000, Target: NZD 500,000
Costa Rica	National Emergency Fund	

Table 5.3a cont.

Country	Name of Scheme	Scale
Cuba	National Institute of State Reserves	
Dominican Republic	Government Contingency Fund	
Fiji	Prime Minister's Relief and Rehabilitation Fund	
France	Immediate Relief Fund Compensation fund	
Guatemala	Permanent National Fund for Disaster Reduction	
Haiti	National Emergency Fund	USD 23 million
Honduras	National Fund for Preparation and Recovery	
India	State Disaster Response Fund, National Disaster Response Fund	
Italy	National Civil Protection Fund	
Jamaica	National Disaster Fund	
Malaysia	National Disaster Relief Fund Special Relief Guarantee Facility	
Maldives	National Contingency Fund	
Marshall Islands	Disaster Assistance Emergency Fund	USD 400,000 annually USD 1.2 million as of 2012
Mexico	National Fund for Natural Disasters (FONDEN)	
Mongolia	Government Reserve Fund	
Mozambique	Contingency Plan Funds	USD 3-4 million
Nepal	Prime Minister's Disaster Relief Fund, Central National Disaster Relief Fund	NPR 50 million annually
Pakistan	National Disaster Management Fund (NDMF), President's Relief Fund, Prime Minister's Disaster Relief Fund	NDMF: PKR one billion
Peru	National Contingency Fund	PEN 50 million
Saint Kitts and Nevis	National Contingency Fund	
Saint Lucia	National Consolidated Fund	
Tanzania	National Relief Fund	
Turkey	Disaster Reserve Fund	
Uruguay	National fund for Disaster Prevention and Attention	
Vanuatu	Disaster Management Fund	VUV 25 million

Source: HFA Progress Report from each country.

are freed for sector expenditure. This approach has resulted in significant savings that can help the country stockpile significant resources to respond to a major disaster
- **Samoa:** About 3% of the total budget has been set aside for unforeseen circumstances, which is available immediately should a disaster occur.

Many countries cited the lack of financial resources as a challenge, preventing the creation of contingency mechanisms. In other instances, no funds have been set aside even though a mechanism exists. The main reasons for insufficient funds include competing priorities, increased demand for response and recovery, and general economic conditions.
- **Honduras:** Even if new law allows for the creation of a budgetary structure for DRR and DRM (under the National Fund for Preparation and Recovery), no money is available. The Secretary of Finance is leading efforts in creating financial mechanisms in order to finance emergency, recovery and risk reduction initiatives.
- **Cook Islands:** Included in the new policy is the recommendation that 2% of the national budget be set aside for a disaster Emergency Fund. Although this policy is fully supported in principle, the reality is that other pressing priorities (infrastructure, education, health, water and sanitation) are competing for the same pool of government funds.

Some countries reported they do not receive enough finances from the fund and they needed to complement DRM financing using budgetary reallocations and loans. Countries struggling with financial constraints need to find complementary mechanisms to respond to large-scale disasters.
- **Jamaica:** There is a National Disaster Fund that is limited in its capacity to mount a credible response in the wake of disaster. Budgetary diversions and sourcing loan grants are sometimes used to respond to large-scale events.
- **Bangladesh:** The contingency fund can meet the need of medium scale disasters, but to cope with larger disasters the government needs to mobilize additional resources.

Several countries noted the importance of timely fund release. One objective of contingency funds is to provide immediate finances without having to engage in the time-consuming process of budgetary reallocation. The speed of government response influences the scale of a disaster, especially in the immediate response phase. Attention to speed is therefore crucial for disaster management agencies, as is the transparency of contingency fund design. The balance between the need for speed and ensuring democratic accountability protocols must be pursued.
- **Sierra Leone:** Responding to disasters in a timely manner has been a herculean challenge for the government. Aware of this, the government is looking to put in place workable mechanisms to intervene or respond expeditiously when disasters occur.
- **Indonesia:** The government needs to formulate clear regulations related to disaster budgets and simplify fund disbursement while still maintaining the transparency and integrity of the system.

Discussions on contingency funding often take place at the central level within the Ministry of Finance (Box 85). This has led to concerns about the role of sectoral agencies/ministries. Some countries have local level contingency fund mechanisms in place, which have proved to be useful in many cases (Box 86).
- **Cook Islands:** No budget is appropriated for disaster response within each ministry and the heads of ministries are often reluctant to use their budget lines. The repeated spending of the emergency contingency funds prior to cyclone season leaves line ministries with a limited capacity to assist with emergency management. This has caused delays in providing immediate response before the funds were finally allocated through cabinet
- **Lao PDR:** The Ministry of Health, the Ministry of Public Works and Transportation, the Ministry of Agriculture and Forestry, and the Ministry of Defence have financial reserves for emergencies, although the amount of funds is not disclosed. The

Ministry of Labor and Social Welfare has a disaster emergency response fund of approximately LAK 1 billion available for immediate use (2011 figures) and assistance levels are based on a case-by-case basis.

- **United Kingdom:** Some financing is available from various departmental contingency funds, and the Treasury has a contingency fund that can be used in the event of a major disaster. Local authorities are required to have contingency reserves to manage local events.

Few of the country reports were explicit about the use of a contingency fund; however, concerns did surface regarding the use of contingency funds to finance immediate response only. Some countries discussed the need to make financing available for DRR (and reconstruction).

- **Marshall Islands:** Regulations involving the Disaster Assistance Emergency Fund present a challenge. Because funds cannot be used for DRR measures, the money sits idly instead of being put towards reducing underlying risks and lessening the impact of future disasters. This in part highlights the limited commitment to DRR.
- **Senegal:** The National Treasury has set two billion West African francs aside under the Disaster Fund. Every year, approximately 0.2 billion is released for the preparation and management of floods before and during rainy seasons.

2 Budget reallocation

Several countries highlighted that they do not have contingency funds in place and instead respond to relief needs by regrouping existing budget lines. While two countries (Germany and Switzerland)

Box 85: Establishment of an independent contingency fund mechanism in Colombia

Law 1523, passed in 2012, identified a new financing mechanism for risk management. The law renamed the National Calamity Fund as the National Fund for Disaster Risk Management and created an independent account for the fund, to ensure flexibility and statutory procedures. In addition, the law led to the creation of five sub-accounts for risk knowledge, risk reduction, disaster management, recovery and financial protection. The law also established the departmental, district and municipal risk management funds, in order to strengthen response capacities at all levels.

