



Federal Ministry  
for Economic Cooperation  
and Development

TOPICS 193

# Disaster Risk Management

Contributions by German Development Cooperation



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Large-scale natural disasters frequently cause massive economic and environmental damage and inflict extreme suffering on the affected communities. They are a significant impediment to development and put the attainment of the Millennium Development Goals at risk.

In early May 2008, thousands of people were killed when Cyclone Nargis swept Myanmar. Soon afterwards, an earthquake devastated Sichuan province in China. Two neighbouring countries, almost simultaneously, thus had to deal with tens of thousands of dead and missing, ruined cities without power and water, and hunger and disease, all caused by these disasters.

In August 2005, Hurricane Katrina highlighted the political, socioeconomic and cultural dimensions of these natural disasters and pitilessly demonstrated that even highly developed countries such as the US are extremely vulnerable to the forces of nature. The list of extreme disaster events could continue indefinitely – and there is a real threat that the frequency and intensity of extreme weather conditions will increase as a result of climate change.

People in developing countries are particularly at risk from the damage caused by natural disasters. Poverty crucially influences the degree of vulnerability to extreme natural events. Women are most at risk, as they account for two-thirds of the world's extreme poor, often lack access to information (such as early warnings), and do not always receive a fair share of aid. Statistics show that in the highly developed countries, the death toll in natural disasters averages 22 persons per disaster. In poor countries, by contrast, every disaster claims an average of 1052 lives. In poor countries, larger-scale natural disasters can also set back the development process by many years or even decades.



Heidemarie Wieczorek-Zeul, Federal Minister for Economic Cooperation and Development

However, experience also shows that people can and must prepare for extreme natural events. Very often, previous mismanagement or deficits are factors which worsen the scale of the disaster and could have been prevented by appropriate disaster risk management. With correct action which takes account of natural processes, societies can greatly reduce their vulnerability – or even prevent disasters such as mudslides or flooding from occurring at all.

The international community has become increasingly aware of this nexus since the 1990s. With strengthened resolve following the tsunami in the Indian Ocean, the Hyogo Framework for Action (HFA, 2005), which builds on the UN's International Strategy for Disaster Reduction (ISDR), was adopted by international, national and non-governmental actors in Kobe, Japan, in 2005.

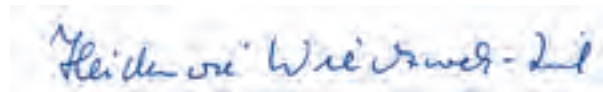
From now on, instead of passive disaster response, there is to be a far greater focus on preventive disaster risk management. Disaster risk management is to be integrated into development and sector planning and in poverty reduction strategies at all levels.

For German development cooperation too, the disaster/development nexus is an important aspect: without disaster risk management, the destructive force of natural disasters will continue to wreak devastation, often reversing the progress being made in the countries with which we cooperate, worsening poverty and thus impeding sustainable development.

We therefore fund projects which take account of disaster risk management and are already supporting numerous programmes in particularly vulnerable countries. Especially at-risk groups such as women, children and the elderly are a key focus of attention in this context. The aim is to mainstream disaster risk management

from the outset in project/programme planning and implementation in at-risk regions. Besides our bilateral activities, we are also acting on our multilateral commitments and are supporting the operationalisation of the Hyogo Framework for Action (HFA).

This publication offers an insight into our efforts to date, our practical strategies and experiences. In view of global trends such as climate change, urbanisation and population growth, we must face up to these challenges. These trends show that we should not underestimate the importance of disaster risk management for the attainment of the Millennium Development Goals.





# 1. Aspects of global change – Why is disaster risk management important?



The frequency and intensity of disasters is increasing: a comparison of the decades 1980-1989 and 1990-1999 shows that the number of major disasters increased from 63 to 91 and that economic damage almost tripled (see Figure 1). In the decade 1997-2006 extreme weather events alone caused 200,000 deaths and direct economic losses totalling more than EURO 450 billion (Germanwatch, 2008).

It is likely that various global trends, including climate change, urbanisation, population growth and poverty, will dramatically increase the risk of disaster, particularly in developing countries. The following three sections illustrate the connection between these trends and the likelihood of disaster, and pinpoint the implications for development cooperation.

