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## NATURAL DISASTERS AND THE URBAN POOR<sup>1</sup>

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Natural disasters made two and a half million people homeless in Latin America between 1990 and 1999. The region has been plagued with an average of 30 disasters causing 7,500 fatalities a year for 30 years. Worse, the frequency of natural disasters appears to be rising. It is generally agreed that rapid population growth leading to larger and denser human settlements, combined with environment degradation are key reasons. The emergence of megacities, population concentration in coastal areas (which are particularly vulnerable), and persistent widespread poverty compound the problem.

### The poor are particularly vulnerable

Data suggest that poor people are particularly vulnerable to disasters. In Mexico, 68 percent of people affected by natural disasters are poor and extremely poor.<sup>2</sup> Average asset losses were 18 percent among the poorest fifth of Honduran households affected by Hurricane Mitch, compared with 3 percent among the richest quintile (Morris et al, 2000). There are no specific disaster statistics comparing the urban poor to other urban dwellers or the rural poor. Nevertheless, there is a general agreement in the natural disaster literature that cities are particularly vulnerable to natural hazards, and that within the urban population, the poor are generally (although not uniquely) greatly at risk.<sup>3</sup>

Cities' vulnerability is attributed to their high density of assets and people, and to the poor quality of housing, urban planning and urban infrastructure common in developing countries. In

addition, the 20 largest cities in Latin America are in areas with steep slopes, swamps, floodable land, or seismic activities. As a result, many of the region's worst disasters have hit cities: earthquakes in Guatemala City, San Salvador, Lima, Managua, Mexico City, Santiago; and landslides that wreaked major destruction in Caracas and Rio.

#### "Natural" disasters?

*If natural hazards can be seen as exogenous shocks, independent of human actions, natural disasters are at least partially controllable, being the result of concentrated human settlements and activities in disaster prone areas. So vulnerability to natural disaster should be seen as a policy outcome.*



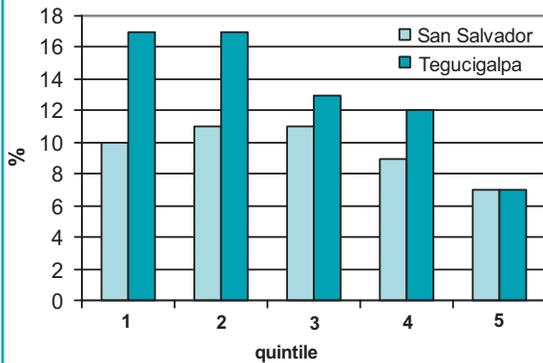
Hazardous locations and poor housing quality put the poor at particular risk for natural disasters. They account for the 30,000 deaths caused by the 1999 mudslides in Venezuela. Poorly functioning land markets, urban sprawl and poor public transportation push low income households to settle in disaster prone areas. In Metropolitan San Salvador and Tegucigalpa, about one fifth of the poor report having suffered damage from landslides in the last five years and 10% and 17% respectively, from floods, much worse than for richer

groups (Figure 1). As of 1993, it was estimated that at least 37% of Latin America's housing stock did not provide adequate protection against disaster and illness. There is evidence also that the bad quality of infrastructure in poor communities contributes to vulnerability.<sup>4</sup>

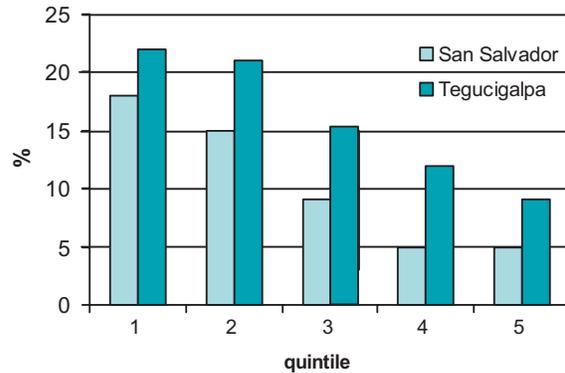
In addition, the poor tend to have different risk behavior

**Figure 1**

**Population who suffered physical damage due to floods**



**Population who suffered physical damage due to landslides**



than higher income people. They are more risk averse in economic terms because they lack savings or assets, but more risk taking in spatial terms (Pantoja, 2002). This could be because they are less informed of the risk, or because the advantages of risky locations are perceived as outweighing the risks. In fact, in locations where catastrophic risk is recurrent and well understood, the low income housing market clearly factors in this risk (Box 1). Alternatively, the poor may not engage in risk reduction strategies because they lack resources – resettlement, home retrofitting, or insurance coverage (seldom available for the poor) may be too costly relative to savings capacity and perceived benefits.

**Box 1: Efficient housing markets in the Santo Domingo slums?**

Santo Domingo’s central city slum spans several worlds with varying vulnerability to flooding and landslides. The risk of flooding when it rains varies from 45% for households near the river or along the eleven main drainage systems and *cañadas* (gullies) to 6% for households on higher, consolidated parts. Knowledge is common about which areas of the neighborhood are at risk of landslides. Rents (actual or imputed) reflect location safety and are almost twice as high in the consolidated, safer, areas than near the river or around gullies. Housing quality also reflects risk perception, with simple wooden shacks in areas at risk for regular, catastrophic floods, and homes of durable materials, several stories high, on the consolidated part.

