

Chapter 4

CONCLUSIONS AND RECOMMENDATIONS

The aim of this Report is to map out an agenda for change in the way disaster risk is perceived within the development community. It presents a range of opportunities for moving development pathways towards meeting the MDGs by integrating disaster risk reduction into development planning.

The Report argues that disaster risk is a product of inappropriate development choices, just as much as it is a threat for future development gains.

This Chapter summarises key findings from the analysis of disaster risk and the discussion of disaster-development linkages undertaken in the Report.

The summary leads into six recommendations for further action. Each proposal is kept broad, drawing from the evidence presented in the preceding chapters. Each recommendation supports a specific agenda for reform in the management of development processes and disaster risk, which will need to be unpacked and further developed in each specific regional and national context.

At the beginning of Chapter 1, four questions concerning the disaster-development relationship were posed. The first two questions guided attention to the mapping of disaster risk and its relationship with development. By way of a summary, we return to them again in section 4.1. The final two questions sought ways for refining development policy and disaster risk assessment tools to enhance the practice of disaster risk reduction. These are addressed through the presentation of recommendations in section 4.2.

4.1 Development and Disaster Risk

4.1.1 How are disaster risks and human vulnerability to natural hazards distributed globally between countries?

The DRI exercise undertook the first global level assessment of natural disaster risk, calibrated according to the risk of death between 1980 and 2000.

Four natural hazard types (tropical cyclones, earthquakes, floods and droughts) responsible for 94 percent of the deaths triggered by natural disaster were examined. The population exposed and relative vulnerability of countries to each hazard were calculated. The drought DRI was presented as a work in progress at this stage.

Results are summarised below in global terms and for each hazard type. In global terms and for the four hazard types, disaster risk was found to be considerably lower in high-income countries than in medium- and low-income countries.

Earthquake

High relative vulnerability was found in countries such as the Islamic Republic of Iran, Afghanistan and India. Other medium-development countries with sizeable urban populations, such as Turkey and the Russian Federation, were also found to have high relative vulnerability. As well as countries such as Armenia and Guinea that had experienced an exceptional event in the reporting period.

Tropical cyclone

High relative vulnerability was found in Bangladesh, Honduras and Nicaragua, all of which had experienced a catastrophic disaster during the reporting period. Other countries with substantial populations located on coastal plains were found to be highly vulnerable, for example India, the Philippines and Viet Nam.

Flood

Flooding was recorded in more countries than any other hazard. High vulnerability was identified in a wide range of countries and is likely to be aggravated by global climate change. In Venezuela, high vulnerability was due to a single catastrophic event. Other countries with high vulnerability to floods included Somalia, Morocco and Yemen.

Drought

African states were indicated as having the highest vulnerability to drought. Methodological challenges prevent any firm country-specific findings from being presented for this hazard. The assessment strongly reinforced field study evidence that the translation of drought into famine is mediated by armed conflict, internal displacement, HIV/AIDS, poor governance and economic crisis.

For each hazard type, small countries and in particular, small island developing states, had consistently higher relative exposure to hazard. And in the case of tropical cyclones, this was translated into high relative vulnerability.

4.1.2 What are the development factors and underlying processes that configure disaster risks and what are the linkages between disaster risk and development?

The measurement of hazard-specific relative vulnerability for each country flagged the importance of mediating development processes in the translation of natural hazard into disaster risk.

In many countries, despite large exposed populations deaths were low (Cuba and Mauritius for tropical cyclones), suggesting development paths that contained disaster risk in various ways. For other countries, deaths were very high (Honduras and Nicaragua for tropical cyclones), indicating development paths that had led to the accumulation of catastrophic levels of disaster risk.

The analysis of socio-economic variables, available with international coverage, and recorded disaster impacts enabled some initial associations between specific development conditions and processes with disaster risk. This work was undertaken for earthquake, tropical cyclone and flood hazard. A lack of appropriate variables limited the confidence that could be placed on the analysis of drought. Consequently, no findings for this hazard are presented here.

Losses to earthquakes were associated with countries experiencing rapid urban growth and high physical exposure. For tropical cyclone, losses were associated with a high percentage of arable land and high physical exposure. Vulnerability factors associated with flood were low GDP per capita, low local density of population and high physical exposure.

