

Should Disaster Strike...

*Health in the International Decade
for Natural Disaster Reduction*



World Health Organization

Disaster Myths and Realities

The actual effects of disasters are perceived in different ways. Some of these perceptions are incorrect. Evaluate your knowledge and ability to react appropriately to disasters by responding to the following statements. Then turn to the inside back cover for the answers.

1. In case of disaster, send out an immediate appeal for international medical personnel.
 True **False**
2. When a disaster occurs, people in other countries should react by immediately organizing the collection and despatch of whatever can be obtained in the way of medicines, clothing equipment, etc.
 True **False**
3. A few weeks after a disaster occurs, things are usually back to normal and most of the major services are restored.
 True **False**
4. Disasters cause fewer deaths in rich countries than in poor countries.
 True **False**
5. Disasters bring out the worst in human behaviour.
 True **False**
6. When disaster strikes, outbreaks of infectious diseases are inevitable due to the presence of unattended dead bodies.
 True **False**
7. Mass hunger cannot be avoided after a disaster strikes.
 True **False**
8. Following a disaster, it is best to house people as close as possible to their own dwellings rather than in settlement camps.
 True **False**
9. In case of limited food supplies following a disaster, priority should be given to the young and the old.
 True **False**
10. When disaster strikes, each individual should take care of his own family and belongings first.
 True **False**
11. The intensity of two recent earthquakes in Armenia and San Francisco was the same, but in Armenia several thousand died whereas in San Francisco 60 people died. The difference is mainly due to earthquake-proof construction.
 True **False**
12. The Sahelian drought in Africa is caused by a combination of climatic and man-made factors.
 True **False**

Interview with Hiroshi Nakajima, M.D., Ph.D.

Director-General of the World Health Organization

"We cannot pursue our long-term strategies of Health for All without paying attention to the global problem of disasters."



Dr Hiroshi Nakajima

Why does it seem that the number of disasters has increased in recent years?

Unfortunately, we have every reason to believe that the continuing deterioration of the environment, particularly through deforestation and land misuse, is contributing to the frequency of disasters such as flood and drought, and will increase over the next decade. The crowding of cities due to the growth of world populations is also increasing the vulnerability to disasters.

How are disasters and health related?

During recent decades, we have seen significant advances in health, social and economic development. Yet this progress has been repeatedly interrupted by man-made and natural disasters that have had a terrible impact on the overall health of communities, nations and even regions. The setbacks caused by these often devastating events have made it clear that we cannot pursue our long-term strategies of Health for All without paying attention to the global problem of disasters.

What is WHO's role during the International Decade for Natural Disaster Reduction?

Part of health preparedness and response is to have a sound understanding of the causes and the ways of controlling a disaster situation. The World Health Organization (WHO), in cooperation with governmental and nongovernmental organizations and the United Nations system, is engaged in tracking the history of major disasters so as to detect patterns of vulnerability. For example, epidemiological mapping shows that most disasters occur in countries that are already adversely affected by ill-health and poor economic conditions. Detection tools such as these, combined with training and preparedness planning, are critical components in a nation's ability to understand, anticipate, survive and recover from disasters.

How can the international community improve its disaster response capabilities?

Disasters are everybody's business. But sometimes the well-intentioned donor community actually overreacts by supplying excessive amounts of some types of supplies, while ignoring others of greater priority. Standard lists of supplies, such as WHO's Emergency Kit, can be useful in responding to emergency situations. Experience has shown that better coordination among all participants and the full involvement of people in the affected area are vital prerequisites to effective disaster preparedness, relief and rehabilitation.



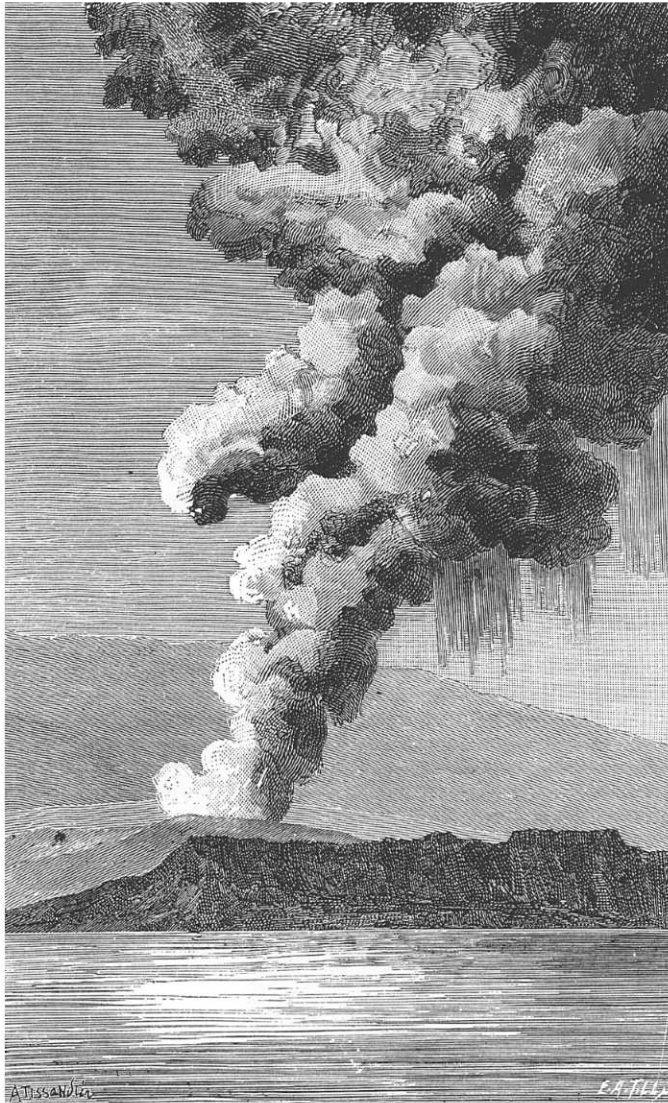
Floods in Cuba in the aftermath of Hurricane Albert, 1982

**Should Disaster Strike ...
Be Prepared**

Natural Disasters from Pompeii to Krakatoa

"Fatalism is no longer acceptable; it is time to bring the full force of scientific and technological advancement to reduce the human tragedy and economic loss from natural disasters."

Dr Frank Press, "Implementing the International Decade for Natural Disaster Reduction"



The eruption of Krakatoa, 1883

The history of disasters is essentially one of fatalism versus preparedness. Tragically, fatalism has prevailed for most of human history. But as we approach the 21st century, a lasting case for preparedness must be made. That it prevails as a philosophy and a science is of concern to every one of us. The consequences of failure will be measured in human misery and lives lost.

It must first be understood that within this dichotomy of preparedness and fatalism lies a complex tale of rich and poor, of vast human migrations away from the countryside and into cities, of the explosive growth of world population, of the uneasy relationship between the desire for economic growth and prosperity and our planet's ability to sustain it.

It is also a history of myths and realities. It could be argued that humankind has, in part, defined itself through its relationship to catastrophes. In several of the world's major religions, the catastrophic flood is a pivotal event. In others, the anger of the gods is believed to be manifested in droughts or volcanic eruptions. Our attachment to fatalism is therefore understandable, ingrained deep within our psyches is an abiding reverence for the elemental forces of nature.

There is good reason for this reverence. Disasters have played important roles in the history of entire civilizations. The southern Italian city of Pompeii was buried completely under cinders and ash in 79 AD. Earthquakes and the 1450 BC eruption of the Thera volcano on the Mediterranean island of Santorini resulted in the submergence of nearby islands by huge, seismically triggered waves called tsunamis (incorrectly called tidal

waves). The event is believed to have given rise to one of the most enduring disaster myths: the lost continent of Atlantis.

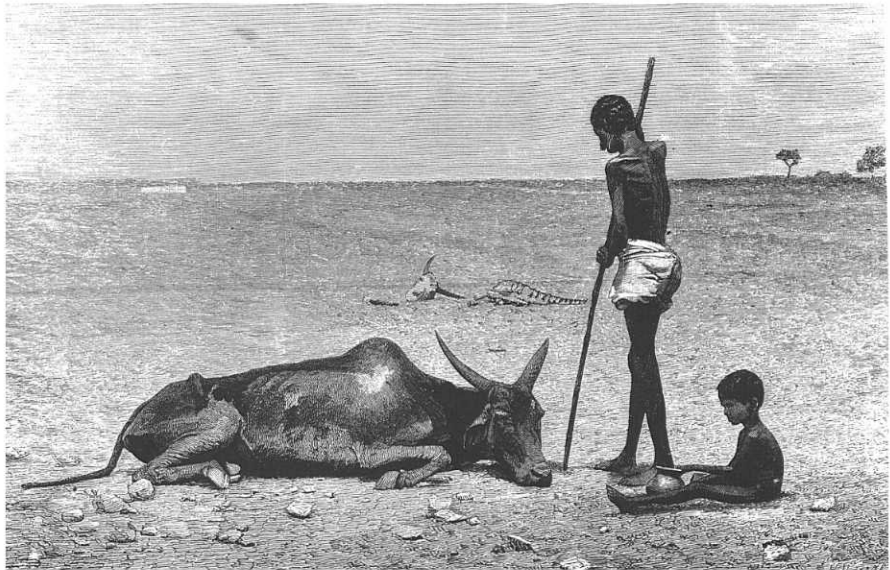
We are more certain about the impact of the 1883 eruption of Krakatoa: One of the greatest volcanic explosions in history, in the Sunda Straits of Indonesia, was also one of the first to be widely observed and recorded. It is estimated that 26 times the energy of a hydrogen bomb was released. The ash cloud, propelled by winds, was 80 kilometres high and covered the earth in a ring thousands of kilometres in width. The explosions were so loud that they were heard 4 811 kilometres away. Tsunamis as high as 36 metres swept over 250 coastal towns, drowning 36 417 people.