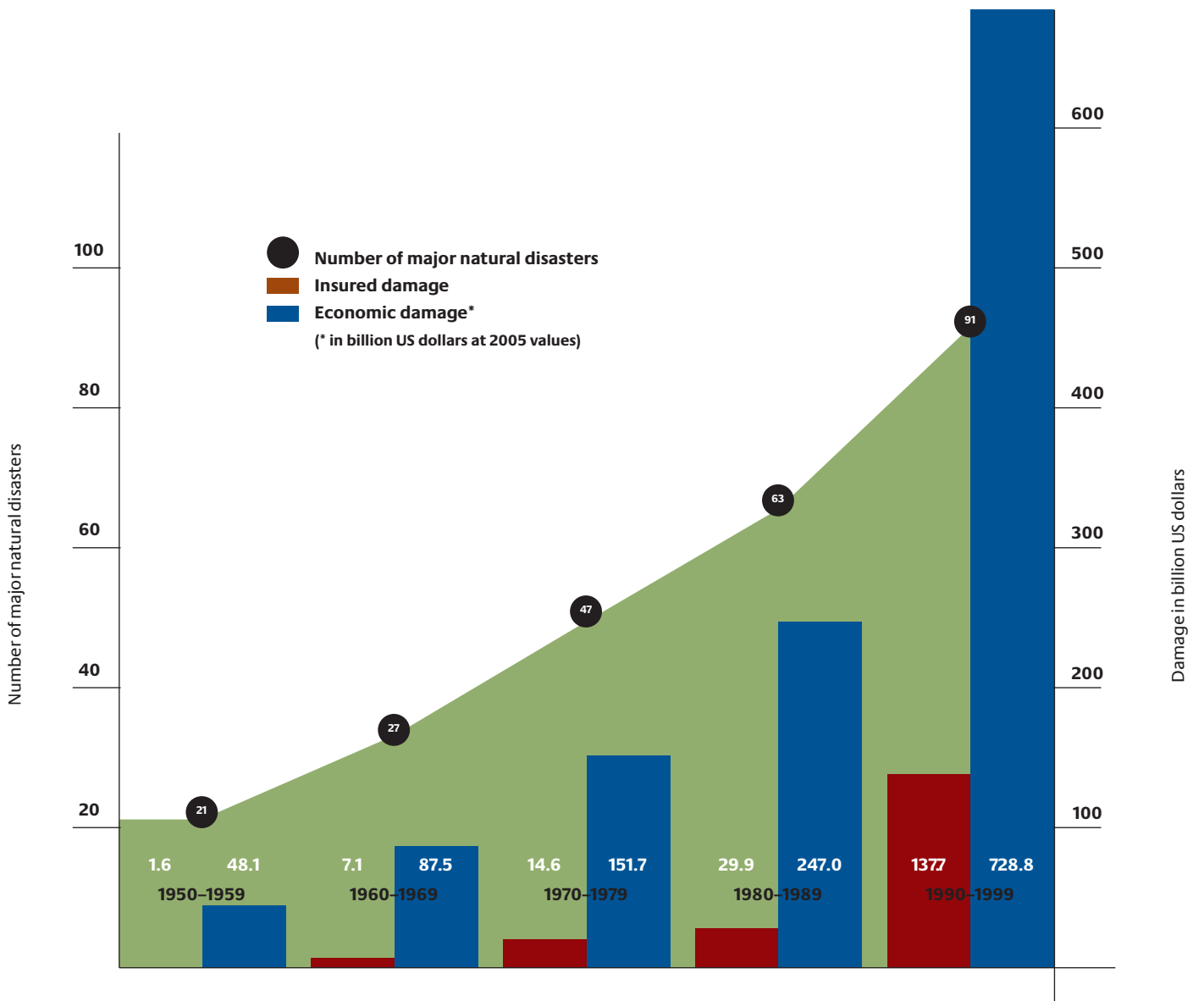
### **What is a natural disaster?**

The International Strategy for Disaster Reduction (ISDR) defines a disaster as “a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts which exceeds the ability of the affected community or society to cope using its own resources”. According to the definitions used by the United Nations, a natural disaster is considered to be “major” if the ability of the affected regions to help themselves is significantly exceeded and supra-regional or international aid is required. This is usually the case if the number of people killed runs into thousands or the number made homeless is measured in hundreds of thousands, or if the total damage (depending on the affected country’s economic circumstances) or the insured damage is on an unusually large scale.

### **What is disaster risk management?**

Disaster risk management comprises the whole systematic and conceptual framework of measures that are closely linked to each other and that are taken before a natural hazard occurs with the aim of limiting or avoiding adverse impacts of a natural event on society. The central aim is the reduction of the disaster risk for people living in the regions that are exposed to natural hazards. Reducing the disaster risk involves, firstly, reducing the vulnerability of the population itself to events such as earthquakes, floods and storms and, secondly, preventing the occurrence of new hazards, such as landslides caused by inappropriate land use or floods caused by deforestation along the upper reaches of rivers.

Damage by major natural disasters



Source: Munich Re, 2006

Figure 1

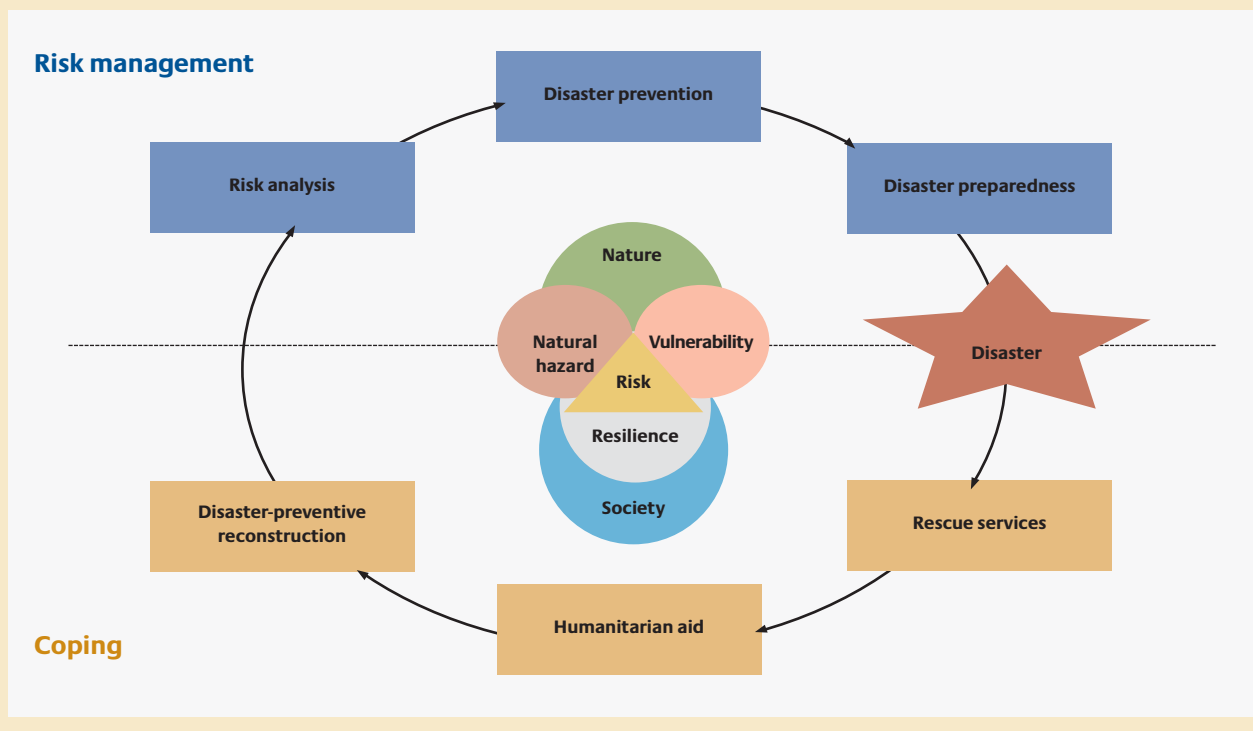
**What does disaster risk management involve?**

