



Pakistan Policy Note 12

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Managing Natural Disasters

Pakistan is prone to geological and hydrometeorological hazard events—earthquakes, floods, droughts, cyclones. Combined with rapid population growth, urbanization, environmental degradation, and a high concentration of people and assets in exposed areas, this hazard profile has raised population and infrastructure vulnerability, especially in urban areas. Losses from disasters have increased over the past 40 years, a trend that can be changed only through targeted interventions that boost resilience. Fortunately, the country is well endowed with capacity in government, academia, the private sector, and nongovernmental institutions.

Greater resilience can be achieved through a holistic approach to disaster risk management: strengthening capacity and clarifying responsibilities of institutions engaged in disaster risk management at all levels of government; improving understanding of disaster risk among policy makers and disaster risk management practitioners, including the physical, human, and financial elements; investing in structural and nonstructural risk reduction measures; developing robust financial tools to reduce the fiscal impact of disasters on the state; and increasing awareness of and coping mechanisms for disaster risk among vulnerable populations.

Disasters result from the intersection of three key elements. First are natural hazards, such as earthquakes, cyclones, excess rainfall, floods, and tsunamis. Second is exposure of people, property, livelihoods, and infrastructure (also known as human and physical capital) to these hazards. And third is vulnerability of the exposed elements, which is created by physical, social, economic, and environmental factors that increase a community's susceptibility to the impacts of a

natural hazard. The natural hazard element is difficult to change, but well-planned and timely investment in preparedness and mitigation can reduce vulnerability and build resilience.

The purpose of engaging in disaster risk management (DRM) activities is to reduce the vulnerability of current and future assets exposed to natural hazards.

Once vulnerability is carefully assessed, structural and nonstructural mitigation activities can be launched. Structural measures include retrofitting buildings and constructing protective infrastructure. Nonstructural measures include land-use policies to manage construction in vulnerable environments, contingency and response planning, and fiscal protection mechanisms.

Pakistan is highly susceptible to natural hazards, with its location on a seismically active geological plate, a coastline frequented by cyclone events, and an active floodplain fed by snowmelt from the Himalayas, Karakoram, and Hindukush mountains. Additionally, 60 percent of the landmass is classified as semi-arid and prone to drought. This hazard profile intersects with a growing population, rapid urbanization, and sociopolitical factors contributing to increased vulnerability. The result is that the country has, and will continue to have, frequent large disasters that halt or reverse development.

Pakistan's disaster record for the last 40 years shows severe impacts on citizens and the state. Major events include:

- Floods in 2010 and 2011 that caused damage amounting to \$10 billion (ADB and World

- Bank 2010) and \$3.7 billion (ADB and World Bank 2011), respectively. Other significant floods were recorded in 1950, 1992, and 1998.
- An earthquake in 2005 resulting in 73,000 fatalities and \$5 billion in losses (Naeem and others 2005). Other damaging seismic events took place in 1974 and 1990.
 - Droughts in 2000 and 2002 that severely affected livelihoods and forced thousands to migrate. Drought is prevalent two or three years every decade.
 - Cyclone Yemyin in 2007 that caused \$537 million in damage (IFRC 2007)—one of 14 cyclones to have reached Pakistan's coastal zones in the past 40 years (ADB and World Bank 2007).

The Calamity Act of 1958 historically governed government actions in DRM, but a series of disaster events highlighted the need for a holistic DRM framework, which was established in 2007 (NDMA 2007). Under this (and subsequent laws), the National Disaster Management Authority and the National Disaster Management Commission were created at the federal level, and Provincial Disaster Management Authorities (PDMAs) and District Disaster Management Authorities (DDMAs) were created subnationally.

The government has also drafted a national Climate Change Action Plan.¹ Key impacts of climate change highlighted in the plan include glacial melt, which is causing the Indus river system to swell above historical averages, and rainfall events, which have been especially intense and irregular. The abnormal rainfall in 2011 over parts of Sindh Province, including the Thar Desert, was attributed by the Pakistan Meteorological Department to cloudburst,² characteristic of erratic rainfall patterns. These impacts highlight the need for further research and investment in mitigation and adaptation interventions.

Policy Issues and Challenges

Weak institutional capacity for DRM

Lack of preparedness, poorly executed emergency responses, and weak institutional systems to manage disasters have undermined government credibility among its citizens. Pakistan has, though, begun

to institutionalize and mainstream DRM activities, but much work remains. The PDMAs have only recently started receiving support through the government budget and international donor community. Continued support is required to enhance the capacity of the Provincial Emergency Operations Centers, to prepare standard operating procedures for response, and to institute policies to mainstream DRM. At the district level, DDMAs are functioning as ad hoc inter-departmental committees, activated only in times of disaster and without dedicated staffing or budgets.³ The country's major urban centers also lack an effective, dedicated DRM structure.