Source: Chattopadhyay, Fay and Guasch 2001.

As most of their income is allocated to immediate survival, the low frequency risk of a natural disaster, however catastrophic its effects, may not justify a change in behavior.

The poor are also less able to recover from natural disasters, partly because of their lack of resources but also of public policies. In Tegucigalpa, four years after Hurricane Mitch, bridges linking poor neighborhoods to the city center are still

not repaired, whereas other infrastructure has long been replaced. In Venezuela, 8 months after the landslides, 33,000 people still lived in shelters or barracks in appalling conditions. Most were in extreme poverty. Poor conditions in shelters and accumulated uncertainty over the future were linked to rising rates of rape, domestic violence, child prostitution and drug abuse. The government was criticized for focusing on rebuilding roads and other economic infrastructure at the expense of social issues.<sup>5</sup>

Women (especially household heads) are more likely to suffer

**Box 2: Even poor countries can improve disaster prevention and mitigation**

Comparing the impact of similar events in developed and developing countries suggests that developing countries are more vulnerable to natural disasters. The 1989 San Francisco earthquake, magnitude 7.1, caused 63 deaths, while a 6.2 earthquake in Guatemala in 1976 resulted in 22,780 fatalities. Countries with similar occurrences of natural disasters, such as Japan and Peru, have very different disaster related death statistics – between 1970 and 1999 Peru had 2,420 fatalities; Japan only recorded 315.

This seems to be related less to countries’ wealth than to their degree of preparedness. Hurricane Mitch killed 20,000 people in 1998, but in 2001, when Hurricane Michelle, a similarly powerful storm, ripped through Cuba, only 5 people died. In Cuba, with successful civil defense and red cross planning, 700,000 people were evacuated to emergency shelters in time. Search and rescue and emergency health care plans were in place. Havana’s electricity and water were turned off to avoid electrocution and sewage contamination. A UN report concluded that the Government’s high degree of preparedness was essential in preventing major loss of life.

Source: Charveriat 2000; International Federation of Red Cross and Red Crescent Societies, 2002.

long term consequences after natural disasters. The proportion of women living in shelters in the immediate aftermath of Hurricane Mitch equaled their proportion in the general population in Central America. This percentage significantly increased over time, particularly for women household heads, possibly demonstrating their greater difficulty in accessing lodging and food-for-work programs. Disasters can also create opportunities for female leadership and empowerment — nearly a third of shelters in Honduras were managed by women.<sup>6</sup>

### What can be done to make the poor less vulnerable to natural disasters?

Disaster risk can be reduced by acting upon the hazard factor or vulnerability factor. Some hazards (floods or landslides) can be mitigated through engineering solutions, others (earthquakes and hurricanes) cannot. Much can be done to reduce vulnerability. Land use planning can prevent settlements in dangerous areas. Infrastructure and housing can be made more disaster resistant – through building codes for earthquakes, provision of hurricane shutters and improved quality roofing for better hurricane resistance. Finally, insurance can speed recovery and limit long term impacts.

Unfortunately, many of these recommendations are difficult for poor cities to implement and pose special difficulties for poor people. Few Latin American cities have undertaken the hazard or vulnerability assessments needed to plan for development, evaluate options for mitigation or risk reduction investments and plan responses to possible disasters.<sup>7</sup> Nor do many LAC cities have the capacity to prevent settlement in disaster prone areas. Rules and regulations, when they exist, are seldom enforced. Alternatively, they may make matters worse –by limiting the land available for safe settlement or because land deemed unsafe becomes cheaper and therefore even more attractive to those who cannot afford anything else. As noted, lack of alternatives often results in poor people settling in areas known to be unsafe, regardless of rules or land use plans. Finally, infrastructure improvements or retro-fitting is usually targeted to richer parts of town where the infrastructure exists. Poor neighborhoods typically have low quality infrastructure, often waiting for simple repairs, let alone upgrading or retro-fitting.

Nevertheless, there are success stories, even in poor communities. Cuba's experience shows that political will and good institutional organization can overcome the lack of wealth (Box 2). Several communities and cities have organized themselves and successfully averted major disasters. The Dominican Republic government and an NGO coalition organized workshops to help communities devise community emergency plans. During Hurricane George (1998), communities with plans successfully evacuated people, established shelters, organized clean-up brigades and requested and distributed assistance effectively, and suffered much lower impacts than communities without plans.<sup>8</sup> Building social assets in neighborhoods can also greatly reduce the impact of a disaster. In Catuche, a Caracas neighborhood, very few people died during the floods, reportedly due to community mobilization and mutual help efforts.<sup>9</sup>

Some countries are experimenting with improving disaster preparedness through improved buildings. In the British Virgin Islands, all new buildings are equipped with hurricane shutters, which are tax exempt. National development foundations in Antigua and Barbuda, Dominica and St Lucia have implemented hurricane resistant home improvement programs for poor and vulnerable communities. These programs promote safer building practices in the informal housing sector by conducting safer building training workshops for builders and artisans and providing access to loans for home retrofitting and upgrading.<sup>10</sup>

While disaster insurance is fairly common in industrialized countries, largely thanks to government intervention, in developing countries it is mainly confined to wealthy individuals, large companies and government organizations. Irregular settlements without titles or valuation and sub-optimal housing are generally considered un-insurable. But Manizales city, Colombia, has proved that innovative schemes and political will can provide even the very poorest with access to catastrophic insurance (Box 3).