Disaster risk management consists of the following elements:

- > risk analysis,
- > disaster prevention and mitigation,
- > disaster preparedness and
- > disaster-preventive reconstruction.

There is a risk of natural disaster when a society is exposed to natural hazards but lacks adequate means and ability to protect itself from potential negative impacts (vulnerability). The **risk analysis** examines the natural hazard in relation to the society’s vulnerability, in order to first evaluate potential damage and losses. This involves calculating the probability that a natural hazard will occur, identifying vulnerability factors in society, drawing up damage scenarios and evaluating measures for rapid reconstruction in the event of a disaster. A society’s ability to continue to function while dealing with a hazard is described as **resilience**. **Prevention and mitigation** covers activities whose long-term aim is to mitigate the possible adverse impacts of a natural event and its consequences and provide permanent protection against its effects. Prevention and mitigation measures may be constructional (e.g. dykes) or norma-

tive and non-material (e.g. land use restrictions). Appropriate **preparedness** enables a rapid and effective response to be made to an imminent disaster. Important elements are emergency plans, the availability of rescue and emergency services, emergency medical care, rapid and efficient transmission of warnings and the availability of means of communication. **Early warning systems** as a component of good preparedness can significantly reduce the impact of disasters. A good early warning system will promptly identify and assess a hazard. Warnings are issued to the affected population and institutions, who respond appropriately. **Disaster-preventive reconstruction** aims to draw appropriate lessons from the natural disaster and to include disaster reduction criteria and measures directly in the reconstruction process (e.g. through building codes).





### What are the requirements of successful disaster risk management?

Disasters arise only from the combination of a natural event (hazard) and a society that is vulnerable to this event. A society's vulnerability is determined by a number of economic, social, physical and environmental factors. Disaster risk management therefore requires the involvement of all relevant sectors (including internal security, agriculture, education, natural resource management) and the involvement of civil society groups on an equal footing. Poor sections of the population, including women and children, are particularly hard hit by disasters and must be enabled to protect themselves and their property, and to play an active part in local risk management strategies. The particular needs of women must therefore be taken into account from the outset in the analysis of vulnerability

factors. However, women are not just victims: very often, they can also make a targeted contribution to the mitigation of disaster risks. For that reason, gender aspects have to be considered for successful disaster risk management. Good governance (effective political institutions, responsibilities and resources that are clearly allocated according to the subsidiarity principle, and the state's responsible handling of political power and public resources) promotes successful disaster risk management. The aim of disaster risk management is to reduce disaster risk to a socially acceptable and manageable level. As a contributor to sustainable development, disaster risk management should be integrated into poverty reduction strategies.

### Classification of vulnerability factors

#### Physical Factors

- Technical construction/ Quality of settlements and quality of buildings
- Basic infrastructure
- Population growth and density

#### Environmental factors

- Usable soil
- Usable water
- Vegetation, biodiversity, forests
- Stability of the ecosystems

#### Economic factors

- Socioeconomic status
- Poverty and nutrition
- Farming and cultivation systems, technology, seed and structure of cultivation
- Structure of income and economy
- Access to resources and services (water, energy, health, transport)
- Reserves and financing opportunities
- Incentive or sanction systems for prevention
- Research and development

#### Social factors

- Traditional knowledge systems
- Risk perception
- Education
- Legal situation and human rights, property relationship
- Civil participation, social organisations and institutions
- Legal frameworks, norms, legislation
- Politics, corruption
- Minorities, old and young people
- Health status
- Power structures and access to information

### 1.1 Climate change – developing countries are particularly hard hit

Anthropogenic climate change has become noticeable far more quickly and on a far greater scale than was originally forecast. We are already witnessing an increase in extreme weather events such as strong precipitations, storms, droughts and heat waves as well as a rise in sea levels.

In its fourth assessment report on the state of knowledge on climate change, published in February 2007, the Intergovernmental Panel on Climate Change (IPCC) forecast global warming of between 1.1 and 6.4°C by the year 2100, a rise in sea level of between 18 and 59 centimetres and increased intensity of strong precipitations and storms. These changes are caused by emissions of greenhouse gases (GHGs), primarily from fossil fuels but also as a result of large-scale deforestation.

Depending on local and regional circumstances, the consequences of climate change can vary widely. In some regions there will be more frequent droughts, while other areas will be more

severely affected by flooding. The melting of the glaciers and permafrost will lead to more frequent landslides, particularly in mountainous regions. Many plant and animal species will migrate or even become extinct as a result of changed climate conditions. Climate change is already affecting the extent, quality and distribution of water resources. Rising temperatures will cause diseases such as malaria to spread.

Climate change also represents one of the greatest challenges to world food security. As a result of the predicted climate changes, the total area that can be used for farming will shrink in many parts of the world. The productivity of many agricultural areas will decrease, sometimes drastically, and the rising prices of basic foodstuffs will spark social and economic tensions.

