Indonesia after the earthquake that hit Jave - May 2006
(Olav A. Saltbones / International Federation of Red Cross and Red Crescent Societies)

Disaster definitions

Introduction

This chapter reviews the public health impact of disasters on populations and how the capacity of vulnerable communities can be strengthened to cope with disasters. It looks at the social, political, economic and cultural factors that create vulnerabilities. This chapter answers the question 'What is a disaster?'

Learning objectives

- To describe different types of disasters, their trends and consequences on displaced populations;
- To describe the disaster cycle of preparedness, response, reconstruction and mitigation;
- To define the factors the influence risks to a population from a hazard and steps which can minimize these risks;
- To list the major political, economic, social and cultural factors which affect the public health of a population during disasters;
- To be able to list the various levels and components of a disaster management plan;
- To define the strategies for strengthening community participation in developmental relief programmes;
- To describe the public health needs of refugees and internally displaced persons.

Key competencies

- To analyze current trends and public health consequences in large populations after disasters;
- To understand how mitigation and preparedness can reduce public health consequences of disasters;
- To recognize how humanitarian organizations can reduce populations' vulnerability to risks in disasters;
- To be able to participate effectively in the disaster management process with local and national organizations;
- To understand the critical role of community participation in disaster management programmes.

Two men walk along a broken concrete sanitation drain in Nokalat, Pakistan. Photo: Mubashir Fida/ International Federation

Defining a disaster

The word *disaster* implies a sudden overwhelming and unforeseen event. At the household level, a disaster could result in a major illness, death, a substantial economic or social misfortune. At the community level, it could be a flood, a fire, a collapse of buildings in an earthquake, the destruction of livelihoods, an epidemic or displacement through conflict. When occurring at district or provincial level, a large number of people can be affected. Most disasters result in the inability of those affected to cope with outside assistance. At the household level, this could mean dealing with the help from neighbours; at the national level, assistance from organizations such as the International Federation of Red Cross and Red Crescent Societies, the United Nations, various non-governmental organizations (NGOs) and government agencies themselves. As the limiting factor in disaster response is often the coping capacity of those affected, improving their resilience when responding to disasters is a key approach to lessening the consequence of a disaster.

Defining the scope of a disaster

The ruins of a housing complex in the Indonesian city of Banda Aceh three days after the disaster. Photo International Federation

There is no single measure of a disaster that can capture the full scope of a disaster. A common measure is the number of people killed or affected. The individual will consider the impact on his or her family and livelihood. Disaster managers will assess the speed and success of the disaster response. Economists will measure physical loss to houses and buildings and loss of production. Politicians will assess political damage from a poor response by state agencies. Health workers will consider the resources required to contain an outbreak of meningitis or Ebola. Others may focus on the nature of the hazard, the social consequences and the impact to specific elements of the infrastructure. To think seriously about a disaster means we must consider all affected and their losses both in the immediate and the longer term.

Classifying disasters

Natural disasters

In the minds of many, disasters are divided into those thought of as originating from forces of nature or from the effects of humans. The list of natural disasters include weather phenomena such as tropical storms, extreme heat or extreme cold, winds, floods, earthquakes, landslides and volcanic eruptions. Disasters caused by humans have included transportation accidents, industrial accidents, release of hazardous materials and the collapse of buildings. Disasters are still widely thought of as sudden onsets of cataclysmic events. However, disasters such as famine and global climate change could be considered ‘slow-onset’ disasters. As odd as the idea sounds, disasters can even be ‘chronic’ – that is: continually occurring over a protracted period of time.

In reality, although humans can do little about the causes of weather events, humans have been increasingly able to reduce the impact of weather events on society. Early warning systems can alert costal populations of approaching tsunamis and they can give populations time to be evacuated from danger areas. Zoning codes, where enforced, can keep populations from building in flood-prone areas. Responsible land use can reduce the risk of landslips caused by unchecked felling of trees.

For other events classified as natural disasters, risks can be dramatically reduced through careful planning. Construction codes when enforced can reduce loss from earthquakes. Governments can institute measures to assist in extreme cold and extreme heat. Food security programmes can protect a population against food crises arising from pests and failed crops. Surveillance systems and high coverage by routine immunization programmes can help prevent outbreaks of disease. Social programmes can reduce vulnerability to disasters which otherwise could not be controlled.

Natural hazards increased by humans

From the earliest days, disasters were often classified as acts of God or acts of man, a language which persists in the terminology of insurance companies. As society has become more complex, it is evident that people are increasingly responsible, directly or indirectly, for the consequences of events previously ascribed to forces beyond their control. Many disasters arising from natural hazards would not have occurred or would have had a smaller impact on communities had it not been for actions by people: deforestation for firewood or building materials has resulted in landslides during heavy rainfall in Central and South America; overgrazing of cattle has allowed desertification in the Sahel; uncontrolled housing construction close to beaches increases risks from tsunamis and storms: removal of wetlands has eliminated a natural mitigating factor for the damage caused by tropical storms; political systems have turned droughts into famine, particularly in Africa.

Disasters caused by humans

Though weather and geologically related disasters are considered to have generated the greatest number of deaths and economic loss, disasters generated by humans are increasing in importance. In former Soviet-bloc countries, industrial systems have left the environment heavily polluted with dangerous substances in many places. Globalization is now carrying industrial production to previously agrarian societies. The risk from the unintended release of hazardous materials is becoming ever more widespread. Potentially hazardous products are now available in communities and populations which do not have adequate regulations governing their use and, in fact, may not even be aware of their presence or health risks. Rapidly increasing transport of people and commodities across continents means that transportation disasters pose increasing threats to millions. Although effective methods to contain these threats are possible and used in many countries, others see implementing these disaster mitigation tools as contrary to short-term financial interests.

