



Emerging trends in disaster impact, hazards and vulnerability patterns

More than 90 per cent of natural disaster related deaths are to be found in developing countries. Disaster impact statistics show the global trend – there are now more disasters but fewer people die in proportion, even though more population is affected and economic losses are increasing, as discussed in the next section.

Closely linked and influenced by changing perception, hazards and vulnerability is constantly shaped by dynamic and complex socio-economic and ecological processes. They are compounded by stresses felt within individual societies.

The current aspects of physical exposure of human beings and economic assets have been partly shaped by historical patterns of settlements. Beneficial climatic and soil conditions that have spurred economic activities are in many cases also associated to hazard-prone landscapes. Both volcanic slopes and flood plains areas have historically attracted human habitation. Where settlement patterns have contributed to configure risk scenarios, new forces, such as population growth and increased rural/urban migration, act as dynamic pressures contributing to changing patterns in increasing people's exposure to hazards.

The processes through which people and goods become more exposed to hazards are also socio-economic conditioned. In particular, poverty levels and the impact of development processes, especially those associated with an increasingly globalised society, are reflecting, to some degree, current trends in socio-economic vulnerability to disasters. The pace of modern life has also introduced new forms of vulnerabilities related to technological developments. In addition to discouraging poverty levels, the emergence of virulent biological threats has revealed even greater vulnerability.

Systemic ecological and localized environmental degradation is becoming highly influential as well, lowering the natural resilience to disaster impact, delaying recovery time and generally weakening the resource base on which all human activity is ultimately dependent.

At the ecosystem level, phenomena like El Niño/La Niña, climate change and the potential for rising sea levels, are affecting the patterns and intensity of hydro-meteorological hazards. Environmental degradation influences the effects of natural hazards, by exacerbating their impacts and limiting the natural absorptive capacity and resilience of the areas affected.

Biological hazards in the forms of pest infestations, human disease epidemics and pandemics, continue to factor into the disasters-development scenario in new and unpredictable ways. They exert considerable socio-economic impacts on food security and human mortality, health and economic productivity, among other things.

Technological disasters often resulting from major accidents associated with industrialisation and forms of technological innovation, have significant socio-economic and environmental impact. Although technological hazards have been part of society for hundreds of years, the trends are showing an increasing impact. Technological advancements, specifically in the energy, transport and industrial sectors, are developing innovations with associated risks that are not always understood or heeded. The adverse effects of some technological disasters, both on society and on the environment, can considerably outlast the impacts associated with natural disasters.



The ecological footprint

Demographic pressure means more forest loss and more land degradation. This means more flooding, drought, or both. Every human requires an area of land and shallow sea for food, water, shelter, transport, energy, commerce and waste. This is called an ecological footprint. In rich nations such as the US, this ecological footprint is almost 10 hectares per person. But even in the poorest places in the US this footprint is at least one hectare.

Every day, another 200,000 newborns will require up to 200,000 hectares of what might have been a benign and necessary wilderness. More people also means more fossil fuel consumption, which means more carbon dioxide emission, which means climate change. And such a world, climate scientists have warned repeatedly, is a world with a greater frequency of extreme events.

The combination of climate change and population growth will exact a price. The latest UN calculation is that three decades from now, around 70 per cent of the world's land will be affected in some way by human activity and half the people in the world will be short of water. Many of the other half will be at risk from increased flooding. By that time, there could be eight billion people on the planet.

Adapted from the environmentalist E O Wilson (writing in Scientific American, February 2002)

Trends in disaster impact

While no country in the world is entirely safe, lack of capacity to limit the impact of hazards remains a major burden for developing countries, where more than 90 per cent of natural disaster related deaths are to be found.

Twenty-four of the 49 least developed countries (LDCs) still face high levels of disaster risk. At least six of them have been hit by between two and eight major disasters per year in the last 15 years, with long-term consequences for human development (*UNDP, 2001*). These figures do not include the consequences of the many smaller and unrecorded disasters that cause significant loss at the local community level.

The re-insurance giant Munich Re, a member of the ISDR Inter-agency Task Force, in its annual publication *Topics* for 2000, looked at the trend of economic losses and insurance costs over a 50 year period linked to what it calls "great natural catastrophes".