Box 86: Local contingency mechanisms in New Zealand, Ghana and Pakistan

- ✓ **New Zealand:** The Local Authority Protection Programme Disaster Fund (LAPP) is a cash accumulation pool to help local authorities pay their share of infrastructure replacement costs for water, sewage and other uninsurable essential services damaged by natural disaster. The LAPP covers up to 40% of a local authority's share above the threshold set by central government for recovery assistance. Of the 85 local authorities, 59 are currently LAPP members. The Fund equity is approximately NZD 40 million, supplemented with reinsurance to enhance this balance.
- ✓ **Ghana:** A 1999 Presidential decree mandated that all districts must set aside a percentage (~5%) of the district assembly funds for emergency response. The exact percentage has yet to be legalized and the management of the fund is not explicitly defined.
- ✓ **Pakistan:** At the provincial level, the Chief Minister's Relief Funds and provincial disaster management funds are being maintained under respective Relief Commissions, to cater for contingency needs of the provinces.

intentionally chose this option, many others were obliged to adopt this approach, in part due to their inability to establish contingency financing mechanisms. Fundamentally, budget reallocation takes time and can affect the smooth delivery of relief efforts. In the long run, it can also affect economic growth by depleting funds allocated to other development projects.

- **Germany:** There is no special fund for disasters because the federal government, states and private actors possess enough resources for emergencies. The government is responsible for any large-scale damage, which is normally facilitated by regrouping budget resources.

3 Expectations for international donors

Several countries addressed the possibility of acquiring external financial resources such as aid from international organizations and INGOs. External financing has been important in complementing (often meagre) resources in developing countries, however the expectation of acquiring resources in this way risks hindering national efforts to establish contingency mechanisms.

- **Vanuatu:** There is an expectation that the donor community will provide support and can put together a large-scale, rapid response that would exceed government abilities to mobilize and manage on their own.
- **Marshall Islands:** There is little incentive to commit finances to disaster preparedness since it is believed that the United States of America (contributor to the Disaster Assistance Emergency Fund) will support the country in times of disaster.

4 Catastrophe insurance and bonds

Several countries have dedicated catastrophe insurance, others in need of such insurance to protect public finances, subscribe to a regional facility (the Caribbean Catastrophe Risk Insurance Facility for example). The expectations for having a regional insurance mechanism in place are high in some regions (e.g. Pacific, Africa and southeastern Europe). The need for catastrophic insurance and bonds comes from the inadequacy of funds for recovery efforts, especially after large-scale, intensive disasters. The problem is that insurance is often costly, and a regional mechanism is required to spread the

Box 87: Comprehensive risk financing in Mexico

The Ministry of Finance and Public Credit has developed insurance to cover the losses from high frequency or high impact events. Insurance covers infrastructure for communication and transportation, water, education, sports and health, facilities for urban municipal solid waste, electricity, marine and tourism facilities, fishing and primary aquaculture, forestry and nurseries, protected natural areas, as well as rivers and lakes, patrimonial low-income housing, and archaeological and historic monuments. Of these assets, water, roads, education, health centres and social housing must be highlighted, as they have been earmarked for over 90% of all disbursements by the FONDEN (National Fund for Natural Disasters) since 1996.

The government, with support from the World Bank, successfully completed the second edition of the Catastrophic Bond, which transfers the risks of hurricane and earthquakes from investors and provides attractive returns if events do not occur within established parameters. Should the event occur, resources are deposited in the trust and transferred to Agroasemex SA (insurance company) that pays out to FONDEN. Furthermore, the Reconstruction Fund for Federal Entities, established in 2011, provides 20-year loans to affected federal states.

risk and decrease premiums to a reasonable level. Catastrophe bonds are not prevalent and Mexico is the only country that reports having them (Box 87). Contingency loans were also mentioned in some country reports (Box 88).

- **Australia:** Based on changes introduced in 2011, states must submit independent assessments of their insurance arrangements to the federal government, which reviews these arrangements to ensure they are appropriate, cost effective and will minimize financial exposure borne by all taxpayers.
- **Mozambique:** Without other financial mechanisms (e.g. insurance) in place, resources made available through the national fund may not be enough for reconstruction and recovery efforts following a complex major disaster.

5 Crop Insurance[ii]

Crop insurance is especially important for countries dependent on agriculture. More and more governments have introduced or are developing schemes for crop insurance and some countries link crop insurance with credit programmes. Doing this will give farmers the incentive to purchase crop insurance and make them more resilient. While crop insurance involves an aspect of social policy to support vulnerable farmers and ensure food security, the cost of insurance premiums is often beyond the reach of farmers. The challenge is determining how to develop the private market by gradually decreasing the involvement of government.

- **Canada:** Canada has a Crop Insurance Program that has been available for 25 years. Although it started out as a federal initiative, crop insurance is now administered at provincial and territorial level.
- **Mauritius:** Given the long agricultural history of the country, well established crop insurance policies cover the main crops in the country. Most farmers have crop insurance to hazard proof their business.
- **China:** Since 2007, the subsidy policy of agricultural insurance premium from the central government has been established, attaining the integration of government and private sector. However, government's financial subsidies assume the majority share of the premium and farmers in some provinces are even exempt from paying the premium.
- **Pakistan:** The Federal government has introduced Crop Loan Insurance Schemes for five major crops to provide farmers with a safety net. Under the crop insurance policy, agricultural credits/loans will be offered for insured crops only. The implementation of the announced policy requires consistent support and commitment from the government.

6 Risk financing in the private sector

Information relating to risk financing in the private sector, especially insurance, is scattered across HFA progress reports. For simplicity's sake, information

Box 88: Contingency loans

Contingency loans are another mechanism for risk financing. Latin American countries including Panama, Ecuador and Costa Rica mentioned their contracts with development banks. In the case of Panama, in March 2012 the Cabinet Council approved a contract for a Contingent Loan for Emergencies to Natural Disasters (for up to the USD 100 million), which was signed between the Ministry of Economy and Finance and the Inter-American Development Bank. There is also a contingency loan with the World Bank that can be activated in case of disaster.

has been compiled under this section. Most of countries provide inputs about insurance, which is the most important contingency mechanism in the private sector. The type of insurance provided (the risks they must respond to and items that are being insured) is dependent on each country.