Further analysis was structured around two development factors shaping contemporary disaster risk: rapid urbanisation and rural livelihoods.

Rapid urbanisation configures disaster risk through a range of factors: the founding of cities in hazard-prone locations, the concentration of population in hazard-prone locations, social exclusion and poverty, the

complex interaction of hazard patterns, the generation of physical vulnerability, placing cultural assets at risk, the spatial transformation of new territories, and access to loss mitigation mechanisms.

In general, disaster risk considerations are rarely factored into urban and regional planning and the regulation of urban growth has been ineffective in managing risk. Economic globalisation concentrates economic functions in cities that might be at risk and promotes the speedy flow of international capital — heightening inequality and instability, but also providing opportunities for building capacity and resilience.

In rural areas, livelihoods become at risk due a range of factors: poverty and asset depletion, environmental degradation, market pressures, isolation and remoteness, the weakness or lack of social services and climatic fluctuations and extremes. Global climate change makes rural livelihoods more risk-prone by increasing uncertainty.

The configuring of risk by contemporary patterns of urbanisation and rural livelihoods needs to be viewed alongside other critical development pressures. Violence and armed conflict displaces people and disrupts social and economic development. Changing epidemiologies, especially of HIV/AIDS, malaria and tuberculosis, bring new configurations of hazard. Changing governance regimes offers possibilities for the integration of international with national and local action to reduce disaster risk. The increased role played by civil society in development and disaster risk reduction highlights the capacity of local actors to organise and confront disaster risk.

The Report argues that meeting the MDGs will be made more difficult if disaster risk is not integrated into development planning. More positively, if the MDGs are met this could result in a substantial reduction of international disaster risk. Whether this is the case depends on the extent to which synergies in the disaster risk and development agendas are recognised and acted upon.

The next section advances recommendations for building a closer synthesis between disaster risk and development planning.

4.2 Recommendations

Recommendations 4.2.1 to 4.2.5 propose an agenda for change in broad terms. A final section, 4.2.6, presents a more detailed set of recommendations to enhance the data collection and analysis of disaster risk that should underpin the process of integration. They emanate from the experience of undertaking the DRI.

4.2.1 Governance for risk management

Appropriate governance for disaster risk management is a fundamental requirement if risk considerations are to be factored into development planning, and if existing risks are to be successfully mitigated.

A number of key elements in governance regimes were highlighted in the Report. They deserve reiteration as critical areas for reform in building national and global disaster risk reduction capacity and in mainstreaming disaster risk management.

The detailed changes in elements of governance advocated here can be interpreted as an outcome of the influence of a particular body of rules and values, that place importance on equity in the distribution of risk, and security and widespread participation in decision-making. These are key tenets of UNDP's perspective on international development and inform the basic orientation of this Report.

There is a need for institutional systems and administrative arrangements that link public, private and civil society sectors and build vertical ties between local, district, national and global scale actors.

Legislative reform is necessary but on its own, not a sufficient tool for increasing equity and participation. Legislation can set standards and boundaries for action, for example, by defining building codes or training requirements and basic responsibilities for key actors in risk management. But legislation on its own cannot induce people to follow these rules. Monitoring and enforcement are needed.

Legislation has its strength in societies where most activities take place in the formal sector and are visible to administrative oversight. In many high-risk nations and locations, monitoring and enforcement — and even widespread knowledge — of legislation is not

achievable in the short- to medium-term because of financial and human resource constraints.

Fortunately, the principles of equity and participation in disaster risk management are not solely dependent on legislative reform. Much of the discussion in Chapter 3 sets out key pathways through which good governance can be enacted beyond legislative standards. The strategies described outline ways in which inclusive decision-making could be encouraged so that the knowledge and views of all stakeholders in development and disaster risk management could become involved.

The key challenge in building governance structures for human development and risk reduction is to play off efficiency with equity. Decisions often have to be made quickly, but rapid decision-making can factor in participatory approaches if planned appropriately. Enhancing the influence of local actors, through their participation in the local governance of risk, offers great potential for increasing the sensitivity and responsiveness of development planning to disaster risk.