1. Disasters from forces in nature
- Tropical storms (hurricanes, cyclones)
- Floods
- Droughts
- Extreme hot or cold
- Volcanoes
- Earthquakes
- Landslides
- Tsunamis

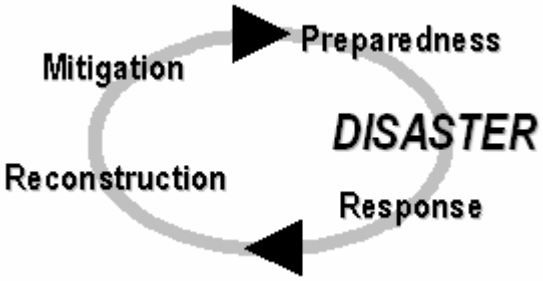
2. Disasters with humans as a factor
- Mudslides from deforestation
- Famine
- Desertification

3. Disasters directly caused by people
- Conflict
- Industrial events: explosions, hazardous materials and pollution
- Transportation events

Armed conflicts, often called Complex Humanitarian Emergencies (CHEs) are the worst disaster that can befall populations. The deaths among civilians in Vietnam, the Democratic Republic of the Congo, Mozambique and Iraq are counted in hundreds of thousands and, in some cases, in millions. In violent conflicts, civilians now bear the great majority of injuries and death. The effects of conflict continue for decades, not only through the remaining landmines and displaced populations, but also through the economic consequence to the countries affected as well as their region. This is an area where perhaps disaster mitigation has been the least effective. Those states with the power to reduce these risks may have their own strategic interests in not doing so. Further, excluding warfare, repressive states inflict major loss of life on their own people.

The ready availability of weapons and munitions means that small groups with violent intents can terrorize large populations. The roots of terrorist movements are often poverty, inequity and marginalization. These roots are often forgotten in efforts to improve the security of developed countries.

The disaster cycle



Disasters are often thought of as a cycle.[5] A disaster may occur with or without a *warning phase*. A *response* is made following a disaster. The response may be helped substantially by any *preparedness* actions which were made before the disaster occurred. Relief activities occur during the emergency phase, which follows the impact of the disaster. This phase transitions into the *reconstruction* (rehabilitation) phase. During this phase, the lessons learned are applied to *mitigating* or totally *preventing* the effects of future reoccurrences of this type of disaster and, at the same time, make preparations to respond to this type of disaster, should it return. The conceptual diagram above is helpful in planning disaster response. Its neat order suggests that one phase follows another in a clear sequential fashion, when, in fact, many things occur simultaneously. The cycle concept conceals the fact that the consequence of disasters may go on well beyond a reconstruction phase. In fragile states, there may be only minimal resources to undertake reconstruction and mitigation, with each disaster further reducing the status of the country's people. Weak efforts at reconstruction and mitigation are easily overwhelmed by subsequent disasters. The cyclic concept often breaks down when thinking about armed conflicts, where there are often false starts toward resolution and reconstruction may break down with a return to the armed conflict. Protracted conflicts create populations for whom abuse and displacement are part of their normal existence.

Disaster impact

Most disasters have sudden impact, though some, such as droughts and famines, are somewhat awkwardly called 'slow onset' disasters. In some cases, there may be warnings, such as weather predictions. Getting these warnings to those at risk is often difficult in developing countries. Even with warnings, there is little many people can do in the absence of disaster preparedness or adequate resources.

Alert phase, (warning phase)

Certain types of disasters can be predicted. An early warning can be issued, lessening the impact. Tropical storms are in this category, where weather satellites follow and track a disaster's build-up. Populations can be alerted to droughts and the potential for famines through the timely collection and analysis of data. Many web-based early warning systems are now available and UN, NGOs and the International Federation are using them extensively. Still further development in this area is expected as technology develops.

Response in the emergency phase

Some form of disaster response capacity is present in most countries. This may be organized through a national civil defence or emergency management agency. Military forces may take disaster response responsibilities because of their communication and logistical capacity. The Red Cross and Red Crescent National Societies are chartered in many countries to provide relief in emergencies. Civil society organizations such as non-government organizations and those associated with religious groups may be the first responders. In almost all disasters, local communities play the first and often most important role in responding by rescuing those affected, providing first aid and emergency shelter, usually long before outside organizations arrive at the scene. Building a strong volunteer group is an important disaster response asset.

Many international agencies have developed excellent disaster response capacities and they can augment local capacities in disasters. International agencies are often most successful in channelling external resources into the long-term reconstruction work in developing countries. There is a fear that resource-poor countries might abandon their own responsibilities for disaster response and recovery in order to rely mainly on international agencies. The belief that extensive external assistance following disasters causes dependency to develop has been shown not to be the case.

Reconstruction phase

In developed countries the effects of a disaster may be repaired in a short period of time, though the psychological damage among survivors may persist for years. In developing countries the reconstruction process may take years. Consensus on reconstruction policy may take time to reach, records of property ownership may be lost and official permission delayed. At the household level families may take time to decide whether to return to disaster affected areas or rebuild their lives and houses elsewhere. A rapid early response can demonstrate serious commitment to assist survivors by government, as well as promote an early return to normality which will help health psychological trauma for the disaster. Humanitarian aid organizations must think about what affect their actions will have on local governments and future disaster responses.

Mitigation

Mitigation means to take actions which will lessen a disaster's consequences and subsequent hazards. Many of these actions are an integral part of the reconstruction process. An improved design should be incorporated into the reconstruction of buildings following an earthquake or a tropical storm. Housing in marginal lands or flood plains which have been destroyed by flooding should not be reconstructed. At a time of heightened awareness following a disaster, attention should turn to other vulnerabilities and mitigation efforts should also be directed toward reducing these additional risks. Disasters expose social vulnerabilities which may predispose populations to other potential disasters: these should be addressed. Efforts at mitigation may overlap with plans to improve preparedness for the next disaster. Mitigation activities and longer term development programmes have very similar goals and can reinforce each other. Making available adequate and affordable insurance helps share risks and mitigates the potential effects on the economic devastation that might arise from future disasters.

