Cities At Risk

Making Cities Safer... *Before* Disaster Strikes

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International Decade for Natural Disaster Reduction

IDNDR

1990–2000

Contents

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Foreword

In 1992, the Earth Summit in Rio de Janeiro presented Agenda 21 as a master plan to achieve sustainable development. Agenda 21 demonstrates universal goodwill and commitment for a world that is prospering, just and habitable. Rio's action plan is based on the premise that sustainable development is not just an option, but an imperative. It is equally based on the firm belief that sustainable development can be achieved if appropriate action is taken.

Three years earlier, in 1989, the international community agreed on a far-reaching and innovative strategy to counter the threats of natural disasters. The United Nations General Assembly proclaimed the 1990s the International Decade for Natural Disaster Reduction, and established a multisectoral Framework of Action. IDNDR's mid-term review was carried out by the World Conference on Natural Disaster Reduction, in Yokohama, Japan in May 1994. The Yokohama Strategy and Plan of Action confirm and strengthen IDNDR's objective to reduce the loss of life, property damage and socioeconomic disruption caused by natural, technological and environmental disasters.

In June this year, the international community concluded a thorough process of developing an agenda for two themes of global importance: "Adequate shelter for all" and "Sustainable human settlements in an urbanizing world." The Second United Nations Conference on Human Settlements, held in Istanbul, brought a cycle of thematic world conferences to a successful close. The Habitat Agenda is a global call for action and offers a positive vision of sustainable human settlements.

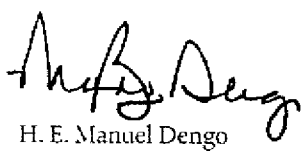
All three conferences and their plans of action are closely intertwined in their general commitment towards a safe and just world in the twenty-first century. They also have in common many areas of specific action. One of these areas is the reduction of vulnerability of people and communities at risk from the threats of nature and the earth. The protection of assets from the impacts of disasters – protection of lives, knowledge and skills, property, financial assets, means of production and infrastructure – is an indispensable part of national plans and strategies for sustainable development.

This publication highlights the threat from natural, environmental and technological hazards in an area of rising concern – urban settlements and cities of the future. It demonstrates even more amply our potential to combat these threats effectively.

On the historic commemoration of the United Nations fiftieth anniversary, in November 1995, Member States adopted on a Declaration which solemnly reaffirms the purpose and principles of the United Nations Charter. At the same time, Member States seized the opportunity to redirect the United Nations to help those who are suffering and are deeply deprived.

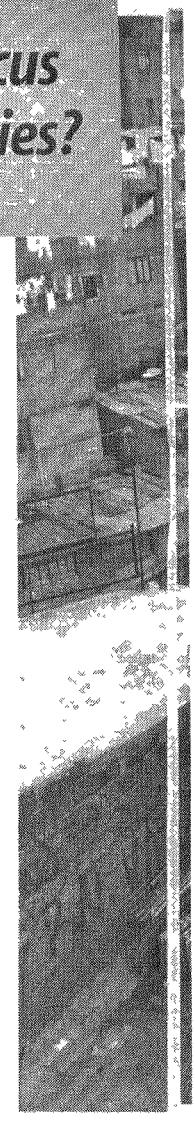
To foster sustained economic growth, social development, environmental protection and social justice in fulfilment of commitments made on international cooperation for development, Member States declared that they will: "intensify cooperation on natural disaster reduction and major technological and man-made disasters, disaster relief, post-disaster rehabilitation and humanitarian assistance in order to enhance the capabilities of affected countries to cope with such situations."

For "Cities at Risk," action must not be delayed.



H. E. Manuel Dengo
Ambassador of Costa Rica to the United Nations
Chairman, IDNDR Contact Group, Geneva, Switzerland

Part One: Why Focus on Disasters in Cities?



Are the cities of today and tomorrow waiting for a disaster to happen? Every day, there are news reports about cities stricken by natural or technological disasters. This is likely to continue, and become worse unless we change our policies and actions on environment and development.

Why are cities at risk? First, more people are setting in areas vulnerable to hazards. Second, rapid population growth and migration make it difficult for authorities to protect people from disasters. Finally, urbanization is upsetting balances in ecosystems, with added disasters as a result.

Kobe, Los Angeles, Medellin, Quito, Almaty... What these cities have in common is that they all have been stricken recently by major natural disasters. Disasters have become part of the image and psyche of these places.

But these cities and towns have something else in common: a new awareness and political commitment to protect their communities from future disasters. This kind of awareness and commitment, unfortunately, usually comes *after* a disaster strikes.

How to Use this Publication

This publication aims to:

- Encourage urban authorities to lead the way in protecting their cities from disasters.
- Raise awareness among local, national and international organizations about the growing need to integrate disaster prevention and emergency management in urban public policies.
- Outline policies and examples that may be adapted to local circumstances.
- Facilitate networking, an exchange of experiences, and partnerships between all organizations interested in making cities safer from disasters.

It is hoped that this report will serve as a practical tool for debate and action.

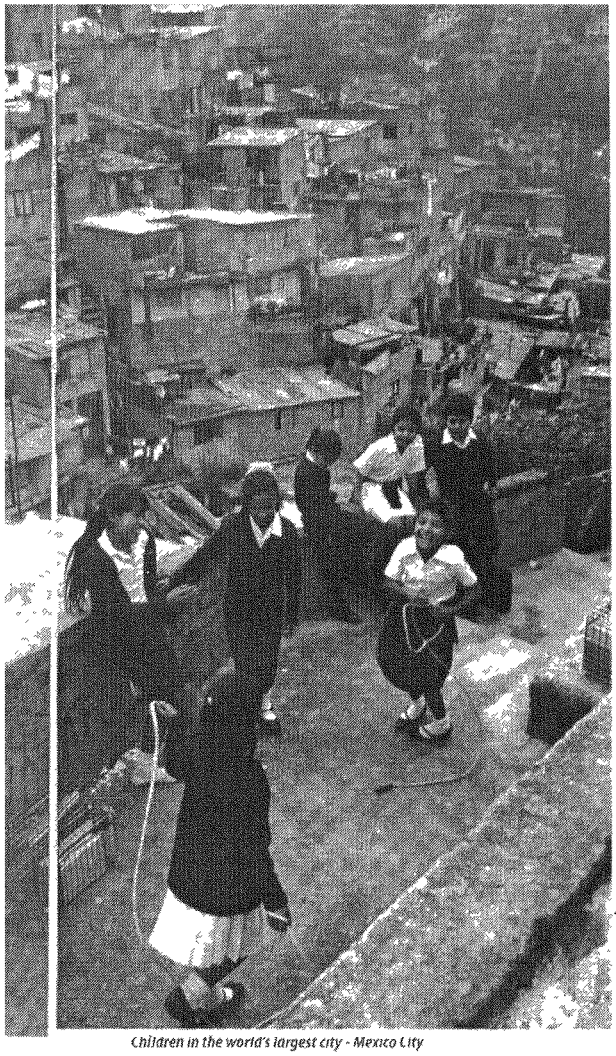
Format

The publication is divided in three parts. The first section indicates why cities are at risk, and which people are most vulnerable. The second section provides insights on how some local communities are protecting themselves. The third section provides policy guidelines, networking contacts, references, and a copy of a poster detailing solutions for cities at risk.

Public Awareness Campaign for Cities at Risk

This report is part of the 1996 public awareness campaign on Cities at Risk for the International Decade for Natural Disaster Reduction (IDNDR, 1990-2000). Each year, organizations around the world celebrate a World Disaster Reduction Day on the second Wednesday of October. The campaign is coordinated by the United Nations IDNDR Secretariat. Partners include national and local government agencies, NGOs, businesses, universities and UN agencies. Other IDNDR Secretariat campaign contributions include an Internet conference, an international poster contest, five flyers with tips for local organizers, and an internationally acclaimed community action booklet for children (reprinted from last year's campaign). These tools are designed to help interested organizations organize local campaigns for World Disaster Reduction Day. Reports are provided to the IDNDR Secretariat and published to encourage further networking and exchange.

The campaign complements the 1996 UN "City Summit," Habitat II. Habitat II discussed how cities can become environmentally, economically and socially sustainable in the 21st century, and its final document recommends more widespread use of disaster mitigation measures in urban



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Children in the world's largest city - Mexico City

areas. Yet disasters were not among the priorities on Habitat II's two-week agenda. "The concept of allocating some resources for hazard mitigation in the urban Third World is in its earliest infancy," noted Spencer Havlick, a US disaster mitigation expert, in 1986. "The norm of most cities in developing nations is to cope with the immediate day to day challenge of biological and political survival." Ten years later it is hoped that this report and the collective efforts of organizations involved in this year's campaign will encourage urban decision makers to make cities safer - before the next disaster strikes.

Information Sources

The report is based on primary and secondary sources, both published and unpublished. These included interviews, books, articles, conference proceedings, videos, research papers, statistics, letters and memoranda.

- **Interviews:** about 25 experts working in the field of disaster management were interviewed between January and April 1996.
- **Circular letters** requests for success stories of disaster reduction in urban areas and policy background materials were addressed to three groups between October and February 1996:
  - (a) Mayors in selected disaster prone cities in all geographic regions (60)
  - (b) International city associations and networks (6)
  - (c) National IDNDR Committees, members of the IDNDR Scientific and Technical Committee, international organizations, selected NGOs, and other organizations that conducted activities for IDNDR Day 1995 (1500)
- **Written and audiovisual materials** about 100 sources were reviewed between December and June 1996. Those used (directly or indirectly) are acknowledged within this report.
- **Conference announcement:** During the 2nd International Conference of Local Authorities Confronting Disasters and Emergencies (Amsterdam, April 1996), calls for case studies were made at the start of each of the 18 workshop sessions (600 people attended).
- **Newsletter/Internet announcements** by the Natural Hazards Observer, Disaster Research electronic bulletin (Natural Hazards Research Center), and the Disasters Newsletter (PAHO) in the first months of 1996.

There were a few problems in gathering information. International and national databases do not distinguish between rural and urban areas when collecting statistics on disasters. Urban disaster statistics used in this report were pieced together through interviews and articles, on a case-by-case basis.

In addition, there were few documented urban success stories on reducing the impact of disasters. Urban disaster mitigation research is difficult to find, in part because national and international funders (not local practitioners) influence research agendas. The other reason is because disaster mitigation is, by definition, an issue that receives little visibility. Successful mitigation efforts avert disaster. They therefore receive much less attention than disaster events and subsequent relief activities.

An Overview of Natural Hazards and Urban Concerns

Earthquake

Sudden violent shaking of the earth. Caused by friction of plates under the earth's surface, earthquakes occur along narrow belts where mountains are forming and/or volcanoes are active.

Urban concerns: Most of the biggest urban disasters are due to earthquakes -- many densely built, densely populated cities lie on earthquake belts. Collapsed buildings/ infrastructure are the main cause of deaths and damages following urban earthquakes.

Landslide

Rocks and soil sliding rapidly downhill. Variations: mudflows, rockfalls, avalanches. Triggered by: earthquakes, volcanic eruptions, storms, waterlogged soil, heavy construction.

Urban concerns: Growing amounts of badly built housing on/below steep slopes, on cliffs, or at river mouths of mountain valleys. Often on illegally occupied land, such housing ignores planning/building codes.

Volcanic Eruption

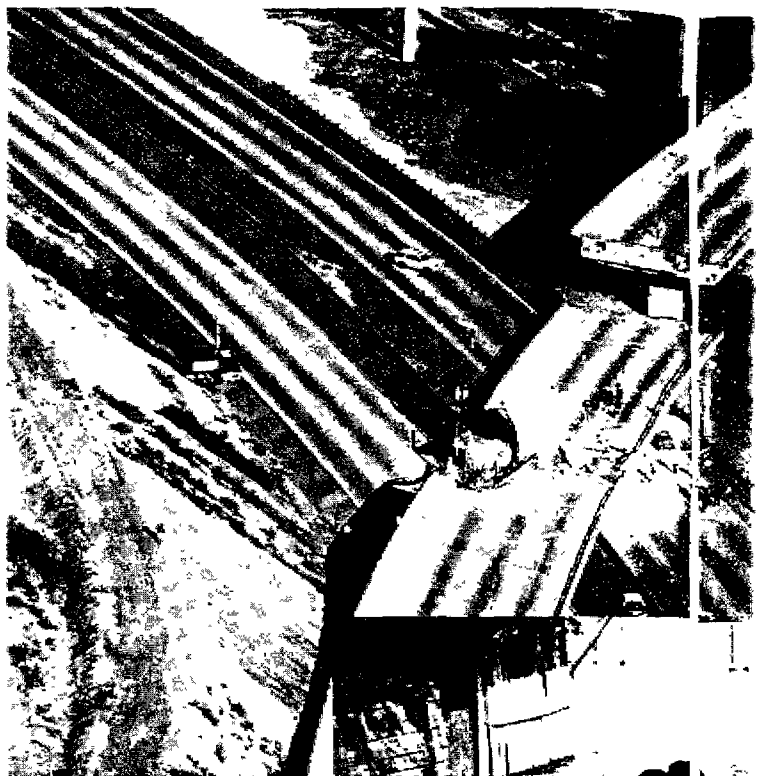
Burst of ash, rock, gases and/or flowing lava from deep inside the earth. Effects: ash falls pollute air (regionally or even globally), mudflows (lahar) of up to 100 km/hr., blasts of gas, ash, fragments (pyroclastic flows)

Urban concerns: Settlements on volcano flanks or in historical paths of mud/lava flows; adequate early warning, constructions to withstand ash and lahar are concerns for urban areas as well as rural ones situated near volcanoes.

Tsunami

Series of big sea waves that crash onto coasts, following vibrations from earthquakes, volcanic eruptions or landslides on the ocean floor. From Japanese "tsu" (harbour), "nami" (wave). Mostly in the Pacific, due to many earthquakes. Tsunamis affect coasts up to 400m inland.

Urban concerns: Many urban areas are along tsunami-prone coasts. Construction, early warning and evacuation are primary concerns for them.



Collapsed highway in the 1994 earthquake in Los Angeles.

A mother and children in the 1988 flood in Bangladesh.

Tropical Cyclone

Heavy rain/wind over sea and coast. Also known as hurricane, typhoon. Affects large areas, floods, storm surges, landslides, mudflows. About 80-100 cyclones/year around the equator.

Urban concerns: Shantytowns along coasts are a particularly urban concern. Construction and early warning are concerns for both urban and rural areas.

S Starr/Sahel/Contrasto

A Mason/UNICEF 3029/88

Flood

Too much water in the wrong place. Causes are both natural and human, including dam failures, blocked drainage systems, burst water mains, and heavy storm rains. Floods are the most frequent disasters and growing more rapidly than other disasters.

Urban concerns: Rapid urbanization is a major factor in the increase of floods. Flash floods a growing concern due to concrete/compacted earth which absorbs little water, the decline of open spaces, engineering works that divert river flows and weak city drainage systems. Inappropriate housing on river banks or near deltas (due to construction and/or location) is a major concern

Wildfire

Spreads over large areas and can get out of control.

Urban concerns: Urban fires stem from industrial explosions or earthquakes Fire risks are increasing due to heavy building density, new building materials, more high-rise buildings, greater use of energy in concentrated areas

Drought

Much less water than crops or people need A "slow-onset" disaster -- too little rain, groundwater or river water over a period of time Affects more people than any other disaster.

Urban concerns. May trigger mass migration to cities, putting pressure on housing, employment, basic services. Cities may lose food supply from surrounding countryside

Technological Disaster

Systems failures, chemical accidents, industrial explosions, spillage in ground, water, or air. Can be a secondary disaster following earthquakes and other natural disasters (natural/technological compound disasters, or "na-techs")

Urban concerns: Na-tech risks are increasing with rapid, uncontrolled urbanization and industrialization.

Rapid Urbanization Increases Disaster Risk

Cities are growing fast...