The ISDR/UNDP Framework to Guide and Monitor Disaster Risk Reduction has the potential to make risk governance more transparent. If taken up globally, international comparisons will help refine and target policies to reduce risk and build a structured approach to the identification of good practice.

4.2.2 Mainstreaming disaster risk into development planning

Development needs to be regulated in terms of its impact on disaster risk.

For many projects, especially large industrial developments, environmental and social impact assessment and risk assessment provide a ready framework for building disaster risk assessment into development planning. What is missing is a detailed procedure for identifying, categorising and placing some appropriate value on disaster risk. Again, the technical tool kit exists to build such a framework. In addition to quantitative environmental and social impact and risk assessments, and insurance risk assessment methods, more qualitative methods for judging investment risk could be applied. What is missing is the political will to build a more holistic assessment of development impact into development planning.

Assessing disaster risk will put the spotlight on environmental and social externalities, sometimes at temporal and spatial distance from specific developments. Making disaster risk reduction explicit in planning a development could enable a broad participatory decision-making process, in which levels of acceptable risk can be debated on a case-by-case basis. National and municipal governments will need to be lead actors in this process, perhaps aided by international actors.

Some examples of existing best practice can be pointed to. The World Bank, through its Disaster Management Facility, has begun to incorporate disaster risk into its lending considerations. Up to 1999, US\$ 6.5 billion in loans included some form of mitigation to reduce disaster vulnerability within a larger development project.¹ Innovative urban planning for rapidly expanding cities has shown the need for flexibility in applying planning regulations, but also the great need to apply planning guidance quickly as cities grow. The aims are simple. For example, by keeping access roads and fire breaks between housing blocks to enhance security from urban environmental risk, fire and communicable disease. These tasks require a rethinking of the professional role of urban planners and the legitimacy of peri-urban satellite settlements, many of which might not have formal land rights. Creative thinking and political support are needed to move this agenda forward, but the seed is there.

Perhaps the greatest challenge with mainstreaming disaster risk into development planning is geographical equity. This is a problem shared with environmental management and environmental impact assessment. How to attribute responsibility for disaster risk experienced in one location, but created by actions in another location?

Examples of this dilemma include the degradation of fisher-people's livelihoods and health from the pollution of waters by urban sewerage or industrial practices, or the contributions of individuals and industrial production to global climate change.

Attributing responsibility is particularly problematic when degradation and risk is the consequence of multiple actions from multiple locations spread over time. This is an ongoing area of concern for the wider environmental management community with opportunities for cross-fertilisation in policy innovation.

The observation in this Report is that environmental impact assessment should be extended to include a risk analysis component.

Factoring risk into disaster recovery and reconstruction

The argument made for mainstreaming disaster risk management is doubly important during reconstruction after disaster events.

It has long been argued that reconstruction efforts need to learn from the disaster experience and factor risk-reduction strategies into the rebuilding of the physical and social fabric after a disaster. Unfortunately, there are still many examples where reconstruction means the rebuilding of pre-disaster risk or perhaps worse — an incomplete effort that leaves many without the basic necessities for maintaining a livelihood or their physical or psychological health. With more than thirty years of international experience in disaster reconstruction, many examples of good practice are available but need to be more widely applied.

And further work is required. Tools need to become mainstreamed within disaster reconstruction programmes as well as ongoing development. Reconstruction is often a politically opportune moment to introduce change into development procedures or goals. It can offer a more easily justified moment to introduce disaster risk at the programme and project levels.

4.2.3 Integrated climate risk management

Building on capacities that deal with existing disaster risk is an effective way to generate capacity to deal with future climate change risk.

Over the long-term, climate change will manifest as a difference in baseline weather parameters. But more importantly, this change is likely to be experienced as an increase in both the frequency and magnitude of extreme hydrometeorological hazards, such as tropical cyclones, floods and droughts. Efforts to track and respond to both elements of change can learn a great deal from the expertise and tools already developed within the natural disaster community.

Particular strengths exist in different world regions. For example, the European and North American rural development agencies could learn from work developed in Africa and Asia on tracking livelihood sustainability and slow onset disaster that is linked to changing

environmental baselines (for example in drought vulnerability assessment). Similarly, there is much technological skill that could be transferred from the global North to the global South to aid the monitoring of physical processes, and to build appropriate governance regimes to maximise opportunities for adaptation and risk reduction.