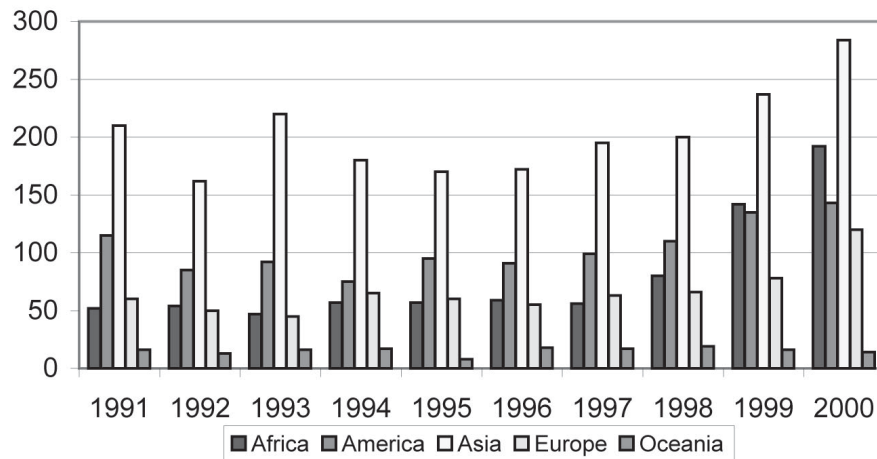
There were 20 of these, costing the world US\$ 38 billion (at 1998 values) between 1950 and 1959. However, between 1990 and 1999, there were 82 such major disasters and the economic losses had risen to a total of US\$ 535 billion. That is, disasters had multiplied fourfold but economic losses were 14 times higher. And in each decade between, both the number of great disasters and the economic loss involved had risen steadily. However, losses in 2000 and 2001 were down.

These are absolute figures of economic loss, most of them to be found in developed and industrialised countries. But seen as losses by percentage of GDP, it is developing countries that loose most in relative terms, as shown in the graphic based on figures provided by MunichRe. For example, the economic losses of the United States from the 1997-98 El Niño event were estimated to US\$ 1.96 billion or 0.03 per cent of GDP. The economic losses in Ecuador were 2.9 billion US\$, but this represented 14.6 per cent of GDP (*ECLAC 2000*).