The Fourth Assessment Report of the Intergovernmental Panel on Climate Change concludes that the intensity of tropical storms is likely to increase as a result of climate change. This is a satellite picture of Hurricane Isabel off the north coast of the Dominican Republic in 2003.

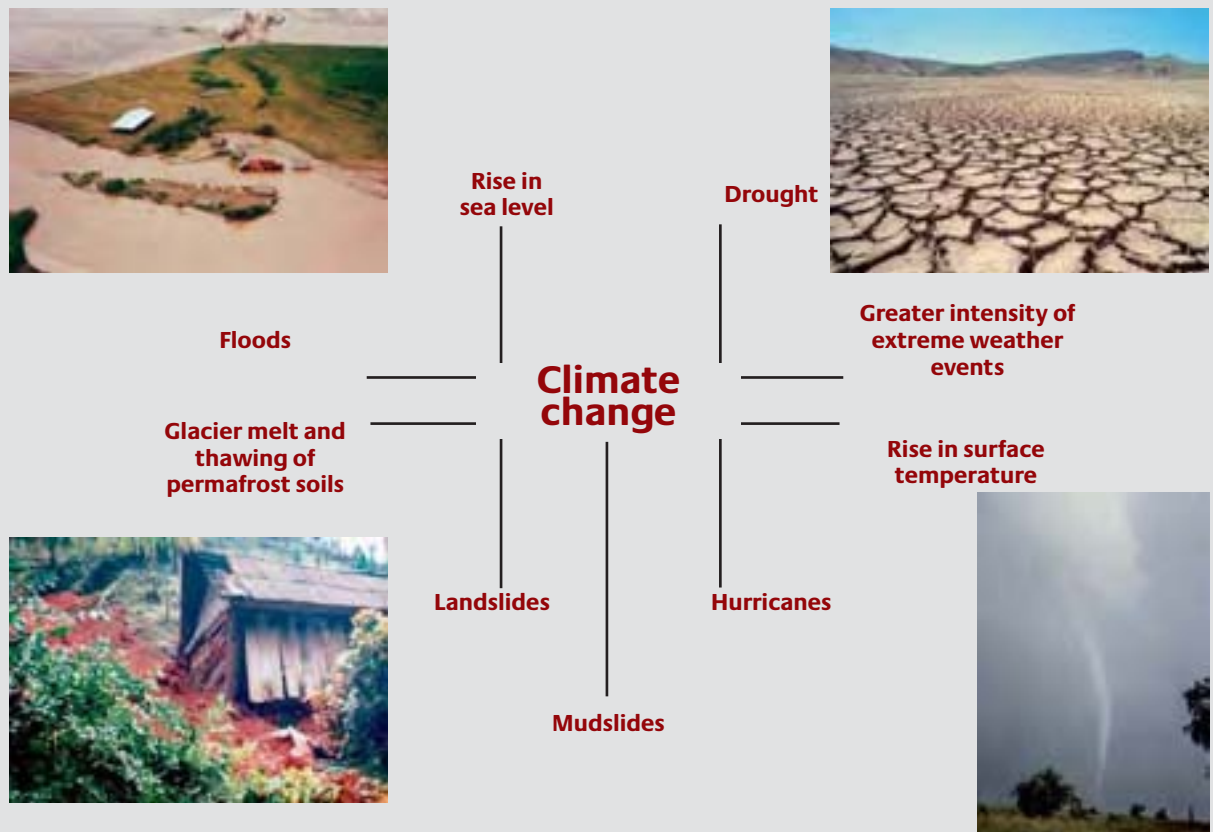


Sensitive ecosystems, coastal zones and regions with limited potential for adaptation are particularly at risk from the adverse impacts of climate change. Countries such as Bangladesh, the Philippines, Indonesia, Madagascar, Mozambique and the countries of Central America, which are already subjected to floods and hurricanes, will face intensified extreme weather events as a result of climate change.

In developing countries, however, people's scope for adapting to changes in climate and

the increasing frequency of extreme weather events is limited by their poverty. They are directly affected by the consequences and are usually unable to deal with them unaided. Furthermore, many people in developing countries are dependent on agriculture, which is particularly vulnerable to changes in climate. In addition, the capacity of government institutions to adapt to climate change and cope with the increased disaster risk is restricted by their weak political and institutional structures and limited financial resources.

**Extreme weather events affected by climate change**



Many extreme natural events will increase in intensity and/or frequency as a result of climate change.

Figure 2

### What can be done about the security risk posed by climate change?

In its report “Climate Change as a Security Risk” the German Advisory Council on Global Change (WBGU, 2007) recommends the following approaches to improving disaster risk management as part of Initiative 6: ‘Supporting adaptation strategies for developing countries’:

> **“Developing cross-sectoral approaches in development cooperation:** Development cooperation should develop and implement cross-sectoral strategies for the mitigation of disaster risks to a greater extent, focusing especially on emergency planning, adaptation of land-

use planning, establishment of clear decision-making structures at an early stage, and the inclusion of disaster mitigation in education programmes. Early warning systems should be embedded in comprehensive development programmes. “

> **“Integrating disaster risks into development strategies to a greater extent:** should be taken into account in consultations regarding Poverty Reduction Strategy Papers and in the major poverty reduction programmes.”

If these institutions fail to cope with disasters, the collapse of the country’s infrastructure and subsequent humanitarian disaster can in extreme cases lead to uncontrolled migration and even to crises and conflicts. For this reason the German Advisory Council on Global Change considers it likely that the number of conflicts that are induced by and exacerbate disaster will increase.