As the climate change community continues to place more emphasis on adaptation in addition to the established discussion on mitigation, so the natural disaster community should play an enhanced role.

It is important that the mitigation agenda is not overshadowed by adaptation. The Kyoto Protocol has advanced a set of policy tools that aim to make national development strategies sensitive to their contribution to global climate change risk. Following the same logic, this Report argues for development planning to take up decision-making and information tools that will build sensitivity to disaster risk processes. At the local level in particular, this will require a focus on building capacity for adaptation as proactive risk management.

Climate change will affect most aspects of life. Therefore, it is also important that guiding principles be established for ensuring the mainstreaming of climate change concerns within ongoing human development practices. Key sectors of economic planning — agriculture, tourism, land-use planning, public health, environmental management and basic infrastructure provision — will all need to take climate change into consideration. But mainstreaming efforts might also need to incorporate foreign relations and immigration or emigration policy, as well as resettlement schemes linked to restructuring of the economy. In all of these efforts, lessons gained from natural disaster risk management can form a rapidly accessible resource from which to build tool kits for adaptation.

4.2.4 Managing the multifaceted nature of risk

Natural hazard is one among many potential threats to life and livelihood.

Often, those people and communities most vulnerable to natural hazards are also vulnerable to other sources of hazard. Livelihood strategies for many people are all about playing off risks from multiple hazards sources — economic, social, political, environmental. From this perspective, the increase in perceived risk

accruing to an individual or group from not investing time or energy in natural hazard risk reduction, may be an accepted cost in the face of more immediate needs for security from economic collapse, social violence and conflict. When choices are limited, energy is spent on coping with the most immediate of threats.

Analysis in Chapter 2 has shown the value of an integrated approach to risk assessment as a step towards integrated risk reduction. This is not a new idea. Complex political emergencies have for some time been recognised as containing many different drivers of risk, with natural hazard as one possibility. Some key hazards were identified in Chapter 3 — disease (HIV/AIDS, malaria, tuberculosis), landmines and internally displaced people. To this list, we could add small arms, terrorism and crime as risk elements that play out with vulnerability to natural hazard.

From a disaster risk reduction perspective, multi-hazard approaches are uncommon. Perhaps with the exception of work on drought and rural crisis that includes political emergencies and HIV/AIDS. There is a need to explore the relationships between natural hazards with other sources of hazard in the accumulation of risk as a precursor to developing an integrated disaster risk reduction approach.

National level Poverty Reduction Strategy Papers (PRSPs) offer a timely opportunity for factoring multiple-hazard perspectives into development planning.

4.2.5 Compensatory risk management

In addition to reworking the disaster-development relationship, which this Report hopes to make a contribution towards, a legacy of risk accumulation exists today and there is a need to improve disaster preparedness and response.

The agenda proposed in this Report is one of reform in the disaster risk sector and a reorientation towards the long-term management of disaster risk within sustainable development. This is needed over the medium-term to contribute towards the meeting of the Millennium Development Goals. But the time-span for change is likely to be best measured in decades and generations rather than years.

Within this long-term agenda of reform, existing risks remain to be managed. Indeed, development actions of yesterday and today will continue to shape the

accumulation of disaster risk for the foreseeable future. Chapter 3 of this Report outlined an array of good practices that can be used to reset the balance between development and disaster risk. Ongoing disaster risk needs to be addressed using the whole gamut of existing good practices.

Large populations remain at risk with only partial access to disaster risk management tools. Such tools include those aimed at reducing exposure to hazard events through preparedness planning and early warning systems; tools that spread losses through insurance mechanisms, including mechanisms developed for low-income groups and informal settlement dwellers; and tools to help people bear disaster impacts, including policies aimed at enhancing livelihood sustainability. This is by no means an exhaustive list and there remains great scope for the exchange of best practice and for innovation.

As local contexts continue to filter the impacts of global climate change and economic globalisation, there will be an ongoing need for innovation and learning to cope with the changing manifestation of disaster risk at the local level.

