

NGO Initiatives in Risk Reduction

Case Study no. 19

Risk mapping in Central America

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Name of NGO: Oxfam

Location: Central America (Costa Rica, El Salvador, Honduras, Guatemala, Mexico, Nicaragua).

Date(s): 1997-2000

Hazard(s): multi-hazard

Key words: risk mapping, local capacities, research

Background and aims

'Risk Mapping and Local Capacities: Lessons from Mexico and Central America' is a study begun in 1997 by a team commissioned by Oxfam GB to map out risks, vulnerabilities and local capacities in order to inform work in emergency situations.

The aims were:

- To predict possible emergencies that might arise in the region and to ascertain their potential impact on those most vulnerable.
- To identify local capacity for emergency response within each country.
- To envisage the type of external assistance needed for an effective and appropriate response to emergencies.

The emphasis was less on the scientific and technical aspects of phenomena, and more on the links between socio-economic realities, culture, policies and planning.

Activities

The study was written on the basis of field visits made to Costa Rica, El Salvador, Honduras, Guatemala, Mexico and Nicaragua in 1997 and 1998. The researchers analysed the main threats, both natural and caused by humans – including hurricanes, seismic risks, volcanic activity, floods, landslides, drought, conflict, technology-related

emergencies, and abuses of natural resources. This was based partly on the evidence of past occurrences and partly by reference to local institutes and authorities, such as the Coordinating Centre for the Prevention of Natural Disasters in Central America (CEPREDENAC) and others.

The sectors and elements exposed to the threat were then analysed, in particular the threatened communities' agro-ecological conditions and the state of their economies, infrastructure and services. This was followed by an analysis of vulnerability, defined as the relationship between the level of risk, local capacities and the living conditions of the threatened community.

Finally, the study undertook an analysis of local capacities by considering firstly the institutional framework for disaster management and secondly the current capacities of civil society. It also considered initiatives for developing existing capacities and steps already taken in the fields of prevention, preparedness, rehabilitation and response.

The study is accompanied by a set of four maps, which show the risks of the main natural hazards in Mexico and Central America.

Findings

Hazards

The study presents a typology of natural threats for the whole region, and also some country-specific facts, such as a detailed assessment of the dangers of the Popocatepetl volcano in Mexico. The study found that the whole region is extremely disaster prone: it is a zone of high seismic activity; it is vulnerable to hurricanes originating in four off-shore regions; it has some of the largest concentrations of populations near volcanoes in the world; and it suffers flooding every couple of years, exacerbated by severe deforestation.

While these are the main hazards in terms of human deaths, drought and wind erosion can cause greater economic losses. Furthermore, conflict – affecting particularly Guatemala and Mexico (Chiapas) – and other human-caused hazards such as forest fires, pollution and oil spills are on the increase.

Vulnerability

The most vulnerable groups are those living in areas that also show the greatest levels of poverty. The study found six social vulnerability factors to be particularly significant:

- the level of poverty
- the standard of health
- the level of malnutrition
- the proportion of households headed by women
- the level of illiteracy
- living conditions

These factors allow the degree of protection or weakness of a community to be determined, should a threat occur. Not only do these vulnerable conditions make people more disaster-prone but these kinds of vulnerability are more commonly found in high-risk zones. For example, in western and southern Honduras, which are high-risk in

terms of drought, nine households out of ten are on the poverty line, illiteracy is well above the national average, overcrowding, lack of access to drinking water and lack of basic sanitation are respectively 18 percent, 53 per cent and 56 per cent higher than the national average.

The study places much emphasis on high levels of female poverty and shows that woman-headed households have a lower probability of survival in the event of an emergency. Indigenous people are also at much greater risk from hazards.

Capacities

Each country was assessed in terms of local capacity. Institutional frameworks for disaster management were analysed country by country.

The study found that in most countries national emergency committees are weak, but the presence and influence of the armed forces is strong. NGOs are relatively weak in this region and that the vast majority of local organisations involved in development work do not focus on emergencies at all. Scientific and technical research is relatively advanced, but is often inadequate for determining local-level risks. A great deal of useful work has been done on information networks and training on preventive and preparedness work, especially by organisations such as LA RED (Network of Social Studies for the Prevention of Natural Disasters in Latin America).

Prevention and mitigation

The study found a number of new initiatives in the area of preparedness. Furthermore, local and rural needs have recently been prioritised. However, overall, 'improvisation is still the order of the day, as a way of managing potentially disastrous events.' Populations in rapidly growing urban centres are particularly at risk. Building regulations and codes exist on paper but are seldom applied; and irrational use of land is becoming the main risk factor for huge numbers of *barrio* dwellers in cities like Tegucigalpa and San Salvador at high risk from flooding, landslides and earthquakes. The study warns that the region suffers from anarchic urban sprawl. Urban planning is a critical aspect for the future.

Issues

Many lessons have been learnt from the risk mapping initiative, including the following:

- This study is one of the most comprehensive and wide-ranging attempts to marry physical and social vulnerabilities in a single exercise; it is extremely interesting and is a useful reference for policy and planning.
- The process of producing this report has increased Oxfam's standing with governments and inter-governmental agencies in the region.
- But, as a regional report, it is inevitably limited in terms of detail, and Oxfam staff find that it is not a practical tool for localised emergencies.
- The maps only show hazard risks. It would have been more useful to also show patterns of vulnerability (levels of poverty, health, malnutrition, gender inequality etc.) overlaid onto the physical hazards.

Oxfam is continuing with further risk mapping exercises in Ecuador and Haiti and it remains to be seen whether such studies will be of more practical use. Possibly the most useful aspect of such exercises is the identification of local and regional capacities.

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NGO Initiatives in Risk Reduction' is a series of short case studies designed to introduce project planners and managers to the range of NGO work in this area, and to highlight some of the issues arising. It is one of several outputs from a study carried out by a team of independent researchers, funded by the Department for International Development and managed by the British Red Cross Society. The case studies (and the project's other outputs) can be downloaded from the project's web page (<http://www.redcross.org.uk/dmp>).