Some countries reported a lack of private insurance markets, and even when there is a market, the penetration rate is too low or at an undesirable level. One reason for such low penetration rates is an absent insurance culture. Raising awareness regarding the importance of insurance is one necessary step, as is mobilizing the insurance sector in the national platform, which may facilitate awareness amongst stakeholders and the public.

- **Mexico:** One important challenge is to promote and create a culture of insurance among the population, particularly in low income communities.
- **Mongolia:** Citizens' trust in insurance is limited. To rectify this situation, public knowledge on insurance should be raised through campaigns.
- **Argentina:** The country has not mobilized any concrete and structured insurance system for preventing disaster risks, though some institutional commitment has been seen, particularly through the inclusion of some insurance groups in the National Platform. Civil Society is also pressuring the government to get access to insurance schemes.

Second, insurance premium payments are out of reach for poor households and communities. Governments need to support access to insurance for low-income groups or communities through the use of subsidies on premiums. Public private partnerships can be useful in establishing such mechanism.

- **Dominican Republic:** Even if insurance exists, they are privately operated and owned, so low-income populations (the most vulnerable to disasters) generally cannot access insurance mechanisms.
- **Sri Lanka:** People from low-income families are not interested in contributing to insurance schemes promoted by insurance companies, as the premiums often exceed earning capacity. The National Council for Disaster Management has approved the establishment of a scheme to insure homes of low-income families against natural disasters, where the government and beneficiaries share the cost of premiums.
- **Japan:** An earthquake insurance system has been established by the national government. To promote earthquake insurance protection, a tax deduction for taking out earthquake insurance premiums was introduced in fiscal year 2006.

Other factors that empower private insurers are the existence of reinsurers, enabling laws and regulations, and capacity building of public and private sectors. The strong involvement of government is necessary to support the development of the private insurance market, and public private partnerships (PPP) can be a promising avenue for increasing penetration rates (Box 89).

- **Sri Lanka:** Insurance companies experience difficulties in finding reinsurers in the absence of reliable disaster information.
- **Mozambique:** Technical capacities have to be raised in the private and public sectors so micro- and crop insurance mechanisms and premiums are understandable and acceptable for all interested stakeholders.
- **Mongolia:** The possibility to develop and provide insurance products that accumulate funds over time is constrained by the existing Law in Mongolia on Insurance.
- **Australia:** The Federal Government implemented new regulations to ensure that a standard definition of "flood" is used in home building, home content, and SME. The federal government is also in the process of introducing regulation that requires insurers to provide consumers with one page fact sheets that set out key information on the coverage provided under home building and contents insurance policies.

Some countries make insurance a legal requirement (Box 90), while others debate whether to make insurance compulsory by law. Even if insurance is not

legally mandatory, loan conditions required by banks sometimes render insurance obligatory.

- **Algeria:** After the 2001 floods and earthquake of 2003, financial mechanisms were introduced that included obligatory insurance for disasters. This law grants coverage for earthquakes, floods, storms and strong winds.
- **Italy:** There has been a long-standing debate on the introduction of compulsory risk insurance. The country is exposed to a number of risks with non-homogeneous distribution. This makes it difficult to identify national policies that would be convenient for everyone.
- **United Kingdom:** While insurance for homeowners is not compulsory in the UK, it is virtually impossible to obtain a mortgage without some form of insurance.

Savings or establishing reserves is also a way to finance risk, however this seems to be restricted to large companies (with the capacity to establish reserves) and formal sectors under an

Box 89: PPP Schemes to combine public disaster mitigation with support for private insurers

- ✓ **United Kingdom:** The government has an agreement with the insurance industry that the latter will insure property at risk so long as the Environment Agency has announced plans to defend the property against flooding. This ensures those vulnerable to flooding have enough insurance to protect themselves.
- ✓ **United States of America:** The National Flood Insurance Program offers flood insurance to homeowners, renters and business owners if their community participates in the programme. Participating communities adopt and enforce ordinances that meet or exceed Federal Emergency Management Agency's requirements to reduce the risks of flooding.

Box 90: Compulsory insurance in New Zealand

A levy for loss or damage (to residential property, land and personal possessions) from earthquakes, landslides, volcanic eruptions, hydrothermal/geothermal activity, tsunamis or fires is a compulsory component of all home and/or contents fire insurance policies (Earthquake Commission (EQC) Act 1993). A national natural disaster insurance scheme (through the EQC) provides automatic coverage – with a maximum cap – for property and goods, through a levy attached to private household insurance. Asset insurance and, in some cases, income protection are generally required as part of a lender's mortgage and loan agreements

By international standards, New Zealand has a high percentage of coverage for property (structures and content) damaged by floods simply because it is a standard part of insurance policies. While household insurance is high (approximately 95% nationwide) it is likely that some are still under-insured for total losses. Small to medium businesses in particular do not have the capacity to withstand an extended period of trading disruption. Further education is needed to raise awareness of hazard risks, individuals' responsibility in addressing them and reasonable expectations for state support following an event.

EQC's fund reserves and reinsurance has underpinned much of the losses incurred by households following the Canterbury earthquake. As a result of this experience, a review of the EQC funding model, to better reflect current risk and operational needs, is been undertaken. A significant increase in national insurance premiums, after the Canterbury earthquakes, suggests that the insurance/reinsurance market is reassessing risks in New Zealand. This has had significant financial implications for owners of highly earthquake prone buildings. There is also a shift in the form on insurance offered from full replacement to that of sum insured. This reflects a market rebalancing in the short to mid-term and further incentivizes building upgrades. While further reinsurance has been attained initially, it has been at a higher cost and the Commission's reserves also require rebuilding.

institutionalized savings framework. Cooperatives will close the gap by opening avenues for the vulnerable communities (Box 91).