The extent of the consequences of climate change described above, some of which can already be seen, depends to a large extent on whether we succeed in significantly reducing future emissions of greenhouse gases. **Reducing concentrations of greenhouse gases** in the atmosphere must therefore be seen as an important step in mitigating climate change. In addition, strategies for **adapting** to the changed climatic circumstances are crucial. The impact that climate change will have thus depends not only on the degree and extent of local climate changes, but also on the options available to the population and their ability to adapt themselves and their lifestyle to these changes.

German development cooperation has already risen to this challenge and is supporting affected countries in their efforts to mitigate the effects of climate change.

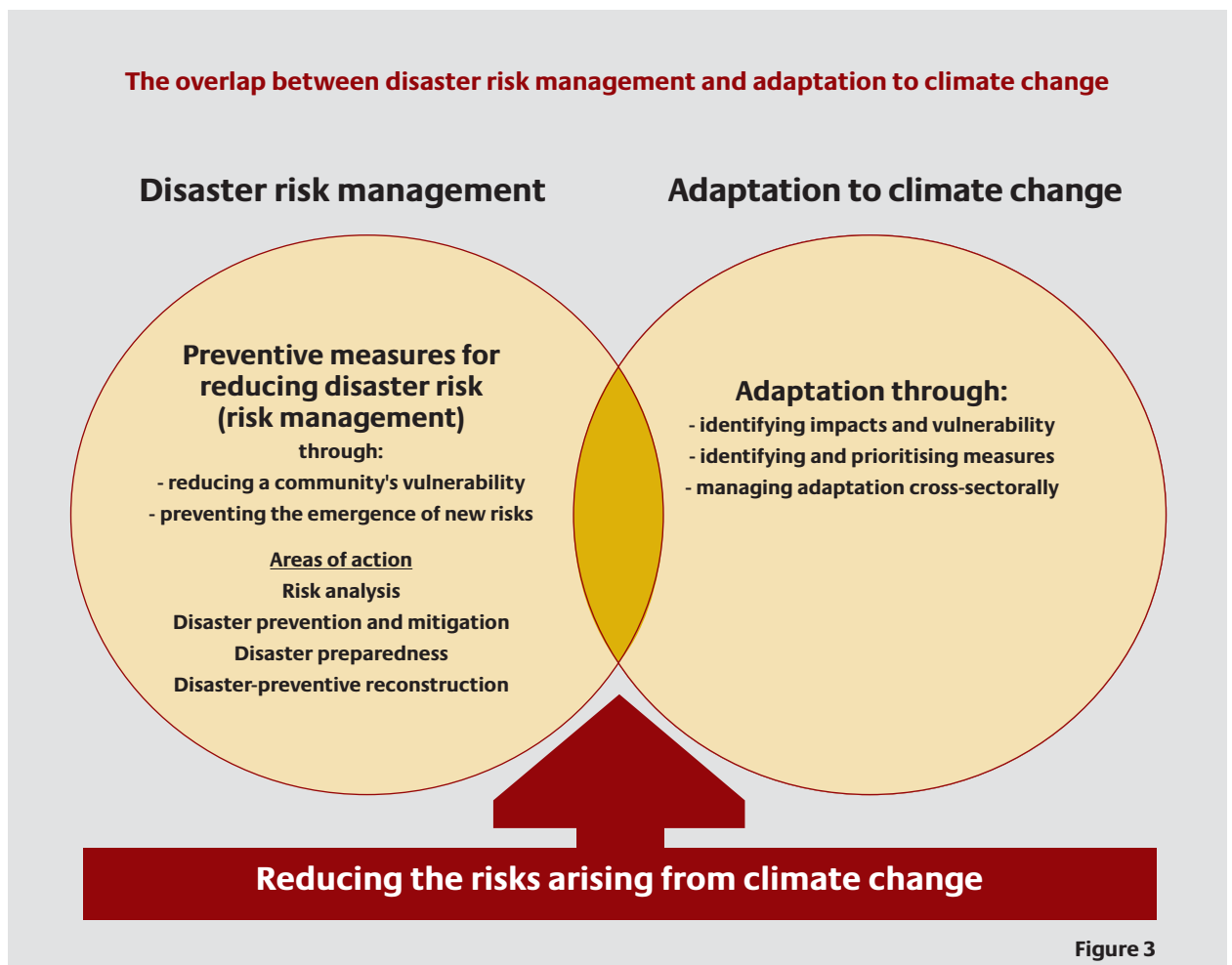
In 2007, as part of this response, the “Climate and Development” programme of action of the German Federal Ministry for Economic Cooperation and Development (BMZ) announced that measures designed to tackle the causes of climate change and limit its impacts would be significantly extended. Disaster risk management is particularly relevant to limiting climate change impacts (adaptation). From now on climate risks will be systematically examined in all affected projects and – where necessary – disaster risk management will be integrated in the project within the framework of adaptation strategies. In this context the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ – German Technical Cooperation) is currently working on the development of a “Climate Check”.

Since disaster risk management has for some time formed a component of many projects,

important and field-tested approaches and instruments for adaptation strategies can now be made available. These include risk analysis (see Section 3.1).

German development policy has helped partner countries adapt to climate change, for example through the “Climate protection programme for developing countries” and the advisory project

on “Disaster risk management in development cooperation”. As a result, authorities and local communities in Mozambique, for example, have adopted measures to mitigate existing disaster risks, which are likely to increase due to climate change; among other things, they have set up a local flood warning system and have included disaster preparedness as a topic in the curricula in local schools (see Section 3.2).