Seismic disasters are not the only killers, however. While crossing the Alps in 218 BC, up to 18 000 of Hannibal's troops perished in avalanches. Over two millennia later, in 1916-18, avalanches in the Italian Dolomites killed an estimated 40 000 Austrian and Italian troops.

Floods have been particularly deadly. Perhaps the worst such disaster was the flooding of the Hwang Ho River in China in August of 1931. Estimates of the death toll range from 1 400 000 to as high as 3 500 000.

Drought and famine have been equally devastating. The potato famine in Ireland in the 1840s killed 1 500 000. The Russian famine of 1920-21 killed a minimum of 5 000 000 people; a famine in 1877-78 killed tens of millions of people in India and China.

The harrowing statistics are numerous, and, delivered in quick succession, too numbing to be comprehensible. Yet these statistics tell only part of the



famine in South India, 1877

story. They talk only of those most severely affected by disasters. Many more tens of millions experienced disasters in nonfatal but painful ways such as illness, malnutrition and homelessness.

As history approaches the present, it can rely on the exhaustive record keeping of the modern age. Statistics become more reliable and precise. But rather than vindicate the modern age, the statistics show that disasters are still with us in all their destructive capacities. They are not just phenomena of the ancient world. The statistics confirm that we, for all our technological prowess and economic advancement, can still suffer terribly from storms, floods, hurricanes, droughts and earthquakes.

And although we are still tied to the movements of the winds and tides and of the earth, we tend to forget, or

dismiss, their power. A distressing collective amnesia often sets in during the absence of disaster, as people turn their backs on quiet volcanoes or tranquil seas and return to their daily tasks. The lessons taught by storms to one generation of coastal residents are forgotten by the next.

Such forgetfulness can be fatal. The history of disaster awareness and preparedness, unfortunately, is short. We must have the courage to remember, and the conviction to act immediately. History reminds us that disasters are rarely announced, and never postponed.

Natural Disasters in Our Time

"The General Assembly has called on all those who can contribute to disaster mitigation to participate in a global effort to act: each in his own sector and all in a coherent forward-looking programme to reduce vulnerability. The wisdom and foresight which produced the Decade must now lead to concrete initiatives and actions designed to bring early results."

*Javier Pérez de Cuéllar
Secretary-General of the United Nations*

Few people prepare for disasters, preferring to relegate the possibility – and in many cases, the probability – of disasters to the back of their minds. Yet no one is immune from disasters. Even in the latter half of the 20th century, single disasters have killed a great many people. During the years 1946-70, 59 typhoons battered Japan, often taking direct paths over the most populous areas. The casualties were staggering: 13 745 dead, 576 378 houses destroyed, a further 4 479 665 houses flooded.

Between 1960 and 1989, according to the WHO Collaborating Centre for Research on the Epidemiology of Disasters in Brussels, natural catastrophes in China affected an astonishing 233 million people, killing 727 849 and injuring 425 162. The Tangshan earthquake in China on 27 July 1976 alone killed 242 000 people.

There have been numerous cataclysmic events like the Tangshan earthquake during the last 30 years. One of the worst disasters of the 20th Century, the cyclone that devastated Bangladesh

in 1970, caused incredible destruction. Its force, and the resulting famine and disease it caused, is estimated by some observers to have taken one million lives.

In 1987, over 23 million people, from Asia to the Americas were affected by disasters. 1988 and 1989 did not fare better. According to the Red Cross, 80 million people in southern China were affected by typhoons, floods and landslides in 1989.

In the same year, a single country – Malawi – suffered from five different disasters: cyclones, floods, an earthquake, a drought and a mealy bug infestation that destroyed the crops of 200 000 farmers. The 300 000 victims of these natural disasters joined the 800 000 refugees that have migrated to Malawi since 1986 to escape the conflict in Mozambique.

1990 was also a devastating year. An estimated 40 000 lives were lost and 500 000 people were made homeless by the earthquake in the Islamic Republic of Iran. Torrential rains followed by violent storms affected 20 000 000 people in the Hunan province of China. Drought again affected millions in Africa.

There is every reason to believe that disasters will be with us during the International Decade for Natural Disaster Reduction. War and the degradation of the environment, combined with the overcrowding of cities and the overflow of those populations into high-risk areas, makes the task at hand increasingly difficult.

Difficult or not, disaster reduction is now a human imperative. Further delay will be rewarded only with more death and destruction. We must therefore seize every opportunity to reduce the impact of disasters. Our lives depend on it.



High winds batter homes on a Caribbean island.

Man-Made Disasters

Natural disasters have usually had a human component. It can be argued that a natural disaster in an unpopulated region represents a phenomenon rather than a tragedy. It is when human populations move into vulnerable areas, or themselves create conditions of vulnerability, that natural disasters become human tragedies.

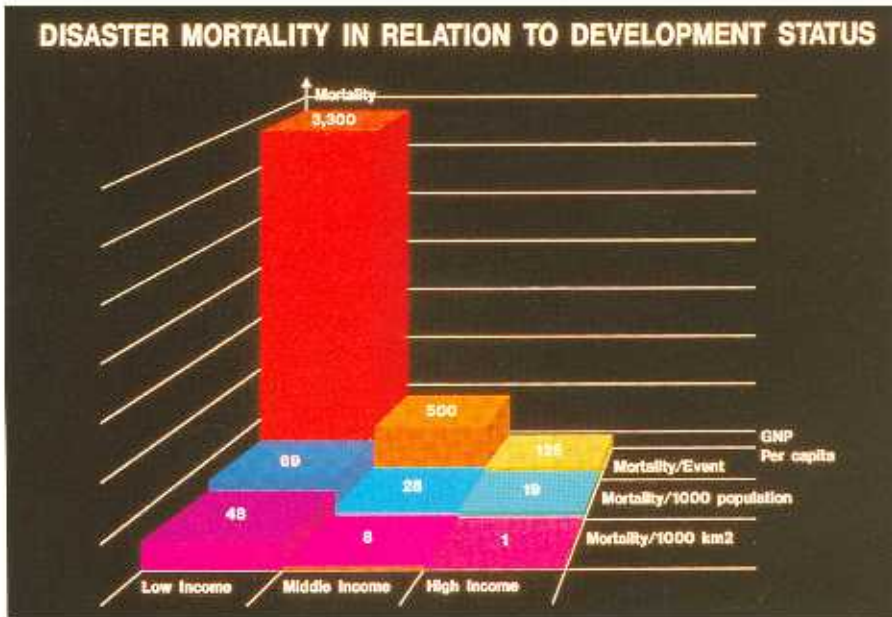
Poverty and population pressures have pushed people onto increasingly unsafe ground: hillsides prone to landslides, undefended coastal plains and islands, river water sheds, areas of great seismic risk. According to the United States Overseas Development Council, six out of every 10 of the world's poor are being pushed by agricultural modernization and high population growth into marginal lands that are more vulnerable to disasters.

Few have a choice in where they live. Many are driven by slow man-made calamities such as overpopulation, economic inequalities, personal and national debt burdens, and civil war.

Disasters and the Environment

There are numerous ways that humans, by their own acts or negligence, create disasters, or add to the suffering caused by "slow-onset" natural disasters.

The chemical disaster at Bhopal, India, was particularly devastating to those most vulnerable - the poor. The full impact of the explosion at the Chernobyl nuclear power plant and the resulting release of radioactivity are just now being fully assessed. According to a Soviet trade union organization, 4 million people in the vicinity of Chernobyl live in areas contaminated by radioactive substances. The Supreme Soviet of the Ukraine has declared the entire republic an ecological disaster area.



Chemical or nuclear disasters are not the only ways that we burden our environment. The degradation of the environment by the burning of fossil fuels is already a calamity, and we are now seeing the relationship between so-called "slow-onset" disasters and sudden impact disasters.

Deforestation poses a great hazard. From Nepal to the Amazon, it threatens not only individual communities but the entire world. While clear-cutting and slash-and-burn agriculture eats up vast parts of our forests, the search for firewood leads to the loss of the ground cover that prevents landslides and soil erosion.

Global warming and rising sea levels may represent cataclysms in the making. Increased desertification combined with population pressures will increase the incidence of drought and famine, and rising seas could submerge entire countries.

Water scarcity is an acute problem for over 40% of the world's population. 1.2 thousand million people are without safe water.

Add to the safe water supply problems a staggering sanitation problem: over 1.7 thousand million people in the developing world have no sanitation facilities.