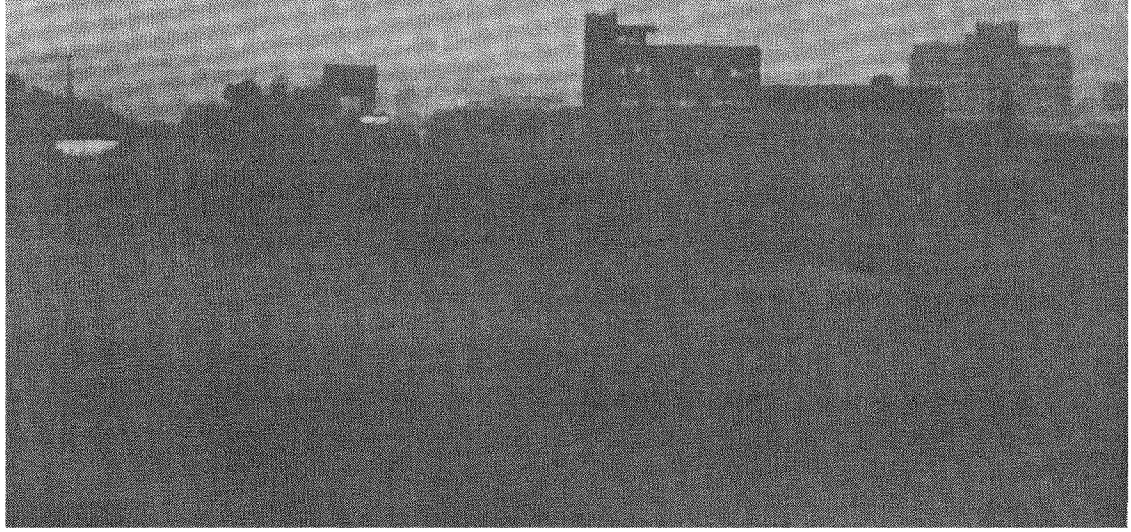
- By the year 2000, half the world's population will live in urban areas, crowded into 3% of the earth's land area.[1]
- In 1995, 2.4 billion were living in cities, out of the world's total population of 5.7 billion. The number of urban dwellers will double by 2025 to nearly 5 billion.[2]
- At least 80% of population growth in the 1990s occurs in urban areas.[3]
- Most of the future urban growth take place in small and medium-sized urban centres.[4]

... and even faster in the developing world

- In the developing world, cities with over 1 million people jumped sixfold between 1950 and 1995 (from 34 to 213). By comparison, in the developed world, the number of cities with over 1 million people only doubled (from 49 to 112).[5]
- 17 of the 20 largest cities in the world will be in developing countries by 2000 (compared to 7 of 20 in 1950). Most of these cities are in areas where earthquakes, floods, landslides and other disasters are likely to happen.[6]
- 80% of the world's urban residents will be in developing countries by the year 2025.[7]

This growth threatens to make cities unsustainable...

- City authorities in many developing countries have difficulty providing basic infrastructure and services. As a result, 30-60% of people in the largest cities of the developing world live in densely populated squatter settlements.[8]
- Demand for land in cities has led to use of unsuitable terrain (floodplains, unstable slopes, reclaimed land) prone to natural hazards.
- Urban development increases the flood risk by disrupting natural drainage channels.
- Fast-growing cities contain increasing numbers of poorly constructed or badly maintained buildings, leading to unnecessary deaths.
- Increasing numbers of industrial complexes and hazardous materials concentrated in urban areas put cities at risk: In the event of a natural hazard they may cause considerable secondary disasters, such as fires, explosions, radioactive radiation, etc.

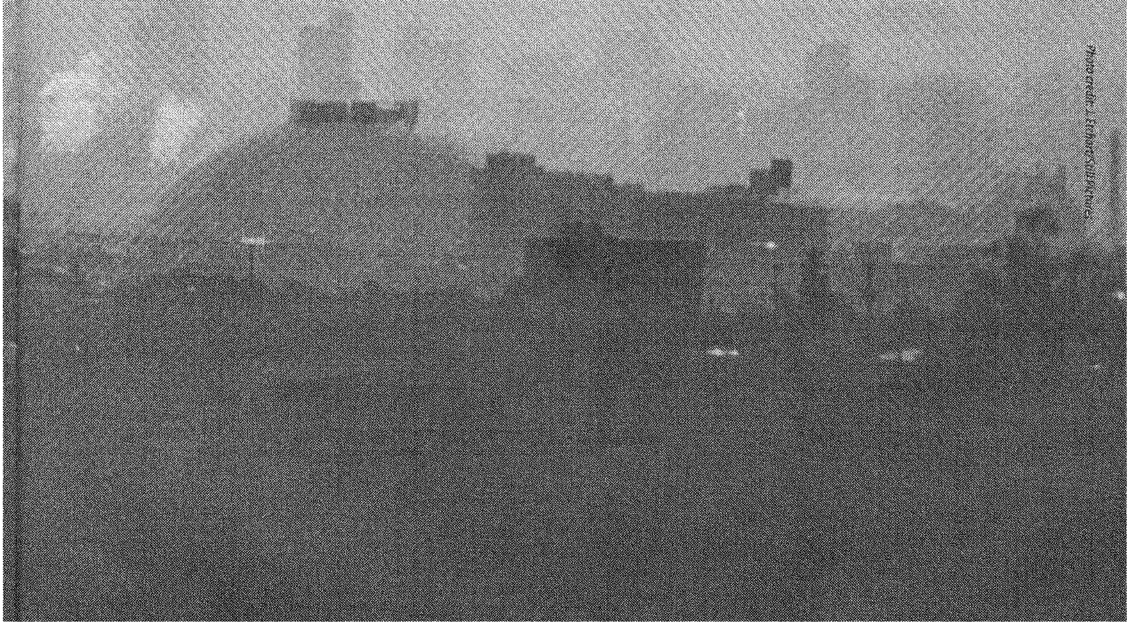


...and makes more people vulnerable to disasters

- The number of people affected by disasters has been growing 6% each year since 1960. Of these victims, 90% have been affected by natural disasters, many in urban areas.[9]
- Cities in industrialized countries are also at risk: the 1995 Kobe earthquake killed 6300 people and incurred financial losses of $100 billion – the costliest disaster ever.
- Before 1987, there was only one disaster that cost insurance companies $1 billion. Since 1987, there have been at least 15 – and most of this loss was in industrialized countries.[10]
- Poor people everywhere are most at risk. For example, the 1976 Guatemala earthquake is known as a "poor-quake" because nearly all of the victims in Guatemala City were in slum areas near ravines.[11]

But we can do something...

- Current trends of rapid urban growth and ensuing environmental degradation increase people's vulnerability to disasters. If left unchanged, disasters will take an ever-greater toll on lives and property.
- Technical knowledge exists on how to reduce the effects of disasters. Structural measures are available, such as making buildings cyclone or earthquake-resistant. There are also non-structural options such as limiting types of land use or providing tax incentives that direct development away from hazard-prone areas.
- In many cases, this knowledge has been applied successfully. Warning systems installed in Caribbean countries have reduced the number of lives lost each year during the hurricane season. After new soil and grading regulations were introduced in Los Angeles, USA, losses from landslides were virtually eliminated.[12] In a 1990 earthquake in San Jose, Costa Rica, a retrofitted portion of a hospital survived intact, while ceilings fell, glass broke and walls cracked in the unreinforced part.[13]
- Such measures need not be costly. Building earthquake-resistant hospitals, for example, only adds 10% (sometimes as little as 2%) to construction costs. Nor do all of these measures have to be sophisticated. By planting trees, buildings are sheltered from strong winds, or hillsides are less prone to erosion.
- But technological knowledge alone is not enough. People need to be aware that cities are at risk, and politically committed to reduce those risks. The key message is: people can contribute to the rise of natural disasters, or they can help keep them under control.



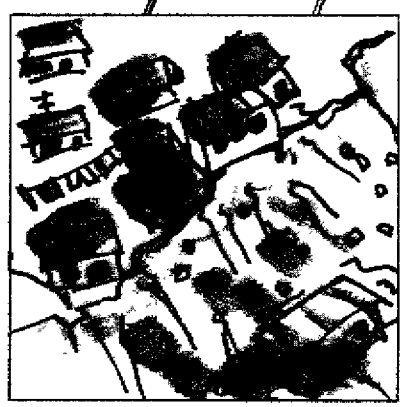
What Makes Cities Vulnerable to Disasters?

Rapid Growth and Inadequate Planning

As cities cannot always manage rapid population growth, poor people settle illegally in hazardous areas (Less hazardous areas are already occupied.) Basic services are lacking, and local governments as well as new settlers often have too many daily problems to worry about preventing disasters that may occur years later.

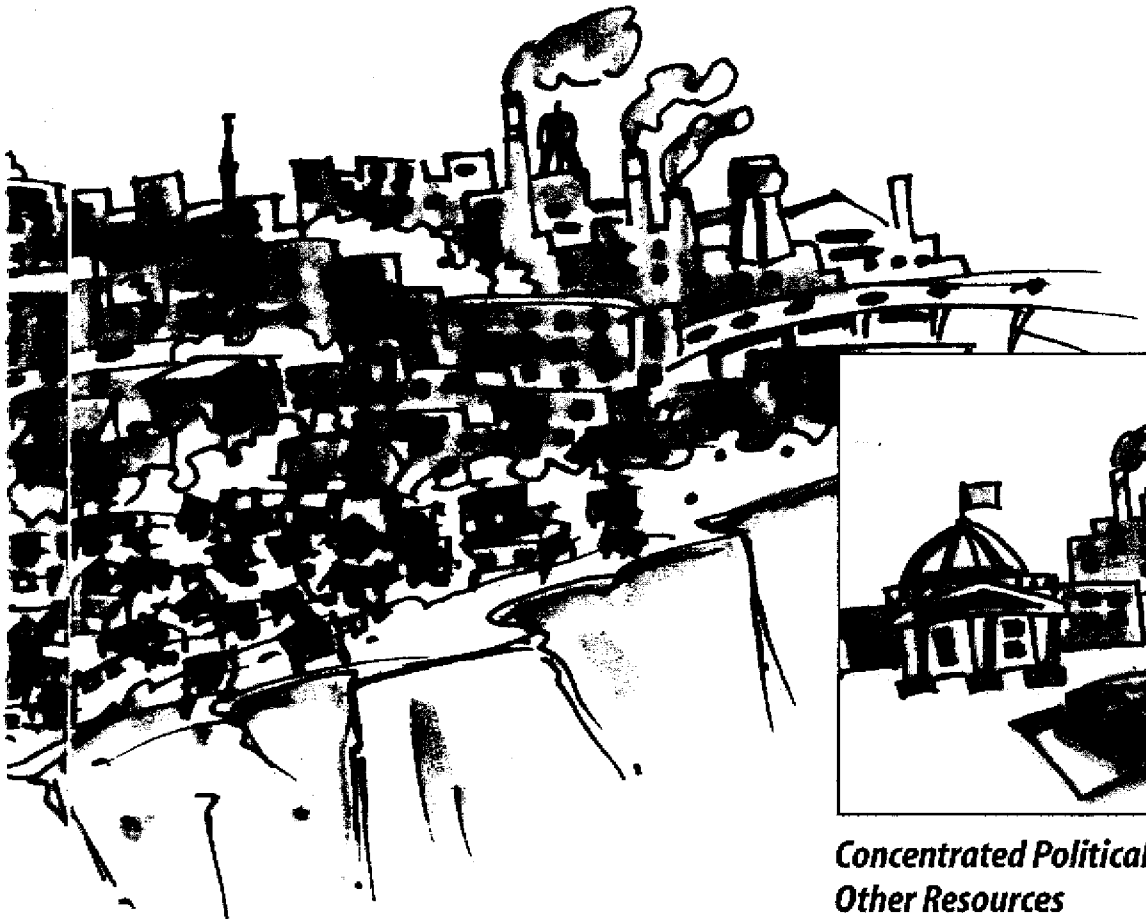
Population Density

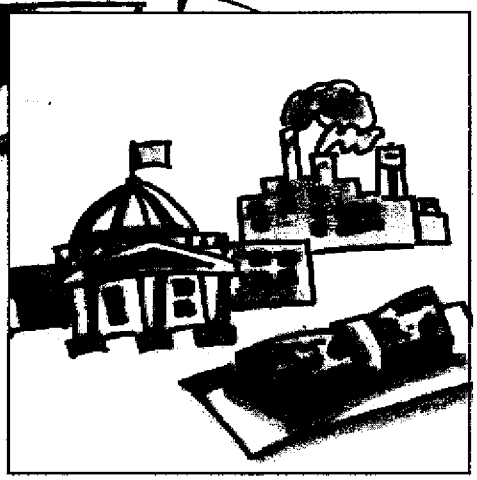
When people are concentrated in a limited area, a natural hazard will have a greater impact than if people are dispersed. Population density in the largest cities in developing countries is high, and often higher in old parts of the city or in squatter settlements.



Ecological Imbalance

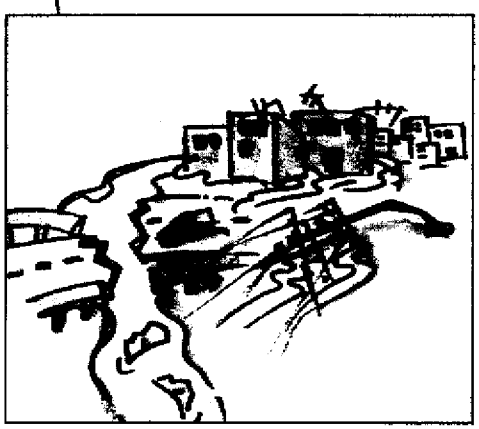
As rapid urban development changes local ecosystems, "natural" disasters can result A shortage of appropriate drainage systems, squatter encroachments on waterways, and insufficient planning has made some cities vulnerable to flash floods. In others, deforestation has led to hillside erosion, making people vulnerable to landslides triggered by heavy rains. Overuse of groundwater resources leads to land subsidence, making the area more vulnerable to flooding or earthquakes. The use of concrete has changed the ability of soil to absorb water, leading to flash floods.





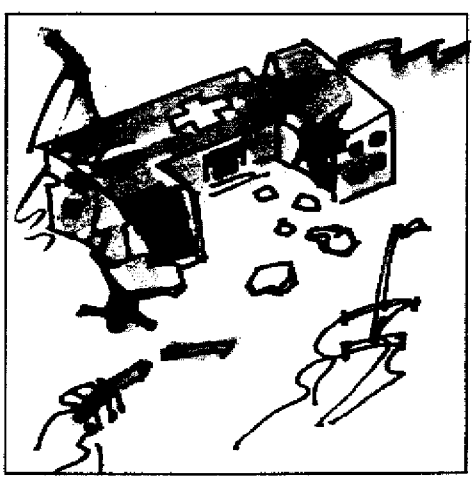
Concentrated Political, Economic and Other Resources

Too many political, industrial, financial or other resources in one urban area can have regional, national or even international repercussions. If a major earthquake were to strike Tokyo, for example, global financial markets could be affected.



Dependency on Infrastructure and Services

People in cities depend on infrastructure and public services. It is difficult for the population to meet their daily needs if the electricity is cut, bridges have collapsed, telephones don't work and water mains are broken. Essential services such as health care and firefighting are especially important after a disaster. After the Mexico City earthquake in 1985, the collapse of hospital buildings killed trained personnel, seriously hampering health services.



Inappropriate Construction

Many people die in buildings that collapse in a disaster. In earthquakes, up to 80% are killed by falling buildings. Brick buildings without a concrete frame are often dangerous in an earthquake. Wooden houses need to be strapped to their foundations so that they don't blow away in hurricane winds. Improving construction methods is usually effective in reducing casualties, and can be done at low cost.

The Urban Poor are Most Vulnerable

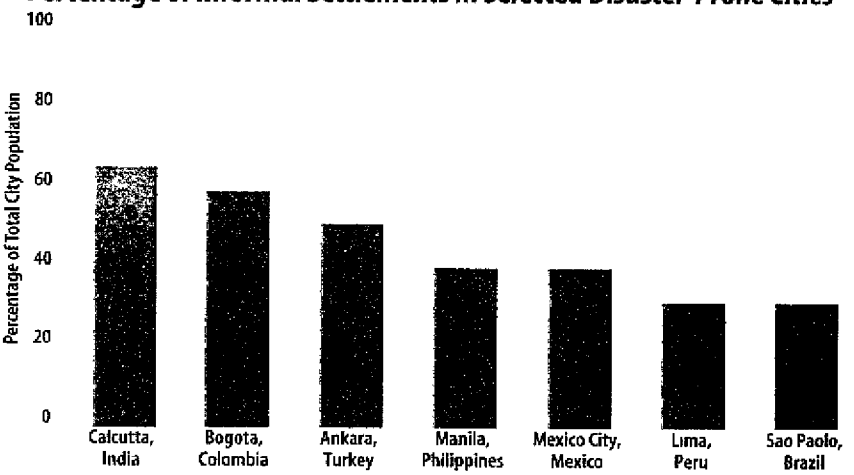
Urban disasters are selective in whom they strike hardest, and the poor are the most vulnerable. Those who can afford it avoid ravines prone to landslides following storms or earthquakes, or marshy areas and riverbanks prone to seasonal floods. As cities continue to grow exponentially, marginal land is often all that is left. The urban poor live in these areas to be near a source of income (whether they are fertile flood plains or industrial factories).

Conventional solutions for urban disaster mitigation in developed countries are not easily applicable to the urban poor. Building codes, zoning measures and urban planning techniques, for example, are difficult to enforce when people occupy land illegally. Consequently, these measures have had little impact in reducing vulnerability of the urban poor.[1]

Why Focus on Informal Settlements?