➔ **More information?**

- > **United Nations Framework Convention on Climate Change (UNFCCC):** [www.unfccc.int](http://www.unfccc.int)
- > **Intergovernmental Panel on Climate Change (IPCC):** [www.ipcc.ch](http://www.ipcc.ch)

**1.2 Poverty – reducing vulnerability to extreme hazards**

One person died in an earthquake of strength 8 in Hokkaido, Japan, in 2003, while in the same year an earthquake of 6.5 in magnitude killed 22,000 people in the Iranian city of Bam. These figures show that a society’s vulnerability has a major influence on the impact of an extreme event. Poverty is one of the major causes of deaths associated with natural disasters. More than half of all deaths from natural disasters occur in underdeveloped countries.

If we compare the United Nations Human Development Index (HDI) with data on 2,500 disasters between 1991 and 2000 the correlation between development and vulnerability becomes clear: half of the disasters took place in countries with a medium HDI, while two-thirds of the deaths occurred in countries with a low HDI. Only two percent of the deaths occurred in countries with a high HDI (Wisner et al., 2003).

According to the World Bank, around one billion people live in absolute poverty and more than two billion suffer from malnutrition (World Bank, 2007). Poor sections of the population

have only limited access to resources such as water and secure accommodation, education, work, land and health; they are unable to create financial or material reserves, which makes them particularly vulnerable to economic crises and natural hazards. Poor people have less access to knowledge and information about steps they could take to reduce their risk. Poor people often migrate to the slums of the big cities, which are frequently sited in areas where natural hazards pose an increased risk (see also Section 1.3).

The vulnerability of the poor to natural hazards is also affected by their income, ethnic origin, gender and age, and by whether they live in an urban or rural location. Women and children are particularly hard hit by disasters – partly because of their high rates of illiteracy, their limited mobility and their widespread social dependence on male relatives. In outlying rural regions, women often perform community and socially-oriented tasks because men are forced to earn a living elsewhere.

This means that women in particular must be prepared for disaster events and be involved in the planning and implementation of preventive

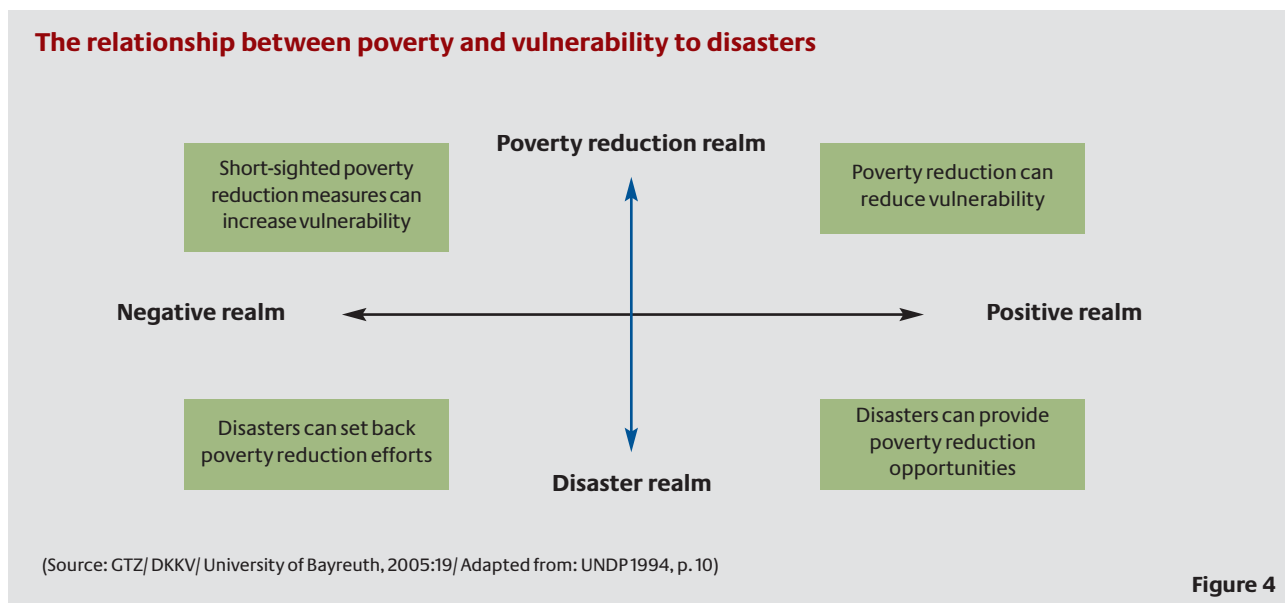


Figure 4



measures from an early stage. This is the only way to ensure that appropriate account is taken of their views and meaningful use is made of their capacities at all stages from prevention to response.

At the World Conference on Disaster Reduction in Kobe, Japan, in 2005, scientists, practitioners and politicians emphasised the importance of disaster risk management for attainment of the United Nations Millennium Development Goals (MDGs). They stressed in particular its relevance to MDG 1, which aims to reduce extreme poverty and hunger.<sup>1</sup>

The causes of hunger and of the emerging global food crisis include shortfalls in food production as a result of climate change and consequent rises in the price of basic foodstuffs such as cereals. The higher food prices exacerbate the precarious situation of people who are already living below the poverty line.

Agricultural development has important potential for the sustainable reduction of poverty: it is essential that this potential is more effectively harnessed. Measures for disaster risk manage-

ment and adaptation to climate change can help to save lives and reduce production shortfalls caused by droughts, storms, floods and changed precipitation patterns (see Section 3.2). In addition, information and early warning systems can serve as a basis for risk management for food security. The overall aim must be to reduce the vulnerability of agriculture to extreme weather events and the anthropogenic influences.

The study “Linking Poverty Reduction and Disaster Risk Management”, published in 2005, confirms the mutually reinforcing association between poverty and vulnerability to disaster (GTZ / DKKV / University of Bayreuth, 2005).