Water pollution clearly compounds health problems. Water-borne diseases such as cholera, gastroenteritis, malaria and other infectious diseases carried by mosquitos and other organisms breed in stagnant ponds in many countries. The consequences are terrible: an estimated 10 000 children die of diarrhoea each day.

These formidable barriers to health are only compounded by the onslaught of disasters, which take an already precarious situation and place more stress on it. Preventive measures, such as immunization, go a long way towards shielding the most vulnerable, not only from everyday hazards, but also the added stress of disasters.

What Everyone Should Know about Disasters

Pär Stenbäck, Secretary General, League of Red Cross and Red Crescent Societies, Geneva



Pär Stenbäck

One of the most important things to know about disasters is that the very individuals and communities who are most vulnerable to life's daily emergencies are also those most severely affected by both sudden impact emergencies, such as floods and earthquakes, and slow-onset disasters such as famines.

We also need to understand that disaster preparedness, response, rehabilitation and development are all inter-related. We need to help decrease people's vulnerability and strengthen their capacity to respond to events that undermine their physical, mental and social well-being.

Having said that, we also need to rid ourselves of the idea that disaster-affected communities are apathetic and helpless. The people in these communities are usually the first to respond, particularly in the early stages. Com-

munities who are affected by disasters show an enormous amount of resilience and ingenuity in dealing with the aftermath of disasters.

We need to pay much more attention to ways of strengthening this resiliency. At the same time, we need to put more energy into primary health care and other development programs that decrease people's vulnerability. In this context, primary health care could be considered disaster preparedness.

We should also be starting, from the word go, to think about the rehabilitation phase. The problems caused by disasters do not disappear when the television cameras and journalists move to the next disaster. In fact, it is precisely when media attention is diverted that the problems begin in earnest. We need to impress on donors and relief organizations that responding to disasters is not an end in itself, but the beginning of the phase of rehabilitation and recovery.

Finally, we need to have the courage of our convictions and accept the fact that sometimes doing nothing is the most appropriate response in the first few days. It needs to be constantly emphasized that before responding to disasters we must first understand what the likely problems will be, and, secondly, we must make adequate assessments before we act. It's simply not good enough just to "do anything." We need to channel people's very genuine desire to help into areas that genuinely need help.



Members of this Mexico City community began rescue efforts immediately following the earthquake of 1985.

How Children Perceive Disasters

Children are the group most vulnerable to disasters. The World Health Organization and the International Children's Art Museum in Oslo, Norway, have initiated a Global Art Competition to find out how children perceive disasters.



"Famine", Loh Lee Ku, 16 yrs, Malaysia



"Chernobyl", Julia Agova, 10 yrs, USSR

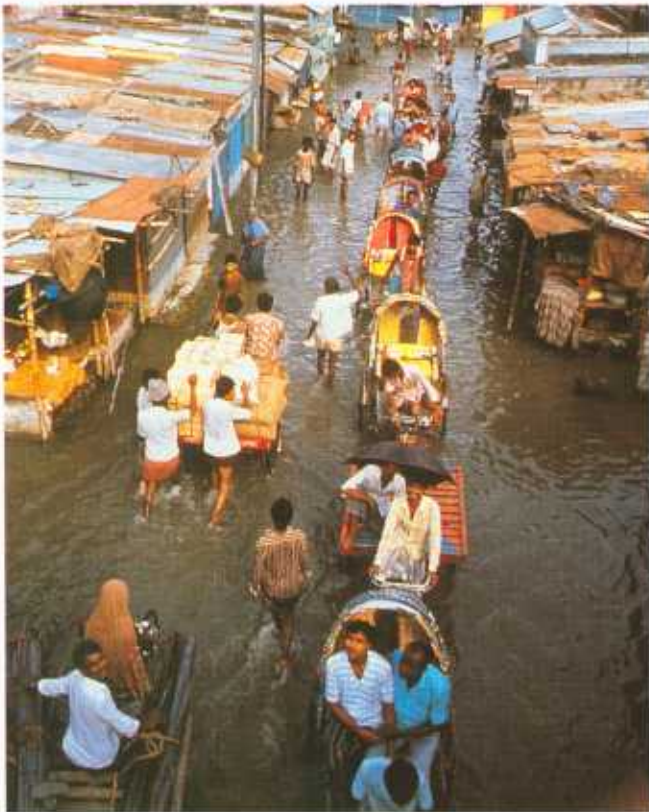


Untitled, Mark Pogasyan, 10 yrs, USSR



Untitled, Shahnaj Begum, 10 yrs, Bangladesh

Disasters and Response



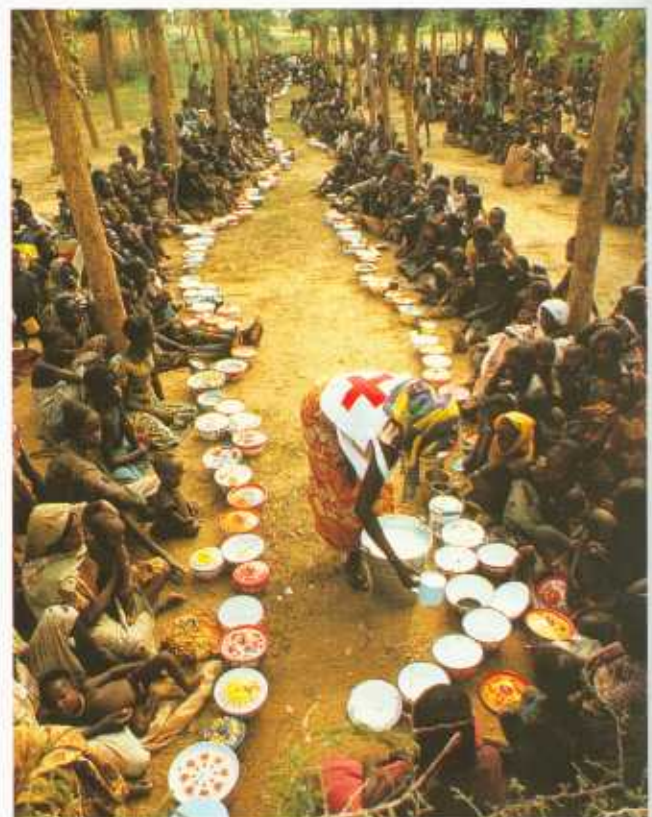
Flooding in Bangladesh.



Flood shelter built in Bangladesh.



Trucks transporting food to areas of famine in Ethiopia.



Feeding station in the Sahel.



Collapsed building after Mexico City earthquake, 1985.



Reconstruction begins for new earthquake-resistant buildings.



A camp in the Jordanian desert housing refugees fleeing the Iraq-Kuwait war, 1990



Laboratory equipment in a refugee camp in Pakistan allows a health worker to monitor and diagnose diseases.

Economics of Disaster

"In explaining famines, we have to look not primarily at the total food supply ... We have to concentrate, therefore, on the economic and political changes that rob particular occupation groups of their ability to command food. For example, the development of extensive unemployment leading to widespread inability to earn an income, or a severe rise in food prices vis-à-vis wages, or a sharp fall in the price of the products that craftsmen make, can lead to widespread starvation".

Amartya Sen, address at the award ceremony of the 2nd Senator Giovanni Agnelli International Prize

The economic consequences of catastrophes are always tallied, as they should be, after counting the number of dead and injured. What is sometimes overlooked is that disasters cause aftershocks to a nation's or region's economy that can affect the quality of life and health for years to come. In some cases, an earthquake, drought or flood is matched in destructive power by the quiet and pernicious economic disaster that follows in its wake.

According to the World Bank, disasters cost US\$ 40 thousand million in physical damage each year. Windstorms, floods and earthquakes alone cost US\$ 18.8 million per day on average. A single event can carry an astonishing price. The total cost of damage caused by the earthquake of 7 December 1988 in the Armenian SSR was estimated at 10 thousand million roubles (US\$ 16 thousand million at the official United Nations exchange rate).

All countries are susceptible to the negative economic effects of disasters, but nations with fragile, developing economies are especially vulnerable. It has been estimated that the losses to

GNP due to disasters can be 20 times greater for developing countries than for more developed nations.

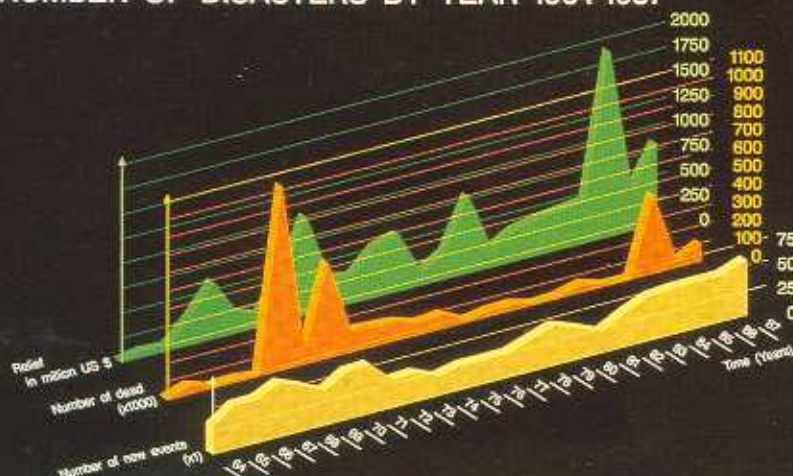
The Food and Agriculture Organization of the United Nations (FAO) has estimated that the 1970s drought in the Sahel halved the GNPs of Burkina Faso, Chad, Mali, Mauritania, Niger and Senegal.

