Disaster causes and effects

Who is vulnerable and why?

The Federation describes its disaster response strategy in the following terms: "The aim of disaster interventions is essentially the same as the aim of development support. That is, sustainable improvement of the well-being of vulnerable individuals". The emphasis is placed on reducing disaster vulnerability. But what does disaster vulnerability really mean and why is it so important?

First, it is not always obvious who is most in need in the immediate aftermath of a disaster. Nor is it always obvious how best to help them. Even if it is known who needs help and what they need, lives may be saved only to leave people in a heightened state of vulnerability so that, the next time disaster strikes, a larger number of people are affected in a more extreme way.

Secondly, most disaster response agencies are now firmly committed to disaster preparedness and prevention. But how can you prepare for a disaster if you do not know who is likely to be affected? How can you work to prevent it if you do not know what is causing the disaster?

What is a disaster?

Disasters are catastrophes at the interface between physical events and a vulnerable human population While there is no reason to believe that the causal factors of natural catastrophes are increasing in intensity or frequency (at least until global warming has a greater impact), disaster statistics over the past 30 years show that more people are being affected by disasters because there are more poor people vulnerable to disasters Not only will more vulnerable people mean disasters affect larger numbers, but the increasing depth of that vulnerability means many more disasters because previously low-impact events will have a far larger effect.

Without actions to reduce vulnerability, the number of people vulnerable to disasters can only increase. Earthquakes, for instance, usually only become disasters when they affect urbanised areas. In the countryside they do little damage. Today 76% of Latin America's population is urbanised. By the year 2000, a further 90 million Latin Americans will live in urban areas. many of which are in earthquake zones.

Vulnerability models

People can be vulnerable to disasters, but they can also have capacities which help them resist or recover from disasters. Vulnerability and capacities can be divided into three areas: material, organisational and socio-psychological.

Material vulnerability may be equated with the everyday definition of poverty A reduction in the resources to sustain human physical needs, or in the options for attaining those needs, will increase material vulnerability. Poor people cannot afford to build or rent earthquake-resistant houses or buy food at hyper-inflated prices during famine. Equally, the possession of resources increases capacities to resist disasters. In the Sahel, families with household possessions to sell, from tools to vehicles, survived recent famines much better than those who had accumulated less wealth.

People with access to few support structures are organisationally vulnerable. When kinship groups break

down or medical services fail, organisational vulnerability is increased. Those in Ethiopia who had access to organised kinship support structures possessed a capacity which helped them survive the famine of the mid-1980s. Of equal importance is access to state support structures, such as a health service or urban clean water supplies. People weak from disease are less able to resist the stresses of disaster.

Social-psychological vulnerability is less clearly defined. A study of Ugandan refugees in southern Sudan showed how their ability to cope with their plight was not just a product of the amount of wealth and organisational structures available to them, but also depended on their mental ability to cope with the traumas they had suffered. Similarly, people supported by a strong ideology seem better able to cope with crisis

An increase in any of these three classes of vulnerability may lead people into non-sustainable development and disaster vulnerability. The breakdown in kinship support structures or faith in an ideology can be every bit as calamitous as a fall in personal wealth. So can the loss of traditional wisdom or inherited knowledge which, ironically, may be squeezed out by "aid" programmes which are culturally non-sustainable.

This simple analysis can be applied in any potential disaster situation to identify who is likely to be most affected, why they are more vulnerable than their neighbours and, equally important, what local capacities exist to resist disaster and to rebuild the community after disaster strikes.

Based on: Mary B Anderson and Peter J Woodrow, Rising From The Ashes, Development Strategies in Times of Disaster, Westview Press/UNESCO 1989.

Vulnerability in Ethiopia

Many studies over the past 10 years have demonstrated that African farmers and pastoralists have developed sophisticated strategies for coping with the repeated stress of food insecurity. A look at one community in Ethiopia's Rift Valley, south of Addis Ababa, illustrates the point.

The history of famine, as told by those who have suffered it, contains a wealth of detail not even hinted at in official reports. From the victims' perspective, food aid brought in by aid agencies did not play a decisive role in controlling the famine of 1984-85 Rather, the victims' own endeavours formed the backbone of the relief efforts.

All the community's farmers agreed that the 1984-85 famine was by far the worst they had experienced. Most farmers were used to seasonal hunger, had experienced famine at least once in their lifetimes and had developed a series of coping mechanisms to deal with the resulting stress. During the famine of 1984-85, households went through a number of strategies to cope.