4.2.6 Gaps in knowledge for disaster risk assessment

A first step towards more concerted and coordinated global action on disaster risk reduction must be a clear understanding of the depth and extent of hazard, vulnerability and disaster loss.

Where data on sub-national distributions of disaster losses exists, it suggests that a large number of small- and medium-sized disasters and sub-disaster scale loss events associated with natural hazards are unfolding below the level of global observatories. The critical policy significance of these events is their contribution to the accumulation of risk and situations where livelihoods and health are eroded to a point at which individuals or communities become susceptible to large-scale loss.

Global databases and risk assessments would carry additional value if local and sub-national databases using uniform data collection and analysis frameworks were available. The lack of such databases makes it impossible to accurately trace the changing geography of risk and track factors shaping the production of vulnerability and hazard, both within countries and

between scales. A focus on global-scale trends and distributions of risk is useful, but tells only part of the development and disaster risk story.

Below the national level exist a rapidly growing array of tools to measure vulnerability and hazard as well as record disaster events and loss for many countries and communities. These tools have been developed with particular local contexts in mind. The number and variety of tools available suggests that a next stage in the maturing of disaster risk assessment could be attempts to combine information and begin to piece together the jigsaw of local human development and disaster risk experiences at the sub-national and national levels. The possibility of knowledge accumulated from the bottom up meeting global assessments of risk and vulnerability offers an exciting prospect for verifying assumptions and findings made at both levels for disaster and development policy-making.

The mainstreaming of disaster risk assessment into the ongoing development planning processes can build on the wealth of methodologies already available and on administrative structures already in place at the local, national and global scales.

A great deal of data is collected or known at the local scale, but structures are not in place for the centralised collation of this material at the national, let alone global scales. Local governments, line ministries of central governments and networks of non-governmental and community-based organisations all have roles to play in the developing of shared reporting conventions and methods that will maximise the amount of data that can be used for strategic policy-making.

In many cases individual networks of organisations are already commencing the task of reforming data collection (such as the IFRC), but broader cooperation is needed. Some important steps forward have been made in networking disaster risk datasets and examples are provided in this Report. The journey is, however, in its early stages. The prospects for data collection to support data-informed disaster-development policy-making are exciting.

Specific recommendations towards this end are to:

1. **Enhance global indexing of risk and vulnerability, enabling more and better intercountry and interregional comparisons.**

A number of global level projects have begun to map intercountry and interregional comparisons of risk and vulnerability. There is scope here to share methodological experiences and data.

A future goal, but one that should be addressed in this initial period of modelling, is to construct models around a uniform central language of assumptions and definitions in order to build multiple-risk and vulnerability assessments.

Broadening the array of data collected nationally for global comparisons to include key information needed for risk assessment (number of trained paramedics, number and capacity of active community disaster response groups, etc.) and vulnerability factors (armed conflict, governance, social capital, epidemiology). This would increase the quality of global level assessments. The process of preparation of the DRI shows just how far we are from being able to draw a complete picture of comparative national risk.

2. **Support national and sub-regional risk-indexing to enable the production of information for national decision makers.**

The DRI is moving towards building a global picture of disaster risk. Bringing this work together with sub-national assessments will provide added value. If disaster risk management is to move from a reactive agenda of disaster response to embrace disaster risk-sensitive development planning, national level data is essential. This is needed to target policy and track shifting patterns of hazard and vulnerability. Vulnerability will be shaped by a myriad of forces — such as the global economy, global climate change, internal migration patterns, local environmental resource use and community development interventions — that constantly reconfigure geographies of risk.

3. **Develop a multi-tiered system of disaster reporting.**

The vision is of a unified global system of disaster reporting that connects nationally maintained country databases to a global database that is administered through international institutions and made accessible to the public. A number of stages would be required to make this a reality. A preliminary survey of existing databases to find out what information is already available at the national level, and then make this information available at the global level, would be

appropriate. An agreed system for generating a global identifier for each disaster event would be needed. Reporting standards and software would have to be developed to promote data compatibility across national datasets. Skills training would be needed to establish databases in countries where they are not already present.²

It is particularly important to establish and standardise a methodology for estimating the socio-economic losses associated with medium- and small-scale disaster events. Such a method exists that works very well for larger-scale disasters, but it could be simplified for more localized applications. In general, economic losses need to be more routinely assessed and reported.