According to the Office of the United Nations Disaster Relief Coordinator (UNDRO), the 1972 Philippines flood set the country's development efforts back three to five years.

Typhoons in southeast Asia during 1961-1970 cost \$10 thousand million in damage - \$500 million more than the total assistance provided by the International Bank for Reconstruction and Development during the same period.

An earthquake or a flood causes obvious physical damage, but the broader economic implications are harder to assess. The long-term impact of the loss of skills due to the death of technicians or craftsmen, for example, is very hard to quantify. A natural catastrophe can also destroy vital sectors of a nation's economy. Between 1946-1951, six million coffee trees in an area of 130 square kilometres were blighted by toxic sulphur fumes from Nicaragua's Masaya volcano. The November 1970 cyclone in Bangladesh, in which at least 300 000 people died, drowned 60% of the country's fishermen. The tragic loss of the fishermen, and the resulting loss in the supply of fish, undoubtedly had secondary effects on the economy as well as nutrition levels.

LEVELS OF RELIEF EXPENDITURE, HUMAN LOSS AND NUMBER OF DISASTERS BY YEAR 1964-1987



The physical damage from a catastrophe can limit severely the ability of health workers to respond to the emergency at hand. The December 1988 earthquake in the Armenian SSR, which killed 25 000 people and injured 15 000, also damaged or destroyed 32 hospitals and 224 local clinics and health centres. Caring for the 500 000 people who were made homeless was complicated by the wide scale destruction of the schools and academic buildings that are often used as secondary shelter during emergencies.

The restoration of the health infrastructure is one of the most important tasks facing the government and people following a disaster. Rehabilitation that is slowed or prevented due to a lack of funds can lead to health hazards. When personal hygiene regimens are interrupted by natural disasters, the possibility of typhus-carrying fleas and lice arises. When sewer systems are damaged during floods, the potential for widespread contamination of water supplies is great. The risk of water-borne diseases in populations living near pools, rivers and lakes must be monitored closely.

The costs of rehabilitating a shattered infrastructure and economy are enormous, particularly when, as in many developing countries, property is uninsured. A lack of adequate insurance compounds the economic costs, slowing recovery and reconstruction.



Earthquakes can reverse economic growth in developing countries when they destroy part of the economic infrastructure.

Measures taken before disasters can pay off handsomely after it. For example, hospitals built in San Francisco after strict earthquake-resistant building codes went into force were able to function immediately after the powerful 1989 earthquake. Prevention or mitigation measures should be seen as prudent long-term investments that will weather the sudden downturn that disasters create.

Incorporating preparedness planning into long-term developmental strategies is therefore not a luxury; it is an essential need. Developed and develop-

ing countries alike can improve their preparedness planning. An estimated two-thirds of the countries most vulnerable to disasters are still without adequate disaster planning.

Should disaster strike, the measures taken to strengthen the infrastructure and stabilize the economic base will be as important to the lives of survivors in the long term as relief efforts immediately following it.

Opportunities and Challenges in Natural Disaster Reduction

Interview with Dr H. A. Hamad-Elneil, M.D., Ph.D.
Director, Emergency Relief Operations, WHO, Geneva



Dr H. A. Hamad-Elneil

What are some of the challenges we all face during the International Decade for Natural Disaster Reduction?

The combination of rapid population growth, unconstrained urbanisation, shrinking natural resources and newly emerging technological dangers now confronts us with a mix of conditions which amplifies the potential impact of both natural and other catastrophes - and their unaffordable human costs. It highlights the urgency for improved disaster prevention and preparedness in all sectors.

What is the health sector's role in natural disaster reduction?

Health workers have a lead role to play. For example, they can identify epidemiological risk factors associated with disease outbreaks. Organizationally, there is a real chance for health personnel to work alongside hydrologists, meteorologists, urban planners, engineers and other professionals at all stages of disaster prevention and rehabilitation.

How important is cooperation between the various organizations?

Disaster reduction is by necessity a multisectoral and multi-agency

responsibility. No single organization or discipline can do it alone. Preparedness planning presents rich possibilities to pool the collective expertise of health workers, civil defence officers and representatives of local and nongovernmental organizations to minimise the impact of likely catastrophes.

What is technology's role?

Progress in satellite imaging now alerts us to approaching cyclones and droughts. Rapid developments in global communication and computer technologies speed our ability to transmit assessment findings from disaster-affected areas within hours of impact.

There are many parallels between forecasting strategies used in the meteorological sciences and in the epidemiological surveillance/early warning techniques applied to the detection of epidemics.

Our challenge is to explore ways in which emergency preparedness strategies can be more effectively integrated into these and other ongoing health activities at the national, provincial and community levels.

What are some of the priorities during the International Decade for Natural Disaster Reduction?

A technical priority at all levels is training. Better disaster preparedness in the health sector clearly requires training of health workers at all levels, as well as the integration of key preparedness principles into the curricula of training institutions.

At a global level, WHO has long supported disaster training activities on a wide range of technical subjects in partnership with regional offices and collaborating centres.

The WHO Pan African Centre for Emergency Preparedness and Response in Addis Ababa, Ethiopia, supports the special disaster reduction training needs for Africa. The Asian Disaster Preparedness Centre at the Asian Institute of Technology in Bangkok, Thailand, has started similar activities for the Asian region.

In the Americas and Caribbean, the Pan American Sanitary Bureau has played a vigorous role in stimulating disaster preparedness training at the country level. Despite the extraordinary challenges we face in the mitigation and prevention of natural and man-made catastrophes, we as health workers have a clear goal - to increase preparedness. That is why we say, 'Should disaster strike, be prepared.'



Health worker training is one of the priorities for the Decade for Natural Disaster Reduction.

Health and Natural Disaster Reduction

The International Decade for Natural Disaster Reduction (IDNDR) is a call to all governments and the international community to work together to reduce the effects of disasters, particularly in developing countries where the risk and the impact of natural disasters is greatest. Central to this effort is the critical role that the health sector plays in all aspects of disaster reduction.

The health sector's importance is clearly seen after sudden impact natural disasters such as a flood, earthquake or tropical storm strikes a community. In the immediate post-impact period, several hours or even days may pass before outside help arrives. During this time, people turn to their families, friends, neighbours and local services for immediate help. When community members have been trained in simple first aid, they can effectively reduce the numbers of serious casualties and deaths before outside help arrives.

In much the same way it is essential that health facilities and services continue to function after a disaster strikes. Therefore, it is important that health facilities are constructed to withstand the effects of a natural disaster and are equipped so that they can provide basic assistance following emergencies of all kinds.

The complete disruption of water and basic environmental sanitation services during disasters is another major concern of the health sector. In crowded conditions, such a disruption increases the risk of communicable disease transmission. These hazards can be minimized if public health officials work closely with municipal workers to set up a response system which reduces risk of water contamination, water- and insect-borne disease and safe disposal of solid waste as part of routine preparedness planning.

The Health Worker Network

It is also important to note that the network of health workers in any country represents an excellent channel through which disaster preparedness measures can be brought to the people. In all countries, health programmes extend from national to district and community levels. Moreover, health workers can be found working in hospitals, in environmental services and providing care to women and children. Their daily contact with such a wide audience provides an invaluable opportunity to encourage community-based disaster preparedness efforts in the context of the Decade.



A health worker in Mali explains health measures.

Disaster Preparedness in Health

Many poor communities still lack the basic communication, laboratory and other types of equipment which are as essential for daily health care as they are for a rapid emergency response. The lack of such basic needs represents a dangerous deficiency. Because health services have a responsibility to be prepared for likely disasters, it is important to strengthen front-line community health programmes so they are better equipped to provide better services routinely as well as during disasters.

Early Warning Systems

Just as early warning systems alert us to impending famine or tropical storms, health services need to have dependable detection and reporting systems, particularly for epidemics. In some countries, epidemic illnesses claim lives unnecessarily because health workers in outlying areas are not adequately trained to detect conditions, such as meningococcal meningitis, or lack the equipment, such as short-wave radios, to rapidly report suspected outbreaks to the national capital. When these diseases are not detected or reported quickly, they can account for thousands of avoidable deaths each year.

Vulnerability Assessment

A key tool for identifying populations who are at increased risk from disaster, vulnerability assessment, is as relevant for the health sector as for other services. The populations likely to be most severely affected are often the poorest groups. These groups usually have limited access to basic services of all types, including health facilities, and face the greatest risk of death and disease following a natural or other catastrophe.



A simulation exercise such as this helps in disaster preparedness planning.

Rescue Chains

In communities which face risks of sudden natural and technological disasters, an important aspect of health emergency preparedness is the setting up of "rescue chains" from neighbourhood to hospital, so that disaster victims can be transferred quickly for proper care.