Prevention

Some disasters can be prevented entirely. Mudslides can be prevented from happening by controlling deforestation or undertaking engineering works. Loss of life and property can be prevented by enforcing housing codes in disaster-prone areas. This requires resolute governments with strong public support to enforce such restrictions. Civic authorities seldom receive credit for disasters that never occurred through careful planning and enforcement.

Preparation for the next disaster

After every disaster, organizations involved should examine their actions to see what could be done to improve their effectiveness in responding to future disasters. 'After Action' reports are now widely done by many of the more effective agencies. The planning process, the mapping of vulnerabilities and the assessing of the shortfall in existing resources help communities and organizations to prepare. 'Chance favours the prepared mind' is the often repeated quote from Louis Pasteur. In recent years, an 'all hazard' approach to disaster planning has become popular. This approach emphasizes the common features of disaster response. Unfortunately, the training and updating of skills which are required to make disaster preparedness really effective are often not done, causing disaster preparedness to remain a false assurance. While no two disasters are the same and a subsequent one may be much different in character. The mitigation efforts

focus on and provide minimal protection. Preparation is still an important step to reducing the damage of a disaster.

Although preparedness often includes stockpiling of emergency supplies, few organizations, other than the military, can afford to do this on a large scale, give the capital costs and the costs of regular rotation of provisions.

The risk formula

The risk formula attempts to capture the various components which influence the amount of risk which a hazard may produce for a community or population. This draws on the work of Wisner, a risk scientist in London and others.[12]

$$\text{Risk} = \text{hazard} \times \text{exposure} \times \frac{\text{vulnerability}}{\text{manageability}}$$

Risk = the possibility of loss, injury, death or other consequence

The concept of risk is the basis for calculating insurance premiums: how likely or probable is it that a given event will occur and what will be the costs associated? In disaster planning it is common to speak of the frequency or probability of events such as 10-year or 50-year floods. Risk by definition is the possibility of damage to the lives of people affected. But it is also common to speak of 'elements at risk.' Such elements at risk include failure of communication and transportation systems and health services.

Hazard = a destructive phenomenon or event

This could be earthquakes, tropical storms, volcanic eruption or industrial events. In themselves, hazards are not disasters. Only when they affect populations directly or indirectly, through the destruction of crops, water sources or physical infrastructure do they become disasters. There are many rating scales for the intensity of hazards, such as storm categories, earthquake magnitude, or the height of flood waters. Hazards can be mapped ahead of time. This can give information on what land will be inundated by a tsunami of whatever height, or what areas will be covered by ash from a volcano as well as the various wind directions.

Exposure = duration and/or extent of a hazard

In earthquakes, this could be not only the duration of the tremor, but the duration of the aftershocks, some of which may be almost as severe as the original event. Exposure could mean the duration of a drought. In an armed conflict, exposure could be measured in decades of human displacement. The exposure could also be a measure of the number of people affected and even the extent to which they are left exposed. The words *exposure* and *vulnerability* may be used by some in a similar way. A local electricity generating facility may be left 'exposed' to complete or partial failure through poor engineering or a failure to prepare for potential hazards.

Vulnerability = susceptibility to damage or harm by a hazard

This captures the idea of protection and coping. For people it implies that there is exposure to the effects of a hazard which can hurt them or damage their shelter, possessions or livelihood. It suggests that, for various reasons, their ability to cope with the consequences of a hazard is limited. The extent of vulnerability depends very much not only on characteristics of the person or household, but on the nature of the hazard. Vulnerability of persons living in a substandard apartment house to a drought would differ from their vulnerability to an earthquake. Vulnerabilities to the same hazard will differ between subsistence workers and the rich. There are many forces in a society, from

geographic location to social and economic factors which affect vulnerability. Poverty is perhaps the major vulnerability of a population, yet some disasters may have an impact across all social strata.

Vulnerability can also be assessed for various services. Hospitals may be vulnerable to earthquakes, storms, power failures and flooding. Even if well protected against a hazard, health workers may not be protected, leaving health facilities and health systems unable to cope with demands after a disaster.

Like hazards, vulnerabilities to different events can be mapped. This information provides disaster managers with important information to map target vulnerability reduction strategies as well as potential assistance needs for various populations or types of services. Understanding the nature of risks and their locations in a community is a key component in a comprehensive disaster plan.

Manageability = the capacity to respond to Needs created by a Disaster

On the one hand, this measures the organizational capacity of national disaster programmes, the Red Cross/Red Crescent activities and NGOs, but also addresses the capacity within the affected communities to cope with calamities. Building the household's capacity to mitigate the effects of common disasters has been the centre piece of most disaster preparedness programmes. The extent that disasters are managed is known only after an event has been dealt with. But training, practices and drills can give some indication of how well a real disaster could be managed. Insurance, which transfers risks from the individual or business to insurers, is an important manageability tool.

Macro forces in an environment

The more obvious components for planning and managing disasters have already been listed. There are, however, many macro, often more subtle and pervasively cross-cutting forces that affect the response of populations to disasters. Some of these are listed in later sections.

Demographic forces

Disasters can trigger or encourage migration. Often, people in migration are at heightened risk. The massive outbreak of cholera in Goma (Congo) occurred among people fleeing Rwanda.[3] Epidemics themselves may cause mass migration that can counter all efforts to quarantine all epidemics. People migrating from rural to urban are particularly vulnerable unless they are established in an urban existence. Many people moving to cities are forced to settle in risky areas of land which are susceptible to flooding, fire or disease. These growing settlements around cities create pressures which can degrade the environment and further increase vulnerabilities. The uncontrolled cutting of trees for building or fuel creates the potential for landslides during rains. Even in rural areas, rising populations reduce the land per capita available for agriculture and increases social tension as in Rwanda.[5]

In many countries, aging populations are creating a new class of vulnerable groups. Where there is extensive migration because people are looking for labour or males have been killed in conflicts, new vulnerable groups are created. These may be female- or child-headed households, villages or small towns that have been emptied of their young people.