First, normal hungry season strategies were used. Grain consumption was deliberately cut back before the family grain store had emptied. In most years, grain stores are empty by the middle of the rainy season in August. During the famine, many stores were empty by May. Men travelled to the capital, Addis Ababa, to look for seasonal labour and returned during the rainy season to plough. Women and some men travelled to distant markets where grain was cheaper. They bought grain, brought it back and sold on some of it at a higher price, consuming the rest. Wild plants were gathered by women to supplement family diets. Women tried to grow more of the local "one month maturing" cabbage. When these strategies failed, more drastic measures were taken.

People sold their cattle, then oxen, then household goods, then the houses themselves, piece by piece. For those not rich enough to have oxen or cattle, household goods were traded. During 1984, one wooden stool was bartered for one tin of maize, a goat skin for two tins.

Under normal conditions, a stool would fetch enough to purchase 20 tins of maize Thus famine prices for buying small quantities of food were inflated by 2,000%. Many of the women, who are the majority of petty traders, pointed out that they could not have traded in larger quantities as their only means of portage was their backs. Ownership of donkeys was the prerogative of better-off households. The poorest people with less valuable assets were clearly most vulnerable and hardest hit The "price" of food for them was three to five times higher than for better-off households.

If the above strategies were not enough, people migrated in search of relatives who could give them food. Some families split up, with the man and wife going to their respective families. Many people talked of going to the *Enset*-growing areas in the hills. (*Enset* is a drought-resistant indigenous perennial crop, looking rather like a banana tree. It takes five to six years to mature and does not grow in the lowlands.) They emphasised, however, that food could only be obtained from relatives, no stranger would be fed. Further, it was felt that this "social asset" was something that could only be called upon once. If a famine occurred next year, so soon after the last, relatives who themselves were not wealthy might legitimately refuse to give food.

As a final strategy, people moved into the towns to beg and search for work It was at this stage in people's coping strategies that relief food became available in the area.

The famine victims were clearly

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Focus 9: Disaster priorities - prevention and preparedness

In western Ireland, facing the Atlantic, an area called the Burren is internationally renowned for its beauty. Walk up any of the little valleys and you will come across a ruined village, chimney stacks poking through the undergrowth. Until the 1840s this was a thriving community; then the great famine struck.

That famine robbed Ireland of over half its population through death or migration Ireland does not suffer famine today.

While the drought that devastated the Sahel in the 1980s caused death and destitution on a continental scale, across the Atlantic, in mid-west America, a similar drought was taking place. It did not result in continent-wide death and destitution.

The Loma Prieta earthquake that struck California in 1989 was of almost exactly the same strength as that which struck Erzincan in Turkey in 1992. Both hit densely-populated areas. In Turkey, 547 died and more than 100,000 were made homeless, while 65 people were killed in California

Clearly, there is often very little that can be done to prevent drought, floods, hurricanes or earthquakes, but we can all, from governments, aid agencies and communities to families and individuals, mitigate their effects.

Epidemics are among the most preventable disasters. Sanitation and safe drinking water have a dramatic impact on water-borne disease

Surveillance monitors the health of individuals and communities, alerting them to risks Mass immunisation not only reduces vulnerability when other disease pre-conditions exist, but it helped eradicate smallpox, for example, which caused devastating epidemics throughout history until it was finally eliminated in 1977

In India, a name once synonymous with famine, highly-organised cash-for-work schemes and feeding programmes have rendered all-out famine unheard of for 20 years Red Crescent cyclone shelters saved up to 300,000 lives in the 1991 Bangladesh cyclone In Ireland and the USA, economic prosperity means that farmers survive drought and crop failure with government subsidies, private insurance and long-term investment in improved land management and crop varieties.

Preventing disasters requires actions which reduce people's vulnerabilities to natural events and diminish the effects of those events Such actions require the political will and economic means to make them work. In many disaster-prone countries, the poor and the vulnerable who are potential disaster victims exercise little political power, and are thus denied fundamental human rights There is little they can do to persuade governments to invest in their future.

Research into successful famine mitigation shows that famines are most effectively tackled by countries with democratic institutions, from a free press to adversarial politics, which lead to the creation of safety nets for the most vulnerable, land reforms and literacy to reduce future vulnerability, and enhance their human rights and dignity.

Although there is very little that can be done to prevent extreme natural events, there is a great deal that can be done to reduce their effects and to render people less vulnerable.

Disaster prevention and preparedness: Preparedness starts at the household level and builds up from there. But the early warning of sudden onset disasters is often handled at the national level.
Singapore, 1984. Steve McCurry/Magnum.

having to tackle not just a food and nutrition crisis but a wealth and power crisis. They chose to do this in a systematic fashion designed to safeguard the long-term viability of their household economy for as long as possible. Famine is tackled by extending and then supplementing the strategies used to cope with normal seasonal stress. For many people these strategies proved insufficient and many of those who survived are now in a much more vulnerable position than before the famine. They have been weakened physically, materially, socially and psychologically.