None of these requirements are unachievable and the opportunities offered by such a dataset for strategic international and national disaster policy planning are considerable.

4. Support context-driven risk assessment.

The dynamic qualities of forces shaping risk mean that assessment tools need constant refinement. This is demonstrated by the recent recognition of urban areas as places of high risk. This realisation began a revision of assessment and intervention tools initially developed for rural vulnerability work. Some excellent advances have been made in this regard. Keeping track of new places and social groups at risk is only half of the story. As policy perspectives or background socio-economic structures and physical systems change through time, so will assessment methods need to evolve. Sensitivity to context is a priority for locally meaningful assessment tools, but this needs to be weighed against the need to generate data for sharing along the assessment production chain.

A Final Word

The aim of this Report has been to map out the ways in which development can lead to disaster, just as disaster can interrupt development. The DRI work has shown that billions of people in over 100 countries are periodically exposed to at least one of the hazards studied, with an average of 67,000 deaths annually (184 deaths each day). The high number of people

exposed to natural hazard shows the scale of connection between disasters and development. Recorded deaths provide a tip-of-the-iceberg measurement of the extent to which past development decisions have prefigured risk.

The medium-term goal of meeting the MDGs and the longer-term goal of moving towards more sustainable pathways for development need to take disaster risk into account. The Recommendations have highlighted a number of emerging agendas in disaster risk management that offer great potential for integrating disaster risk and development planning. They also point at achievable policy and project actions that can be undertaken to reduce risk in development.

Most fundamental is the role of governance at all scales from the local to the global. A balance between equity and efficiency in the distribution of decision-making power and in making decisions will need to be kept. A concern for governance dovetails into more generic development planning policy. Like many of the proposals, the argument is for a change in emphasis and a broadening of development worldviews to take disaster risk seriously, rather than a call for development planning perspectives to be rewritten. While it may be true that core elements of dominant development paradigms are the root causes for development prefiguring risk, this Report has focused on what can be achieved within existing development approaches.

A particular opportunity for mainstreaming disaster risk reduction into development planning is provided during the reconstruction periods after large-scale disaster events. These are periods where social and political structures as well as physical infrastructure can be rebuilt to enhance quality of life and reduce future disaster risk.

Natural disaster risk reduction can provide a useful basis for adapting to climate change. Bringing the disaster and climate change risk agendas and communities together should be a priority. This will be facilitated by the proactive, adaptive mode of risk reduction championed in this Report, which has much in common with the orientation of policy work on adaptation to climate change.

We live our lives in the context of multiple everyday risks. The periodic nature of natural disaster risk means it is often easily overlooked until it is too late

and accumulated risk provokes disaster. Local risk reduction will need to be sensitive to the multiple sources of competing risks people face. Governance regimes need to work to reconcile the pressing need to respond to frequent and everyday risks, while avoiding the creeping vulnerability that can lead to disaster risk.

The focus of this report has been on proactive strategies for reducing future risk. However, today we live with the accumulated risk of past development pathways. Disaster preparedness and response should not be seen in any lesser light. Our argument is to compliment compensatory risk management with a prospective or adaptive approach that can support development without building future disaster risks.

The policy agendas supported in this Report require refined and more complete data. Current global efforts signify a substantial step in the right direction towards producing a globally accessible disaster database

with national and sub-national resolution. Equally, the sub-national databases reviewed in this Report provide examples of existing good practice that could be usefully replicated among societies at high disaster risk.

The DRI exercise has contributed by making the first global assessment of disaster risk exposure and human vulnerability. The process of mapping disaster risk as presented in this Report has only just begun. But the message is clear. The work of linking disaster risk reduction to development planning offers great potential for advancing the cause of human development.

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1. Gilbert and Kreimer 1999. "Learning from the World Bank's Experience of Natural Disaster Assistance," Urban Development Division, Working Paper Series 2, World Bank.
 2. ISDR Working Group 3 on Risk Vulnerability and Impact Assessment. *Improving the Quality, Coverage and Accuracy of Disaster Data: A Comparative Analysis of Global and National Datasets*. 24 October 2002.