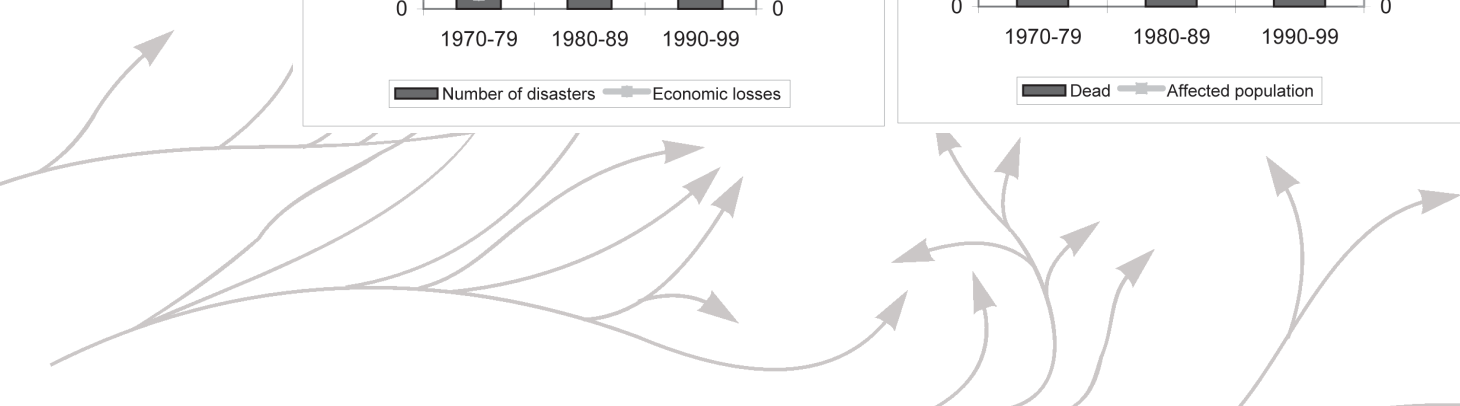
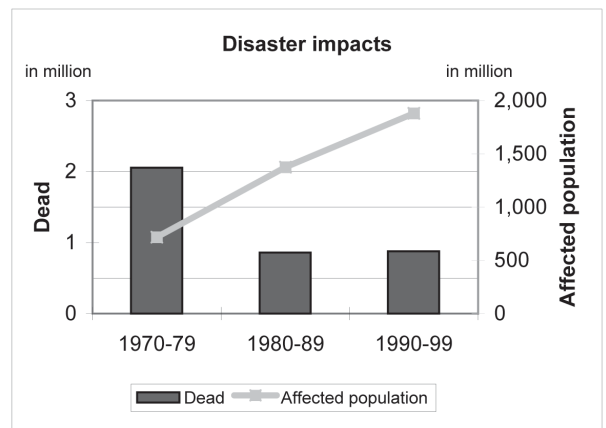
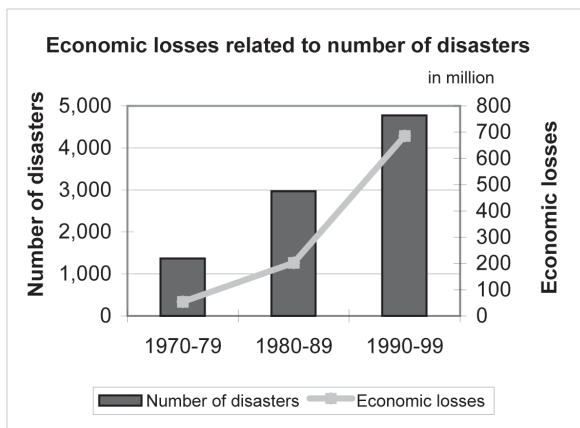


The International Federation of Red Cross and Red Crescent Societies, another ISDR Task Force member, confirms the worsening trend of human suffering and economic loss during the last decade. The total number of people each year affected by natural disaster – that is, who at least for a time either lost their homes, their crops, their animals, their livelihoods, or their health, because of the disaster – almost doubled between 1990 and 1999, by an average of 188 million people per year (*CRED 2002*). This is six times more than the average of 31 million people affected annually by conflict (*OCHA*).

Total Number of Reported Disaster (1991-2000)



Comparing the last three decades, the trend shows an increase in the number of natural hazard events and of affected populations. Even though the number of disasters has more than tripled since the 1970s, the reported death toll has decreased to less than half. This is among other factors due to improved early warning systems and increased preparedness. This statistic varies enormously depending on region and figures used. One needs to bear in mind that large disasters are rare events that defeat any statistical analysis in the short term. Perhaps more significant in the life of many are those daily disasters, generally underreported and not reflected at all in global figures on losses, but accumulating to probably large tolls of both economic and health losses.





There is a considerable geographic variation in the occurrence and impact of natural hazards. Asia is disproportionately affected with approximately 43 per cent of all natural disasters in the last decade. During the same period, Asia accounted for almost 70 per cent of all lives lost due to natural hazards. During the two El Niño years of 1991-92 and 1997-98, floods in China alone affected over 200 million people in each year. Nevertheless, in relative terms and counted per capita, Africa is the most heavily affected country, in particular when drought and famine is included.

The single most terrible year in human loss during the last decade was 1991, when a cyclone devastated Bangladesh killing 139,000 people, bringing the global total of deaths for that year to 200,000. Cyclones are cyclical events and they continue to hit the Bangladesh coasts but no such catastrophe has happened again. This is at least in part because the machinery of warning and preparedness – watchful officials, an aware public and a stronger sense of community responsibility – came into play.

The worst global economic loss during last decade occurred in 1995, due to the Great Hanshin-Awaji earthquake in Kobe, Japan. A highly developed, prepared and economically strong nation faced serious set backs economically by loosing important facilities of its primary port. Even seven years after that disaster, the amount of shipping trade in Kobe has dropped by 15 per cent. But now Kobe is rebuilt and modernised and is a safer place