Economic and social forces

Poverty, although its effect is uneven, is the major single contributor to vulnerabilities. Subsistence farmers may be protected in one type of disaster but highly vulnerable in another. Generally speaking, those at the lower end of the economic and social scales lack the potential to control or mitigate many of the events that affect their lives. Loss and recovery from Guatemala earthquakes, or hurricane Katrina in New Orleans are well documented examples of how poverty increases vulnerability. Because the increasing disparities in living standards across nations and within countries may greatly increase vulnerabilities, these are of concern to disaster planners.[6] Hazardous materials and industrial processes that use such materials are often located in the poorer parts of urban areas. The availability of cheap labour means that basic protection of the employees and the surrounding community may not be practiced

Cultural practices in such diverse areas as land use, housing construction and traditional decision-making processes affect the ability to prepare and to respond to disasters. In societies where there is a tradition of working together to achieve community goals, these practices can help mitigate the effects of many hazards.

Rapidly expanding populations are comprised mainly of young people who will soon be looking for education and jobs. Without access to these, populations become restless and create economic tension which may cause within a country political instability. This can cross borders and have unfortunate economic consequences in neighbouring countries.

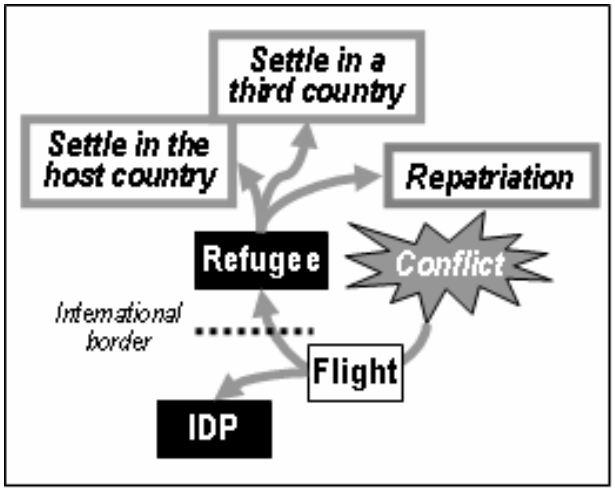
Political inclusiveness and ideology

Access to government decision-making avenues is an important method for reducing vulnerabilities. Non-representative government both locally and nationally usually lacks the capacity to respond to needs expressed by citizens. Such governments also tend to suppress the development of civil-society organizations, which are important in reducing vulnerabilities through volunteer groups and community organizations. Some political ideologies continue to discourage initiatives which do not originate within political systems. Governments may believe they 'own' disasters. Such attitudes limit their willingness to include non-governmental groups in the planning process. It also discourages individual and household initiatives which could mitigate the effects of disasters. When disasters occur and non-governmental and community groups often respond in an effective grass-roots manner, this can create resentment whenever government ineffectiveness is exposed.

As education levels in a society rise, there is often a greater willingness to take personal actions or to participate in community activities aimed at reducing risks from disasters. Much of this may be tied to a rising capacity to take control of one's own life. The low levels of education, which often go with subsistence agricultural economies, may, however, be a particular challenge to introducing those changes that could reduce disaster risks.

Armed conflicts as disasters

Of all disasters, the effects of armed conflicts are probably the greatest. After the birth of the United Nations, the number of violent conflicts between states has been diminished, but with some notable exceptions. Instead, the majority of conflicts have been within states. During the Cold War, these were often 'proxy wars'



fought generally by two parties, each aligned with one of the two superpowers. Almost all of these occurred in the world's least developed countries. Since the end of the Cold war internal conflicts tend to have multiple warring factions, making resolution more difficult. Consequentially, the numbers of refugees and internally displaced persons (IDPs) have reached at least 30 million throughout the past decade. Among all disasters, some of the largest public health challenges are those associated with the care of persons displaced by conflict.

A refugee was defined in 1951 as a person outside his or her country of origin and unwilling to return because of a well-founded fear of persecution over race, religion, nationality or membership in a social group or political opinion[8]. An additional component is the unwillingness to return because of a threat to life or security as a result of armed conflict or wide-spread violence which seriously disturbs public order.

Though having the same fears and suffering the same threats, because some people might not cross an international border, they are, therefore, not considered as refugees, but IDPs. This difference is very important because there are no UN protection mandates covering IDPs. Also, the international funding to assist them is but a fraction of that available for refugees. An additional group, sometimes called the 'internally stranded' are those who would flee if they could, but are trapped. This group is highly vulnerable to violence, much of which is neither witnessed nor documented.

Refugee crises are generally divided into three phases. The **emergency phase** usually occurs at the start of a refugee influx and is defined by a death rate twice the baseline crude (all-cause) death rate for that group. At this point, displaced populations are particularly vulnerable to outbreaks of disease, malnutrition and environmental hazards. Putting public health measures into place rapidly to minimize excess mortality is a major challenge in the emergency phase. The **post-emergency phas**e begins when that death rate drops back below twice the normal or background rate. Often, this is considered a maintenance phase as refugees wait for conditions to be right for repatriation. This is a time to build good health knowledge and community practices during the protracted waiting which often occurs. The lack of political will sometimes causes refugees being totally reliant on humanitarian aid to remain in camp-like situations for decades. This has lead to campaigns by some against the practice of 'warehousing' refugees in dependent situations.[10] Finally in the **repatriation phase**, refugees return home. This is often termed the 'durable solution' when refugees settle permanently in their host country, move to a new country or return to their homes. Obviously, only the latter option is available to IDPs. Often, the displaced return home to shattered and depleted circumstances, requiring continuing assistance until they are firmly re-established in their communities.

Refugees might be housed in camps, be self-settled or live with a host family. Camps for displaced populations are a management convenience. There is evidence from many situations that self-settled refugees do better in many respects than those in camps. High death rates are usually due to the poor access to public health resources such as water, sanitation, food, shelter and health services. However, these are difficult to establish in the absence of a secure environment.