Rescue teams should be trained in the safe transfer of injured victims to the appropriate health facility. After an earthquake, for example, injuries may range from cuts and abrasions to complicated fractures needing life-saving surgery. By knowing in advance which hospital to take someone suffering a particular injury, rescue teams can both improve the patient's chances as well as reduce the overwhelming number of casualties at a particular hospital.

The staff at the hospital should be trained to manage large numbers of casualties in short periods of time.

Disaster drills, involving the admittance of mass casualties, can test a hospital's ability to cope and refine its response planning.

The benefits of planning are clear. When training is not considered part of routine responsibilities, rescue team and health personnel are poorly prepared to deal with a disaster when it occurs.

Disaster-Resistant Buildings

When disasters strike, communities immediately turn to health facilities. Those facilities should be housed in buildings that are designed to withstand the impacts of tropical storms, earthquakes, floods and other sudden impact disasters. Back-up electrical and water systems and reserve supplies should be incorporated into the preparedness planning so that hospitals can be ready when their communities turn to them for help.

How Preparedness Works: Three Scenarios Drawn from the Field

WHO sees the International Decade for Natural Disaster Reduction as an opportunity to strengthen the health sector's preparedness and response capacity. The three scenarios that follow show that even basic preparedness measures can go a long way when disaster strikes.

Short-wave radios and improved training:

A purchase of short-wave radios allows rural health workers to report an ominous rise in meningococcal cases in a sub-Saharan African country. Having learned the lessons of a previous meningitis epidemic when 10 000 people had to be hospitalized, the national manager of vaccine stores dispatches 50 000 doses of meningitis vaccine to cities in rural areas. An emergency immunization campaign is quickly undertaken.

Improved training of health workers in diagnosing the illness, combined with a better equipped laboratory and the short-wave radios that allow the health workers to communicate quickly with national health authorities, prevents thousands of meningitis cases.

An electrical generator and reserve supplies:

A violent tropical storm cuts a swath of destruction across an isolated island in the South Pacific, injuring many people and causing considerable damage to the island's buildings and roads. High winds knock down electrical lines, blacking out the island.

But because the local health authorities have planned for such emergencies, a doctor can carry out life-saving surgery on injured islanders. A stand-by generator purchased in response to



A flood of donated medicines — some past their expiration date and many marked only with brand names — had to be sorted laboriously during the aftermath of the Mexico City earthquake. Medicines should always be labelled with generic names and should have expiration dates that run beyond anticipated relief efforts.

electricity loss during the last such storm ensures a reliable supply of electricity, and a stock of important drugs and medical supplies kept in reserve for just such emergencies keeps the hospital well-stocked and functioning.

A computer program for a relief effort:

In the aftermath of an earthquake in a South American country, the central medical store manager reviews a computer print-out of the medicines that have arrived from nearby countries. A simple computer program allows him to monitor and distribute the drugs that are being received. By matching the actual needs to offers of help, and by regulating the supply lines, the manager helps the relief effort proceed smoothly.

The smooth operation is in stark contrast to the chaos of a relief effort after an earlier earthquake. Much personnel time had been diverted from practical relief work to sort tons of unneeded supplies airlifted in by well-meaning donors.

Learning from the chaos of the previous earthquake, national health ministry officials had prepared a list of priority supplies which would be needed in disasters. The list was then sent to neighbouring countries and possible donors and linked into the computer program. The result is a smoother relief operation, with the appropriate medical supplies getting to where they are needed and increased efficiency in the overall effort.

WHO's Role in the International Decade for Natural Disaster Reduction

"Africa's vulnerability to various forms of natural disasters has been proven in recent years. Its lack of preparedness to respond adequately to such disasters has been clearly demonstrated. WHO's Panafrican Centre for Emergency Preparedness and Response is a most welcome project and answers to Africa's crying need".

Dr M.T. Mapuranga, Assistant Secretary-General of the Organizations of African Unity, Addis Ababa, Ethiopia

The World Health Organization is the leading technical agency in the United Nations system. Its mandate is to direct and coordinate international health work, with the aim of "attainment by all peoples of the highest possible level of health".

WHO's role at the Country Level

In its ongoing work with national ministries of health, WHO provides technical cooperation on subjects as diverse as health information systems and community water supply. Under the International Decade for Natural Disaster Reduction, WHO proposes to incorporate disaster reduction strategies into established country programmes. By employing systems that are already in place and working, WHO hopes to make disaster awareness as central a concern as primary health care.

WHO country representatives will work closely with United Nations Development Programme (UNDP) resident coordinators to promote

disaster reduction strategies that are appropriate to the special needs of each country.

WHO will also provide technical cooperation in planning and developing country-level preparedness programmes. This will include a wide range of activities, such as technical assessments of current preparedness capacity and identification of gaps in planning. WHO will cooperate with ministries of health in the development of preparedness programmes that complement and strengthen health activities at national and community levels.

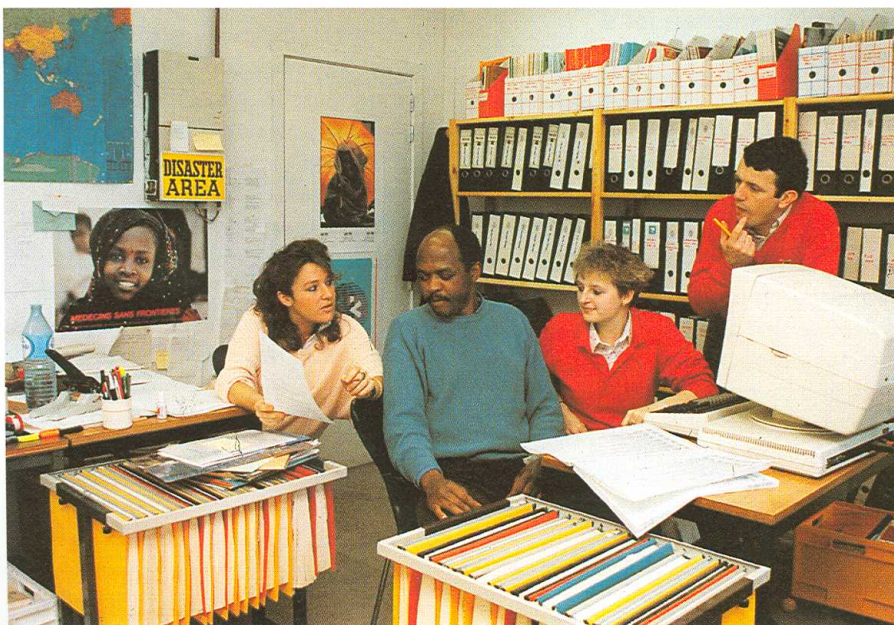
At the Regional Level

Because natural hazards vary by region, a clear priority for WHO is the development of human resources at the country level. WHO's focus, therefore, is to channel relevant information and training materials from the regional level to the country level.

WHO's regional offices will not only back up the emergency preparedness programmes in individual countries, but will also play an important role in regional disaster awareness. So that countries can share the "lessons learned" from disasters that may have struck them separately, intercountry workshops are arranged. These regional offices also produce the training manuals needed by country programmes.

WHO also creates networks of experts so that when disaster strikes, they can be quickly employed to deal with the emergency at hand.

At the Centre for Research of the Epidemiology of Disaster, a WHO collaborating centre at Louvain University, Brussels, staff members are creating an "institutional memory"—a database on disasters and relief efforts that will aid in reducing the effects of disasters as well as in the management of relief operations.





Visit to a refugee camp in the Islamic Republic of Iran

At the Global Level

Reducing the effects of disasters on health workers and hospitals is a formidable challenge. WHO is preparing a wide range of measures to improve awareness and preparedness.

The measures can be classified in four categories: training, technical cooperation, distribution of health information, and research in health preparedness and response.

Training

Training is one of WHO's primary goals. Health workers are, naturally enough, the focal point for health issues. Insofar as health and disaster reduction are interrelated, health workers should also be the focal points for disaster reduction.

Technical Cooperation

Gaps currently exist in the availability of technical guidelines which incorporate basic emergency preparedness and response principles and procedures in

health programmes at country level. From environmental sanitation to immunizations, there is an urgent need to incorporate – within existing guidelines – the information relevant to disaster reduction.

By assembling a global network of experts, WHO can match needs to specific expertise in emergencies at all levels.