It comes to the conclusion that poverty compels people to overexploit existing natural resources; the consequences of this overuse, including soil degradation and deforestation, increase people’s vulnerability to natural disasters. A disaster, if it occurs, impedes sustainable development, thereby further increasing people’s vulnerability to any new disruption. Less developed countries, in particular, are unable to break out of this self-reinforcing vicious circle without outside



Poverty compels many people to settle in dangerous locations.

<sup>1</sup> According to MDG 1 the number of people suffering from hunger should be halved between 1990 and 2015.

assistance; their capacity to prepare themselves for disaster and to cope with disasters when they occur is limited. Disaster risk management and the concomitant reduction of vulnerability to external hazards must therefore be a fundamental element of long-term poverty reduction. The study recommends that disaster risk management should be considered when national Poverty Reduction Strategy Papers (PRSPs) are drawn up for high-risk countries. Sector policies and development strategies at every stage from national to international level are also relevant. Poverty analysis should be complemented by risk analysis and concrete disaster risk management should be included in budget proposals. These conclusions are underlined in the report “Climate Change as a Security Risk” by the German Advisory Council on Global Change (WBGU, 2007: 219).

However, only sporadic successes have been achieved in mainstreaming disaster risk management in PRSPs so far (see Section 3.2). Integrating a (cost-intensive) prevention concept into a national strategy has proved to be a difficult undertaking, a challenge for both the countries concerned and the donor community.

The overall aim of German development policy is to break the cycle of poverty and vulnerability. In development-oriented reconstruction, poverty reduction and disaster risk management are therefore important and related elements. Measures for increasing farmers' incomes are often closely linked with disaster prevention and mitigation – for example, when constructing terraces cultivated areas can be enlarged and at the same time protected from landslides. The additional control of irrigation leads to direct increases in crop yields. Local people who are themselves involved draw up appropriate strategies for reducing people's vulnerability and improving their life situation.

### ➔ More information?

- > **United Nations Development Programme (UNDP) - Poverty Reduction:** [www.undp.org/poverty](http://www.undp.org/poverty)
- > **Millennium Development Goals:** [www.un.org/millenniumgoals](http://www.un.org/millenniumgoals)



High population density in megacities increases the disaster risk. Earthquakes are an ever-present threat in Manila.

### 1.3 Urbanisation and population growth – disaster vulnerability will increase

The world population is not only increasing; its distribution around the globe is also changing dramatically. 90 percent of the world's population growth in the coming decades will take place in the cities of the less developed countries. In 2015 the world will have 58 cities with more than five million inhabitants. Only ten of these will be in the industrialised countries, with the vast majority in developing countries. Around half of the world's population already lives in urban centres; by 2030 the proportion will have risen to almost two-thirds. Population growth and urbanisation are therefore particularly characteristic of developing countries. Cities such as Manila, Mexico City and São Paulo are undergoing an extreme urbanisation process which is already overwhelming their existing infrastructure and capacity to deliver basic services. Many of these metropolises are also directly threatened by natural hazards. Earthquakes, volcanic eruptions

and floods have a catastrophic impact on the population of conurbations if disaster risk management measures are inadequate. A number of factors make cities particularly vulnerable to natural hazards:

- > The higher population density means that potential victim numbers are much higher in cities than in rural areas.
- > Because of the concentration of goods and services in cities the potential economic damage is enormous.
- > Building methods that are not adapted to existing risks and the absence or inadequate implementation of disaster-preventive building codes result in very high destruction potential. Corruption is often the cause of the inadequate implementation of building codes.
- > Cities in developing countries often face rapid and uncontrolled urban growth and slum



Rapidly expanding cities are not adequately prepared for sudden heavy rainfall. The flooding which can occur as a result has negative impacts on local communities and the environment.

building. The capacity for risk reduction through urban planning is often limited. As a result, many settlements are located in hazard zones.

- > Slum-dwellers' resilience to disaster is limited by unclarified issues of ownership, the illegal nature of the slums and by poverty. Low incomes and limited access to a wide range of public services make the urban poor particularly vulnerable.
- > Illegal settlements are often established in high-risk locations such as river flats or slopes where there is risk of landslides. In the event of a disaster, effective cooperation between illegal settlers and civil protection authorities is unlikely. In post-disaster reconstruction illegal slum-dwellers are also disadvantaged because they have no legal basis for their claims.
- > Risk awareness and disaster risk management capacity among the population are low.
- > Inadequate emergency and evacuation plans and unclarified division of responsibilities between individual sector bodies and civil pro-

tection organisations can result in complex breakdowns of urban service systems in the event of a disaster. In large cities, in particular, there is a danger that public order will collapse when a disaster occurs; drinking water and electricity supplies and the accessibility of critical infrastructure such as hospitals and emergency accommodation may quickly be at risk. In extreme cases this can lead to epidemics and to large-scale security problems.

- > Awareness of the need for early warning mechanisms and cross-sectoral disaster risk management measures is as yet relatively low among municipal governments and authorities.
- > Due to a lack of information and expertise, industrial sites are inadequately protected from the hazards that could lead on to environmental disasters.
- > If a metropolis is of major economic interest – for example, an important port – the impact of a disaster may be felt supra-regionally or, if the city is part of a global economic network, even internationally.