Disaster summary

Disasters are complex events that defy simple explanations. No two disasters are the same, yet they all have similarities in human suffering and material loss. In addition, there are some basic actions which can mitigate the impact of future disasters. Increasingly, disasters arise from human actions. Some of these are based on economic activities needed for survival, but many are based on exploitation for short-term gain without any serious consideration of longer term alternatives.

Few developing countries have yet to implement effective national disaster management systems. Without these, developing nations remain dependent on international organizations to provide assistance in times of disaster.

Armed conflict has the greatest impact of all types of disasters on people. Yet prevention of conflict attracts little interest from political leaders and policy makers compared with the time and resources spent on defence and the waging of war. From the public health standpoint, the measures developed in the past decade have dramatically reduced illness and death among the displaced.[7] Yet, the public health community has met only indifference whenever it advocates for the prevention or resolution of conflict through non-violent means.

Managing disasters

Many people still think of disasters as 'accidents' or events which cannot be anticipated. This results in a focus on responding to the immediate needs created by a disaster rather than preventing or reducing effects. Disaster *management* conveys the important idea that protecting populations and property also involves the estimation of risks, preparation, activities which will mitigate the consequences of predictable hazards and post-disaster reconstruction in a way that will decrease vulnerabilities. An important goal is building a culture of awareness that preparation is not only possible, but also will greatly reduce the consequences from disasters in terms of human and economic loss. In these, public health is an important partner with engineers, planners, elected leaders and community organizations.

An effective response to disaster begins with effective planning, but must include many other steps. Each of these steps depends on the strength of other links in the disaster management chain. While no one organization or group 'owns' a disaster, the ultimate responsibility rests with governments to protect its people against disaster. No government can carry out these responsibilities without cooperating with many other groups in a country. An effective national disaster management system is largely absent from many developing countries. In some countries, disaster response has by default devolved to the military, which often has the best communication and logistic systems. However, militaries do not generally coordinate well with other organizations that function in different ways. Militaries lack the mandate or the expertise for effective disaster planning. In some countries where floods or droughts are common, national agencies have been created to deal specifically with these disasters. However, increasingly an 'all hazard' approach is being used, which emphasizes common features in managing a response to disasters rather than focusing just on specific types of disasters such as tsunamis or earthquakes. This 'all hazard' approach exceeds the scope of drought and famine agencies. In this approach, disaster commonalities are stressed with specific annexes setting out the management for specific disasters where responses differ.

Improving resilience to disasters

Many efforts have contributed to the ability to manage the consequence of disasters more effectively by building better resilience among governments and their citizens. Among these have been the UN International Decade for Natural Disaster Reduction,[14] the Yokohama strategy,[15] the International Strategy for Disaster Reduction and its Hyogo framework[16] and the extensive work in Disaster preparedness by PAHO[17] and ADPC.[18] These have greatly advanced knowledge on effective approaches to mitigate the effects of disasters and support communities in coping with disaster consequences. The Hyogo framework focuses on building national and community resilience to disasters.[19] It outlines three strategic goals: the

- Introduction of disaster risk reduction into planning for sustaining development at national and local levels;
- Development and strengthening of institutions, mechanisms and capacities to build resilience to hazards;
- Systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes.

Disaster management planning is often seen as a separate activity from the main functions of governments and organizations. A challenge has been to integrate disaster reduction approaches into all activities. This means having legislative provisions which are current, disaster 'desks' in line with ministries, operational links to civil society organizations such as Red Cross/Red Crescent National Societies and to work actively with commercial sectors which are part of prevention activities or which would be involved in disaster response. As efforts continue to strengthen community services as part of poverty alleviation or sector-wide approaches, building community resilience must be incorporated.

Data is critical to reducing risks and improving response. Mapping vulnerabilities and resources and understanding historical patterns of disasters are key elements in coping with disasters. Surveillance systems that both identify risks and monitor needs and the adequacy of response to a disaster are indispensable, though often poorly resourced parts of disaster management. Reducing risks also means strengthening surveillance to provide early warning about public health threats and building preparedness to meet them. The use and exchange of information among disaster managers is critical for building a comprehensive and coordinated management capacity at national as well as local levels.

At the heart of any approach to minimizing loss and improving resilience is the reduction of underlying risks. This requires a comprehensive approach which includes environmental management, improving food security, protection of critical public facilities, land and building code enforcement and protecting livelihoods.

National level disaster management

Where a national disaster management agency has been established, responsibility is often located in the office of the president, prime minister or a minister with cabinet-level presence. Being a government auxiliary, Red Cross/Red Crescent is often a member of a national disaster management agency. The responsibilities for disaster management need to be set out in enabling legislation. A national council or committee with a secretariat is often set up to involve all organizations that can contribute to a country's disaster management. Typically, this includes various ministries, non-governmental organizations both local and international which jointly oversee the development of national disaster plans and monitors their use. Each of the component organizations will develop its own planning process to support its role in national disaster management. A disaster command centre is often housed by the secretariat to manage disaster response.

While national disaster planning is important, the people of a country will have little benefit without supporting organizations at regional, state, district, county, municipal and community levels. Groups at the community or local government level are the groups which actually provide help to affected populations to prepare and respond to emergencies. Where national systems exist, these groups have often not followed up in the development of strong community components. Consequently when disaster strikes, the community response will lack the coordination and the training necessary to provide the life-saving response needed. In the absence of a national disaster management system, civil society organizations such as the Red Cross and Red Crescent and NGOs have developed their own disaster response capacity which can help populations in times of disaster.

Even where national planning is largely absent, effective planning at the province, state, district and municipal levels can protect people and their property. Organizations with an extensive presence already at the community level are probably in the best position to help communities both prepare for disasters and respond when they occur. The development of community plans based on the participatory appraisal of risks, strengths and vulnerabilities to various hazards offers the best strategy to mitigate disasters at the community level.

Often overlooked is the importance for key services such as health facilities and communication bodies to have their own disaster plan. Ministerial, national or regional

disaster planning bodies can help health units, local organizations and agencies develop their own disaster plan.