The sequence of coping strategies shows that, when another drought occurs, those who will suffer will not be just the farmers with the worst harvests It will be the households which have nothing to sell, those who have no income coming in from family members in urban areas and those who can no longer call upon the goodwill of neighbouring communities to help.

Extracted from: Peter Walker, Coping with famine in southern Ethiopia, International Journal of Mass Emergencies and Disasters, August 1990, Volume 8, Number 2, pp 103-116

Vulnerability in Peru

An analysis of potential earthquake victims in Peru will illustrate the complexities of vulnerability.

Peru's capital, Lima, has been badly damaged or destroyed by earthquakes throughout its history (in 1586, 1655, 1687, 1746 and 1828) and the last major earthquake it suffered, on 24 May 1940, killed 249 people and left 3,500 injured At that time, the Lima-Callao urban area contained 645,000 people, and 34.8% of the country's population was urbanised. Four decades later, 65 1% of Peru's population was urbanised, and the number of people living in

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Focus 10: Equity in effects - poverty and disasters

Television images portray disaster as devastating entire regions Mile after mile of flooded land is seen broken only by small groups of people clinging to the roofs of houses. In Africa, the camera pans across the famine camp showing thousands of destitute people. But the camera only shows part of the picture.

The effect a disaster has upon people really consists of two components how much they suffer during the disaster and how quickly they recover after the disaster. People who are poor and must live in low rent but high-risk areas of inadequate health care, clean water and education inevitably suffer more in disasters and take much longer to rebuild their livelihoods than more affluent neighbours living in safer areas

On top of this, disasters can often be very effective mechanisms for wealth redistribution - from the poor to the rich. During famines, grain prices multiply and grain merchants often make huge profits Even at a village level, opportunities exist to profit. Farmers often have to sell all their possessions to buy food The market is flooded with oxen, farm tools and household possessions, all at knock-down prices Those with a little money to spare are able to buy up these goods for a fraction of their real value.

In fact, disasters are extremely selective. they select the poor and vulnerable, forcing them further towards total destitution and death. Disasters are catalytic events in the long-term erosion of the security of the poor, especially the poor in poor countries.

The *World Development Report* of the UN Development Programme in 1991 showed that the richest billion people on the planet had, on average, incomes 150 times those of the billion poorest people. That gap between rich and poor in the world was growing fast The net flow of global finance is from South to North, making the rich richer by making the poor poorer. echoing the process of impoverishment suffered by the poor within many countries.

Meanwhile, the total value of all aid flows, including grants and loans, tied and untied, is approximately US$50 billion a year; UNDP estimated the benefit of fully fair trade at US$500 billion extra a year for developing countries, but the world is not even close to achieving a fair world trade agreement

The planet's most vulnerable inhabitants are those billion poorest people being slowly but surely pushed off the edge of the world. The trigger events of disasters are merely the last item on a long list of economic, political and environmental processes increasing their vulnerability by destroying their ability to survive and progressively eliminating their human rights. It is vulnerable people who suffer most during disasters. Assistance should be targeted at vulnerable people in disaster relief and in preventing disasters.

Equity in disasters: Disasters seek out the vulnerable and have most effect on those least able to cope. It is the poor of Burma who are the first to become refugees.
Bangladesh, 1991. Chris Steele-Perkins/ Magnum

Lima-Callao reached 4.6 million.

In 1980, seismologists estimated that there was a 96% probability of an 8.6 Richter earthquake hitting the city within the next 100 years. At the time of their prediction, such an earthquake would have destroyed 26,000 dwellings and made 128,000 people homeless.

Three sets of factors converge to determine who in the city will suffer during an earthquake. First, geological factors will determine which areas of the city will receive the most severe shaking. Second, building structures, levels of maintenance and construction materials will determine which buildings are most likely to collapse, and third, social factors (income levels, community organisation, population density) will determine which groups of people are most likely to suffer.

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Focus 11: Disasters and development - blocking progress

Disasters are costly to all countries. One study shows that, between 1970 and 1985, disasters of only three types (wind-storms, floods and earthquakes) cost on average US$18.8 million a day. But the impact of disasters is disproportionately high on developing countries. Assessments of disaster costs include both the immediate effect on physical assets, employment and output as well as the impact on future economic prospects.