- A very high percentage of people in cities in the developing world live in informal settlements *(see graph below)*.
- This percentage will continue to rise. Informal settlements grow at about twice the average urban rate. They double every 5 to 7 years, while the overall urban population doubles every 12 to 15 years.[2]
- The urban poor rarely own their homes. Residents have little incentive to improve land they don't own.
- Governments rarely are able to provide adequate water, sanitation and other services for squatter inhabitants. They can hardly keep pace with new growth. (Istanbul, which hosted the UN "City Summit" Habitat II, is growing by about 450,000 people each year, and already has 10 million inhabitants.) Furthermore, city authorities often fear that they sanction and encourage settlements on unauthorized land by providing services.
- Many informal settlements are located in environmentally vulnerable areas: ravines, deforested hills, marshes, riverbanks and floodplains.

Percentage of Informal Settlements in Selected Disaster-Prone Cities



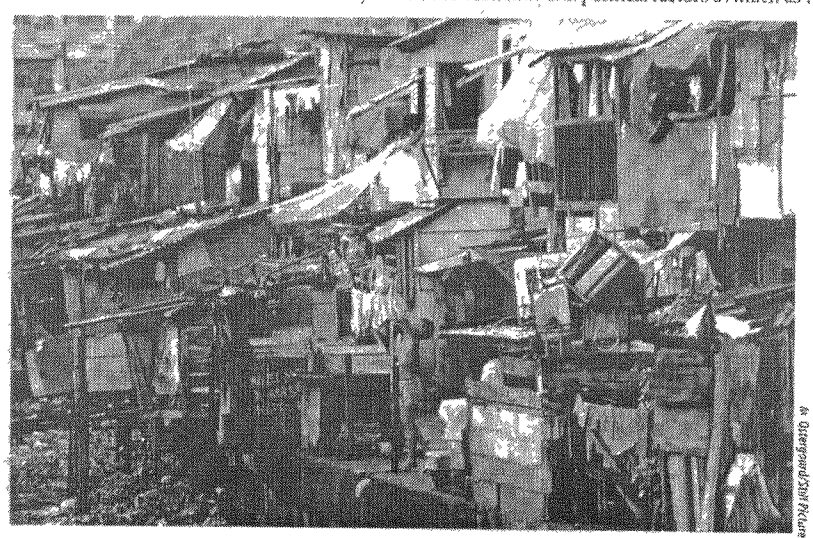
Sources: Global Report on Human Settlements, UN Center for Human Settlements, Oxford University Press, 1987; At Risk, P Blaikie, T Cannon, I Davis, B. Wisner, Routledge, 1994

The 1976 Guatemala "Class-quake"

Twenty years later, the urban poor are still at risk

Highly vulnerable to earthquakes, floods and landslides, Guatemala City is one of the most disaster-prone areas of the country. No disaster in Guatemala is more memorable than the 1976 earthquake. The disaster killed 23,000 people. In Guatemala City, it left 1,200 dead and 90,000 homeless out of a population of 1.3 million. Twenty years later, the 1976 quake and its aftermath continue to serve as a vivid example of how disasters affect people in urban areas in unequal ways.

The consequences of the 1976 earthquake on the country's social structure were profound and the inequitable nature of its damage is still evident today. Many in the poorest sectors of society have yet to recover from their losses. The quake demonstrated that vulnerability of the urban poor of Guatemala city was due to economic and political factors as much as the type of land and buildings which were occupied.



© Hutchison Picture Library

Another example of the urban poor at risk to disasters: informal settlements in Manila.

A local journal reported at the time that "...almost all [of those affected] lived in the slum areas of the city. In this well known fault zone, houses of the rich have been built with costly anti-earthquake specifications. Most of the poorest housing, on the other hand, is in ravines or gorges which are highly susceptible to landslides whenever earth movements occur..."[1]

In the aftermath of the 1976 earthquake, many survivors left the steepest areas and resettled on safer, gentler slopes, a short distance away, leaving the most dangerous areas unoccupied. Since then, the city's population has grown to some 2 million inhabitants. Due to accelerated population growth, a larger metropolitan area has emerged, exceeding the original boundaries of the city. As the memory of the 1976 quake fades, new generations of migrants and urban poor are willing to live in the disaster-prone areas.

Middle and high-class residential areas established in the steep terrain to the east of the city have been built to resist and mitigate the effects of natural disasters. Yet, many migrants and urban poor, in an effort to find solutions to their housing problems, often organize themselves to occupy vacant land and build in a haphazard fashion. A recent study identified 197 precarious settlements around Guatemala City, which encompass a total of 589,900 inhabitants, and include 76 sites considered highly susceptible to earthquakes, floods and landslides.[2] Thus, 20 years later, the urban poor remain the most vulnerable targets for natural disasters.

Natural/Technological Disasters: Few Plans to Meet a Growing Threat

Chernobyl and Bhopal have become shorthand to describe tragedies associated with a growing malaise of the last 50 years: technological disasters. The links between technology and natural disasters, however, are less well-known. Nevertheless, two trends are clear. One the one hand, urban natural disasters are increasingly likely to trigger technological disasters. On the other hand, technology also plays a hand in "natural" disasters, especially when development actions upset the balance of local ecosystems.

There are several examples of how natural disasters can lead to technological ones Earthquakes may cause gas pipelines to rupture, causing major fires, as happened in the 1995 Kobe earthquake. During floods in the US Midwest in 1993, liquid gas tanks floated down the Mississippi River, posing a major technological threat. Drought and windstorms spread radioactive materials over a wide area in Russia in a 20-year period *(see box)*.

There are also examples of how development practices, based on technological innovations, can lead to natural disasters. Loggers may cause deforestation, for example, leading to erosion and landslides during heavy rains. In another example, as land in cities is replaced by concrete, the ground's natural ability to absorb water declines, leading to flash floods.

These compound disasters are sometimes labelled by researchers as "na-techs" (natural/technological disasters). Na-techs are the clearest evidence of how distinctions between "natural" and "technological" disasters have become blurred, as more and more people echo the title of one well-known book *Natural Disasters – Acts of God or Acts of Man?* [1]

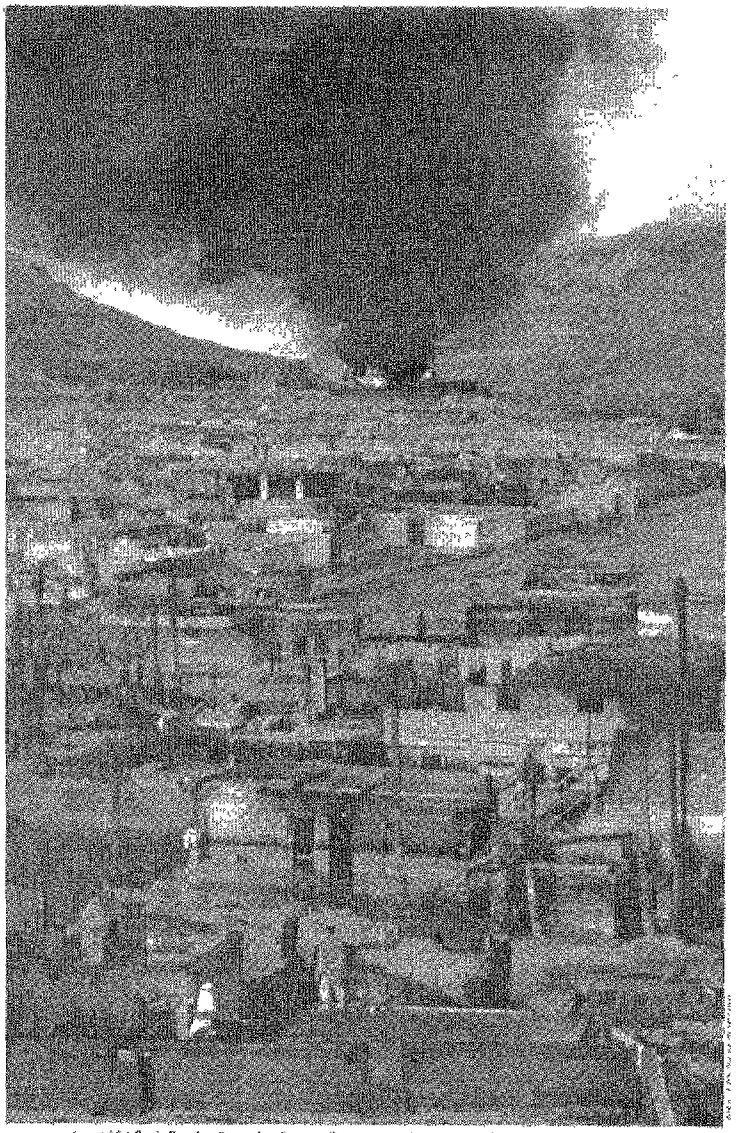
Research on the two-way relationship between natural and technological disasters is in its early stages. While more na-techs are occurring, preparations "remain cursory," notes E. Quarantelli, a US sociologist and disaster expert.[2] As with the case of natural disasters, measures to reduce risks usually happen after the event During the 1978 Sendai earthquake, for example, petroleum tanks with corroded bottoms poured oil into the adjoining bay. Within two years Japanese building codes were amended, and petroleum storage tanks are now be emptied and inspected for corrosion every five years [1]

While all urban areas have technological disaster risks (more or less controlled), those most at risk to na-techs are rapidly growing cities in developing countries. Often, it is the same rapidly growing cities which are most at risk to natural disasters that are most at risk to technological disasters. With rapid industrialization, hazardous materials are accumulating in densely populated areas – usually with little attention to adequate zoning, planning and safety measures.

The question remains as to whether na-tech risks will be addressed by rapidly growing cities in developing countries, as they continue their quest for economic growth. The answers depend on city administrators and residents from those cities, but also from national and international partners. "Aid providers who usually finance...large scale payments in third-world countries do not consider disaster prevention plans as a prerequisite to funding such projects," points out Christie Silva, an official at the Ministry for Shipping, Ports, Rehabilitation and Reconstruction in Sri Lanka. "Proper training and education in disaster preparedness is not considered important to large populations living in the vicinities of such projects This has already caused some serious problems in developing countries that see quick industrial development as a stepping stone to Newly Industrialized Country (NIC) status." [4]

Decoupling the link between technology and disasters is possible – but not widely practiced. Environmental impact assessments for new urban development projects infrequently assess potential natural disaster risks. Development projects in outlying areas don't always assess potential environmental effects that eventually may lead to floods, landslides or other natural disasters in adjacent urban centres.

Policy recommendations and practical techniques to make cities safer from natural disasters obviously can be extended to protect cities from na-techs One can take many of the same concepts used for natural disaster



In a 1994 flash flood in Durunka, Egypt oil storage tanks burst into flames

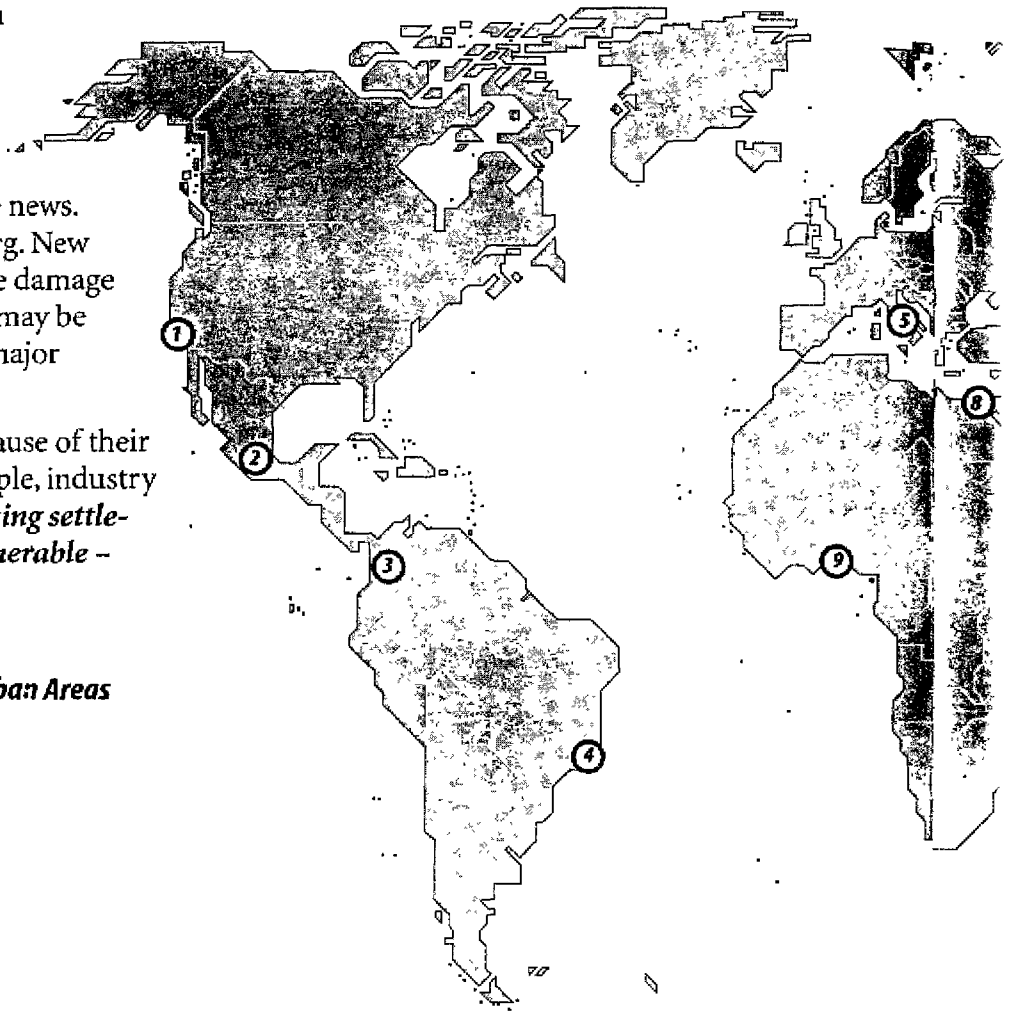
reduction (creation of emergency management committees, local public awareness programmes, hazard assessments, construction regulations, etc.) and adapt them to technological disaster reduction. For example, common sense dictates that a nuclear plant, or even an industrial plant with highly combustible materials, not be built along an earthquake fault.

How Disasters Affect Urban Areas, Large and Small

The few examples below indicate the many different ways in which major disasters affect urban areas, small and large, in every region of the world.[1] Taken collectively, these examples are representative of the range of social, health, economic, environmental, cultural and historical effects caused by recent disasters in urban areas. By no means is this a comprehensive list of major disasters in urban areas.

Spectacular disasters affecting megacities are often featured in the news. But that is only the tip of the iceberg. New evidence shows that the cumulative damage from thousands of lesser disasters may be even greater than the spectacular major disasters featured in the news.[2]

Megacities attract attention because of their scale – large concentrations of people, industry and government. ***But all fast-growing settlements in hazardous areas are vulnerable – no matter what their size.***



Selected Recent Major Disasters in Urban Areas

(Ordered roughly by geographic region, left to right.)

(1) Los Angeles (pop. 12.4 million), USA

The 1994 Northridge earthquake was the strongest to shake the region in two decades, killing only 57 but causing over $30 billion of economic losses.

(2) Mexico City (pop.15.7 million), Mexico

A 1985 earthquake killed over 10,000 people, left tens of thousands homeless, destroyed nearly 34,000 buildings and affected 65,000 others.