The failure to update, train and practice implementing disaster plans can mean that all the effort put into planning is largely wasted. When the disaster occurs, those involved in planning have often moved to other jobs, telephone numbers have changed and few remember what actually had to be done. All that is left for the many hours spent preparing a disaster plan's substantial efforts is a forgotten set of paper plans. At the national level it is critical that readiness be assessed regularly through a variety of approaches, and that the same standard is required of regional and local disaster

Finally, all disaster management efforts need both human and financial resources. From the beginning, it is important that a disaster plan has set aside for it the resources to develop further planning; from its required committees and workshops, to the training and practices and then to maintain the reserves necessary to mount a disaster response effort at any time of need. In the event of a disaster, there is likely to be a great need for the rapid deployment of resources, which itself requires extensive planning and collaboration between organizations.

Local level disaster management

More than three million people became homeless after the earthquake. Photo International Federation

Public health practitioners, members of NGOs and of community based organizations are most frequently asked to take part in disaster management at the local and community level. This will be considered in greater detail here.

The local and especially the community planning for disasters is often the weak link in the organization of a country's disaster management system. Yet, a quick and robust community response is the key to saving lives and property. NGOs, the International Red Cross and Red Crescent Movement and various Community Based Organizations (CBOs) with strong links to the community are key partners in local disaster planning. Often these organizations are the key responders where other resources are limited. Such organizations heavily depend on volunteer or part time staff, often with high turnover. This makes the need for regular training and communication most important.

A typical local or community disaster response plan contains certain key components. These are considered in the sections below. As plans are constructed for specific communities, components may differ in nature or emphasis from the typical format.

Organization of a local response

The first stage is identifying who is responsible for disaster management in the specific administrative unit or local government area. Usually, the person responsible will be a senior administrative or elected official, but supported by a disaster management committee or board. Roles and responsibilities need to be set out as well as organizational communication and supervision. This needs to be consistent with whatever national legislation governs disaster management in the country.

Disaster management committee or board

This disaster committee contains persons responsible for public safety such as administrative, public works, police, fire, communication, finance personnel and often a judge or magistrate. In addition to the public sector, the disaster management committee should contain persons from NGOs, community based organizations and organizations such as Red Cross and Red Crescent National Societies which have the disaster management capacity. The disaster management committee has the overall responsibility of preparing, updating or modifying the disaster plan for the area in its responsibility. Further it is responsible to be sure the preparations are in place and to take action whenever weak parts of a potential response are identified. Through its members, community resources are brought into the disaster management capacity. When disaster strikes, these communication and coordination linkages may to a large degree determine the success of the response.

Implementation plan

The implementation component addresses how the disaster plan will be put into place. This component contains timelines, resources and persons responsible. It identifies resources, conducts situational analyses, maps vulnerabilities and sets out a training plan.

Community profile

The local community description includes its population and their geographic distribution, social and economic characteristics, weather patterns, and rivers. Roads, communications and utilities should also be mapped.

Community resources

Community resources which could provide assistance in disasters are each inventoried and mapped. The maps should include shelters, warehouses, energy sources, community organizations, fire and police stations, financial institutions and health and education facilities. Resources also include community organizations or groups which can effectively participate in disaster management at the household level. Key contact personnel from various organizations and from each population area are identified with contact numbers. This part of the plan must be updated regularly as it is likely to outdate quickly whenever people’s positions change.

Hazard analysis

This section gathers information from assessments and local information to identify what hazards are likely to affect the community. These could be cyclones, floods, excessive heat, fires, transportation accidents, earthquake, industrial events or other hazards, depending on the location and characteristics of the community. A historical table can be constructed to indicate when these occurred and list their consequences for the local community. An annual calendar is often developed to show which various events might be expected in which months. For each of the likely hazards identified, an assessment of potential impact and vulnerable areas is made. In some cases, the geographic areas of vulnerability may be mapped, but in other cases the vulnerabilities are listed. This would include population groups, elements and services at risk. For populations, it could include groups such as the elderly, lower economic groups or people living in flood-prone or isolated areas. Elements or infrastructure at risk could include livestock, water sources, health facilities, roads and communication structures.

Prevention plan

Although the effects of many disasters can be mitigated, some can be prevented completely. Careful analysis of potential hazards can be used to stop future disasters before they start. At the community level, housing can be restricted in flood planes,

earthquake or fire resistant building codes can be strictly enforced and hazardous materials stored away from residential areas. At the household level, fire risks can be eliminated, first aid and safety supplies stocked and a household evacuation plan established.

Mitigation plan

A mitigation plan is often divided into various sectors such as infrastructure, health, communications, livelihoods, agriculture, etc. For each sector, mitigation measures are listed, and identification of responsible or 'nodal' persons for disaster management activities. This would also include making people aware of alternate roads in case of flooding, maintenance of standby power sources, protecting windows, stockpiling of essential medications, keeping emergency shelters and blankets available in certain seasons and ensuring the availability and function of emergency communication systems. The longer-term mitigation efforts would include improving building codes, safe locations for new residential areas, emergency communication systems, cross-training of potential responders.

Schedule of essential preparedness activities

From the time when a potential hazard has been identified, certain preparedness actions should begin. These can be designated ahead of time in a standing schedule of preparedness activities. For any emergency, a chain of responsibility must be established starting with who decides on when an alert is announced and how this alert is disseminated. Once an alert is announced, a specified chain of activities needs to be carried out. Among such actions could be the deployment of field staff, coordination with NGOs and Red Cross and Red Crescent National Societies, notifying vulnerable populations, the placement of emergency transportation and organizing health personnel for emergency response.

Standard Operating Procedure (SOP) for crisis response

No matter how much preparedness has taken place, a disaster system is judged mainly by its response. A Standard Operating Procedure (SOP) is created for the disaster control site which will set out roles and specific actions to be taken when a disaster occurs. This SOP can be used as the basis of drills and exercises. The SOP lists specific actions needed to prepare, to alert and to respond. Among the items included are a standard disaster assessment instrument, a register of messages and dispatch of vehicles and personnel. An important part of any response is the coordination and linkages with other organizations which will play a part in assisting the populations affected.