- **Germany:** Large-scale industries typically have their own protective measures in place.
- **Samoa:** Some financial assistance is provided to the public and businesses for responding to and recovering from disasters. The Samoa National Provident Fund is a compulsory savings scheme for employees, and compliance is enforced under the National Provident Fund Amendment Act of 2009. Contributions to the fund are made partly by employers on behalf of employees and constitute 10% of an employee's gross salary (5% from the employee and 5% from the employer). Members are able to loan up to 45% of their contribution.

Box 91: Cooperatives to complement private insurance schemes in Malaysia

The establishment of a cooperative (the Endeavor Trust of Malaysia) in 1987 has improved the resilience of communities previously vulnerable to disasters. It has provided services to more than 180,000 families in Malaysia, including making micro-finance contributions, compulsory savings and welfare funds available for poor and marginalized groups.

Core indicator 5.4

Procedures are in place to exchange relevant information during hazard events and disasters, and to undertake post-event reviews

1 Information exchange during disasters

Countries cited the importance of information exchange during a disaster and many countries have a functioning central emergency operations center or network (see **Table 5.2b** in Section 5.2). Despite the existence of such centers, many countries have suffered from poor information exchange. Sectoral divides still impede the smooth flow of information, and the clear assignment of roles and institutional arrangements are needed to ensure the commitment of all stakeholders. Technical arrangements connecting different systems and reporting styles are also a challenge due to intensive resource requirements. The benefits of establishing coordinated data sharing systems were also outlined (Box 92).

Box 92: Data sharing in the Cook Islands, Germany and Sweden

- ✓ **Cook Islands:** Lessons learned from the response to Tropical Cyclone Pat indicated challenges in information sharing with multiple templates used by different agencies and significant information gaps. This can be addressed through the Frontline Emergency Response Network (FERN). FERN is a new information tool for preparedness and response. It will enable inter-agency management and dissemination of DRM data including GIS data, risk maps and contact details for each island, as well as task lists for when an emergency occurs. It will permit automated email lists and a template for communication with the media, which will help in resolving conflicting information being broadcast at the time of a disaster. It also includes a tool for assessing relief needs in disaster areas. Although the framework for this system has been created, more funds are needed to populate the directory with data. Clear agreement will be required on who is responsible for entering/maintaining data.
- ✓ **Germany:** The Federal Office of Civil Protection and Disaster Assistance (BBK) runs a German Emergency Planning Information System (deNIS II plus) together with partners from all areas of disaster management. DeNIS II was created to support emergency/relief units and authorities with real time information on disaster events, geological data (e.g. location of critical infrastructure, risky facilities or resources for emergency assistance), risk types and background information. The core elements of the web-GIS system form three modules to support situation (interactive situation map), information (dispatching of instructions/announcements) and resource management (management of all reactionary resources). DeNIS II is accessible by all decision makers and actors within the disaster management system at the federal, state and community levels. An automatic review and feedback process was conducted and the integration of current measured values (radioactivity, weather data and water levels) is in progress. The assimilation of data for the integration of systems is tedious; therefore, the BBK and responsible authorities in the federal states hope to build interfaces between these different systems in the near future.
- ✓ **Sweden:** The Swedish Civil Contingencies Agency is responsible for expanding, developing and supporting the digital communication system (RAKEL) used by emergency services and others in the field of civil protection, public safety and security, emergency medical services and health care. RAKEL reduces societal vulnerability during an emergency and serves as a reliable communication system. Besides its resilient attributes, RAKEL provides greater coverage than commercial systems and enhances platforms for interaction. The system streamlines everyday communications, and enables new ways of working, which increases readiness and the ability to manage an emergency. The contingencies agency, together with 40 other organizations, has produced national guidelines for cooperation in using of RAKEL from 2013.

- **Fiji:** Intra-governmental information sharing is challenging before, during and after a disaster, because it is not always known who needs to know what. There is an obvious disconnect between information coming from the National Emergency Operations Center and those needed by various actors to prompt actions.
- **Samoa:** There are currently no policies, regulations or guidelines in place that harmonize and standardize all forms of disaster information, procedures and compliance by government ministries and other relevant stakeholders.

Local level information sharing and dissemination have been identified as challenges, as has the importance of fostering stronger links with national governments. Considering that disasters often occur on a scale beyond local administrative borders, the leadership of the national government in defining information templates and formats should be promoted and capacity building facilitated at the local level.

- **Indonesia:** The standard procedure for exchanging information has been developed at the national level but this has not filtered down to local and regional levels. The constraints faced include the work involved in covering all (497) districts/cities and building their capacity to implement these procedures.
- **Vanuatu:** Improvement is required with regards to the information flow from the community and provinces to the national level. There is currently limited communication between government and non-government actors.
- **Germany:** For official flood protection/management, the reduction of qualified staff and especially the use of different systems, create challenges. This is especially true when it comes to disseminating relevant information in a hazard situation to all actors. In the opinion of most flood management centers, there has to be a uniform system on the Federal state or even national level.
- **China:** As outlined in the Emergency Response Law, above-county level governments should build or ensure a unified local emergency information system to gather, store, analyze and transmit relevant emergency information. This will also help in linking the emergency information systems of the central government, local governments, professional agencies and monitoring networks, and to strengthen inter-departmental and inter-regional information exchange and information cooperation.

Carrying out staff training/drills and updating technological systems is important for emergency operation centers to work smoothly. Information flows should be reviewed and tested regularly through simulations and drills.

- **Norway:** The routine for exchanging information during hazard events are developed and tested regularly.
- **Barbados:** Training should be continuously provided in the use of the Emergency Telecommunications System and technology should be updated when possible.

Regarding the dissemination of information to the public, involvement of the media is important. As discussed in Section 2.3 – on early warning systems – institutional arrangements with the media and telecommunications sectors should be established to ensure better information delivery to the public.

- **Kenya:** The media plays a big role in relaying information on disasters as they happen. Media coverage is almost uniform across the country, especially with regards to radio stations – that now play a crucial role in relaying information. The problem is that there is no systematic way of conveying disaster information. The main challenge is the lack of an institutional framework to guide the development and transmission of such information.
- **Macedonia, FYR:** The Law on Electronic Communications obliges ICT and Telecoms operators to make their networks and infrastructure available to the state for the purpose of rapidly disseminating information following large accidents and disasters.