(3) Armero (pop. 25,000), Colombia

A 1985 volcanic eruption and mudflow rapidly buried the town and killed 21,800 – most of its inhabitants

(4) Rio de Janeiro (pop. 9.9 million), Brazil

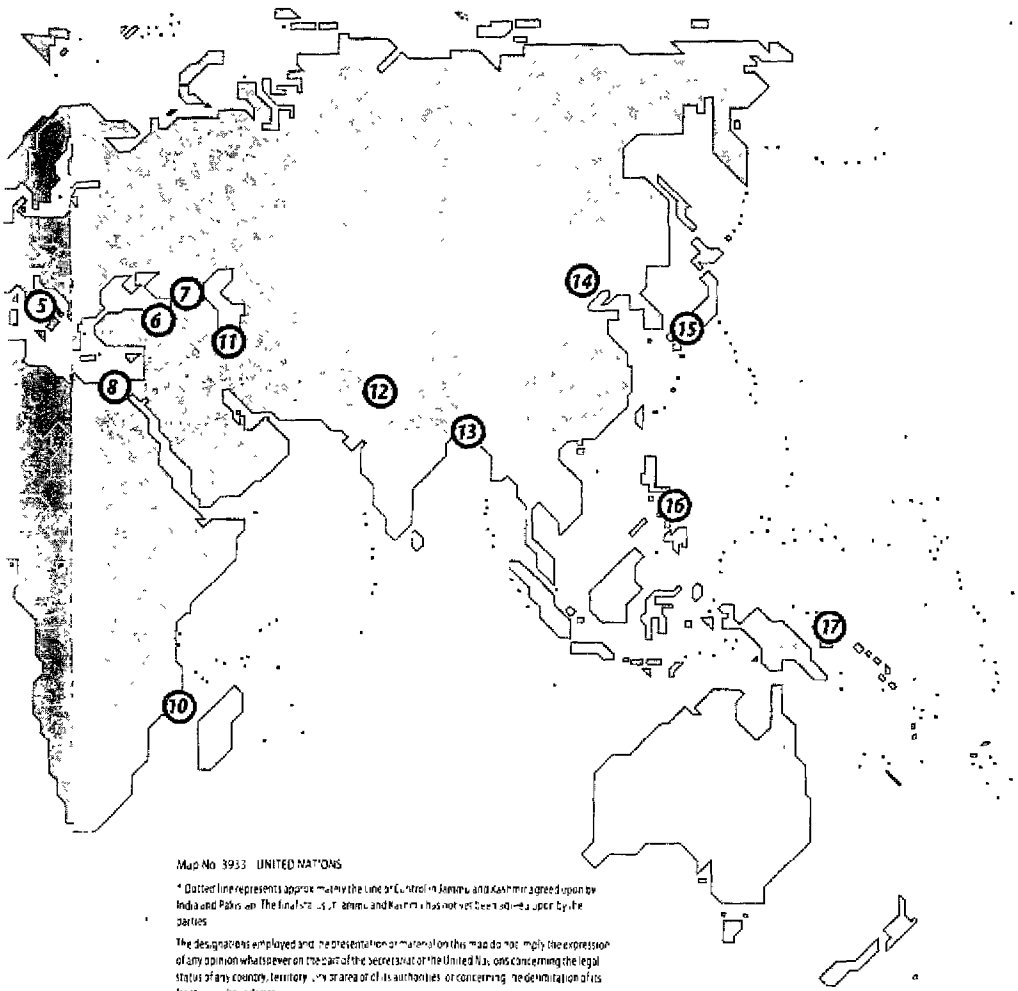
1988 floods affected nearly 20% of Rio inhabitants. Nearby cities of Petropolis and Acre also were stricken. Economic losses were just under $1 billion Greatest damage was to squatter settlements on unstable slopes.

(5) Naples (pop. 1,200,000), Potenza (100,000), Salerno (200,000), Avellino (60,000), Italy

The 1980 earthquake in Southern Italy killed more than 3,000 people in these and nearby cities. Dozens of historic urban centres were hit; about 75% of buildings around the epicentre were destroyed The Pughese aqueduct (largest freshwater distribution network in Europe) was blocked.

(6) Erzincan (pop. 300,000), Turkey

The 1992 Erzincan earthquake affected 230,000, killed 547, and damaged or destroyed over 18,000 buildings



Map No. 3953 UNITED NATIONS

* Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

(7) Spitak (pop. 50,000), Gumri (220,000) and Vanadzor (180,000), Armenia

The 1988 Spitak earthquake killed over 25,000. New constructions (rapidly and shoddily built) were the first to collapse. Lack of water, sewage, electricity or gas caused 120,000 people to evacuate.

(8) Cairo (pop. 9.7 million), Egypt

5,000 buildings were destroyed and nearly 12,000 were damaged, including historical monuments and many schools. The earthquake was perceived as "unexpected."

(9) Cotonou (pop. 650,000), Benin

In the 1988 and 1991 floods, economic life stopped for a week. Floods are recurrent – 56% of houses are flooded regularly.

(10) Nacala City (pop. 1.4 million), Mozambique

The 1994 cyclone Nadia destroyed 75% of homes and cut power and transport lines.

(11) Manjil (25,000), Zanjan (25,400) and Rudbar (95,000), Iran

The 1990 Manjil earthquake destroyed three towns. It killed 40,000 people and left 500,000 homeless. (Rural areas affected included 1,600 villages.)

(12) Uttarkashi (pop. 240,000), India

The 1991 earthquake triggered severe landslides which killed 2,000 people. About 90% of the houses in Uttarkashi collapsed.

(13) Chittagong (pop. 2.4 million) and Cox's Bazaar (40,000), Bangladesh

A 1991 cyclone killed 140,000 in these cities and nearby islands.

(14) Tangshan (pop. 1.8 million), China

The 1976 Tangshan earthquake killed 148,000 people and injured 81,000 in Tangshan City. 95% of houses and 80% of industrial buildings collapsed or were seriously damaged.

(15) Kobe (pop. 1.5 million), Japan

The 1995 Hanshin-Awaji earthquake killed 6300 people (75% crushed/suffocated, 10% burned) and caused over $100 billion in losses.

(16) Ormoc City (pop. 45,000), Philippines

A 1991 mudflow following Tropical Storm Thelma killed 5,000 people and left nearly 46,000 homeless. Damage was $27.7 million.

(17) Rabaul (pop. 30,000), Papua New Guinea

In 1994, the Rabaul volcano erupted. Inhabitants evacuated the area rapidly, but 40% of buildings, transport and communications were damaged by ash and lava.

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.

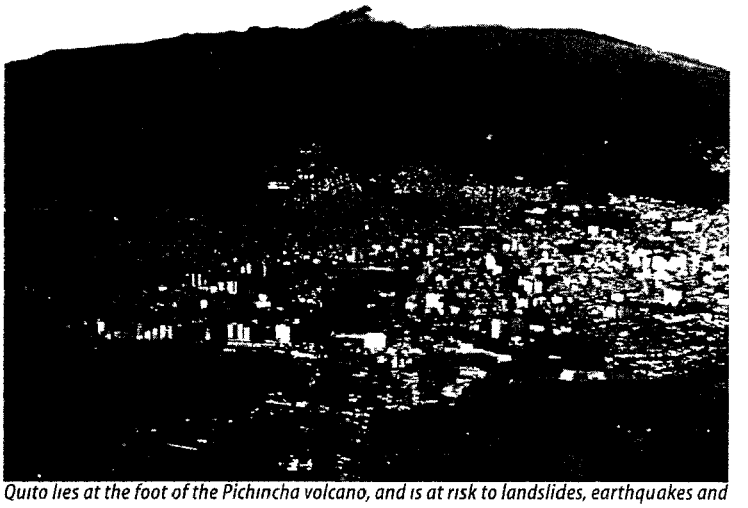
Women in Bangladesh build a fence to protect themselves from floods.

- **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.



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

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 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.

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Quito project description, J. Fernandez, J.Valverde, H Yepes, G Bustamante, J.L Chatelain, in B E. Tucker et al (eds), Issues in Urban Earthquake Risk, Kluwer Academic Publishers, 1994

For more information, contact Ricardo Mena, UN Department of Humanitarian Affairs, Shyris 1240 Y Portugal, Of. 504. PO Box 17-21-999 Quito, Ecuador Ph/Fax. (593) 2469810

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.

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.

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.

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

Community Participation Reduces Vulnerability to Floods

Drought and conflicts in South Africa have triggered many people in rural areas to move to cities for personal and employment security. These people are most likely to settle in dried swampy areas, close to rivers and streams, or too close to industrial installations – places that local authorities consider "unfit" for human settlement.

These precarious living conditions cause several problems:

- Poor building materials (plastic sheeting, wood, cardboard, hardboard) catch fire quickly.
- No phones are available to call the Fire Department.
- Firefighting squads get lost on the way to the fire, because streets and addresses are not on township plans.
- During floods, muddy waters gush through the flimsy structures, carrying away household belongings and damaging the remaining ones.
- Health, education and other services are rarely available, creating further problems for already disadvantaged communities.

Fires, floods and winds devastate these communities regularly. (In 1994, for example, the South African Red Cross and the government assisted 50,000 people in informal settlements.) 1995 floods in Kwa-Zulu-Natal left thousands homeless; 150 people died when a river burst its banks, close to where informal houses were built.

Mandisa Kalako-Williams, head of operations and programmes for the South African Red Cross, believes there is only one realistic solution to make people in informal settlements less vulnerable to disasters: community participation that includes cooperation from local authorities and NGOs. "Because of the problems underlying our type of urbanization (poverty, unemployment), we can only hope for the success of an inclusive and inter-sectoral approach to manage disasters. This would bring together stakeholders such as authorities for housing, health, land issues, development agencies, and the affected community," she says. "This is why the National Disaster Management Committee has such an important role to play in ensuring that the hazards abounding in this land do not become disasters, and that community participation is the only long-term solution."

She cites examples of the budding process in South Africa where community participation is bringing results. For example, after numerous flood relief operations in an informal settlement in Port Elizabeth, residents, government officials and local NGOs agreed to relocate 500 affected households. They moved to higher land above flood level, clearing the area of bushes, paving streets, allocating bigger plots and using better building materials (galvanized iron).

Several organizations started community and household gardens for food security, and enough was produced for home consumption and sales. Development committees were set up to discuss community needs and aspirations. "The key to success," she notes, "was community participation in identifying its own vulnerability to floods, coming up with solutions, and mapping a way forward."

Another example is from Alexandra township, one of the oldest black settlements near Johannesburg, where summer floods occur yearly. Many homes are near the Juskei river, which collects water from various streams and pipes. The river banks are eroded by years of strong water flows, and so the river bursts its banks each year. Some vulnerable families have been moved, but others continue to build new shacks in the vacated areas.

The community is in the process, however, of recognizing its vulnerability to floods. Residents have introduced early warning systems: warning bells, door-to-door warnings, and repeated radio alerts. They are now learning first aid techniques and forming response groups. They have also identified a "safe house" where flood victims can be sheltered in case of emergency, while other arrangements are sought. "Most importantly," says Kalako-Williams, "authorities and NGOs are consulting communitites on relocating people to safer areas."

Summarized from Mandisa Kalako-Williams, "Disaster and Urbanization South African Examples," June 1995, paper provided to the IDNDR Secretariat For more information, contact Mandisa Kalako-Williams, National Director, Operations and Programmes, South African Red Cross Society, PO Box 2829, Parklands 2121, 25 Erlswold Way, Saxonwold 2196 Ph 11 486 1313. Fax 11 486 1092

Community Education Reduces Wildfire Losses

"If you were in Victoria on 16 February, 1983, you would remember what you were doing that day. In South Australia we were all shocked by the fierceness and tragedy of the bushfires which ravaged the Clare Valley, the Lower South-east and the Adelaide Hills," said Barry Grear, an urban planner from the Department of Housing and Urban Development in South Australia. "Lessons learned from Ash Wednesday and applied around Australia are (partly) why fires around Sydney in 1994 were not as tragic as they could have been," he added.

Southeastern Australia continues to be one of the most fire-prone areas in the world. The 1983 Ash Wednesday fire claimed 47 lives, over 2,000 homes, and cost about $200 million. Hundreds of fires occur yearly in the region of Victoria, where many people in urban areas live near forests and are at risk

Local emergency management authorities believe that the most important lesson they have learned from these fires is that in-depth community education programmes make a difference in saving lives and property. Local authorities had already been sending safety messages through mass media channels, but they found that these messages alone didn't make enough of an impact. In addition, these measures were counterbalanced by journalists who reported fire disasters in a way that left the impression that survival was simply a matter of luck.

Consequently, the Country Fire Authority of Victoria developed a community education programme, Community Fireguard, to assist people to develop their own bushfire survival strategies Community Fireguard used research showing that if people were well prepared, they could protect themselves and their homes. To relay the message, they avoided the "top-down" approach that they had been using, of an agency telling people what to do. Instead, the programme focused on identifying the most vulnerable areas in fire-prone communities. Next, they identified local contacts who could generate interest among residents and encourage them to meet

Using trained facilitators and videos, community residents met in someone's home (rather than a public hall). Through this personalized approach, residents came to realize that they are responsible for their own safety, and needed to develop their own fire survival strategies. Only then did the Community Fireguard facilitators work with the groups to enable them to choose the most appropriate strategies, and develop them for their own use.

In some areas groups focus on developing local warning systems Others work with land management agencies to ensure that buffer zones are maintained Some groups have conducted street cleanups, equipment training sessions, or prepared emergency plans.

Photo credit: John Tindall/Country Fire Authority of Victoria

In forests near urban areas, community members clear away brush and hazardous materials.

Since the Community Fireguard programme has been underway, several groups have experienced major wildfires Local strategies have proved effective in preventing losses and mobilizing people to protect themselves and their property. Melbourne University is currently evaluating the programme to assess its effectiveness in changing attitudes and behaviour among residents in high wildfire risk areas

Adapted from Alan Rhodes, "Community Education to Reduce Losses from Wildfire" June 1996, programme summary for the IDNDR Secretariat courtesy of the IDNDR Australian Coordination Committee

Additional sources

Barry Grear, "Bushfire reduction through planning policy," in Hazard-Wise Saves Lives, ed DJ Smith Australian National University, Centre for Resource and Environmental Studies 1996

Pamphlets about Community Safeguard, Country Fire Authority of Victoria

For more information, contact Jon Boura Country Fire Authority, PO Box 701, Mt Waverley, Victoria, 3149 Australia h 61 3 92628394 E-mail jboura@cfa.vic.gov.au

Paraguay

New Riverside Project Changes Local Attitudes

Floods strike urban areas more frequently than any other natural disaster. Asuncion, Paraguay's capital, is flooded each year along the coastal lowlands of the Paraguay River. Embankments have not been an efficient solution, since poor people continue to settle along the riverside – even though floods sweep away their belongings almost every year.

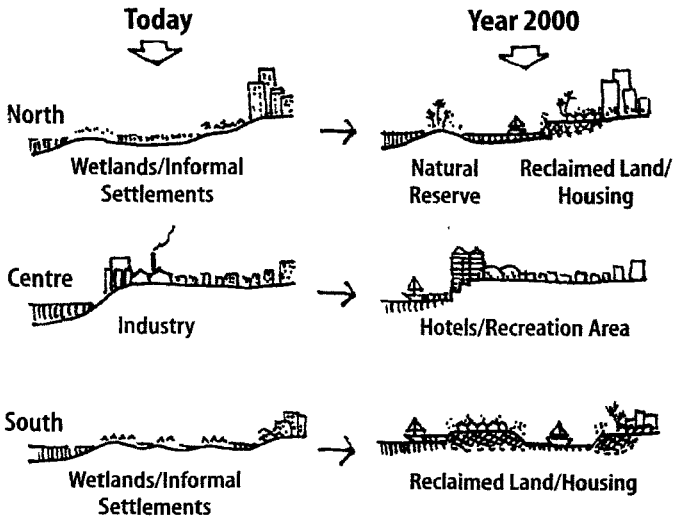
The Asuncion local government has just adopted an ambitious programme, "The Coastal Fringe," which aims to change attitudes and reduce land use of the city's most vulnerable coastal areas by the year 2000.

While there is till long way to go, the plan is in place and solutions are in sight. The new urban development plan takes into account vulnerabilities, risks and historic values of the city. This plan was developed with active community participation from risk areas A household census was carried out to get better socioeconomic and population data upon which to base decisions. Workshops in high risk areas concentrated on solutions that are acceptable for residents and feasible for the city government. A loan from the Inter-American Development Bank is being negotiated to implement the project. So far, the project has generated a spirit of cooperation among public, private and community organizations in a way that has never seen before in Paraguay. Workshops and public information campaigns has already influenced attitudes and encouraged partnerships within the community.

The project has four strategies:

- **Integrate the city and river in a sustainable environmental solution.** This includes land fill in some areas and sanitary recovery in others (garbage solutions, sewage). A coastal path and parkway is being built to avoid settlements in these areas and to give the population access to the beauty of the riverside.
- **Improve living conditions in the flooded areas,** including new services and financial credit for the population to resettle on the landfilled areas.
- **Guarantee ecological sustainability** by creating more green areas (nature reserves and parks).
- **Generate jobs for those who have resettled from risk areas,** by using local manpower to implement the Coastal Fringe project, promote locally produced materials and products, and provide access to credit.

Asuncion Waterfront



Adapted from Documentos Ambiente', No 3 Serie "Construccion de la ciudad", CEPA Foundation, 1995

Adapted from papers provided by Gonzalo Garay, Municipality of Asuncion, and Helena Molin Valdes, IDNDR Regional Office for Latin America/Caribbean. For more information, contact the IDNDR Regional Office or Arch. Gonzalo Garay Z., Director, Officer of Urban Development, Municipality of Asuncion, Meal Lopez y Cap Victoriano Bueno, 4th floor, Block A, Asuncion Paraguay Ph (595-21) 610563 Fax (595-21) 610591

Dominica, Antigua

Safe Houses for Hurricanes at Low Cost

If community authorities have to prioritize, lifeline structures such as hospitals, utilities and bridges deserve special protection from disasters. But what about measures to protect individual homes? Low-income housing in urban, disaster-prone areas is often at risk to disasters due to bad siting and/or inappropriate construction.