Criteria are established in advance covering such areas as evacuation, transportation, the location of emergency shelters, surveillance for disease outbreaks and triage of injured persons. The SOP specifies the responsibilities for making these decisions and overseeing their implementation.

Post-disaster analysis

The most important time for learning from a disaster response is while the events are fresh in the minds of those affected and those involved in the response. An organized evaluation of what went well, what failed and gaps in the response must be conducted immediately after the disaster. From this information the disaster management approach can be strengthened to prepare for the next disaster. Putting disaster lessons in place takes it a long process, involving many people. Reducing vulnerabilities may include changes in construction codes, altering road locations, strengthening utilities and many other actions which can be costly and touch political sensitivities. Disasters managers need to be persistent and patient to see that the changes needed are made.

Strategies for involving communities

Non-governmental organizations and the Red Cross and Red Crescent National Societies have effective links with communities which governments seldom achieve. Often Red Cross and Red Crescent National Societies are part of the national disaster response agency, carrying out complementary preparedness and response work. Using these advantages to mobilize and facilitate communities to respond to disasters can help blunt the effects of many disasters. This section looks at methods to assist communities in managing disasters.

Affected individuals and communities are often treated as dependent and passive recipients of externally imposed programmes. Yet many problems of survival and health that result from a disaster may be handled more efficiently if a community is well organised.[13] Evidence shows that community participation *before*, *during*, and *after* a disaster can greatly reduce the overall mortality as well as improve the use of resources in the following ways:

- If a community is in a state of preparedness before a disaster strikes, this may reduce the impact of the disaster with regard to the number of injuries and deaths, damage to infrastructure, loss of property or livelihood;
- Whatever the type of disaster, the greatest number of lives can be saved during the first few hours following a disaster before help from the outside arrives which can take several hours or days. The local community must, therefore, be ready to assist since they may only have themselves to rely on;
- Most health and survival problems can be handled by the community. This is possible if the community is active and sufficiently organized to sustain itself until outside help arrives.

Steps in building community participation

Disaster preparedness programmes that are planned with the community are more likely to secure their long-term support and resources. To ensure the disaster preparedness programme addresses the concerns of the community rather than only those of donors, there are several methods, discussed below, that can be used to help motivate the community, analyse past experience, assess risk and start action.

Community motivation

There may be a general lack of interest in disaster preparedness among political leaders and communities. This lethargy will make it difficult for the emergency manager to engage the community in disaster preparedness activities. The following reaction may be observed in communities frequently faced with catastrophic events:

People living in hazardous areas or who are frequently exposed to hazards are observed to have attitudes of marked indifference. They tend not to worry about the coming earthquake, flood, hurricane or disease epidemic until it happens. Believing they have little control over such events, they tend to be fatalistic about the impact of any catastrophe.[4]

Depending on the resources available, at-risk communities may be motivated to participate in disaster preparedness through the following ways:

- Organize informal meetings and events to improve the relationship between citizens and their local, regional, and national public officials;
- Build the community's pride by broadcasting their achievements through the local media (newspapers, radio and television reporters);

- Explore both traditional and modern techniques of reducing the risks posed by local hazards and how to cope with disasters;
- Involve vulnerable groups from disaster-prone areas (e.g., women and minority groups). They can help monitor changes in weather, water levels, food prices and availability, etc;
- Respond appropriately to disaster warnings from the community such as making investigations, taking preventive measures, etc;
- Offer to train volunteers and other members involved in rescue work, communications, transportation, construction of shelters and food supply.

Several members of the community may be interested in supporting disaster preparedness activities, including people from:

- Emergency services and law enforcement;
- Public and private health services;
- First aid and volunteer groups, such as the Red Cross and Red Crescent or from churches, mosques, etc;
- Community and professional associations;
- The business sector, trade, construction, etc;
- School teachers and school children;
- Women and youth groups.

Analysis of past experiences

The emergency services staff, local health personnel and members of the community concerned should form a disaster committee and analyze the key problems that arose during past disasters. This will help determine the priorities for future disaster response. Thereafter, action plans can be drawn based on available resources and combining both modern and traditional methods. The following table lists questions to analyze a community's disaster experiences.

Table 1-1: Analysing the disaster experience[6]

Questions to help analyse a community's disaster experiences
1. What were the principal causes of damage to infrastructure such as roads electricity and water as well as buildings and houses?
2. What were the main causes of illness and death in disaster victims?
3. What were the main difficulties in providing relief?
4. What problems arose soon after the disaster (by hours and days)?
5. Would it have been possible to predict the disaster before it occurred?
6. What preparedness measures could have limited the numbers of victims and the damage?
7. What errors were made that must never be repeated?
8. What actions did the most good?
9. What equipment and supplies were lacking?
10. What problems were encountered when transferring the injured to hospitals or clinics?
11. What were the difficulties of co-ordinating with the authorities and other community groups?
12. Would it have been possible to get better co-operation from volunteers?
13. How would it have been possible to obtain more effective outside assistance?
14. What health problems arose after the disaster and what were the difficulties of coping with them?

Risk assessment

A detailed risk assessment should be carried out by the community disaster committee led by a local leader. This involves gathering information about the risks that a community is most concerned about such as fires, collapse of buildings, floods, contamination of water sources, etc. The committee should physically walk through the entire disaster location and help community groups, local organizations, industry workers, merchants, teachers and other knowledgeable individuals to identify potential risks. The emergency response services and public health workers can help concerned people recognize factors that make the risk more acute during a disaster such as the neglect of building codes and the inadequate protection of water sources etc. The table below lists some of the questions that should be answered during a risk assessment.