Disasters are directly linked to the success or otherwise of development initiatives for three reasons:

First, poverty increases disaster vulnerability. Most disasters occur in poorer countries and the people who suffer most are almost always the poor. One study estimated that 95% of deaths resulting from disasters occur among the 66% of the world's population that lives in poorer countries. For example, Japan's average annual death toll from natural disasters is 63, while in Peru, with one sixth the population and similar natural hazard occurrence, the average annual death toll is 2,900.

In addition, though natural events which cause loss of property and life occur in every country, the losses, when seen relative to the resources of a country, represent a higher burden on poorer countries. The proportion of GNP lost because of disasters is estimated to be about 20 times greater in developing countries than in developed countries. Poverty increases the likelihood that any crisis event will become a disaster.

Second, badly-planned development can increase the likelihood of disasters. Given the relationship between poverty and disaster proneness, one might have assumed that any money spent on decreasing poverty would be a bonus to disaster prevention. This is not always true.

The development of industry increases the possibility of industrial accidents, some of which, such as those which occurred in Bhopal or Chernobyl, are disasters. Some development projects, planned without recognition of local natural hazards, directly contribute to increased disaster proneness. Examples include projects to construct human settlements in earthquake-prone regions without an adequate understanding of local seismic activity or earthquake-resistant building techniques, and poorly designed agricultural programmes which lead to a loss in soil fertility or an increase in erosion.

Development sometimes leads indirectly to an increase in disaster probability. For instance, populations may move to urban areas for productive employment but, because of a lack of planning, live in areas susceptible to flooding or mud-slides. The environment is often the interface between developmental programming and disaster vulnerability.

Every development programme or project in disaster-prone countries either increases or decreases the likelihood of disasters. When development investments increase a country's capacities to cope with natural hazards, they contribute to disaster prevention, when development programming is undertaken without an awareness of disaster proneness, it may create the possibility of a new disaster or increase the potential negative impact of existing natural crises.

This leads to the third reason. When development projects are undertaken without regard for disaster potential, scarce development resources are frequently inefficiently allocated.

Investment money is lost when a project is financed which is later wiped out by a predictable typhoon, earthquake or mud-slide. Disasters shorten the economic life of development investments. Yet there are many examples of donor-funded development projects in disaster-prone areas in which this has occurred or in which a development investment has increased the likelihood of disaster.

Even more common is the experience of development planners that a disaster interrupts ongoing programmes and diverts resources from their originally planned use. When disaster proneness is well known, failure to include the likelihood of natural crisis events into planning represents a serious mismanagement of resources. Good project planning considers the risk of disasters and thereby minimises their potential impact on long-term development.

Extracted from: Mary B Anderson, Analysing The Costs and Benefits of Natural Disaster Resources in the Context of Development, Environment working paper No 29, World Bank, 1990.

Disasters and development: Disasters can destroy the very infrastructure necessary for sustainable development. Unsustainable development increases people's vulnerability. Armenia, 1989. Gueorgui Pinkhassov/ Magnum.

Deaths, injuries and loss of livelihood will be worst where unstable soils, poorly built and maintained buildings and socially vulnerable people come together.

Building construction and social position, two man-induced factors, combine to create three broad classes of seismic vulnerability in Lima·

First, in the private sector and government-sponsored high income residential areas, homes are well constructed, well maintained and built to withstand earthquakes. Population density is low and there are many open spaces. High incomes increase people's chances of recovering from an earthquake.

Second, the "pueblos jovenes" shanty towns around the city are mostly constructed of light-weight materials, which kill or injure fewer people if they collapse. As there are few multi-storey buildings in Lima, population density is low. Incomes are also low, but the population in the pueblos jovenes is quite stable so there is a high level of community organisation which aids recovery after disasters

Third, there are the inner city slums. As the land owners and industrialists have moved out of the city to the suburbs, their once great houses have become the first port of call for the poor of Peru, who move to Lima in search of jobs. Most houses are in the colonial Spanish adobe style of construction, with heavy walls and tiled roofs, which has virtually no seismic resistance because it was designed for a country with little earthquake activity.

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Focus 12: Disasters and human rights - claims and duties

The increasing complexity of disasters and the blurring of the distinction between man-made and natural disasters forces should focus attention on the prime causes of vulnerability to disaster. Be it famines or earthquakes, Africa or Europe, there is a close correlation between disaster vulnerability and people's ability to claim their basic human rights.

Article 3 of the Universal Declaration of Human Rights proclaims the right to life, liberty and the security of person

Article 25 states that we all have the right to a standard of living adequate for the health and well-being of ourselves and our family, including food, clothing, housing, medical care and social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond our control.