Building codes taking disasters into account are an important start, but they are not enough: builders may ignore the codes, insurance companies don't always provide incentives to build safely, and established housing often has been built without taking disasters into account. What's more, building codes are often too sophisticated for "non-engineered" homes.

One way to ensure safe housing at low cost is by retrofitting (adjusting the building to make it resistant to winds, ash, tremors, etc.)

In the Caribbean, one inexpensive, successful example of retrofitting to protect homes from hurricanes is being carried out jointly by the Organization of American States CARITAS Antilles and the National Development Foundation of Dominica. In 1994, the two NGOs trained 100 builders, who retrofitted over 50 homes in Dominica. The total cost per house for a complete retrofit was $200 to $700 (building materials and construction costs). The project provided loans of $185 to $500. Other costs included the training session in safe construction techniques.

All of the retrofitted homes withstood the impact of Hurricane Marilyn in 1995, and at least one was used as a hurricane shelter by residents.

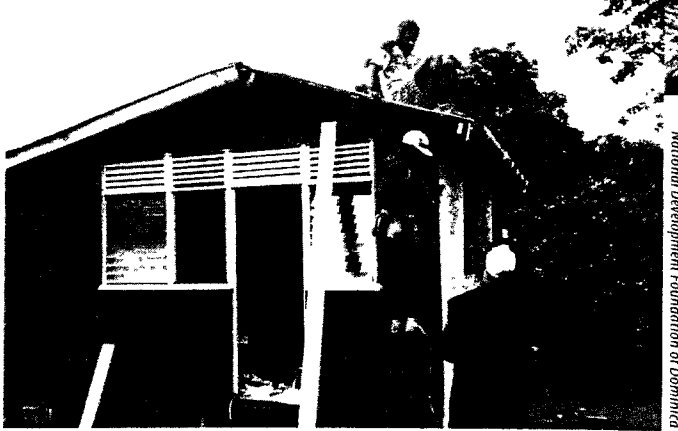
Local financial institutions are now providing funds to retrofit more houses. The project is now being implemented in Antigua by Antigua's National Development Foundation and the Caribbean Council of Churches. Finally, insurers in Dominica have indicated their willingness to adjust insurance rates for those individuals who retrofit their houses.

This is part of a wider OAS Caribbean disaster mitigation project funded by USAID. For more information contact Christabel Charles, National Development Foundation Dominica, phone 809 448 3240 fax 809 448 86[illegible]

Source: Keith Ford, OAS Caribbean Disaster Mitigation Project, programme summary provided to the IDNDR Secretariat, May 1996

Norani/UNICEF CP95/1 05

Damaged house in Bangladesh, another cyclone-prone country.



National Development Foundation of Dominica

Workers in Dominica secure the roof before Hurricane Marilyn in 1995.

Emergency Planning: Key to Smooth Evacuation During Floods

In December 1993, heavy rains in France, Belgium and the Netherlands caused flooding in the southern part of the Netherlands. Thirteen months later, in February 1995, a new flood struck an even larger area in the south. This led to the evacuation of 250,000 people, the largest evacuation in the Netherlands since World War II.

Each emergency situation requiring evacuation is unique. In all mass evacuations, however, the risk of panic and chaos exists. The element in this Dutch case which stands out as a model for others is its emergency plan: it stressed coordination among municipal services, and placed a high emphasis on a communications strategy.

Why the Evacuation Succeeded

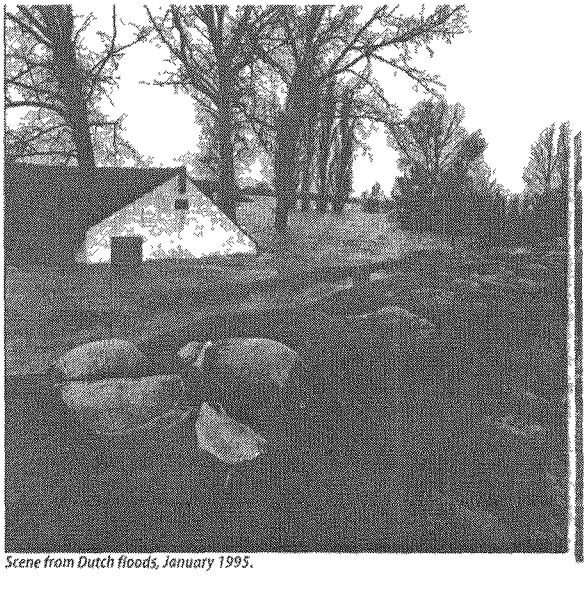
As in any emergency, successes were due to a mix of good planning, good implementation, improvisation and some luck. Among the factors that led to a smooth evacuation:

- ***An updated, approved emergency plan for the city and region.*** Nijmegen developed an emergency plan in early 1994, right after the December 1993 flood. It was approved in early 1995, weeks before the second flood. The plan served as a model for other nearby areas.
- ***Tailored evacuation plan and successful first evacuation.*** Nijmegen police developed a sub-plan specifically for evacuation as soon as 1995 high water levels approached those of 1993. 60,000 citizens in the Nijmegen area were the first to evacuate; the successful operation gave confidence to others in the province.
- ***Integrated communications strategy.*** Communications strategies were part of the emergency plans developed in 1994. Steps had been taken so that information officials were part of the decision-making crisis management team. Good planning ensured that the public and press were informed on a regular basis about the threat of flooding and when and why evacuation was needed. As a result, about 75% evacuated at least 24 hours before the deadline.
- ***Collective memory.*** People still remembered the 1993 flood, in which cattle drowned, utilities started to fail, and some businesses flirted with bankruptcy.
- ***Slowly rising waters.*** The water rose visibly over a period of several weeks in Europe, giving people time to act without being completely rushed. Before their own waters rose perilously high, people saw large parts of Koblenz and Cologne, Germany, under water. People moved furniture in their homes, and arranged temporary shelter with friends and relatives. Only 3% of those evacuated relied on public transportation and shelter (government plans were for 10%) and less than 3% required public temporary shelter.
- ***Cultural homogeneity.*** Virtually all inhabitants spoke the same language, avoiding potential linguistic or cultural misunderstandings in a crisis situation.

Sources: Proceedings, 2nd [illegible] of Local Authorities [illegible] April [illegible]

[illegible] Nijmegen 1995," [illegible] City of Nijmegen, Postbus [illegible] Nijmegen [illegible] Fax [illegible]

"Mass Evacuation During the Dutch Floods," [illegible] The Netherlands.



Scene from Dutch floods, January 1995.

Focus on Communications

The smooth communications plan for press and public was one of the key factors for the successful operation. For people to calmly leave the area in stages, with a minimum of rumours and conflicting press reports, city authorities need clear communications strategies developed in advance.

"If you have never experienced it, you will have no idea what large-scale international press interest is all about – an enormous herd of reporters, cameramen, technicians, each with their own language, their own wishes and their own need for an exclusive story," points out John De Munnik, the public relations manager for the city. "For press officers the emergency starts earlier than for other officials involved and ends later, with the corresponding consequences for staffing and workload. Press interest rises noticeably with the water levels at a moment when there is not yet any operational reason whatsoever to take measures. And at the moment when all operational services take a rest after having accomplished their mission, press and public go on asking questions for weeks."

Successful elements in dealing with the press and public included:

- ***Communications was part of the overall emergency plan.*** "Anyone who has no plan is totally dependent on improvisation and thus runs the risk of chaos," DeMunnik noted. "Essential for emergency action is a good balance between preparation and improvisation. Crisis management is about setting up a good structure, seeing to it that people can do their work undisturbed and providing proper communication channels... Everyone involved must know who decides about what." For example, communications officers for operational government services and local towns in the region were asked to provide all communications by fax, and only comment on their own field of activity.

- ***Access to radio.*** Officials contacted the regional broadcasting corporation to ensure that a radio station could be reached around the clock and transmit official announcements within two minutes. The public was informed of this plan. As a result, local citizens found the regional radio station to be the most trustworthy of various information sources, and in some municipalities radio was the primary source of information.
- ***High Water Information Line.*** 100,000 calls were handled in one week, from as far away as Australia. 15 phone lines (and eventually 13 more) were set up apart from the operational phone lines, so that operational activities could continue without interruption. In a special room filled with notice boards, maps, extra phone lines and tv-teletext sets, information officers trained municipal employees to answer questions. During the peak period, 100 different people per day were recruited by the City Personnel Department from various municipal services and trained by information officers for the city. Due to the heavy workload, four hours per day was the maximum amount of time people could reasonably answer questions.
- ***Regular briefings for changing shifts of press officers, including confidential background information.*** To prevent panic and rumours, a unified message is essential. Briefings of the situation were planned into schedules for press officers. They learned the background of decisions, implementation concerns and likely developments on a regular basis. "This approach to a press officer's duties is still far from usual. Quite often spokesmen hear no more than is allowed to come out. Due to a lack of background knowledge, they may be taken by surprise by journalists – with their fast connections and good contacts," said De Munnik. "For a spokesman to do his job properly, he needs to have sufficient background knowledge to act in the spirit of the management team."
- ***Regular briefings for media.*** Journalists were briefed regularly. Information officers used several languages in dealing with foreign reporters. No preferential treatment was given for television or big newspapers. For emergency action, local and regional media played an essential role in providing information to the public.
- ***A fast response to rumours and errors.*** Rumours and errors cannot be completely prevented. Their effect can be weakened by providing information as openly, quickly, correctly and completely as possible before people start to guess. The most striking rumour at the time was that an embankment would be blown up on purpose, derived from a local medieval custom that by cutting the embankment across the river, it would reduce the strain on one's own side. Notes De Munnik, "If rumours start, as in this case, the best solution is a firm and fast correction."

Colombia

Medellin: A City-Wide Effort Shows that "Prevention Pays"

Medellin is representative of dilemmas facing many developing world cities, where hope and despair coexist. Despite natural and technological hazard threats, civil conflicts, rapid population growth and poverty, a city-wide commitment has emerged to reduce vulnerability to disasters. The efforts of Medellin citizens were recognized at the first Latin American Conference of Local Organizations Confronting Disasters and Emergencies in Santiago, Chile, where it was mentioned as a leading city in disaster prevention and response organization.

Medellin is notable because it integrates risk management practices in everyday activities -- from environmental protection, to urban housing, technical research, scientific monitoring and civic education. Dynamic teams of people, in universities and government offices, are working in neighbourhoods throughout the city in a wide range of programmes. They are motivated because Medellin faces frequent threats from landslides, floods and earthquakes, and because socioeconomic vulnerability is growing. The process is made easier because recent changes in the national constitution have encouraged decentralization of disaster-related issues to local governments.

Local governments in Colombia have a short history of decentralization on disaster-related (and other) issues. In 1985, the city of Armero was buried by mudslides from the volcanic eruption of Nevada del Ruiz, killing about 25,000 people. This event, a turning point in Colombian efforts to mitigate disasters, led to the creation of a National System of Disaster Prevention and Response. The new system explicitly delegates responsibilities to regional and local authorities. Local authorities were encouraged to form committees headed by the mayor, with representatives from health, civil defense, Red Cross, police, planning and other offices. As city administrators have taken a greater role in making a safer environment, communities have become more involved. Cali, Manizales and Ibaque are other examples of a new social and political commitment to disaster mitigation in Colombia.

Medellin, Colombia's second largest city, has 1.8 million people, and an 18% annual growth rate. Nearly all of the city's slums, which house 200,000 people, are on the city's steep hillsides. Situated in a narrow valley at 1500 meters, the city is surrounded by steep hillsides, rivers and flood basins. Floods and landslides are an annual reality. Medellin is also in a high-risk zone for earthquakes.

Since a 1987 landslide killed more than 500 and left 3500 homeless, city inhabitants have committed themselves to making Medellin safer from natural hazards. A new municipal system for prevention, response and rehabilitation has been able to integrate risk management strategies with municipal physical, social and economic planning. Community participation has changed local attitudes about reducing risks, and the new strategies are bearing fruit. Landslides have decreased from 533 in 1993, to 222 in 1994 and 191 in 1995.

Sources: "Prevention of Disasters in Medellin," Luis Fernando Gonzalez M., UNDP-City of Medellin, June 1996, and "Disaster Mitigation in Medellin: A Social Commitment," Helena Molin Valdes, IDNDR Regional Office for Latin America/Caribbean, June 1996. For more information, contact: Nora Eugenia Villegas Menas, Directora, Sistema Municipal de Prevencion y Vencion de Desastres, Calle 44 No. 52-165, Centro Administrativo La Alpujarra, "Edificio de la Ciudad, Piso 12 Oficina 1206, Medellin, Colombia. Ph: (57 4) 262 5752, Fax: (57 4) 3811497.

Medellin's city-wide commitment to reducing risks includes:

- **Political and financial commitment.** Disaster prevention and management strategies are incorporated in the *Strategic Development Plan of Medellin*, approved by the city council and by popular consensus through open discussions and exhibits. This strategy includes the creation of a *Municipal System of Prevention, Response and Rehabilitation* that depends on the Mayor's Office, and an *Executive Board* (12 committees, including education, planning, housing, response, rehabilitation, etc.) and a *special financial management account* within the municipal budget. Luis Fernando Gonzalez, coordinator of a joint UNDP-City of Medellin disaster prevention project, notes that the aim is "to overcome the common problem in this field: applying multiple, unconnected expedient measures, which imply relatively large financial outlay, but which have relatively little impact on the community."
- **Scientific research and monitoring.** Universities and local authorities have worked together to develop risk assessment maps for most neighbourhoods, software to predict and analyze risk levels, and a disaster prevention geographical information system. Special programmes for landslide, flood and seismic monitoring are constantly updated. City administrators regularly meet with representatives from the university and the community at large to determine and address prevailing vulnerabilities
- **Environmental programmes.** The "My River" Institute, created to protect the rivers of Medellin, incorporates disaster prevention and preparedness measures in activities for sanitation, environmental protection, education, social organization and public information.
- **An integrated programme to improve slum neighbourhoods.** The local government community members, UNDP and the German government agency are working together in high-risk areas to stabilize slopes, improve sites, and, if necessary, relocate families.
- **Civic education.** An educational programme "Our commitment to the earth," launched in 1992, has raised awareness about links between man, the environment, society and disasters. It has focused on primary and secondary schools, universities, community leaders and public servants. The second phase, launched in 1995, is called "Disaster Prevention in Medellin: a commitment to development on a human scale" and includes a two-year, city- approved Educational Plan for Prevention, a training plan for community leaders, teachers and public servants; a public information programme through local media; and an "adopt a tree" campaign, targeted to families through media and schools

Children plant trees on Medellin hillsides to prevent landslides and floods, as part of the "Adopt a Tree" campaign and reforestation effort. Photo credit City of Medellin, Disaster Prevention and Response Office

Japan

Kobe Rises from the Ashes

Two related messages stand out from the Kobe earthquake of January 17, 1995. The first is a stark reminder that many cities are at risk to disasters of tremendous scale and complexity, like the disaster of Kobe. The second message from Kobe is that disaster mitigation can be successfully integrated in urban development plans in the reconstruction phase. There are tradeoffs, however, in carrying out mitigation measures only after disaster strikes. During reconstruction, protective measures will not help those whose lives have been lost, cultural treasures that cannot be replaced, or businesses that cannot be revived.

Scale. The Kobe earthquake was the costliest disaster ever, and the first major earthquake to hit an urban area in postwar Japan. Economic damage is about $100 billion – about half of Kobe region's normal yearly economic output. Over 436,000 buildings burned. About 6,300 people died and 34,000 were injured. 230,000 were homeless.

Complexity. The earthquake triggered a remarkable range of secondary disasters and disaster threats, and shows the need to plan for compound disaster threats. First, tremendous shaking devastated buildings and infrastructure and triggered landslides. Within minutes, sixty fires blazed from the earthquake. More landslides threatened ten days later, as water from heavy rains penetrated cracks in buildings. Six months later, a typhoon affected the area, causing flooding in temporary housing units.

Reconstruction. Both the scale and the complexity of the disaster have posed formidable economic, emotional and logistical challenges for Kobe citizens. The reconstruction price tag is at least $120 billion. Moreover, the psychosocial trauma of a shattered community remains, as those who lost children, parents, relatives, friends, homes and jobs struggle to readjust. At the same time, the disaster provides a window of opportunity for sustainable development plans that take disaster threats into account. "It's not enough merely to repair the quake's damage," said Atsushi Shimokobe, head of Kobe's Reconstruction Committee. "We have great dreams concerning Kobe's role as a centre in the future of Asia."

Reconstruction efforts have been impressive. Electric power, gas, water, telecommunications, and major road and train routes were restored within months. About 20% of the population needed temporary housing. The local government provided 48,000 units within several months, after dealing with issues such as finding available land for rent with utilities in place. 70% of port operations were restored within a year (the port was handling 30% of Japan's container cargo). Kobe mayor Kazutoshi Sasayama considers speedy and efficient removal of debris one the city's most important (if underrated) achievements in the reconstruction process to date. 60% of the debris was successfully reused in landfills.