Table 1-2: Assessing risk

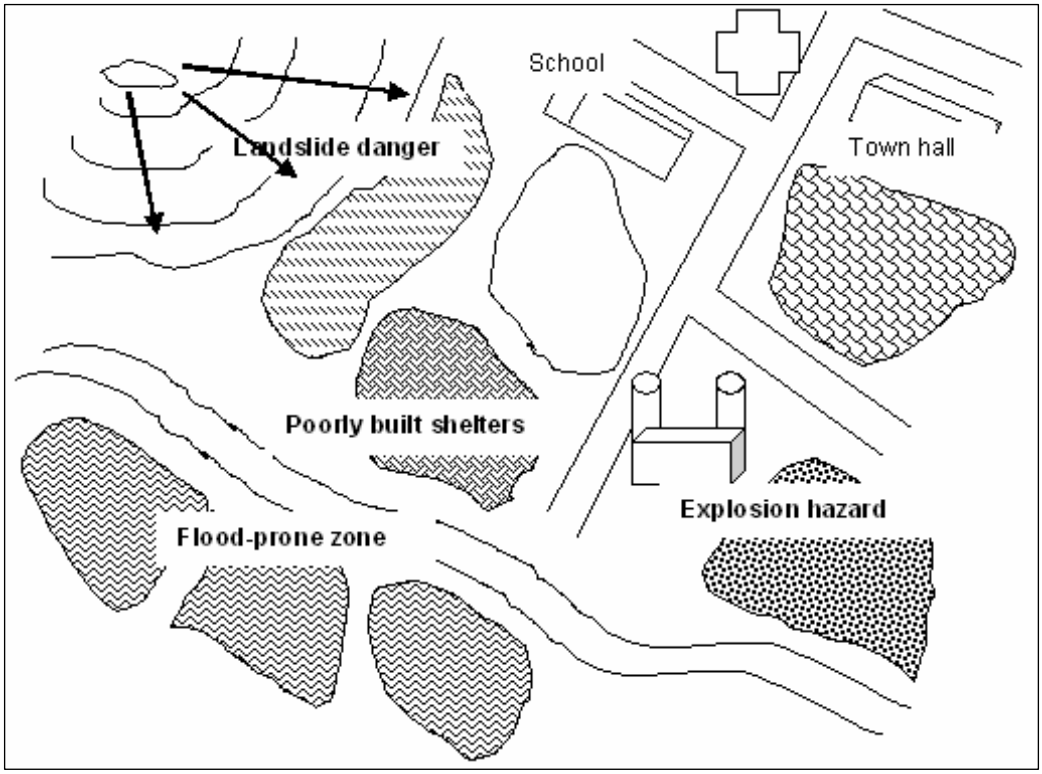
Questions to help in risk assessment
1. What common hazards are likely to affect the area?
2. What and who will be at the highest risk from these events?
3. What are the key factors that make them more vulnerable to these hazards?
4. Which subgroups of the local population are likely to suffer more from their vulnerabilities?
5. What resources and capacities are available locally that can enable the community to respond effectively in times of disaster?

The community disaster team can follow the steps below to assess the risks and the resources that need to be addressed:

- Meet and discuss the risks the committee wishes to concern itself with;
- Conduct visits to those sites exposed to risk and carry out informational meetings;
- Clearly identify risks in writing and locate them on a risk map;
- Have risk maps reviewed by experts and committees made up of emergency service workers, local government leaders and other members of the community;
- List the resources available to the community in case of disaster;
- Propose actions to reduce the risks;
- Carry out efforts with the co-operation of the community to reduce the risks;
- Following the risk assessment, the committee can draw risk maps to summarise their findings and conclusions.

Disaster preparedness and risk reduction. Reading up on disaster preparedness; a lesson in survival. Photo: Amalia Soemantri/International Federation

Figure 1-1: Example of a risk map



Risk maps can serve as useful tools for educating the community on the risks of hazards and for identifying the appropriate preventive actions that can reduce the impact of particular disasters. Risk maps can also be used for monitoring the high-risk sites during a disaster, and for organising relief priorities more effectively. Possible results from risk maps include the following:

- Strengthening inadequate shelters;
- Identifying places that can provide temporary protection against floods;
- Planning evacuation routes in the event of a fire.

Community action

Past experiences with disasters show that most people who are struck by disasters react in a positive way. Communities are frequently willing to volunteer for the following types of activities:

- Warning people of danger;
- Searching for and rescuing victims;
- Giving food and shelter to the homeless;
- Constructing dams or dikes to eliminate flooding;
- Safely disposing of hazardous materials.[9]

Even in the absence of specific disaster preparedness activities, communities and emergency response services operate better if they have some basic knowledge and skills in certain areas. It is important to carry out drills and practice other basic disaster preparedness exercises in areas that can improve the victims' survival and health, such as:

- Chlorinating water and distributing food;
- Setting up temporary shelters and sanitation;
- Performing first aid;
- Transporting the sick and injured to hospitals.
- Reporting critical information by telephone, radio etc;
- Dealing with stray or dead animals.

When a population is threatened by a disaster such as flooding, cyclones, tidal waves, volcanic eruptions or open conflict, evacuation may be necessary. It is important that the community takes part in determining its own evacuation routes and plans, its means of transportation, its next destination and how to access basic supplies. Every member of the community should be made familiar with these plans so that evacuating people can go as smoothly as possible.

Conclusions on community participation

Communities overpowered by a major disaster such as earthquake, flood or fire etc, usually require long-term assistance from national or international levels to recover and resume their normal lives. Introducing the disaster-prone community to practical disaster preparedness activities can build their capacity to cope with future disasters. This can be done by analysing past experiences, conducting risk assessments and creating disaster preparedness plans. Also, a well-organised community can help to improve the quality of external assistance and avoid common mistakes, such as inappropriate aid due to a lack of information about the external resources needed. The emotional trauma from disasters can persist for a long time, perhaps even a lifetime. However, returning to normal life as soon as possible helps people to function better than if the return is protracted.

Bangladesh - Community disaster preparedness

As a result of capacity-building work and increased awareness of disaster preparedness at a community level, the villagers have taken pro-active steps to strengthen their capacity and resilience when facing natural disasters. The community has come together to build bamboo bridges. The bridges help evacuate the most vulnerable people during disasters such as