2 Post-event review to examine lessons learned[iii]

Many countries carry out post-event reviews to share thoughts on experiences and lessons learned in preparation for a subsequent event (Box 93). The review process is important for determining bottlenecks and for sharing information across sectors. Though countries seem to agree on the importance of facilitating such reviews, they are not implemented in a systematic manner. In addition, the commitment of all stakeholders varies, the views of which are essential to assure relevant post-disaster review and impactful recommendations for avoiding future losses (Box 94).

- Germany: As the requirements of collective post-event review are not defined, there are many different reviews and evaluation reports produced by individual organizations and authorities.
- Solomon Islands: There is no uniform participation of relevant sectors in post-event reviews. Effective mechanisms for improving access and sharing post-disaster assessment reports with relevant stakeholders should be explored.
- Trinidad and Tobago: There is a need to improve capacity for conducting After Action Reviews by standardizing and formalizing the review process at the national level and training stakeholders to facilitate these reviews thereby promoting improved participation at all levels.

Lessons from post disaster reviews should be reflected in policy. The distinction made in the United Kingdom between "lessons identified" and "lessons learned" is meaningful in this regard because in some cases, usually due to resource limitations, lessons are dismissed while vulnerability remains. Implementing policies based on lessons should be the status quo for avoiding and mitigating recurrent losses.

Box 93: Systematic post-event reviews in Japan and the United States of America

- ✓ **Japan:** The Cabinet Office has developed databases on lessons learned from emergency response to large-scale disasters. They include an analysis of the incidents, responses and barriers at all phases and are compiled for the purpose of being utilized in the wake of future disasters. The Central Disaster Management Council has established a committee for collecting lessons learned on all disasters since the 17th century, so they can be handed down to the next generation. Further elaboration is expected on the effective use of information.
- ✓ **United States of America:** The US National Institute of Standards and Technology has established a Disaster and Failure Studies repository to identify common vulnerabilities in hazard mitigation strategies and technologies. As part of this programme, post disaster studies help determine the causes of failure and identify valuable data that will help improve the resiliency of infrastructure and DRR through changes in design, materials, building codes and standards.

Box 94: Mobilizing diverse stakeholders in post disaster reviews

- ✓ **Australia:** The private sector has shared lessons learned with government. Critical infrastructure organizations have shared their experiences and challenges in maintaining essential service delivery during the 2010-11 summer disaster season. The information provided has been useful to both businesses and government stakeholders in identifying and understanding the types of issues that inhibited response and recovery activities during that event.
- ✓ **Indonesia:** Participation of affected communities has to be enhanced to make post disaster reviews more relevant to the needs of disaster-affected people.

- **Turks and Caicos Islands:** Given the resource limitations of agency workloads, following through with various aspects of any report is difficult. Any changes must be taken over time to allow for the institutional absorption of information.
- **United Kingdom:** The collection of lessons learned is only useful if there is a clear process for acting upon the lessons and resolving issues in a reasonable timeframe. Central to this is having a dedicated individual who is responsible for addressing the issue and ensuring measures are taken to alleviate the problem for future operational requirements. It is also pertinent to draw a distinction between "lessons learned" and "lessons identified." The Civil Contingencies Secretariat has defined "lessons identified" as being initial lessons drawn out of any exercise or operation. Once action has been taken to alleviate the problem, for example, updating plans and procedures, can a lesson be considered "learned."

3 Post-event assessment: rapid loss and needs assessment

Countries commented on two kinds of assessments under this indicator. The first is a rapid assessment of damage, loss and needs, which is urgently required for estimating recovery costs immediately after a disaster. The second is a more detailed analysis that includes economic and social factors and measures the impact of a disaster more accurately and comprehensively. There are five challenges for both kinds of assessments.

The first is the need to establish and improve standardized methodologies for rapid assessments and socio-economic impact analyses. In rapid loss and needs assessments, many countries stated that they had adopted internationally or regionally established methodologies. While standardized methodologies are available at the regional and international levels for rapid assessments, this is less the case for socio-economic impact analyses.

- **Kenya:** Damage, loss and post disaster needs assessment methodologies exist, however they are institution/agency based. There is a need for uniform and synchronized disaster loss and post-disaster needs assessment methodologies.
- **Canada:** Canada continues the development of a standardized methodology to assess disaster losses, while respecting existing procedures and provincial/ territorial jurisdiction.
- **Sri Lanka:** The Damage and Loss Assessment (DALA) method used in Latin America was introduced in Sri Lanka with modifications to suit local conditions.
- **Indonesia:** A Post Disaster Needs Assessment (combining DALA and Human Recovery Needs Assessment) has been developed and legalized through National Agency for Disaster Management regulation.

Second, governments need to offer training to researchers and users on how to carry out assessments and analyses (Box 95). Human capital is important, as speedy needs assessments are essential for the release of emergency funds and applying for international aid. Countries that have well developed insurance markets and (sector) mechanisms responsible for implementing rapid assessments,

Box 95: Training for disaster loss evaluation in China

✓ China issued a National Medium and Long term Development Plan on Talents for Disaster Prevention and Reduction (2010 – 2020). This plan underscored the development of eight teams (that include youth and mid-aged leaders) and senior disaster evaluators. The Chinese government has already built 13 disaster messenger assessment and appraisal centers at the central and provincial levels. A total of 630,000 disaster messengers are part of the programme.

can complement the human capital provided by the public sector. Public and private partnerships are important in such cases.

- **Turks and Caicos Islands:** Practical experience is needed for persons trained and because of the high turnover rate within the DRR field, continuous training is a must.
- **Solomon Islands:** Training should highlight the difference between rapid assessments and detailed sector specific assessments. Guidance should be provided on gender disaggregated data collection and analysis.
- **Switzerland:** Damage appraisers (from insurance companies and private engineering companies) are quick to assess damage and losses and document the process.

Third, unsystematic data collection and assessment across sectors can mislead response and reconstruction activities. Coordination across sectors (e.g. developing common data collection templates and adopting a universal methodology) is required.