T Wagner/Sabo/Contrasto

Scene from the world's costliest urban disaster

The images of Kobe's disaster riveted world attention, and triggered humanitarian assistance, for a time. But while the world's attention has shifted to other issues, Kobe citizens will continue to rebuild for years. The urban centre still has burned and cracked buildings, and some people are still in temporary housing. As Sasayama noted to a Time magazine reporter, "It will take five more years to finish the reconstruction and another 10-20 years to heal all the wounds."

Lessons learned. Kobe residents have had ample opportunities to assimilate lessons of the quake. Not only can they rely on their own vivid memories, but also on the hundreds of conferences and research studies that have analyzed the Kobe experience from many professional

Kobe includes "disaster-resistance" measures in reconstruction plan

There is a clear link between the "lessons learned" from the quake and Kobe's new urban development plan. A part of the plan is dedicated to "creating a disaster-resistant metropolis, where societies can live in confidence." A variety of measures are underway to protect the Kobe area from earthquakes and related secondary disasters such as fires, landslides and industrial explosions. Among these measures are:

- Underwater storage tanks added to buildings
- Firebreak zones along rivers and roadways
- A new Rokko Mountains Greenbelt to reduce landslide risks
- Hanshin Canal Project to ensure reliable water supply
- Ten-year community reconstruction committee
- Backup systems for utilities and hospitals

Highlights of the Hyogo Phoenix Plan

The emphasis is on:

- **Vulnerable groups** (handicapped, aged, etc. receive special public services)
- **Cultural exchange** (especially internationally)
- **Disaster-resistant metropolis** (see details, left)
- **Economic growth** (strengthening existing industries and encouraging new ones)
- **Communications** (positioning to be an Asian communications/transportation hub)

points of view. At a recent international conference on local disasters, the Kobe mayor highlighted these "lessons learned" in his keynote speech and a private interview.

- **Improve seismic resistance of existing buildings.** "Many lives were lost due to collapsed buildings," noted the mayor. "Many of the old houses did not meet seismic standards established in 1981. Retrofitting of old houses is necessary and will need to be done over time."
- **Improve firefighting capability** by using all available water sources from rivers and sea. (After the quake, the many simultaneous fires overwhelmed the existing fire services. Roads were blocked; hydrants didn't work. Water hoses had to be joined over a distance of several kilometers to get water from the sea.)
- **Protect lifelines.** "We should have backup systems for public facilities, if possible," noted Sasayama. "Of course this costs alot. We are trying to pay attention (to this issue) as we rebuild." With telecommunications, for example, Kobe is considering a duplicate system with optic fibers. (After the quake, many lines were damaged; the few working ones were jammed. People poured into the city for information and were stranded, compounding logistical problems.)
- **Community participation.** "People – individuals and corporations – must participate in *preventive plans* in the community to avert future disaster risks." Community members need to have *basic tools* on hand: after the quake, most search and rescue was done by Kobe citizens, who were lacking tools such as crowbars. Community members also need to be better informed through *awareness and education programmes*, particularly for basic firefighting and stockpiling measures. They must also work closely with NGOs. (During the quake, NGOs and community volunteers played a key role, for they were flexible in ways that official authorities were not.)

"What is needed for the reconstruction," noted Kobe's mayor, "are three things: money, technical skills and the understanding of people in the community. Most important is the latter. None of these goals are easy; but the community must pay for reconstruction, and they must participate in the process, with a good understanding of the situation...People pay attention to their own problems, (but for successful reconstruction), they must pay attention to community as a whole. So we try to provide professionals to give them guidance, and councils for consensus building. It is a time-consuming process, but it seems to be the only way to get support."

Message to Communities

Asked for just one message to share with other communities facing disaster threats, Kobe's mayor said: "Wherever you live, city or village, you have to keep in mind that you must protect yourself. You are the first person to protect yourself. You have to prepare to protect yourself. You cannot fight alone. You must have a system to fight disasters. You have to have cooperation with relations and your colleagues. Each community has to have its own plan to respond in case of emergency. Your community may not be enough. If not, ***then*** you can work with other countries. But first you must protect yourself, for yourself – wherever you are in the world."

Sources: Interview with K. Sasayama, Amsterdam, 23 April 1996

K. Sasayama, Keynote speech and video, 2nd International Conference of Local Authorities confronting Disasters and Emergencies, 22 April 1996

Hyogo Prefecture, "Hyogo Rises from the Ashes: Recovering from the Great Hanshin-Awaji Earthquake," video, 1996

J. Walsh, "Kobe One Year Later," Time, 22 Jan. 1996

Philippines

Harnessing the Power of the Private Sector

Worldwide, the private sector is becoming increasingly involved in urban disaster management. Disaster response generally has been the entry point. In some countries, however, NGOs, private firms, business foundations and associations are now beginning to take steps to protect their own assets, and to initiate preventive measures in the community.

The Philippines provide an example of the evolving role of the private sector in urban disaster management. Philippine NGOs number in the thousands, and are a dynamic local force in disaster and development issues. Since the end of the Marcos regime in 1986, NGOs have evolved rapidly in their managerial and networking skills. New roles for Philippine NGOs in development activities were set out in the 1987 national constitution, and further emphasized in the 1991 Local Government Code.

Because frequent natural hazards make the Philippines one of the most disaster-prone countries in the world, NGOs and private companies have been deeply involved in disaster relief in the 1990s. They are now moving to incorporate mitigation measures in their activities.

Involvement in disaster issues for some private sector partners came after the 1990 earthquake of Baguio City and the volcanic eruption of Mount Pinatubo a year later. Some members of the Philippine Business for Social Progress (PBSP), established 20 years earlier to address local development issues through NGO-business partnerships, created the Corporate Network for Disaster Response (CNDR). These organizations realized that their development work was being disrupted and resources were being diverted to disaster relief. New approaches were needed to address links between disasters and development. Since 1992, CNDR has worked in relief and recovery programmes for the Mount Pinatubo eruption, Typhoon Ruping, Typhoon Ormoc, Mount Mayon lahar flows, and other disasters.

PBSP is part of another successful private sector partnership, the Inter-Agency Network for Disaster Response. In addition to PBSP, the group includes the Philippine National Red Cross, Adventist Development and Relief Agency, the Citizens for Disaster Rehabilitation Network, the Council for People's Development, Catholic Relief Services, the Luzon Secretariat for Social Action, the Philippine National Council of Churches and the Philippine Rural Reconstruction Movement. These networks work closely with the government, particularly through representation on the Social Reform Council, a cabinet-level body that reinforces government and non-government partnerships on disaster management issues.

The tragedy and urgency of disasters often inspire heroic efforts during the disaster response phase, and have brought groups together in the Philippines that otherwise may have been working in parallel. In a typical and understandable pattern, these groups initially focused on disaster response coordination. They have since extended their cooperation to areas of rehabilitation, and then to training and preparedness activities for future disasters. They are now beginning to consider coordination of prevention and mitigation measures.

Private sector organizations involved in disaster management in the Philippines

Environmentalists, psychologists, land-use planners, construction workers, computer specialists, cartographers... the list of professional skills needed to protect cities from disasters is long and varied. So, too, are the types of organizations that can contribute to this process. In the Philippines, the Inter-Agency Network for Disaster Response (IANDR) has identified several types of private sector organizations which have a role in disasters – whether, before, during or after. IANDR is now analyzing their institutional mandates, to better determine their roles. IANDR plans to use the list to coordinate activities in various phases of disaster management.

- Development NGOs
- Disaster Management NGOs/ Institutes
- Issue-Oriented NGOs
- Religious Organizations
- Specialized Groups (health professionals, business associations, local civic organizations, academia)
- Community-Based NGOs
- Business Foundations
- Government-initiated NGOs (relief only)
- Politician-driven local NGOs (relief only)
- Private companies

N Dickinson/Still Pictures

Shantytown devastated by a flash flood, Ormoc City, Philippines.

"NGOs need not crowd the relief begging bowl," notes Marcia Feria Miranda, a Filipina expert on partnership development "There is room for all, and not only when disaster strikes" Explaining the evolution of partnerships for disasters and development in the Philippines, she told participants at the 1994 World Conference on Natural Disaster Reduction: "There are no partnerships -- particularly in prevention, mitigation or preparedness -- that can be looked on as a model of intersectoral coordination and efficient use of resources What exists are the basic building blocks needed for partnership among NGOs, nationally and at the provincial level; in the corporate sector, and among governments and donors."

Sources "Multi-Agency Response to Storm the Philippine Experience," Juan Blenn Huelgas, National Coordinator, Inter-Agency Network for Disaster Response and Sectoral Representative Social Reform Council Office of the President Proceedings, conference presentation, and interview at 2nd International Conference for Local Authorities Confronting Disasters and Emergencies, 22-24 April 1996

Marcia Feria Miranda, "Building Bayanihan -- The partnership role of NGOs in a new disaster management paradigm," in "From Disaster Management to Sustainable Development How the public sector, private sector and NGOs work together," World Conference on Natural Disaster Reduction proceedings Main Committee Session D World Health Organization 1994

Sudan

Flood Committees Help Local Areas Take Protective Measures

The Sudanese government's decision to form a national network of flood commitees is making a difference in how local authorities reduce vulnerability to floods.

Khartoum, Sudan's capital, is famously situated around a juncture of the White Nile and the Blue Nile rivers. The city has swelled in recent years to 4.2 million people; 1 6 million have migrated to the city due to civil conflict and famine In 1988, floods from seasonal rains covered nearly 40% of Khartoum. The city's residents had no warning about the impending flood, which was the worst one to hit the area since 1946 Millions of dollars worth of property was destroyed, and 28% of the people were affected

The floods were used as a case study at a national workshop of the UN Disaster Management Training Programme, attended by government officials, NGOs and UN agencies in 1993. Following a recommendation of the workshop, the Sudanese government subsequently decided to form a National Flood Committee and sub-committees in flood-prone communities throughout Sudan.

A local community sub-committee immediately started work on flood embankments, with help from the national government, NGOs and community residents. In 1994, Sudan experienced floods similar to those in 1988 The new flood embankments, early warning measures and greater community awareness made a difference. In 1994, there was very little damage to areas previously affected.

C Guanta/Still Pictures

Children in Khartoum, Sudan.

Summarized from the paper provided by Yousef Bakheit Idris, Co-ordinator UNDMTP Africa For more information contact Yousef Bakheit Idris, UNDMTP for Africa PO Box 60110, Addis Ababa, Ethiopia, Tel (251 1) 510 152 Fax (251 1) 511 021

Part Three: Where Do We Go From Here?

Policies for Safer Cities

Reducing the impact of disasters in urban areas is not something that will happen overnight, nor even within the time span of the International Decade for Natural Disaster Reduction (1990-2000). The cases in this book illustrate that solutions are available. What is needed is a change in people's attitudes, based on the conviction that cities can organize themselves to resist disasters, and the will to act on this conviction. Here one may draw a parallel with the gradual changes in environmental awareness over the last 25 years. To make cities safer from disasters, what is needed is to build a "culture of prevention" among society at large.

When crises and negative trends persist, it is because the solutions may not be easy, and require tradeoffs. Each year, building codes are ignored and zoning laws are overlooked as communities continue to expand in areas prone to earthquakes, landslides, floods, tidal surges, volcanic eruptions, high winds and other natural hazards. Already, at least a quarter of the world's population lives in high-risk areas. Each year, choices are made at many levels in society, that make people ever-more vulnerable to disasters.

Today the dominant approach to disasters is relief-oriented, whether one speaks of villages, towns or cities. Partly, this is due to fatalism, a belief that disasters are "acts of God." Nevertheless, more organizations (at all levels in society) are undertaking post-disaster reconstruction with long-term development in mind.

It takes just one more step to make cities safer – ***before*** the next disaster strikes. While early, targeted responses to natural hazards and socioeconomic vulnerabilities are more cost-effective and administratively manageable than large clean-up operations, it is never too late to start. Paradoxically, the post-disaster period is often a good time to launch disaster and vulnerability reduction programmes, because public awareness and political will is high. Those are the two elements that keep these policies from becoming reality.

Policy Guidelines for Safer Cities

The most important precondition is political commitment – locally and nationally – to address urban disaster risks. International support for local capacity building in high-risk areas is also important – but first it is the responsibility of individuals, city authorities, and national authorities to guarantee safer cities.

1. Encourage development policies that reduce vulnerability to disasters.

► **Land-use.** Introduce/update regulations for faults, slopes, wetlands, and other disaster-prone areas. Ban dense settlements and infrastructure development in hazard-prone areas, and replace them with urban agriculture and/or recreation areas.

► **Risk assessment.** Carry out hazard and vulnerability assessments for the urban areas in question. Use findings to develop special programmes that reduce local vulnerability to disasters, and use the results in development projects.

► **Disaster Impact Assessment.** Make disaster impact assessments a routine measure in feasibility studies for development projects. An option: make disaster impact assessments a part of environmental impact assessments (better known and more widely used).

► **Design, Construction, Maintenance.** Train community members and give financial incentives to encourage safe, cost-effective, culturally appropriate construction. Enforce design and construction regulations. Protect household belongings and office equipment through maintenance and by securing objects.

► **Integration.** Link projects and policies for environmental management, disaster reduction and urban planning. Develop sustained partnerships between different professions and parts of the community to streamline ad-hoc, short-term or competing efforts.

R. Koch/Contrasto

Rapidly built new constructions were first to collapse in the 1988 Spitak earthquake in Armenia

2. **Prepare city managers to cope with emergency situations.**

► **Emergency Management Planning.** Clarify roles and responsibilities in advance through municipal, provincial and national plans. Include all partners in the community that may have a role.

► **Institutional Strengthening.** Train professionals to carry out new responsibilities, and include refresher courses. Budget enough money to enforce regulations, hire extra staff (if needed) or obtain new equipment and supplies. Maintain and update equipment and databases. Strengthen legal mandates for institutions with key disaster management roles. Legally decentralize responsibilities (and resources) to municipalities.

► **Communications Channels and Warnings.** Establish channels in advance for authorities to announce early warning, evacuation and/or relief measures. Make scientific warnings available to local decision-makers and the public in a way that is understable and timely

3. **Prepare community members to address emergency situations.**

► **Public awareness and education.** Make people aware of their responsibility to protect themselves. Launch and institutionalize public education campaigns. They should raise awareness about disaster risks, and preventive/preparatory measures that people can act upon. Local media, the formal education system, professional training programmes and NGO activities should be part of the process.

► **Community-based programmes and solutions.** Consult regularly with community members (especially those most at risk) to identify feasible solutions. Carry out community-based hazard and resource mapping, as a basis for programmes suited to local needs

4. **Have special programmes for high-risk situations.**

Priorities include:

► **Informal settlements.** Address issues such as land tenure, equity, job creation, provision of basic services

► **Essential facilities.** (Water, gas, phone, hospitals, schools, community shelters...) Retrofit existing buildings. Include disaster-resistant measures in new buildings. Build backup systems. Train personnel providing essential community services for alternative disaster scenarios.

► **High-risk groups.** Focus on: children, the elderly, handicapped, low-income groups. Sample programmes: targeted education campaigns, income-generating projects, specialized health care, specific construction measures (such as ramps), etc.

► **Cultural treasures.** Retrofit important architectural sites; secure objects, maintain buildings

► **Buildings with hazardous substances.** Retrofit and maintain buildings and secure objects. Relocate buildings and/or substances in densely populated residential areas

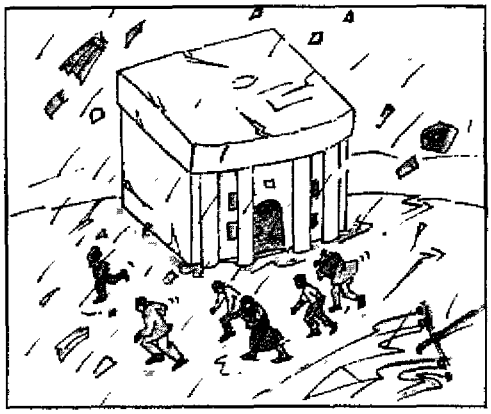
Adapted from: Disaster Reduction in Urban Areas, IDNDR Secretariat policy paper, November 1995. Contact the IDNDR Secretariat for the full version of this paper by L. Vrolijks with ... Palm

Making Cities Safer...

