

Part Two: What Is Being Done?

Part Two contains recent examples of how communities are making themselves safer from disasters. The case examples show progress in a rapidly evolving field. Solutions to protect cities from disasters are available. Little information is readily available, however, on how communities are applying them. This report focuses on bridging that gap. The examples come from all corners of the globe, and touch upon a variety of disasters facing urban areas. Building techniques, community cleanup campaigns, emergency management plans, construction of embankments, resettlement programmes, designation of “green” areas, economic surveys of vulnerable groups – these and other solutions (both structural and non-structural) are highlighted in the pages ahead. Some are success stories. Others are success stories in the making. Together, the stories form a portrait of an evolving field, in which communities are taking a stronger role in determining their own fate.

The portrait gives both hope and concern. Hope, because these examples show how many communities believe that “prevention pays” and invest in it. Concern, because there are still not enough actions to reverse the negative global trends that lead to increased disaster risk.

If cities are becoming more vulnerable to disasters almost by the day, then why aren't more people addressing this issue? It is a new concept, which has taken root in the last half of this century, that man need not be fatalistic about disasters. It is also a new phenomenon that the pace and scale of environmental degradation, rapid population growth and urbanization increase disaster risk. It will take time until all communities realize these facts, and only then can they take action.

But there are other reasons. Local authorities have limited control over urban expansion. Urban areas are growing so fast that authorities have difficulty in providing basic minimum services. With scarce resources, disaster threats are just one of a panoply of urgent problems facing city authorities.

Yet the way a city develops determines whether disaster risks will rise or fall. If urban risk assessments are used to guide future development projects, development investments will become more sustainable. Even with only limited additional resources, urban managers can considerably reduce risk profiles of their cities.

Search for Case Examples – Selection Criteria

The following criteria were used in the research for this report to gather and write the case examples of Part Two.

- ▶ **“Prevention pays” measures.** Solutions to root causes of urban vulnerability (such as settling in hazardous areas), design or construction improvements to make buildings safer against unavoidable hazards, establishing emergency plans that work.
- ▶ **Universality.** A mosaic of examples, with different elements for urban areas to select and adapt to local social, economic and political circumstances.
- ▶ **Success indicators.** Projects at least partially implemented and tested, with measurable results. Examples: less frequent disasters; lives or property saved; professional awards or recognition; adoption of similar measures among more groups in the same community, or in neighbouring countries; changed attitudes among political leaders and/or community members.



Women in Bangladesh build a fence to protect themselves from floods.

- ▶ **Cost-effectiveness.** Preference for examples showing local improvement, relative to the time, money and people involved. Measures were discarded which seemed too expensive for cities in developing countries.
- ▶ **Partnerships.** Preference for projects coordinated with different parts or professions in the community, rather than isolated projects (hence less sustainable over time)
- ▶ **Community-based solutions.** Positive “can-do” approach, led by city residents, with evidence of consensus building. National or international partners are included where their role is an enabling one.
- ▶ **Diversity of natural disasters affecting urban areas** Floods, earthquakes, landslides, fires, tropical storms and volcanic eruptions are covered. Stories on floods, the most frequent urban disaster, are more numerous.
- ▶ **Geographic spread.** Cross-section of countries and world regions.
- ▶ **Cross-section of measures carried out in disaster and development phases** Emphasis on prevention, mitigation and preparedness measures, preferably as part of city development programmes, before a potential disaster. The search was consequently broadened to measures in the reconstruction phase that lessen the impact or prevent future disasters. One example from the relief phase is included, as its success clearly derived from a well-prepared community. Studiously avoided are references to successful logistical relief and recovery that do not fulfill other criteria listed above

New Laws Reflect Changing Attitudes in Quito

“It is just after 9:00 pm. An afternoon of heavy rain has soaked the city; the streets are still wet. Residents of Quito are relaxing with family and friends, having dinner, watching television, or sitting and talking. Older children are studying for the next day of school while the younger ones are asleep in bed. Suddenly there is a slight jolt, then heavier shaking. Dishes quiver on dinner tables, and windows rattle in their casing. The city trembles as the ground shakes violently. People are initially confused by the commotion, but then realize that Quito is experiencing a major earthquake...”

This potential earthquake scenario in Quito, developed as part of a local earthquake risk management project, is used in planning exercises. The full scenario outlines the impact of a potential earthquake in Quito for a month following the quake. It was developed to communicate results of a vulnerability assessment of Quito's city services, public buildings, and infrastructure (17 city organizations were interviewed), and an earthquake hazard assessment. By developing the earthquake damage scenario, assessment results were communicated in a way that government officials, emergency managers, business leaders or the general public could visualize the consequences of an earthquake and be motivated to act.

Earthquake damage scenarios, community participation in evacuation plans in case of volcanic eruption, reinforcement of school buildings, soccer balls and children's songs with earthquake messages... there have been a considerable number of recent projects in Quito which have helped raise public awareness and convince top city administrators to address Quito's disaster threats. These projects are changing community attitudes. The result can be seen in Quito's evolving political and financial framework to keep its city safe from disasters. The steps it has taken in the last few years are giving it a solid foundation for all relevant partners in the city to coordinate their work.