- **Guatemala:** Each institution has its own methodology for collecting, analyzing and reporting data related to disasters (e.g. number of affected people, damaged assets). The current process needs to be improved upon.
- **Fiji:** During operations, there are often multiple, parallel, and not necessarily coordinated assessments going on. It is problematic to verify data across sectors and locations.

Fourth, baseline data (pre-disaster information) is necessary to accurately estimate losses and impacts. It is important to prepare baseline information in times of calm to facilitate post-disaster assessments and analyses.

- **British Virgin Islands:** There is a need to collect baseline information and to establish a national database to allow for more accurate calculations of losses.

Fifth, assessments are rarely carried out in remote and geographically inaccessible areas because of limited human resources and the inability of experts to visit such areas. Transportation and communication infrastructure development contributes to the full territorial coverage of assessments.

- **Peru:** Civil protection centers situated in remote areas lack skilled personnel able to carry out damage assessments.
- **Mozambique:** Rapid damage assessments have been conducted in the aftermath of a disaster, but only cover locations accessible by road.
- **Papua New Guinea:** The majority of localized disasters go unreported as the lack of communication and infrastructure facilities mean that most of the country's population remains isolated.

4 Post-event assessment: economic and social impact assessments

Fewer countries commented on the use of economic and social impact analyses, than did on rapid loss and needs assessments. An economic and social impact analysis is important for promoting smooth reconstruction and preparing for future events. Analyzing disasters that have occurred will contribute to the cost benefit analysis and the economic and social impact modeling of probable disasters, as explained in Section 3.3. Different skills are required for rapid assessment as opposed to comprehensive socio-economic impact analyses implemented at a prescribed time after the disaster.

- **Mozambique:** Emphasis is principally on rapid damage assessments rather than comprehensive damage and loss assessments. In general, economic and social losses are not included in damage and loss assessments. As a result, economic losses are not estimated and the recovery of economic activities at affected sites is a lengthy process.
- **New Zealand:** An additional economic analysis of events is beneficial for better informing hazard and risk impact models, emergency response and recovery planning, and cost benefit analyses for risk reduction purposes. The Canterbury

earthquake raised national awareness of the broader and long-term impacts of such events.

The biggest challenge in carrying out economic and social impact analyses is the lack of common definitions regarding impacts. This leads to ambiguity about the type of data that should be collected.

- **Germany:** The challenge for the German Emergency Planning Information System (deNIS) and the Joint Hazard Estimation of the Federal States and the Federal Government involve the lack of common understanding or appraisal of impacts and determining which losses are to be taken into consideration: capital stock (e.g. damage to residences and lifeline/utilities), environmental (e.g. water pollution), economic (e.g. financial loss to government / business / residents), social and cultural (e.g. loss of life and decreased quality of life), and institutional and policy risks (e.g. increased distrust of government) for example. Therefore, experts from all areas of disaster reduction and management (including public private partnerships) are integrated into a standardized structure that is currently in the process of development.
- **Sweden:** Follow-up studies and evaluations are carried out. However there are no guidelines on what data should be collected after disasters. Therefore, it is difficult to study trends in damages and losses based on these evaluations.

When it comes to social impact analyses – usually implemented to measure the impact of disasters on vulnerable populations –more detailed and disaggregated data based on population groups is required (Box 96). The more detailed an analysis is, the more human resources that are needed.

- **Cook Islands:** The Frontline Emergency Response Network offers stakeholders the opportunity to standardize best practices of inclusive assessment methodologies, by establishing standard templates where quantitative data is disaggregated by age, gender, disability and geographical location, and integrating qualitative data that includes consultations with the most disadvantaged community members. This would ensure the analysis of disaster risks and impacts, as well as relief and response programmes that adequately consider the situation of the most vulnerable.
- **Fiji:** The lack of standardized methodology for post-disaster assessment (teams, tools, forms, sectors) and components measuring the needs of different groups (children, women, men, elderly, disabled) need to be addressed; assessments currently focus on infrastructure. Team sizes are too small and there is no gender consideration. For example, 2 persons cover too large a geographic area and complex situation of different groups of people.

Estimating the economic and social impact of disasters and storing such information in a database is a precondition for estimating future disaster impacts, as discussed in the section 3.3.

- **Cook Islands:** Significant gaps exist both in historical disaster information and in projecting potential impacts of future hazards.

Box 96: Socio-economic impact analysis in Mexico

Since 1998, the country uses the ECLAC methodology for carrying out post-disaster impact analyses with social, economic and environmental considerations. The National Centre for Disaster Prevention developed the *SAVER* tool (System for Analysis and Visualization of Risk Scenarios) that allows users to develop a spatial analysis of affected territory and gather information about the economic and social impacts of disasters. Within *SAVER* there is a module with indicators disaggregated by gender, allowing for a differentiated analysis of the social and economic impact of disasters. Each year, an analysis is published, detailing the socioeconomic impact of major disasters in Mexico.

Barbados: Disaster loss data has not been mainstreamed into scientific and financial data streams, hindering the transition from hazard and risk assessment, to analysis of disaster losses and policy/decision-making for recovery funding. Incorporating information into the DRM database is needed to understand the full impact of disasters on the economy.

Sri Lanka: Lack of historical records, negatively affects the results of damage and loss study. Attention has not been paid to damage and loss assessments at the national and local levels and weak reporting mechanisms combined with a reluctance to share information among the partner organization and maintain the DRM/DRR database, affect the sustainability of disaster risk management in Sri Lanka.

5 Disaster loss databases

Some countries reported having a centrally managed "disaster database" to store data of past events (**Table 5.4a**), a useful step towards the central management of all DRR related information. The challenge is securing financial resources that can boost efforts in data collection, collation and synthesis. The usefulness of disaster databases will be improved if loss data can be added to the catalogue.

To fill the gap between assessing losses and projecting future impacts, data needs to be stored for several years so it can be analyzed. In this regard, *DesInventar* (a conceptual and methodological tool for the construction of databases of losses, damages or effects from disasters) contributed to the construction of disaster loss databases in many countries (**Table 5.4b** and **Table 5.4c**).