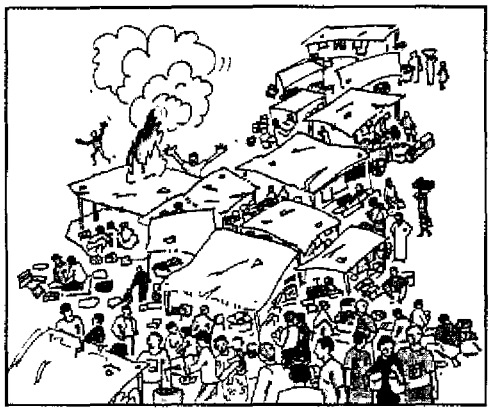
Cities at Risk

(unsafe practices)

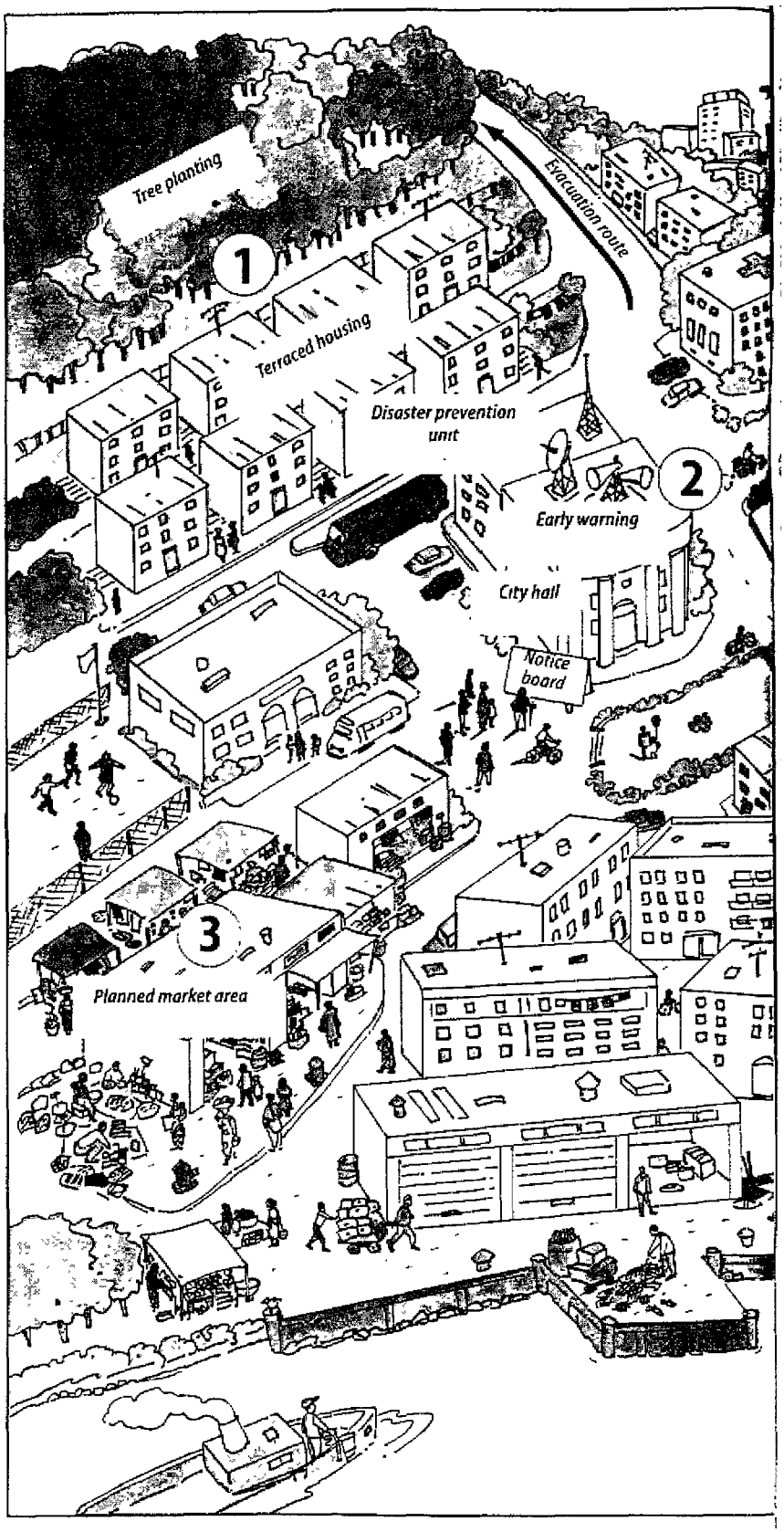
1 Makeshift housing on unstable slopes. Deforestation.



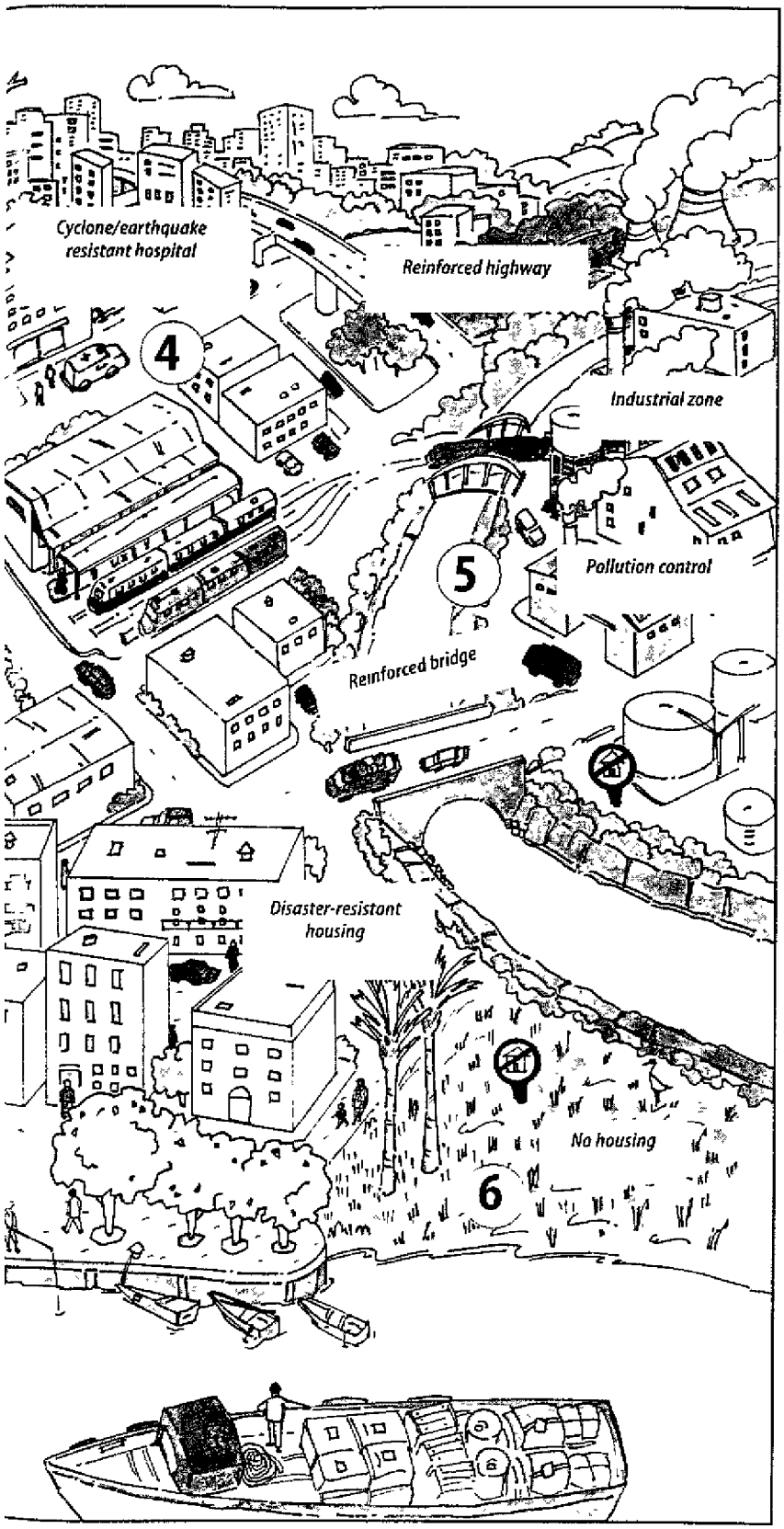
2 Inadequate emergency planning and warning. Unmarked evacuation routes.



3 Lack of urban planning. No safety measures. Lack of open space.

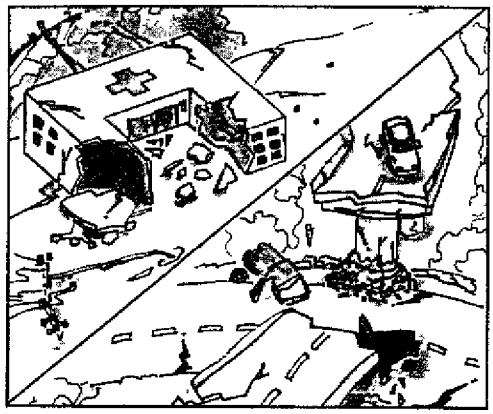


before disaster strikes



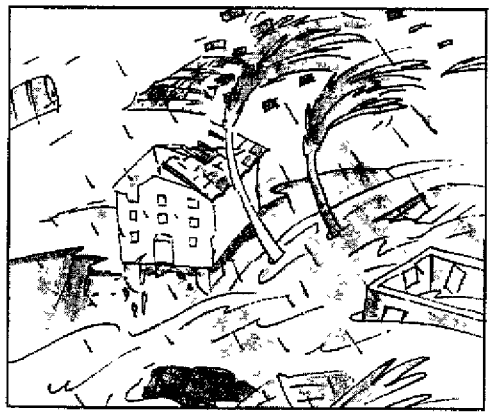
Cities at Risk

(unsafe practices)



4 Inappropriately built and poorly maintained essential facilities and services.

5 Housing and industry too close to each other. Bad management of industrial wastes. Technological disaster risks.



6 Inappropriately constructed buildings in high risk locations.

Contacts on Urbanization and Disasters

The following organizations can be contacted for further information on various aspects of urbanization and disasters. The list is divided into three parts. The first part contains contacts of relevant organizations which provided information for this publication and/or produced reference materials used in this publication

The second part is a list of city networks which can provide further contacts or information on the topic. The third part is a selected list of organizations which have information about disaster mitigation on the internet.

For those seeking additional contacts, please see also Part II of this publication. It contains full contact information for each case example.

For additional contacts in specific countries, IDNDR National Committees (which exist in about 140 countries) can provide more information.

(All lists are in alphabetical order by organization.)

1. Local, National, International Contacts

This section contains individuals and organizations which were information sources for Cities at Risk (excluding those listed separately in Part II). They include a wide range of professions (health, housing, risk mapping, education, public awareness, etc.) and include a mix of organizations at local, national, regional and international level. Most of the individuals listed provided advice in interviews and/or provided books, articles, conference recommendations, further contacts, etc. In a few cases, organizations were added that were not contacted, but were publishers of recommended materials used in this publication.

Asian Disaster Preparedness Centre
G P O Box 2754
1051 Bangkok, Thailand
Tel: (66 2) 524 5354
Fax: (66 2) 524 5360
E.mail: davholl@ait ac.th
Contact: David Hollister, Shelter & Urban Development Officer

Australian IDNDR Coordination Committee
P.O. Box 1020, Dickson ACT 2602, Australia
Tel: (61-6) 2665408
Fax: (61-6) 2571490
Contacts Trevor Hatchard and Susan Whitby

Bogazici University
Kandilli Observatory and Earthquake Research Institute
Department of Earthquake Engineering
81220 Cengelkoy, Istanbul, Turkey
Tel: (90 216) 3326560
Fax (90 216) 3080163
E.mail erdik@boun edu tr
Contact Mustafa Erdik, Professor and Chairman

British Geological Survey
Murchison House, West Mains Road
Edinburg EH9 3LA, U.K.
Tel: (44-131) 6671000
Fax (44-131) 6620216

Bureau de Recherches Géologiques et Minières - SGN/VPE
Savoie Technolac
B.P. 221, 73374 - Le Bourget du Lac
France
Tel: (33) 79253132
Fax (33) 79253130
Contact Philippe Masure, Director (Natural Hazards)

Department of Social Welfare and Development
Batasan Pambansa Complex, Constitution Hills
Quezon City, Philippines
Fax: (63-2) 7416939
Contact: Lina Laigo, Secretary (Minister)

Egyptian Red Crescent Society
29 El Galaa Street, Cairo, Egypt
Tel (202) 5750558
Fax: (202) 5740450
Contact. Prof. Mamdouh Gabr, Secretary General

GeoHazards International
Blume Earthquake Engineering Ctr
Stanford, CA 94305-2215, USA
Tel: (1 415) 7233599
Fax (1 415) 7233624
E mail. tucker@civ.stanford edu
Contact: Brian E. Tucker, President

INMARSAT
99 City Road
London EC1Y 1AX, UK
Tel: (44-171) 7281382
Fax: (44-171) 5280020
E mail: eugene staffa@inmarsat.org
Contact: Eugene Staffa, Manager, Disaster, Emergency and Aid Communications

Institution of Mechanical Engineers
Great George Street
Westminster, London SW1P 3AA, U K
Tel: (44-171) 2227899
Fax: (44-171) 2224557
Contact: Stuart Mustow

Institution of Civil Engineers
1 Great George Street, West Minster
London SW1P 3AA, U.K.
Tel: (44-171) 8399963
Fax: (44-171) 2331806
Contact: Ian Moore

Inter-Agency Network for Disaster Response
3/F, p/o PBSP, PSDC Bldg.
Real cor. Magallanes Str
Intramutos 1002, Manila, Philippines
Tel: (63-32) 95676
Fax: (63-32) 2311970
Contact Juan Blenn Huelgas

Intermediate Technology Development Group
Myson House
Railway Terrace
Rugby CV21 3HT, U.K.
Tel: (44-1788) 560631
Fax: (44-1788) 540270
E.mail: itdg@gn.apc.org
Contact: John Twigg

International Association for Earthquake Engineering (IAEE)
Kenchiku Kaikan 3rd Floor
5-26-20 Shiba
Minato-ku
108 Tokyo, Japan
Tel: (81 3) 453 1281
Fax: (81 3) 453 0428
Contact. Prof. Tsuneo Katayama

International Federation of Red Cross and Red Crescent Societies (IFRCS)
P O. Box 372, Geneva 19, Switzerland
Tel: (41-22) 7304222
Fax: (41-22) 7330395
Contact Yasmin Aysan, Director, Disaster Preparedness Department

International Institute for Environment and Development (IIED)
3 Endsleigh Street, London WC 1H ODD, U.K.
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(Specialization - squatter settlements)
Avenida Corrientes 2835
Cuerpo A - 6 piso B
1193 Buenos Aires, Argentina
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International Union of Local Authorities (IULA)
Wassenaarseweg 39
2595 CG Hague, Netherlands
Tel: (31-70) 3244032
Fax: (31-70) 3246916
Contact. Astrid Van Der Veer

LA RED
PO Box 18-0620
Lima, Peru
Tel/Fax: (5114) 466621
Contact. Andrew Maskrey, General Coordinator

Mega-Cities Project
The Institution of Civil Engineers
1 Great George Street, London SW1P 3AA, U.K.
Tel. (44-171) 2227722
Fax. (44-171) 7991325
Contact Louis Solway, Project leader

National Survey of Seismic Protection
Government of the Republic of Armenia
Davidashen - Massiv IV, 375054 Yerevan, Republic of Armenia
Tel. (7-8852) 282811
Fax: (7-8852) 266813
E mail
ansysp@adonis ias msk SU
Contacts: Prof Dr. Sergey Balassanian, President and Dr Michael Melkumian

Natural Hazards Research and Application Centre
Institute of Behavioural Science No. 6 University of Colorado at Boulder
Campus Box 482, Boulder
Colorado 80309-0482, USA
Tel: (1-303) 492 6818
Fax: (1-303) 492 2151
E.mail.
butler@spot colorado EDU
Contact David L. Butler, Editor, Natural Hazard Observer

Office of Disaster Preparedness
City of Yokohama, Japan
Tel: (81-45) 6712171
Fax: (81-45) 6411677
Contact: Shizuya Kuriya

Organization of American States (OAS)
Department of Regional Development, Natural Hazards Project
1889 F. Street, N.W., Washington DC 20006, USA
Tel: (1-202) 4586295
Fax. (1-202) 4583560
Contact. Stephen Bender, Project Chief

Oxford Centre for Disaster Studies (OCDS)
Oxford Brookes University
Gipsy Lane, Headington
Oxford OX3 0BP, U.K
Tel: (44-1865) 202772
Fax (44-1865) 516865.
Contact Dr Ian Davis, Managing Director

Pan American Health Organisation (PAHO/ WHO)
525, 23rd Street, N W
Washington DC 20037, USA
Tel: (1-202) 8614325
Fax. (1-202) 7754578
Contact. Dr. Claude de Ville de Goyet, Director, Emergency Preparedness and Disaster Relief Coordination Programme