Distribution and Dissemination of Health Information

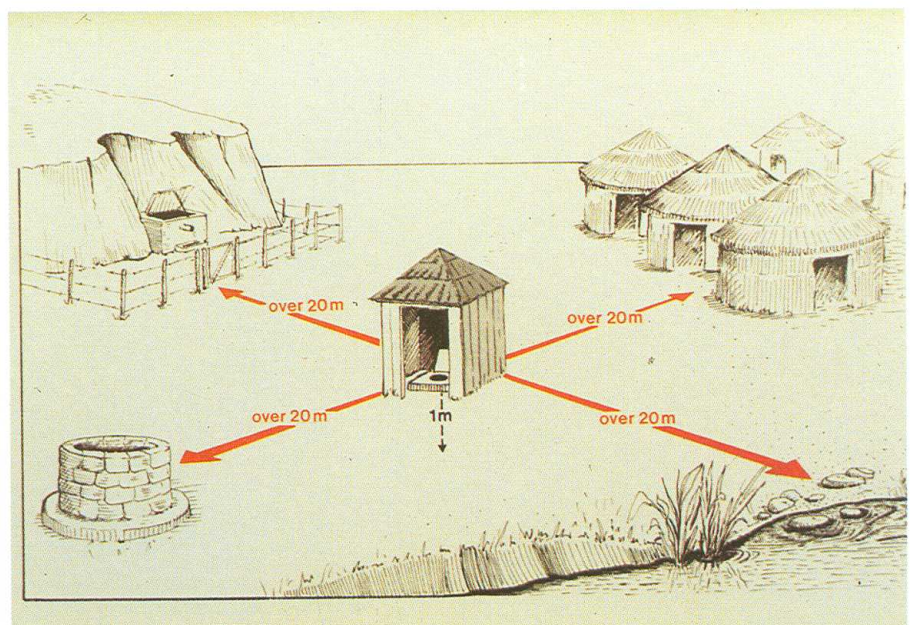
Reaching a broader public with information about disasters and their effects on health is also a priority. Wider dissemination of such materials is intended to create grass-root awareness and support for disaster reduction measures. It is widely acknowledged that awareness at the local level is the critical component of overall disaster preparedness.

Research

There is still much research to be done on issues such as early warning systems for epidemics and famine, the reduction of vulnerability of individuals as well as health facilities, and on what constitutes affordable mitigation measures in poor countries. Effective identification of malaria-prone areas is a specific problem. The capacity to prepare adequately for disaster is predicated on the ability, to some degree, to forecast disasters. The more we know about disasters, the better we can prepare for them.

Resource Mobilization

Although it is not a funding organization, WHO can act as a facilitator in mobilizing funds for disaster relief. It can also advise donors as to the appropriate donation of goods or material.



In temporary settlements following a disaster, it is important to prevent contamination of the water supplies.

Technology's Role in Disaster Preparedness

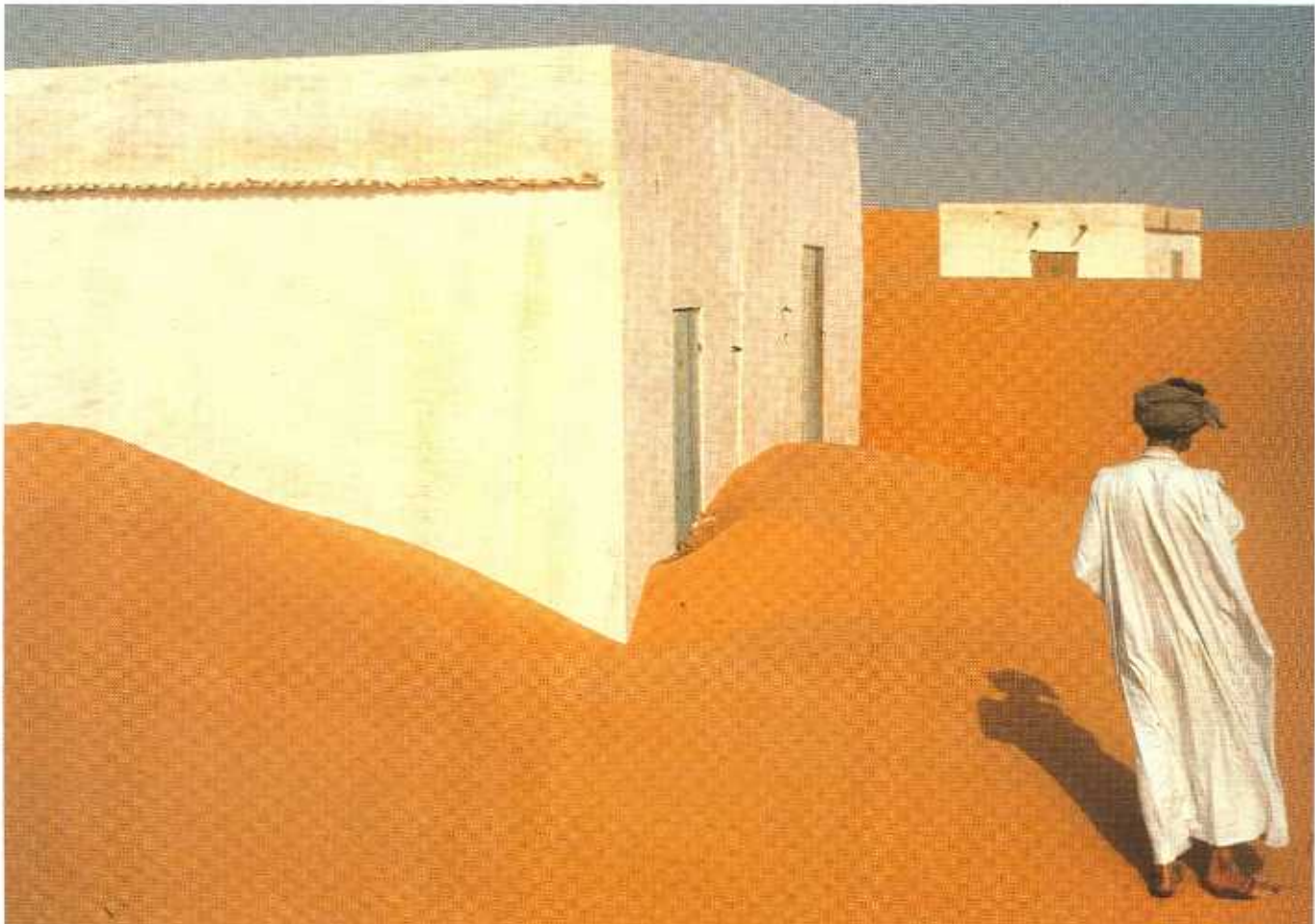
From satellites to data bases containing disaster histories, technology has an important role to play in disaster detection and prevention. The following are two examples of how technology can have a significant impact on disaster reduction.

Remote Sensing

Remote sensing satellites using infrared photography techniques can be used to detect changes in the density of vegetation in drought-prone areas, thereby alerting officials to the potential of drought.

Hazard mapping is another useful tool of satellite technology. For example, maps outlining watersheds, rivers, streams and coastal delta plains can help determine areas that are vulnerable to flooding.

Meteorological satellites and their ground-based crews have saved many lives by the timely prediction and tracking of tropical storms. Darwin, Australia, was razed by a tropical cyclone in 1974 but suffered few casualties because an early warning system had given the population time to evacuate the city.



The desert is encroaching on human settlements in many parts of the world, as in this Mountain town

When a series of six satellites now under development – the Earth Observing System (EOS) – is deployed, the earth will be monitored in unprecedented detail, enhancing observations and prediction capabilities.

Computer Technology

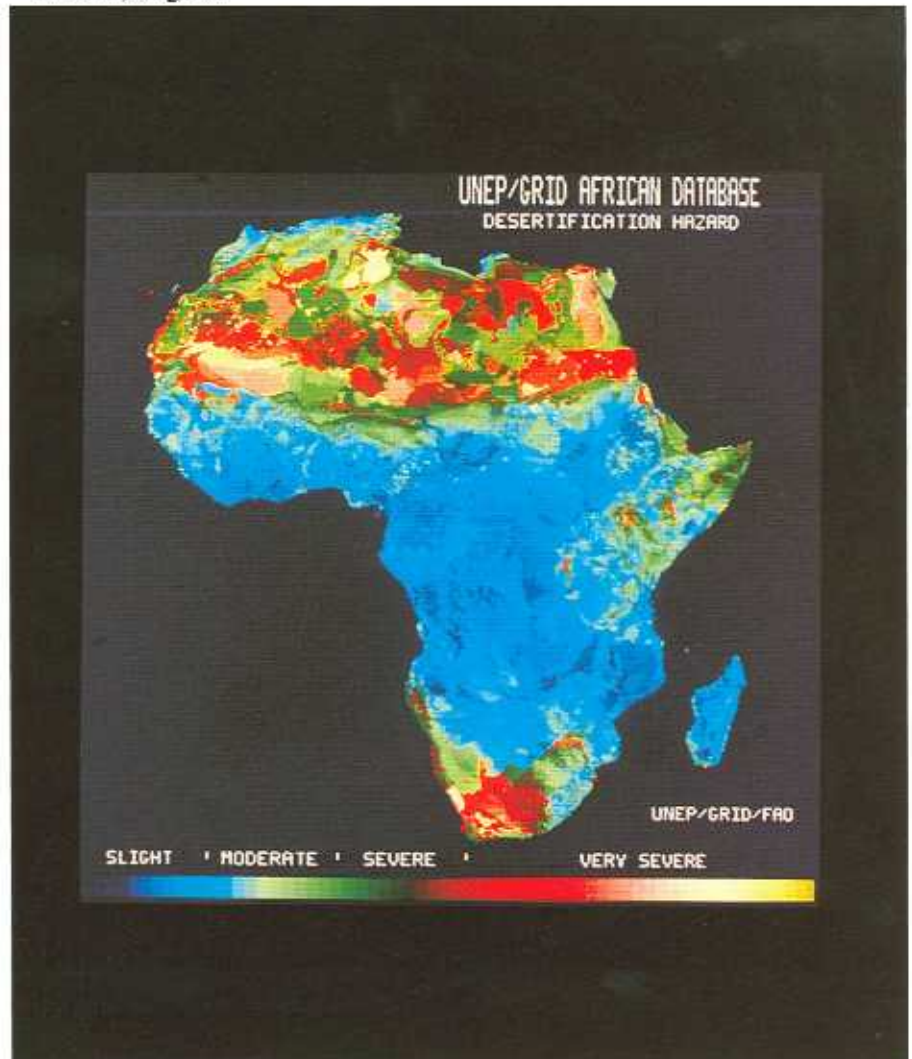
The United Nations sponsors two computer networks related to disaster reduction: UNIENET and the Disaster Events Database.