What is at issue is not whether governments are enforcing these rights, but whether people and communities are able to claim them effectively, and have a realistic expectation that their government will turn that claim into action

Shanty town dwellers are vulnerable to epidemics because of the poor environment in which they are forced to live and their lack of access to health services. Farmers caught up in the complex disaster of civil war, economic dislocation and famine are vulnerable because they cannot claim their right to "liberty and the security of person". Landless labourers living on the flood plain of Bangladesh are unable to claim their right to a "standard of living adequate for health and well-being" When disaster hits, their location puts them more at risk of dying.

If they survive, their lack of ability to claim their human rights means they have less means to recover from the disaster and hence are more vulnerable to the effects of the next round of flooding.

The essence of reducing disaster vulnerability and responding effectively in disaster relief lies in the effective implementation of human rights. Disasters seek out those least able to claim their basic rights. The process is pernicious since disaster vulnerability further reduces the practice of basic human rights

The implementation of human rights is also a key issue in disaster relief and rehabilitation

In its disaster relief policy the Federation states· "The fundamental concern of mankind and of the international community in disaster situations is the protection and welfare of the individual and the safeguarding of basic human rights".

If there is a duty to bring relief to all disaster victims, regardless of nationality, race, religion, social position or political opinion, then receiving aid without discrimination, and based on needs alone, is a fundamental human right. Aid agencies, governmental and NGO, play a key role in ensuring that these rights are exercised.

Just as government voluntarily accept obligations to protect the victims of armed conflicts, so they should accept obligations towards victims of disasters. It is also incumbent upon the aid agencies, both national and international, to assist disaster victims in claiming their right to receive assistance speedily, recognising that the duty to expedite international relief rests firstly with the affected government.

Disasters and human rights: The denial of the right to a decent standard of living can render people far more vulnerable to disasters. The trigger factor of famines is a denial of access to food, not the start of drought.
India, 1974. Raymond Depardon/Magnum.

It is this third group which is most vulnerable to earthquakes In looking for prime causes of this vulnerability, Peru's economic development can be traced through the colonial export-oriented exploitation to industrial growth in the first half of this century built on cheap labour, with wealth and power retained by an elite.

In the 1970s, economic stagnation forced real incomes even lower and the growing distances between the spreading shanty towns and the city proper rendered travel times and costs prohibitive. Today, few people are able to move out of the inner city ghettos to the relatively healthier and safer shanties. Well-meaning government legislation has effectively frozen inner city rents but inflation makes it unprofitable for landlords to collect rent. Houses become more dangerous because they are not maintained. Occupancy rates and population density continue to rise because houses which were built to house one family may now house 20 to 30. With a high turnover of population, social organisation is poor and incomes are low and irregular.

When the next inevitable earthquake strikes Lima, people will die, be injured and made homeless. In the statistical annals of the UN and relief agencies, it will be recorded as a natural disaster. But with the above causes of vulnerability, can it be said that anything other than the final trigger was natural?

Based on. Andrew Maskrey, Disaster Mitigation; A Community-based Approach, Oxfam Publications, 1989

Local capacities

The realisation of the advantages that come from building disaster relief upon local capacities is an increasingly important aspect of modern international disaster response.

Aid which enables people to keep their livestock, tools and seeds will build for the future as well as helping for today. Maintaining social structures will be of equal importance. The UN Food and Agriculture Organisation has highlighted village-level associations as being one of the key components in overcoming famine in a number of African countries. Structures to organise locally on both a kinship and peer-group basis seem to be vital for people facing adversity. Development and relief aid should encourage the formation of such self-help groups and, where possible, work through those that already exist

In India today, famine victims possess the "social capacity" of the right to claim government famine relief It is this ability to claim relief which has largely eliminated mass starvation from India. Famine relief systems in other countries, particularly in Africa, need to take a critical look at the ability of victims to make claims upon their government. As modern governments replace local political structures and impose taxes and national agricultural policies, they often, destroy the local system of claims that formerly acted as a support in times of stress. Famine relief policies should encourage the state to take a critical look at its obligations to the vulnerable.

If we extend this thinking from disaster relief back into disaster prevention and preparedness, then prevention becomes more than a civil engineering exercise and preparedness has to go beyond the stockpiling of relief goods.

The vast majority of disaster victims are poor. The vast majority have little access to adequate health care or clean water. Most have little say in their country's political life and receive little benefit from its development schemes.

Disaster response agencies have to start addressing such issues as why people are forced to live in high-risk areas such as Bangladesh's low-lying delta front, and why it is that some families or communities are consistently unable to obtain equitable access to government services. Disaster prevention programmes, like development programmes, have to tackle the root causes of poverty ■