If data is going to be used for policy-making purposes, it is imperative that disaster loss databases store up to date and accurate data. Databases should be systematically and regularly reviewed and updated and any technical issues (including collection methods, data definition and coverage) should be minimized (Boxes 97 and 98).

- **Trinidad and Tobago:** Available databases, such as DesInventar, are limited in scope and require regular updates.
- **Bolivia:** Despite the existence of disaster loss databases like DesInventar, the permanent

Table 5.4a: Examples of disaster databases

Country	Database
Fiji	Earthquake hazard event database (Ministry of Land and Mineral Resources) Cyclone hazard event database (Fiji Meteorological Service Office)
Georgia	Natural disaster database (M. Nodia Institute of Geophysics and Ministry of Environment Protection)
Greece	Database of weather related hazards from 2000 (The Institute of Environmental Research and Sustainable Development)
Iran	National landslide data bank, Flood data bank
Sweden	National natural hazard database (Swedish Civil Contingencies Agency)
Turkey	Disaster data archive for 50 years
Trinidad and Tobago	Historical hazard data for 2005 – 2012 (Office of Disaster Preparedness and Management)

Source: HFA Progress Report from each country.
Note: From the description, databases were selected that do not appear to include loss data.

Table 5.4b: List of countries and regions using DesInventar

Country	Date recorded
Albania	1851-2013
Argentina*	1970-2009
Bolivia*	1970-2011
Chile*	1970-2011
Colombia*	1914-2012
Costa Rica*	1968-2012
Djibouti*	1944-2012
Ecuador*	1970-2011
Egypt	1980-2010
El Salvador*	1900-2012
Ethiopia*	1957-2012
Guatemala*	1988-2011
Guyana*	1972-2012
Honduras*	1915-2011
India – Orissa*	1970-2012
India -Tamil Nadu*	1968-2011
Indonesia*	1815-2012
Iran*	1895-2011
Jamaica*	1973-2012
Jordan*	1981-2012
Kenya*	1997-2013
Laos*	1990-2012
Lebanon*	1980-2011
Maldives	1946-2008

Country	Date recorded
Mali*	1994-2012
Mexico*	1970-2011
Morocco	1960-2011
Mozambique*	1979-2012
Nepal*	1971-2011
Nicaragua*	1992-2011
Pacific Region**	1567-2013
Pakistan	1885-2014
Palestine	1980-2013
Panama*	1929-2012
Peru*	1970-2011
Philippines	1988-2009
Serbia	1980-2013
Sri Lanka*	1965-2012
Syria*	1980-2009
Timor-Leste*	1992-2014
Trinidad and Tobago	1970-2000
Tunisia	1982-2013
Turkey	1894-2014
Uganda*	1933-2012
Uruguay*	1959-2011
Venezuela*	1530-2012
Viet Nam*	1989-2010
Yemen*	1971-2013

Source: UNISDR.

Note: All countries with * (38 datasets covering 56 countries and 2 Indian states) are in the "GAR Universe", which were updated and customized for the GAR 2013. These datasets contain a standardized subset of the original datasets.

Note(2): The Pacific Islands Regional Database (**) is lead by SOPAC, and contains data for the following countries: American Samoa, Cook Islands, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Micronesia Fed. S. of, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna. For practical purposes, the data recorded period is generalized for all the Pacific Islands Regional Database, but it may vary from country to country if taken individually.

diffusion, easy access and quality of data are challenges.

- **Ethiopia:** Because the disaster loss database is based on official records of disasters and recall surveys, the accuracy level is often questioned due to obvious errors associated with such a data collection; particular challenges are observed in remote areas.
- **Sri Lanka:** Damage and loss assessment data are not properly reported and periodical analysis of data has not been regularly published. Since issuing compensation for damage and losses are mandated to different institutions – subject to the type of disaster – data quality reported at the district level is unreliable.

Second, because the coordination of loss assessments across sectors is rare, assessment results are often stored within individual government ministries/agencies. This has led to challenges in creating comprehensive and consistent national disaster loss databases.

- **Morocco:** In the case of natural disasters, each institution that carries out a loss assessment has its own database.
- **Lao PDR:** Coordination should be fostered between the Water Resources and Environment Administration, National Disaster Management Office and other concerned line ministries so as to ensure all relevant disaster data is recorded in DesInventar.

Third, how disaster loss data is used is a challenge. Disaster loss databases can provide useful information, such as how to assess the vulnerability of building structures (Box 99), but even if a country

Box 97: Difficulties in accurately validating loss information in Mozambique

There are difficulties in validating contentious data in Mozambique, particularly data linked to deaths due to floods and droughts. Very often, indirect causes (e.g. boat accidents) are attributed to floods when they occur during the rainy season even though they can occur during the dry season as well. While many local leaders relate drought to the deaths of stunted children, the elderly or the disabled people that occur during drought, local health authorities often report the official cause of death. This data mismatch was common in 2005 when 800,000 people were reported to be affected by drought in the country and many community leaders and local authorities fought with government officials regarding the number of deaths associated with hunger. More accurate, timely and reliable information at all levels is required.

Table 5.4c: Examples of disaster loss databases (excluding DesInventar)

Country	Database
Australia	Disaster Database
Bhutan	Disaster Information Management System
Canada	Canadian Disaster Database (data recorded since 1900) (Public Safety Canada)
Sweden	Swedish Natural Hazards Information System (data recorded since 1950)
Switzerland	Swiss flood and landslide damage database (data recorded since 1972)

Source: HFA Progress Report for each country.
Note: From the description, we selected databases that seem to include loss data.

has developed a disaster loss database, the capacities required to analyze data and use it for effective policy making may be lacking. Appropriate measures for database use should be researched and communicated to stakeholders and the capacity of potential users needs to be strengthened.

- **Nepal:** In many instances, available information is not utilized for new programmes/activities design and implementation.
- **Sri Lanka:** Officers experience difficulties in using the database and they are not competent enough to retrieve and analyze data. Planning officers need to be trained on how to analyze data.
- **Ethiopia:** Technical and human capacities, along with material and financial resources, required to analyze the bulk of data and manage loss databases are limited; this is particularly true at the local level.