Lack of coordination and clarity of roles in DRM

The roles and relationships among federal and provincial entities—including the Floods Commission, Earthquake Reconstruction and Rehabilitation Authority, National Disaster Management Authority, and PDMAs—lack clarity. These bodies do not agree on which of them are ultimately responsible for understanding disaster risk, which are responsible for integrating DRM into development planning, and which are responsible for leading preparedness and response activities.

Especially problematic is the devolution of responsibilities from the National Disaster Management Authority to the affected PDMA during a disaster. Global experience has proven that such an approach is inefficient due to a lack of national leadership and a lack of contribution from agencies not affected. Further, as nascent institutions, the PDMAs lack the capacity and capability to implement adequate DRM practices.⁴ The PDMAs might exist on paper, but are severely challenged by even medium-size events.

Limited understanding of disaster risk (physical, economic, and fiscal)

Policy makers and DRM practitioners lack the ability to define the occurrence and impacts of disaster events, including floods, droughts, and earthquakes. A comprehensive multihazard risk assessment tied to risk mitigation efforts has yet to be undertaken for Pakistan—a wide variety of actors has followed only a piecemeal approach, generating assessments with varying standards,

implementation arrangements, and outcomes, as well as limited scope and geographic span.⁵

The costs and benefits of risk reduction—financial and nonfinancial—thus cannot be qualified or quantified. This information would provide an evidence base on which to prioritize mitigation decisions, as well as data on how much of the country's budget should be appropriated. The government bears much of the costs related to disasters, including explicit and implicit obligations, but the total fiscal impact is not well understood. Risk transfer mechanisms are used in other developing and industrialized countries⁶ to provide a measure of protection for the state. Pakistan's government has endorsed developing such mechanisms, particularly risk insurance and risk financing for catastrophes, though it has no roadmap, policy, or underpinning evidence to make an informed choice on them.

Weak integration of DRM in government planning and development

The government's focus needs to shift from response to preparedness and risk reduction. This is partly because the costs of predisaster investments and mitigation measures are significantly less than the postdisaster costs of rebuilding. But these investments are not currently prioritized due to the difficulty in quantifying the benefits of such interventions. These benefits include the lives saved and damage averted, as well as the livelihoods protected, the infrastructure left intact, and the services delivered in the aftermath of an event.

Poor communication of risk information and awareness building

A wide range of actors in DRM convey messages on disaster risk. Lack of a single, coordinated message has led to confusion and misinformation over the risks faced and the measures to be taken to increase resilience and response capacity.

Policy Recommendations

Increase institutional DRM capacity

Continue to support the PDMA and DDMA to ensure that they can fulfill their mandated roles and

responsibilities. These institutions are very weak, particularly for their wide-ranging mandates. Each PDMA needs better equipment for its Emergency Operations Center, a management information system, and stronger technical capacity.

Create city emergency operations centers in major urban centers and link them to the current disaster management structure. With the exception of Rescue 1122 in Lahore, the capacity of municipal governments is quite limited due to lack of communication systems, equipment, and technical capacity. Putting fully functioning emergency operations centers in place will improve the ability to respond to disaster events.

Improve coordination and clarity of roles

Review the roles and responsibilities of entities in a postdisaster environment. This should be completed at each level of government to remove overlaps and avoid confusion in times of disaster.

Analyze the roles of governments, nongovernmental organizations, and private companies engaged in DRM. This can be accomplished through local and regional workshops heightening stakeholder awareness of the threat of natural disasters, as well as educational and training activities that increase the understanding of DRM among policy makers and DRM practitioners.

Ensure that local governments, community-based organizations, and nongovernmental organizations use the same interactive tools and information to highlight disaster risks, thus enabling communities to improve their resilience. In addition, work toward a systematic and standardized approach to community-based DRM led by provincial and district authorities, and closely link governmental activities and investments to those at the community level.

Enhance understanding of disaster risk (physical, economic, and fiscal)

Undertake a national rapid risk assessment using existing data and tools. This preliminary information will enable the government to begin

considering policies and procedures for reducing disaster risk. More comprehensive risk assessments should follow once adequate data are gathered and stakeholders are incorporated.

Ensure that systematic methods are in place for collecting disaster risk information in the future. Historical disaster-loss data can then be populated into this database, which will ensure that financial, policy, and disaster management authorities can quantify Pakistan's risk.

Lead the risk assessment process. Pakistan is fortunate to have very high scientific capacity to assess natural hazard risks, but it is spread across government, academia, and the private sector. Harnessing it to produce risk assessments within and for the country will not only help ensure sustainable skills and knowledge but also greatly raise the chances of this information being used by decision makers.⁷

Ensure that decision makers from multiple sectors are engaged in risk assessments. Risk assessments need to be undertaken by scientists, spatial analysts, and engineers, but this requires a collaborative approach between technical experts and decision makers to ensure that the information generated is fit for its purpose and provides answers to the questions posed, such as "How many hospitals may be affected by a 1 in 100-year flood event in Punjab?"

Undertake national, provincial, and city risk assessments. These assessments should be aimed at planning for contingencies and responses, identifying and prioritizing risk mitigation interventions, ensuring that future development is disaster resilient, and guaranteeing adequate financial protection.