UNIENET is a network of computers linked together electronically. It places members of the worldwide disaster management community in direct contact with each other, and provides them instantaneously with both background and operational disaster-related information. UNIENET operates as a joint venture with United Nations agencies and other inter-governmental and nongovernmental organizations.

For more information about UNIENET, contact United Nations Office of the Disaster Relief Co-ordinator, Palais des Nations, 1211 Geneva 10, Switzerland.

The Disaster Events Database is designed to create a data file of disaster history for use in epidemiological and operational research. The base contains over 5000 disaster events (1900-present) and is being enlarged constantly. Any user (institutions, organizations or governments) can request information by contacting the WHO Collaborating Centre for Research on Epidemiology of Disasters (CRED) at the Catholic University of Louvain, Brussels, Belgium.

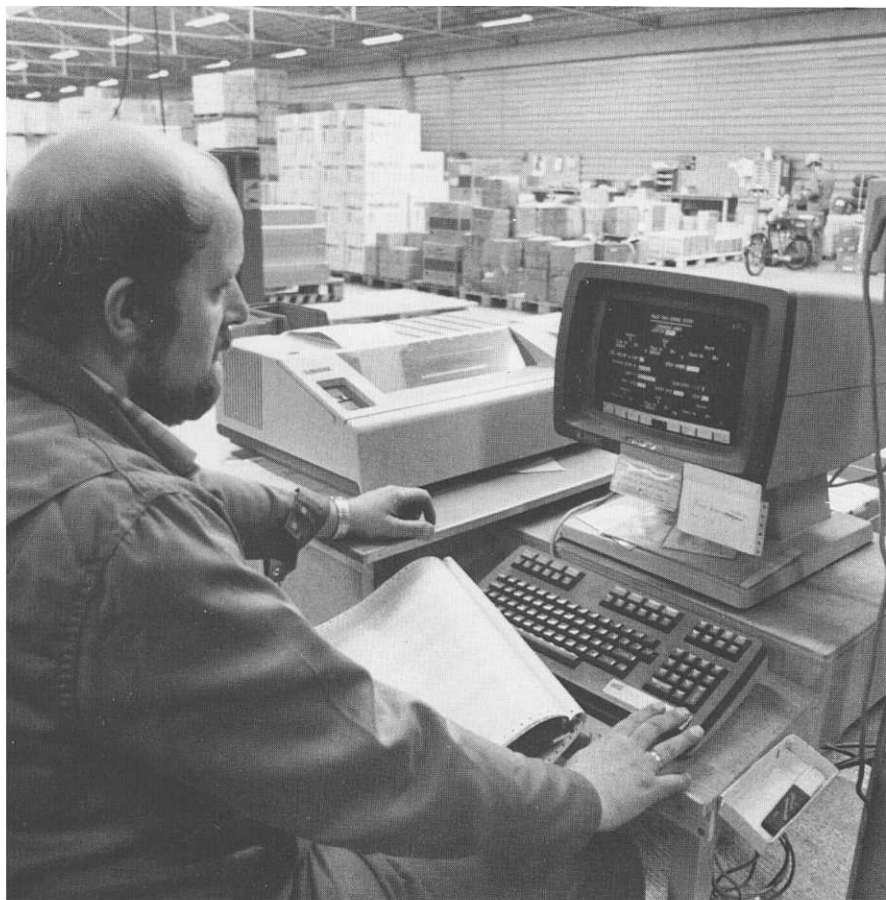
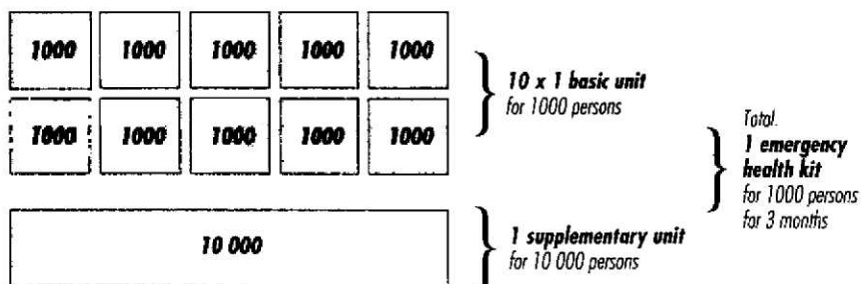
The Disaster Events Data Base is conceived as part of the Emergency Management Information System (EMIS) being prepared by WHO's Emergency Preparedness and Response unit in Geneva. When fully operational, EMIS will help prepare and manage national emergency planning.



A hazard map shows the extent of desertification in Africa.

WHO's Emergency Kit

WHO Emergency Health Kit



Emergency health kits, designed to meet the needs of 10 000 people over a 3-month period, are kept ready to ship in a warehouse in Copenhagen

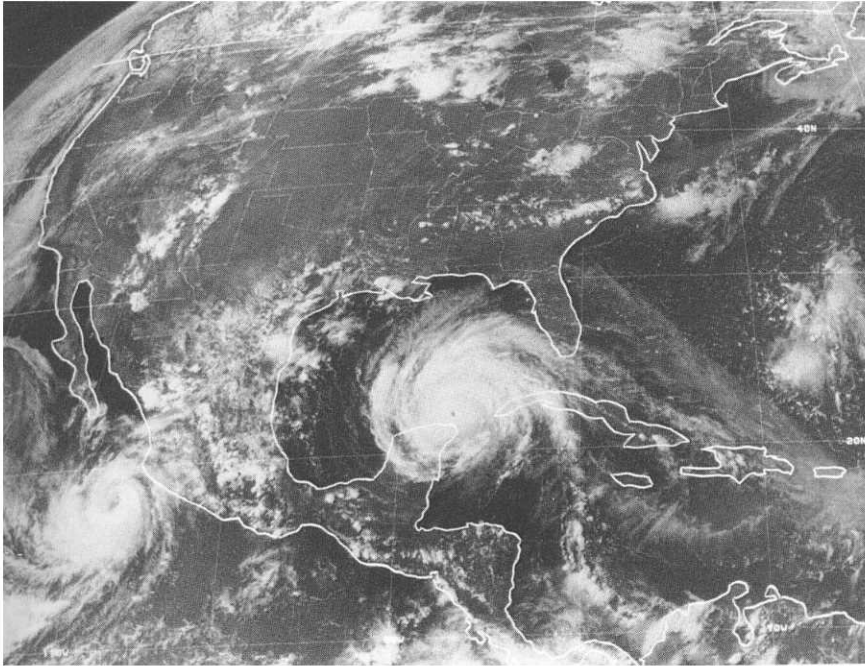
Much of the assistance provided during disasters by donor agencies, governments, voluntary organizations and others is in the form of drugs and medical supplies. But the practical impact of this aid is often diminished because requests do not reflect real needs or because the needs have not been adequately assessed. Donations of unsorted, unsuitable and unintelligibly labelled drugs, or the provision of products which have passed their expiration date, are the unfortunate result. Such problems are often compounded by delays in delivery and customs clearance.

To alleviate this logistical problem and standardize the types of drugs and medical supplies used in emergencies, WHO developed the WHO Emergency Kit in collaboration with the United Nations High Commissioner for Refugees (UNHCR), the London School of Hygiene and Tropical Medicine, UNICEF, Médecins sans Frontières, the League of Red Cross and Red Crescent Societies, the International Committee of the Red Cross, and the World Council of Churches.

The Kit's contents are calculated to meet the needs of 10 000 people for three months. It is designed to be prepared in advance and kept in readiness should disaster strike. It can be provided by several major pharmaceutical suppliers, some of which have a permanent stock of kits ready for shipment within 48 hours.

The Kit has been adopted by many organizations and national authorities as an appropriate, inexpensive, and quickly transported source of the medical supplies and equipment needed in a disaster situation.

A WHO Preparedness Checklist



A hurricane gathers force in the Gulf of Mexico

How do countries and communities assess their level of disaster preparedness? The following questions can help assess disaster preparedness and provide a focus for health preparedness activities at regional, district and community levels.