In addition, an exhaustive study of the role of micro-finance in disaster risk management (Pantoja, 2002) suggests that micro-credit can play a role both in prevention and recovery. Housing loans can help promote adoption of appropriate

#### Box 3: Providing Catastrophic Insurance to the Poor – the Experience of Manizales, Colombia

Manizales has pioneered disaster risk management. Among other programs, the city has established an insurance program for buildings owned by its poorest population. Through an agreement with an insurance company, the city allows any city resident to purchase insurance coverage through the municipal tax collection system. Once 30%<sup>11</sup> of the insurable buildings in the metropolitan area participate, the insurance coverage extends to all properties exempted from property tax. These include buildings hosting organizations dedicated to the public good (NGOs, foundations and non-profits), and all properties of strata 1 and 2 — properties with cadastral value of less than 25 minimum monthly salaries each (approximately US\$3,400).

The insurance contract is priced competitively and designed so that the insurance company ends up with a direct contractual relationship with the individual participating taxpayer. The Municipal Administration acts as a premium collector only, keeping 6% of premia as a handling fee, and transferring the rest to the insurance company, which bears all responsibility for claims. The World Bank is currently working with the City of Manizales to help make the scheme even more performant.

building technologies and micro-finance institutions occasionally include some type of technical assistance. Access to a loan after a disaster can make a critical difference in a poor family's ability to recover. Nevertheless, micro-credit is limited in what it can do. Because disasters are a co-variant risk, micro-finance institutions have to protect themselves to avoid serious financial reversals, and ensure they can keep resources flowing after a disaster. Also, micro-credit institutions do not usually reach the poorest people. Finally, to be viable, micro-credit institutions need to be commercially run, requiring careful balancing of human needs and financial discipline.

A number of cities in Latin America have become active in disaster prevention. A 1997 survey found that a number of cities (Cali, Medellin and Manizales) have disaster prevention and relief systems that are models for the rest of Latin America, although most have limited roles, within the narrow confines of existing national civil defense legislation. The survey notes also that where municipalities do not have the capacity to carry out responsibilities designated to them, the vulnerability of the population is very high.

Importantly, US studies show that communities or municipalities tend not to organize unless there is a federal incentive. Increased recognition of the importance of local level initiatives should not come at the expense of a national framework.

## Conclusions

In sum, disaster management is a critical step in coping with urban poverty and needs to involve central, local and community initiatives. Central efforts can create incentives and programs for communities and municipalities to engage in disaster preparedness and awareness. In many countries, a key problem is poor integration or communication between the agency in charge of disaster management and the ministry in charge of urban affairs. Promoting cooperation between them can help stimulate national urban preparedness campaigns. At the municipal level, critical steps include improved land use management and building code regulations. These need to be designed and enforced with the poor in mind, or else they will be ignored – or make matters worse. Better integrated communities and municipalities with disaster plans fare much better in times of catastrophe. National and municipal agencies can help foster this community preparedness. Finally, micro-finance institutions can help the poor access resources and sometimes technology for better housing, and credit to help recovery. But since they also tend to be vulnerable to disaster risk, they may need support from donors or central governments when disasters strike. As to insurance, the case of Manizales shows that it can work even for the poorest.

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## Notes

- <sup>1</sup> We drew extensively on Charvériat's (2000) review of issues related to natural disasters in Latin America and the Caribbean. For more information on disaster management, see <http://worldbank.org/dmf/> and <http://www.iadb.org/>
- <sup>2</sup> Mexico Draft Concept Paper for a Poverty Assessment, June 2002. Mexico is particularly vulnerable to natural disasters, averaging three per year during 1980-99.
- <sup>3</sup> Charvériat (2000) reviews the issue.
- <sup>4</sup> World Bank, World Development Report 2000/2001
- <sup>5</sup> International Federation of Red Cross and Red Crescent Societies, 2001.
- <sup>6</sup> World Bank (gender note.)
- <sup>7</sup> Hazard assessments identify hazard zones and vulnerability assessments evaluate the expected performance of structures, infrastructure and institutions under the stress of a disaster.
- <sup>8</sup> World Bank 200, Natural Hazard Risk Management in the Caribbean
- <sup>9</sup> Sanderson, 2000.
- <sup>10</sup> World Bank (CGCED) 2002.
- <sup>11</sup> This coverage level was originally set at 40% but was later lowered to 30% in November 2001.

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