Integrate DRM in planning and development

Reduce current physical risk of disasters

Undertake cost-benefit analyses of mitigation measures informed by robust assessments. Data from probabilistic risk assessments can be coupled with information on the expenditures required to reduce risk and on the net social and economic benefits at the local, provincial, and national levels.

Engage in mitigation interventions informed by the National Working Group for Risk Assessments. Invest in structural and nonstructural measures to reduce the impacts of future hazard events. Examples include structural measures (flood control, building reinforcement) and nonstructural measures (land-use policies, early-warning systems).

Reduce future physical risk to disasters

Ensure physical resilience of new infrastructure. This is one of the most important risk mitigation steps the government can take to prevent "locking in" future vulnerability. It is impractical to move people from their homes and livelihoods, but it is possible to start planning processes that ensure resilient construction in high-risk areas.

Increase compliance with building codes through improved supervision of new construction. The public sector can provide economic incentives to owners of existing structures to retrofit their buildings for the benefit of tenants and the public at large.

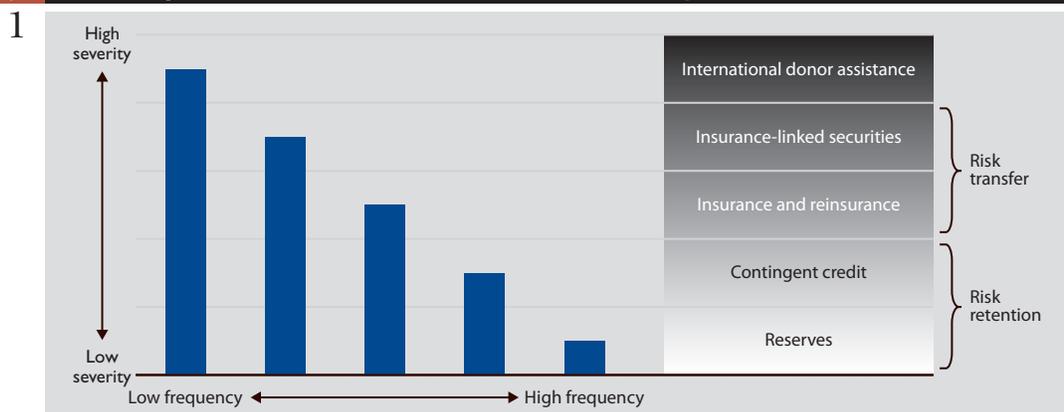
Increase fiscal resilience to disasters

Understand the disaster-related annual expected loss and probable maximum loss to the government budget. These should be understood at the municipal, provincial, and federal levels. The analysis requires research on the fiscal impact of medium-size and large events of the past 15 years.

Improve the National Disaster Management Fund. This needs to be greatly strengthened through standard operating procedures to administer and execute funds efficiently in times of disaster. Such a mechanism, replenished annually, is the most economically efficient source of ex ante risk financing and can be used for small to large events.

Develop a comprehensive risk financing strategy with a range of financial instruments. Cost, size, and timeliness should be the three guiding principles for the instruments. Risks should be distributed among a variety of capital bases that, in aggregate, can adequately withstand the costs of natural disasters (Figure 1).

Figure Combining financial instruments to address various layers of risk



Source: Ghesquiere and Mahul 2010.

Increase communication of risk information and build awareness

Once identified, communicate disaster risks such that both individuals and the government are motivated to increase their resilience. Community-based DRM can help communities understand disaster risk and carry out small, physical resiliency measures. An informed community may decide against building residential structures in vulnerable areas and instead use the land for agriculture.

Incorporate credible and robust hazard and risk information into community-based early-warning systems that advise communities of incoming threats. Such information can also be used by the government to enhance its institutional preparedness, emergency communications, and contingency planning.

Notes

1. The Climate Change Action Plan 2012–2030 is being finalized by the Ministry of Climate Change.
2. A cloudburst is an extreme amount of precipitation, sometimes with hail and thunder, which normally lasts no longer than a few minutes but is capable of creating flood conditions. Rainfall of 100 millimeters or more per hour is a cloudburst.
3. In 2012, the government of Khyber Pakhtunkhwa created full-time positions in the districts for DRM, a practice that should be followed elsewhere.

4. The Federally Administered Tribal Areas Disaster Management Authority has only three staff members, responsible for DRM and issues related to displaced peoples, who respond to complex emergencies in the province. The Provincial Emergency Operations Centers across all provinces need strengthening. All PDMAs lack integrated Geographic Information System-based Management Information Systems and incidence response systems with links to other departments.
5. Donors have made risk assessments (often with external consultants) in the Northern Areas of Pakistan, Muzaffarabad, Mansehra, and Murree, using a range of techniques and implementation methods.
6. In the industrialized world, risk transfer mechanisms, such as insurance, cover around 30 percent of economic losses.
7. Government decision makers are more likely to trust information produced by locals within the country than that produced in a “black box” environment with external consultants.

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