Quito has good reason to take preventive action. Located at the foot of the still-active Pichincha volcano, Quito is also at risk to earthquakes, landslides and floods, as well as chemical accidents and urban violence. It is the second largest urban centre in Ecuador. Its population of 1.2 million is growing fast, inadequate infrastructure and housing, poverty and urban environmental degradation make it highly vulnerable to natural (and manmade) hazards.

Most localities in Ecuador do not have highly developed local mitigation coordination programmes. In part, this is because Ecuador's civil defense system is highly centralized. As the city government became conscious of the need to emphasize local prevention, mitigation and preparedness measures, they created a disaster prevention and



Quito lies at the foot of the Pichincha volcano, and is at risk to landslides, earthquakes and floods in addition to volcanic eruptions.

response unit in 1994 under its Planning Department. It quickly became evident that this unit needed broader and higher-level political backing to address the disaster risks facing the city. The city has now drafted a municipal ordinance for a Metropolitan System for Risk Mitigation and Emergency Response, which will be linked to the mayor's office.

The new system will include all municipal agencies, along with members of the local civil defense committee (Red Cross, Armed Forces, Fire Department, Police Department, Catholic Church). Not only does this have obvious coordination advantages at the local level, it also institutionalizes a link with the national level. In addition, invited members will include NGOs, social and natural science research institutes, businesses, schools, universities, hospitals and others.

The system has three parts, in which all members play a role. The Education Commission is charged with building a "culture of prevention" among citizens, by spreading information and developing courses. The Research Commission is in charge of technical research and monitoring

The Operative Commission is in charge of developing preparedness plans. The system foresees a committee and a coordination unit to link the different parts. For a major emergency or disaster, relevant members of the system will reorganize themselves in an Emergency Operations Committee. The legislation also provides for adequate funding mechanisms.

Sources

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Papua New Guinea

Rabaul: Living with Risk

What are acceptable levels in living with risk, and what are the tradeoffs? These questions drive the rehabilitation programme that municipal authorities are carrying out in Rabaul, Papua New Guinea. Struck by a major volcanic eruption in September 1994, this port city has opted for partial relocation and safer construction to guard against future disasters.

Two volcanoes, Vulcan and Tavurvur, destroyed Rabaul and damaged many settlements on the Gazelle peninsula. The eruption showed how far-reaching the economic impacts of a disaster can be. Rabaul, one of the largest commercial centres in Papua New Guinea, was the administrative centre of the province. Most of the agricultural produce of the island provinces was exported through Rabaul's port, and the city served as a centre of light industry.

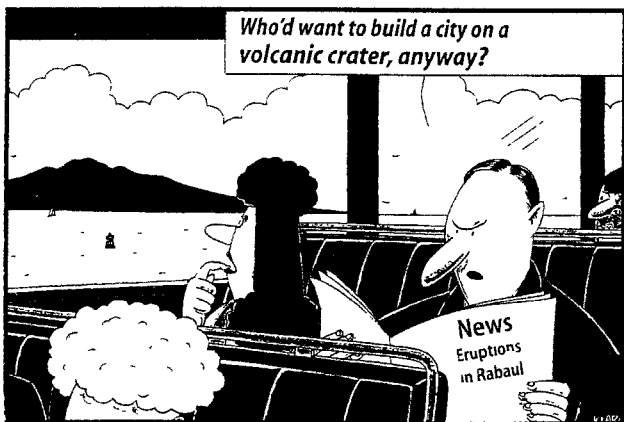
Although only four people died, 100,000 people were affected. The greatest damage was caused by the rain of ash and mud, in some places up to 50 centimeters thick. Most inhabitants lost everything: homes, personal belongings, and their source of income. Most buildings in Rabaul collapsed under the weight of wet ash, and ash rains destroyed many homes and plantations on the rest of the peninsula. Electricity, water supply, phone cables, roads,

government offices, schools, clinics and the hospital were destroyed.

The total direct losses are estimated to be 5% of GNP, the equivalent of two years of national public spending for health. The cost to rebuild infrastructure is estimated at \$70 million. Insured losses were \$50 million; private, uninsured losses are estimated to be double that amount. No figures are available for indirect losses from industry, trade, or agricultural exports.

The government's rehabilitation programme tries to balance the advantages of Rabaul's location with the risk of another volcanic eruption. The government has made land available to disaster victims at a safe distance from the volcanoes. Most housing areas and the administrative centre are being rebuilt in Kokopo, a village 20 km from Rabaul and 15 km from the nearest active volcano. The Kokopo airport has been upgraded to replace that of Rabaul.

Under the smoke of the still-active Tavurvur volcano, however, the harbour of Rabaul has reopened. There is no good alternative location for the port of Rabaul, a sheltered deep-sea harbour; it provides a key service for regional economic development. Meanwhile, it will take some time before the plantations of the Gazelle peninsula will be operational again.



This cartoon appeared in Auckland, New Zealand, after the Rabaul eruption. Auckland is built on a still-active volcanic site.

Adapted from a cartoon by Laurence Clark in *The New Zealand Herald*, 21/Sept/94.

Adapted from 'Rabaul, Papua New Guinea the volcanic eruption of 1994 and its aftermath' by Anja Smid, free-lance journalist, June 1996