Box 98: Temporal and substantial coverage of disaster loss databases affect the utilization of such databases

- ✓ **Mozambique:** The web database is relatively limited in terms of time scale. For a country like Mozambique that is regularly affected by extreme disaster, more comprehensive databases - that integrate various indicators - are required for accurate disaster impact analysis.
- ✓ **Poland:** Disaster loss databases only store information regarding government losses in infrastructure. Improvements are required to extend database coverage to private possessions.

Box 99: Utilization of past disaster loss data for risk assessments in Australia

Effective measurement of floods has contributed to the selection of post disaster recovery and rehabilitation processes. Geoscience Australia conducted post-disaster surveys in Queensland following the 2010/11 floods. Data was gathered on flood hazards (e.g. water depth) and damage caused by the flood and was provided to the Queensland Government in 2012. This data is now used to validate flood models, as well as develop flood vulnerability models for specific types of buildings.

Notes

i Information on contingency mechanisms is often found under indicator 1.2. In this section the information is analyzed in a more collective manner.

ii Crop insurance is addressed in core indicator 4.2 in most country reports but because crop insurance is a contingency financing mechanism, it is being analyzed in this section.

iii Under this indicator, comments are similar to those seen under indicator 2.2 (information management); some of those comments were integrated under this section.

Emerging Issues

Though they appear infrequently in national HFA progress reports, there are a number of increasingly important issues that must be recognized if disaster risks are to be effectively managed. These issues are largely unaddressed, in part because they have not been integrated into the comprehensive DRM framework, but they have been highlighted in recent catastrophic events such as Great East Japan Earthquake, the Thai Flood, and Hurricane Sandy in the US. These issues are explained briefly in the following section.

1 Complex vs. transversal risks

The Great East Japan Earthquake was a classic example of a "Natural Hazard Triggering Technological Disasters (NATECH)". Natural hazards can trigger technological disasters and these simultaneous events can turn disasters into catastrophic events. Administrative organizations, legislation and research agencies are often mandated to deal with a "natural hazard" or "industrial accident", but not both. This can complicate effective risk management efforts.

On the other hand, as in the case of Thai flood, supply chain interruption negatively impacted global production networks. Globalized links, inter-dependent supply chains widen the spatial and temporal impact of disasters. As reports from Japan stated in 2013, "globalization and the rapid spreading of economic activities by corporations tend to trigger a *regional or global chain reaction of economic damages* that are heightened when disaster strikes."

Beyond NATECH and chain reaction of economic damage, the combination of risks (such as disaster, economic and political for example) means that new institutional arrangements, knowledge management and risk management policies need to be put in place. The scope of disaster risk management policy must be widened and comprehensive risk management – covering other social, economic, political risk areas – is needed.

2 Accountability and legal responsibility

Lawsuits for technological disasters (e.g. chemical plant accidents, pollution and oil spills) are commonplace, and legislation has been developed for bringing polluters/hazard producers to justice and preventing citizens from being exposed to future risk. People are increasingly assuming and understanding that anthropogenic factors are contributing to a disaster. Governments and private companies are increasingly at risk of being sued for not enforcing/complying with regulations, mitigating disasters and responding to natural hazard in a timely and effective manner.

Along with the government and industry, academics are also at risk of litigation as seen in the L'Aquila case of 2012. Miscommunication between natural science experts and citizens can be seen to be the cause of serious damage and losses. This case highlights the difficulty in, and importance of, risk communication.

Furthermore, recent catastrophic events have shown it is almost impossible, financially, for governments to take full responsibility for preventing disasters and honoring all compensation claims. Governments and their citizens need to identify a level of "socially acceptable risk" and define the responsibilities (or compensation level) of each stakeholder before a disaster occurs.

Both public and private sectors should be more "accountable" to the risk they produce and the level of risk they are trying to mitigate. This will contribute to improved public finance management in contingency planning by clarifying the scope of compensation and empowering citizens so that they are able to help themselves and each other.

3 Carbon neutral development

DRR is often addressed in relation to Climate Change Adaptation as seen in HFA indicator 4.1. However, climate change mitigation and carbon neutral development was missing in many HFA country reports. As a sustainable carbon neutral policy is increasingly mainstreamed into the overall development framework, DRR must be considered and factored into carbon neutral development. As detailed in the national report of France "one of the remaining challenges is to ensure that all development and urban planning projects consider DRR in tandem with the National Strategy of Sustainable Development." Beyond CCA, DRR issues must be weaved into the overall framework of climate change policies and include innovative measures for carbon and risk neutral development.

4 Considering DRR in an open economy model and mainstreaming DRR in trade and foreign investment policy

Our globalized economy means that trade and foreign investment impact the national economy on a much larger scale. Disasters can interrupt the flow of trade and investment and negatively impact the macro economy. For example, as seen in the GAR 13, the Thai flood of 2011 negatively impacted the operations of many manufacturing facilities in which multi-national and foreign companies had invested. The international tourism industry is also regularly affected by cyclones.

Comprehensive disaster management policy however, is quite often looked at from a domestic policy perspective. Policy makers in trade and foreign investment are rarely part of the DRM stakeholder network, a fact that needs to be remedied as DRM policy must be crafted in the context of an open economy. Impact of disasters on macro- economies, specifically foreign direct investment and trade must be systematically researched. Ultimately, governments that can offer an 'accredited' risk sensitive investment opportunity for foreign direct investors and the suchlike, could become the hallmark of a sound investment.

5 Role of the financial sector

The role of the financial sector, especially banks, is important in strengthening resiliency when a disaster occurs. Financing for recovery, rehabilitation and reconstruction is important for many companies, especially SMEs. In times of peace, transactions are diversified while in disasters most companies simultaneously need to take on a greater level of financial hardship. Banks are expected to prioritize what should be financed and take the lead in steering the early recovery of regional economies. Governments can prepare an enabling environment for financing by providing flexible programmes like "warrant for debt" schemes.

Banks can also play an important role in facilitating disaster risk prevention and reduction. The Development Bank of Japan has provided lower interest loans for DRR investments since 2006. These loans were provided to companies whose DRR initiative was deemed "advanced;" the bank's aim was to foster a business environment where resilient companies were highly valued. Providing lower interest loan for disaster proof housing is another tool that banks can use to facilitate DRR by promoting a resilient built environment.


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