Key Health Preparedness Questions

1. Is there a national health policy regarding emergency preparedness and relief? Is this policy being implemented?
2. Is there a person within the ministry of health in charge of promoting, developing and coordinating emergency preparedness and relief activities?
3. Are emergency preparedness activities coordinated with the health sector, civil defence authorities and key ministries such as the ministry of interior or agriculture?
4. What joint activities in emergency preparedness and response are undertaken between the ministry of health, United Nations agencies, bilateral organizations and nongovernmental organizations?
5. Are there operational plans for health response to natural, man-made or other emergencies?
6. Have mass casualty management plans been developed (both before and after hospital admission) at the national level as well as for individual hospitals?
7. What health and nutrition surveillance measures have been taken for the early detection and response to health emergencies? For example, have disaster-prone geographical areas and high-risk seasons been identified? Are early-warning and surveillance systems established and working? Has a national reference laboratory been established?
8. What preparedness steps have been taken by environmental health services to respond to emergencies and disasters?
9. Have facilities been identified and have safe areas been designated as temporary settlement sites in the event of disasters? What provisions have been made for health care? Specifically, what provisions have been made for general or special health services, staffing, supplies, water and sanitation?
10. What training activities are devoted to emergency preparedness and response in the health sector at national, regional and district levels? What other institutions or organizations involved?
11. What resources are available to facilitate a rapid health response? Is there an organized communications centre in the ministry of health? Is there an emergency budget? Is access to transport or emergency medical supplies assured in the event of disaster?
12. Is there some kind of system for updating information on the key human and material resources needed for an emergency health response – for example, updated inventories of essential drugs, four wheel drive vehicles, etc.?
13. What opportunities exist to test the effectiveness of emergency plans through simulation exercises and drills?

Thinking the Unthinkable

"How many seconds or minutes had passed I could not tell, but, regaining consciousness, I found myself lying on the ground covered with pieces of wood. When I stood up in a frantic effort to look around, there was darkness. Terribly frightened, I thought I was alone in a world of death, and groped for any light. My fear was so great I did not think anyone would truly understand. When I came to my senses, I found my clothes in shreds, and I was without my sandals."

Mrs. Haruko Ogasawara, survivor of the atomic blast over Hiroshima, from "Unforgettable Fire"



A hotel in Baguio City, Philippines, collapsed in the earthquake of July 1990, killing hundreds.

A disaster's raw power, whether in the form of a massive earthquake, tornado, hurricane, flood, or a man-made catastrophe such as an atomic explosion, is an overwhelming shock for survivors. Confronting a disaster's force can be one of the most frightening experiences of a lifetime.

Thinking about natural disasters and their potential for death and destruction therefore is difficult; we push the thought from our minds, preferring to think: It can't, or won't, happen to us. It may be difficult, but during the next decade we must all begin to confront the unthinkable.

The arguments for preparedness are compelling. For example, experts believe that 90% of deaths from earthquakes can be avoided. In some African countries, early warning systems have limited the impact of famine. Better and earlier diagnoses of illnesses have prevented isolated cases from becoming epidemics.

The long-range benefits of disaster mitigation should not be underestimated. A reduction in loss of life, coupled with a softening of the economic consequences – which are sometimes so severe that nations' treasuries are bankrupted and economic growth reversed – can mean the difference between a quick recovery and years of economic stagnation.

That is why WHO asks:

Are you prepared?

"I don't know where to start. All I can say is that I am more than shocked and still suffering from shock with the tragedy that has occurred on the island of Montserrat. I must say that I've never seen anything like this in my whole life. I've lost everything I've got."

Survivor of 1989 Hurricane Hugo



Unloading international assistance in Jamaica after Hurricane Hugo.

"There was last night the greatest tide that ever was remembered in England to have been in this River all Whitehall having been drowned."

Samuel Pepys, remarking on the flooding of the Thames on 7 December 1663



Flooding in Paraguay, 1979.

World Health Organization Offices

For publications and information on disaster preparedness and health, please contact the WHO offices at the following addresses

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 Telex 34292
 Facsimile 1-212-223-29-20
 Telephone 1-212-963-60-04
 1-212-963-60-05

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WHO Regional Office for Africa
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 242-83-38-65

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 Pan American Sanitary Bureau**
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Europe

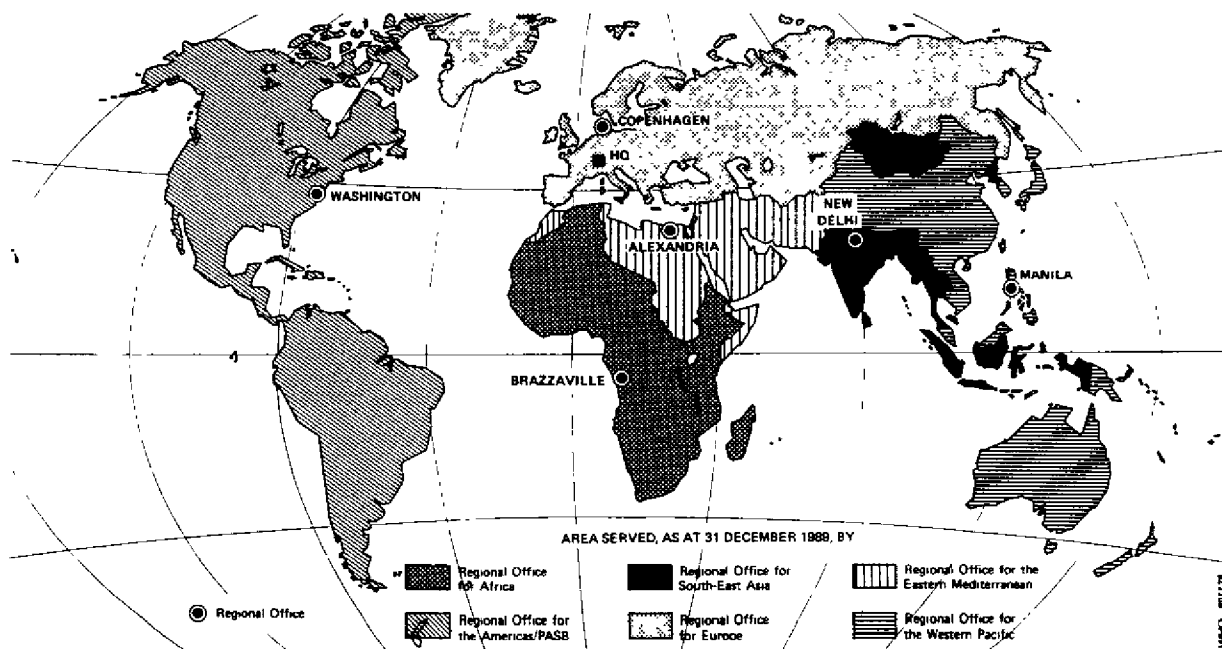
WHO Regional Office for Europe
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 Facsimile 20-2-483-8916
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 or 0096 or 0097

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 Facsimile 63-2-521-10-36
 Telephone 63-2-521-84-21



WHO Regional Offices and the areas they serve

Disaster Realities

Answers to the Disaster Quiz

1. **False**
Local health services are normally able to cope in disaster situations. They have the advantage of their personnel speaking the local language and are familiar with the health service infrastructure. Foreign teams may provide specialized skills and equipment, but they have to be housed and fed.
2. **False**
A fast international response to disasters is not necessarily the best solution. An evaluation of the most urgent needs should first be made so that communication channels do not become blocked by unessential items or by outdated medicines and food products.
3. **False**
The disaster may disappear from the news headlines, but its impact may last for years. There is often permanent damage to water supplies and health services. Reconstruction and rehabilitation are time-consuming and costly.
4. **True**
Poverty leads to poor living conditions, which make the poor more vulnerable when disasters strike. The richer countries have the resources with which to rebuild their lives and are usually better prepared.
5. **False**
Most often disasters bring out the best in human behaviour. The community, both locally and internationally, usually reacts positively and with compassion.
6. **False**
Dead bodies do not cause epidemics or disease transmission during the first 72 hours. After the first three days, the decomposition process may cause contamination of water supplies, but the first priority following a disaster should be to care for the injured.
7. **False**
Disasters such as earthquakes do not damage crops, but drought, hurricanes and floods do. However, if adequate preparations, such as storage and rationing of foods, have been properly organized, there should not be any serious hunger. When international assistance is requested, seeds and tools are often more important than food.
8. **True**
Keeping people as close to their homes as possible is best. Settlement camps should be a last resort since they create other problems. International assistance in the form of building materials and tools may be desirable.
9. **False**
Careful rationing should be organized so that everyone is fed. Those involved in salvage work and reconstruction are particularly in need of a regular food supply.
10. **False**
Teamwork is the most efficient way of dealing with the aftermath of disaster. Training of teams prior to a disaster so that each person knows his or her responsibilities is indispensable for the proper management of a disaster.
11. **True**
Strict adherence to the building code in earthquake-prone areas significantly diminishes the loss of human life.
12. **True**
Overgrazing and a failure to plant trees, combined with mismanagement of land use lead to soil erosion. When this mismanagement is combined with climate change, as in the Sahel, the desert advances.

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SHOULD DISASTER STRIKE...

BE PREPARED!



WORLD HEALTH DAY 1991