Prefeitura da Cidade do Rio de Janeiro
Coordination of International Relations and Protocol
Palacio da Cidade, Rua Seo Clemento, 360,
22260-000 Rio de Janeiro, RJ, Brazil
Tel. (55-21) 2863040
Fax: (55-21) 2869246
Contacts: Claudio Garcia de Souza, Coordinator, International Relations and Protocol and Maria Isabel de Vasconcelos Porto Tostes, Architect, Municipal Secretariat for Housing, Rio de Janeiro City Hall

Prefeitura do Municipio de Sao Paulo
Gabinete do Prefeito,
Sao Paulo, Brazil
Contact: Vera Simao, Chief of Protocol and International Relations

School of Earth Sciences
Macquarie University, North Ryde, NSW 2109, Australia
Fax. (61-2) 8509394
Contact: Russell Blong, Director

Sir Alexander Gibb and Partners
Early House, 427 London Road, Reading, U.K
Tel (44-1743) 635000
Fax: (44-1743) 491054
Contact: Scott Steedman

United Nations Centre for Human Settlements (UNCHS)
PO Box 30030, Nairobi, Kenya
Tel: (254-2) 621234
Fax. (254-2) 624266

United Nations Centre for Regional Development (UNCRD)
Nagono 1-47-1, Nakamura-ku Nagoya 450, Japan
Tel. (81-52) 5619377
Fax (81-52) 5619375
Contact: Mr Kaji Hideki, Director

United Nations Educational Scientific and Cultural Organisation (UNESCO)
7 Place de Fontenoy
75007 Paris, France
Tel: (33-1) 45684120
Fax: (33-1) 45669096
Contact. Mr Badaoui Rouhban, Programme Specialist - Bureau for the Coordination of Environmental Programmes

University of Tsukuba
Urban Disaster Prevention Laboratory
1-1-1 Tennoudai, Tsukuba City
Ibaraki 305 - Japan
Contact: Jose Sato

University of the Western Cape
Private Bag X17 Bellville 7535
South Africa
Tel: (2721) 9593243
Fax. (2721) 9593242
E.mail: ifrc@mango zw
Contact: Ailsa Holloway, Disaster Mitigation-Sustainable Livelihoods Programme

U.S. Geological Survey
Office of Earthquakes, Volcanoes and Engineering
905 National Center, Reston, VA 22092
Tel: (1-703) 6486714
Fax; (1-703) 6486717
E.mail: rhamilto@usgs.gov
Contact: Dr Robert Hamilton, Acting Coordinator, Earthquake Hazards Programme

Wellington City Council
2 Turnbull St. Thorndon
PO Box 2199, Wellington, New Zealand
Tel: ((644) 4600650
Fax: (644) 4737982
E.mail: Britton_N@wcc.govt nz
Contact: Dr. Neil Britton, Chief Adviser, Emergency Management Office

World Health Organization (WHO)
20 Avenue Appia
CH 1211 Geneva 20, Switzerland
Tel: (41-22) 7912752
Fax: (41-22) 7914844
Contact. Dr. Samir Ben Yahmed, Coordinator, Emergency Preparedness Programme

World Meteorological Organization (WMO)
Case postale 2300
CH-1211 Geneva 2
Switzerland
Tel: (41-22) 7308111
Fax: (41-22) 7342326

2. City Networks

This section provides contact information on international city networks. Some of the headquarters of these networks have information or programmes about urban disaster mitigation. All of these networks have member organizations interested and/or knowledgeable about various disaster mitigation aspects.

Habitat International Coalition (Main Office) (NGO network)
Cordobanes no. 24
COL-San José Insurgentes
Mexico DF 03900, Mexico
Tel: (525) 5935194
Fax: (525) 5935194
Contact: Enrique Ortiz, Executive Secretary

Local Authorities Confronting Disasters and Emergencies (LACDE)
Union of Local Authorities in Israel
3 Haftman Street, Tel Aviv, 61200 Israel
Tel (972) 36955024
Fax (972) 36967447

International Council for Local Environmental Initiatives (ICLEI)
City Hall, East Town, 8th floor
Toronto, Ontario M5H 2N2, Canada
Tel. (1-613) 4163921462
Fax: (1-613) 4163921478

International City Management Association (ICMA)
777 N. Capital Street
Suite 500, N. E.
Washington D.C. 20002
USA
Tel. (1-202) 2894262
Fax: (1-202) 9623500
Contact: Don Geis

International Federation for Housing and Planning (IFHP)
43 Wassenaarseweg
2596 CG The Hague
Netherlands
Tel: (31-70) 3244557
Fax: (33-70) 3282085
Contact. Marten Block, Secretary General

International Society of City and Regional Planners (ISOCARP)
Mauritskade 23
2514 HD Den Hague,
Netherlands
Fax (3170) 3617909
Contact Hein Struben, Vice President

Metropolis
World Association of Megacities
61 rue de Babylone
75007 Paris
France
Tel: (33-1) 53856262
Fax: (33-1) 53856269

United Towns Organization (UTO)
22, rue d'Alsace
92532 Levallois-Perret,Cedex
France
Tel (33-1) 47393686
Fax: (33-1) 47393685
Contact: Jorge Sampaio

3. Internet Addresses for Disaster Mitigation

The following is a selection of internet addresses with information about disaster mitigation. Urban disaster mitigation issues are sometimes addressed. The addresses are drawn from IDNDR Secretariat sources and the following publication: *IDNDR -- Disaster Mitigation, Preparedness and Response. An Audit of UK Assets* (D. Sanderson, I. Davis, J. Twigg, B. Cowden), Oxford Centre for Disaster Studies in association with Intermediate Technology, 1995.

Emergency Preparedness Information Exchange (EPIX)
http://hoshi cic sfu.ca/epix

Environmental Organisation Web Division - Disasters
http://www.wcb.directory com/disasters

Global Emergency Management Disaster Counselling Support Network
http://tin.ssc plym.ac uk/gemc.html

International Decade for Natural Disaster Reduction
http //hoshi.cic.sfu.ca/hazard/idndr.html

Natural Hazards Research and Applications Information Centre, University of Colorado
http://adder.colorado.edu/hazctr/home.html

Quipunet
PO Box 4334, South Colby, WA 98384-0334, USA
E mail:
delgado@bach taisei.co.jp
Contact Alberto Delgado

US Agency for International Development (USAID)
http://www info.usaid gov

US Federal Emergency Management Agency (FEMA)
http://www.fema.gov

US National Oceanographic Administration (NOAA)
http.//hoshi cic.sfu.ca/hazard

Volunteers in Technical Assistance (VITA)
http://www vita org

References (Part One & Part Three)

(References and contacts for Part Two are indicated at the end of each case example)

Part One: Why Focus on Disasters in Cities?

Footnote source:

1. Havlick, Spencer W., "Third World Cities at Risk, Building for Calamity", in *Environment*, Vol. 28, Number 9, November, 1986

2. Fischer, Henry W., "What emergency management officials should know about the media to enhance mitigation & effective disaster response", in: *Proceedings of the 2nd International Conference 'Local Authorities confronting Disasters and Emergencies'* 22-24 April, 1996

An Overview of Natural Hazards and Urban Concerns

Information drawn from the following sources:

Alexander, David, *Natural Disasters*, UCL Press, London, 1993.

DHA/UNDP Disaster Management Training Programme, *An Overview of Disaster Management*, 2nd edition, 1992.

Dolan, Chris, *Hazard-Wise* Classroom Resources for Teachers on Natural Hazards and Disasters, Emergency Management Australia, 1995

Domersen, Natalie, *Learning About Natural Disasters*, IDNDR Secretariat, Stop Disasters Special Issue, 1995.

ICE (Institution of Civil Engineers), *Megacities, reducing vulnerability to natural disasters*, Thomas Telford Publications, London, 1995.

Wijkman, Anders and Timberlake Lloyd, *Natural Disasters Acts of God or Acts of Man?*, London, Earthscan, 1984

Rapid Urbanization Increases Disaster Risk

Footnote sources:

1. Masure, Philippe, 'Risk Management and Preventive Planning in Mega-Cities A Scientific Approach for Action", in *Regional Development Dialogue* (RDD), vol. 15, No 2, Autumn 1994.

2. UNCHS, *Global Report on Human Settlements 1996*, Oxford University Press, 1996

3. UNFPA, *The State of the World Population 1993*, United Nations Populations Fund, 1993

4. UNCHS, *Global Report on Human Settlements 1996*, Oxford University Press, 1996.

5. Linden, Eugene, "The Exploding Cities of the Developing World", in *Foreign Affairs*, Jan/Feb, 1996

6. UNFPA, *The State of the World Population 1993*, United Nations Populations Fund, 1993

7. Ibid

8. UNCHS *Global Report on Human Settlements 1996*, Oxford University Press, 1996

9. Masure, Philippe, 'Risk Management and Preventive Planning in Mega-Cities. A Scientific Approach for Action", in *Regional Development Dialogue* (RDD), vol. 15, No 2, Autumn 1994.

10. Munich Reinsurance, Annual Report, 1993.

11. Blaikie, P., Cannon, T., Davis, I. and Wisner, B. *At Risk: Natural Hazards, Peoples Vulnerability, and Disasters* Routledge, London, 1994.

12. OAS, *Primer on Natural Hazard Management in Integrated Regional Development Planning*, Department of Regional Development and Environment, OAS, Washington, D.C., 1990.

13. Cruz, A. M. F., *Vulnerability Study, Seismic Risk and Reinforcement of Hospitals in Costa Rica*, Paper presented at the International Conference on Disaster Mitigation in Health Facilities, Mexico City, 26-28 February 1996

What Makes Cities Vulnerable to Disasters?

Information drawn from the following sources:

Blaikie, P., Cannon, T., Davis, I. and Wisner, B., *At Risk: Natural Hazards, Peoples Vulnerability, and Disasters* Routledge, London, 1994.

ICE (Institution of Civil Engineers), *Megacities: reducing vulnerability to natural disasters*, Thomas Thelford Publications, London, 1995

Vrojlks L. and E. Palm, *Disaster Reduction in Urban Areas*, Policy paper by the Secretariat of the International Decade for Natural Disaster Reduction. November 1995.

Pan-American Health Organization/WHO, *A World Safe from Natural Disasters – The Journey of Latin American and the Caribbean*, 1994

World Bank, *Environmental Management and Urban Vulnerability*, World Bank Discussion Papers No 168, Alcira Kreimer and Mohan Munasinghe (ed.), Washington, D.C., 1992.

UNCRD/UNDDSMS *The Effects of Disasters on Modern Societies*, World Conference on Natural Disaster Reduction, Yokohama, Proceedings of the Technical Committee Session C, 1994.

How Disasters Affect Urban Areas, Large and Small

Footnote sources:

1. Population statistics are indicative only. Sources include Geneva-based diplomatic consulates, United Nations Population Fund and The State of World Population 1993.

2. Statistics for specific disasters were drawn from:

OFDA, *Disaster History* Significant Data on Major Disasters Worldwide, 1900-present, Washington, D.C., June 1995

Munich Re, Topics- Natural Catastrophes, *Annual review of natural catastrophes 1994*

World Bank, *Environmental Management and Urban Vulnerability*, World Bank Discussion Papers No 168, Alcira Kreimer and Mohan Munasinghe (ed.), Washington, D.C., 1992

The Urban Poor are Most Vulnerable

Footnote sources:

1. ICE.(Institution of Civil Engineers) *Megacities: Reducing Vulnerability to Natural Disaster*, Institution of Civil Engineers, Thomas Telford Services Ltd. 1995

2. Spencer Havlick "Building for Calamity", in: *Environment*, Vol. 28. November 1986

3. Blaikie, P., Cannon, T., Davis, I. and Wisner, B., *At Risk. Natural Hazards, People's Vulnerability, and Disasters*. Routledge London. 1994

4. de Perez, Maria Olga, based on a study by the University of San Carlos, Guatemala

5. Comparative analysis provided by H. Molin Valdes, IDNDR Regional Officer, on the basis of interviews in Guatemala City in 1995 and 1996

Natural/ Technological Disasters: Few Plans to Meet a Growing Threat

Footnote sources:

1. Wijkman, Anders and Timberlake Lloyd, Natural Disasters. Acts of God or Acts of Man?, London, Earthscan, 1984.

2. Quarantelli, E.L.,'Projecting disasters in the 21st Century from present trends", in *Proceedings from the 2nd International Conference 'Local Authorities confronting Disasters and Emergencies'* Amsterdam 22-24 April,1996.

3. Selvaduray, Guna, *Corporate Earthquake Programs - Differences and Similarities between the USA and Japan*, Paper presented at the First U.S. - Japan Conference on Corporate Earthquake Programs, Sept. 24-26, 1991

4. Silva, Christie, "Development-Promoted Technological Hazards to the Environment", in *Stop Disasters*, Number 27, 1/1996.

5. Quarantelli, E.L ,"Projecting disasters in the 21st Century from present trends", in *Proceedings of the 2nd International Conference 'Local Authorities confronting Disasters and Emergencies'*, 22-24 April, 1996

Part Three: Where Do We Go From Here?

Policies for Safer Cities

Information drawn from the following sources:

IDNDR Secretariat, *Disaster Reduction in Urban Areas*, Policy paper by the Secretariat of the International Decade for Natural Disaster Reduction (IDNDR), November 1995

Comments on IDNDR secretariat Policy paper, by Mustafa Erdik, member of the IDNDR Scientific and Technical Committee, Professor and Chairman, Department of Earthquake Engineering, Bogazici University, Kandilly Observatory, Istanbul, August 1995.

General conclusions from the Workshop '*Towards a city for life - Latin America, the Caribbean and Habitat II*', Quito 14-16 November 1995

ICE (Institution of Civil Engineers), *Megacities. Reducing Vulnerability to Natural Disaster*, Institution of Civil Engineers, Thomas Telford Services Ltd, 1995.

First Latin American Conference 'Local Authorities confronting Disasters and Emergencies',*Santiago Declaration*, Santiago, Chile, April 1996

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► Contributors for each case example can be found in Part Two.

► Acknowledgement to all IDNDR Secretariat professional staff, who reviewed drafts, and provided contacts, references, information and administrative support; and to the following colleagues at the UN Department of Humanitarian Affairs who provided advice: John Tomblin, Nikolai Solomatin, Dusan Zupka, Masayo Kondo (Disaster Mitigation Branch); Ricardo Mena (DHA Regional Advisor); Maria Keating (Inter-Agency Support Branch)

► Advice and/or materials were also received from a wide variety of IDNDR partner organizations and are gratefully acknowledged. Contact information from these sources can be found in the first section of the Contacts chapter of this publication.

Supplemento al numero 28 di STOP DISASTERS (II/96).
Direttore Responsabile: Raffaele Corsica

About the International Decade for Natural Disaster Reduction

As we approach the twenty-first century, population growth, ecological damage, rapid industrialization and socio-economic imbalances make the risk of major disasters around the world higher than ever. We need not, however, be fatalistic about the vagaries of nature.

To make people aware of how they can do to make themselves safer from natural disasters, the United Nations launched the International Decade for Natural Disaster Reduction (IDNDR, 1990-2000). The World Conference on Natural Disaster Reduction (Yokohama, 23-27 May 1994) was an important milestone in IDNDR's awareness-building process.

IDNDR works through IDNDR National Committees and Focal Points which exist in 138 countries. The IDNDR secretariat, located in Geneva, is part of the UN Department of Humanitarian Affairs. The IDNDR Scientific and Technical Committee is an advisory body of 25 experts from various fields. A UN inter-agency group works regularly with the IDNDR secretariat, as well as a contact group of Geneva-based diplomatic missions.

IDNDR publishes a quarterly magazine, STOP Disasters, and conducts an annual promotional campaign which culminates on the second Wednesday of each October, designated as the International Day for Natural Disaster Reduction.

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80124 Naples, Italy
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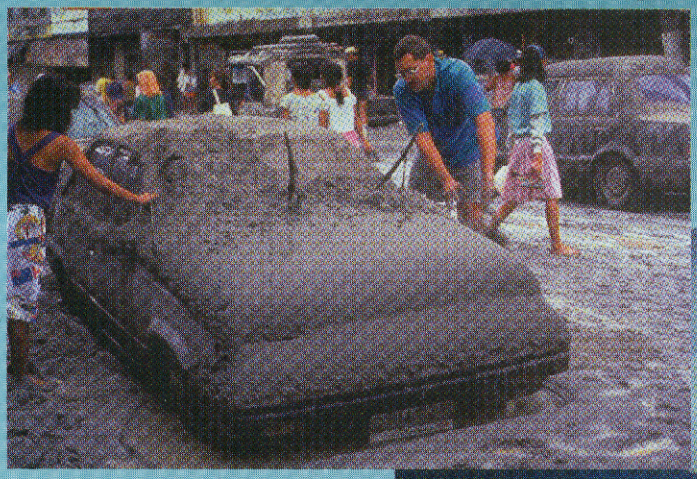

International Decade for Natural Disaster Reduction

IDNDR

1990–2000