The felling of forests along the upper reaches of rivers and land subsidence caused by groundwater withdrawal and the weight of buildings increase the risk of flooding, particularly for cities in coastal regions and on river deltas. Making urban and industrial conurbations in developing countries better and safer places to live is a major challenge for the state and its local and regional authorities. German development cooperation provides support in the development of disaster risk management capacities; its aims include improving urban services, ensuring that urban planning takes disaster risk management into account, and including disaster preparedness in legislation. A first step should be to increase public awareness of disaster risks, either through the media or by addressing issues of natural risks in the school curriculum. Disaster risk management and emergency plans must be reviewed and adapted to current and future risks. The same applies to emergency supplies. The population and all relevant actors, such as civil protection organisations, police, hospitals, disaster

preparedness authorities, urban planning and building inspection bodies, industrial inspectorates, providers of water and sewage services and education authorities, should be involved in the risk analysis and the development of coordinated measures. This ensures that response to a disaster can be more effective, and reduces the vulnerability of cities in the long term by taking account of hazard zones in urban planning, for instance. It is also important to involve the private sector: insurance can cushion material losses and industries can protect their plants against risk. The approach pursued by German development cooperation in urban regions is to involve community members in risk analysis and then in the planning and implementation of risk-reducing measures such as early warning systems or community-based disaster risk management systems (see Section 3.3). Disaster risk management in at-risk urban agglomerations is essential for the viable development of these conurbations and for the protection of those who live there.

### ➔ More information?

- > **Cities Alliance – Cities without Slums:** [www.citiesalliance.org](http://www.citiesalliance.org)
- > **Local Governments for Sustainability (ICLEI):** [www.iclei.org](http://www.iclei.org)
- > **United Nations Human Settlements Programme (UN-HABITAT):** [www.unhabitat.org](http://www.unhabitat.org)





## 2. Reducing disaster risks –

The state of the national and international debate



Following devastating disasters in the 1970s and 1980s, the United Nations (UN) declared the International Decade for Natural Disaster Reduction (IDNDR) from 1990 to 1999. The international community urged member countries to do more to pursue and implement disaster risk management measures in order to reduce the adverse social, environmental and economic consequences of extreme natural events. On account of their great vulnerability, particular attention was to be paid to the needs of developing countries.

In its early years the IDNDR had a strong scientific and technical focus, with the worldwide application of existing technology being a priority. However, at the United Nations World Conference on Natural Disaster Reduction held in Yokohama, Japan, in 1994 the emphasis shifted for the first time to socioeconomic factors. Disaster risk management was recognised as a component of sustainable development and the original IDNDR goals were extended to include this. The Yokohama Strategy for a Safer World was adopted as one of the earliest guidelines for mitigating natural disasters.

As part of the implementation of the Yokohama Strategy, disaster risk management measures in developing countries have since 1996 been supported by the European Commission Humanitarian Office (ECHO) through the Disaster Preparedness (DIPECHO) programme.

As a result of the IDNDR and the United Nations' call for national committees to be set up, the German IDNDR Committee for Natural Disaster Reduction was set up in Bonn. Since the end of the decade in 1999 its work has been continued by the German Committee for Disaster Reduction (DKKV e.V.). The present DKKV is an intermediary to international disaster reduction organisations

and initiatives; at national level it promotes relevant communication between research, politics, business and education. Similar platforms for strengthening disaster risk management have been set up in some affected countries.

In his closing speech to the IDNDR in 1999 Kofi Annan, then Secretary-General of the United Nations, called for disaster reduction efforts to be taken further – away from a culture of reaction to one of prevention. Since the close of the decade these policies have been continued through the United Nations International Strategy for Disaster Reduction (ISDR), which has its own secretariat in Geneva.

In 2002 the importance of disaster risk management for sustainable and secure development was stressed at the World Summit on Sustainable Development (WSSD) in Johannesburg. This brought disaster-related issues to the attention of a wider public, since the work of many United Nations organisations has some bearing on disaster risk management.

For example, operative overall responsibility for disaster risk management in developing countries at the United Nations lies with the Development Programme (UNDP). In 2001 the Bureau for Crisis Prevention and Recovery (BCPR) was set up; it explicitly addresses the vulnerability of developing countries to disaster risks and sees prevention as a cross-cutting task of development programmes and policies.

In the shadow of the devastating tsunami in the Indian Ocean, the second United Nations World Conference on Disaster Reduction – (WCDR) took place in Kobe, Japan, in January 2005. This was a milestone in better disaster risk management: cases of best practice were presented (some of them by Germany), progress to date

### Disaster risk management is a challenge for the international community

“We are convinced that disasters seriously undermine the results of development investments in a very short time, and therefore, remain a major impediment to sustainable development and poverty eradication. We are also cognizant that development investments that fail to appropriately consider disaster risks could increase vulnerability. Coping with and reducing disasters so as to enable and strengthen nations' sustainable development is, therefore, one of the most critical challenges facing the international community.”

Hyogo Declaration, adopted in Kobe, Hyogo, Japan, on 20 January 2005

was analysed and, building on this, the joint Hyogo Framework for Action (HFA) was adopted to general approval. The German government is among those involved in the implementation of the Framework. Since then the HFA has represented the most important international framework for disaster risk management. It lays down the following key priorities for action over the next ten years:

1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation;
2. Identify, assess and monitor disaster risks and enhance early warning;
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels;
4. Reduce the underlying risk factors; and
5. Strengthen disaster preparedness for effective response at all levels.

The world conference has given rise to a range of initiatives for implementation of the HFA:

- > Building on the two previous Conferences on Early Warning, the Third International Conference on Early Warning (EWC III) was held in Bonn in 2006. With the theme “From Concept to Action”, the purpose of the Conference was to promote early warning as an interdisciplinary, cross-sectoral approach in theory and practice. As one outcome, the framework for global implementation of early warning systems was established and practical project proposals were unveiled. Two of them (in Tajikistan and the Southern Caucasus) are now receiving support from German development cooperation.
- > The finding that international aid was not reaching affected areas quickly enough led in 2005 to the setting up of the Central Emergency Response Fund (CERF) through a resolution of the General Assembly of the United Nations. The money thus made available enables affected groups to receive aid quickly in the event of natural disasters and armed conflicts. Germany is among the contributors to the Fund.
- > In order to heighten international awareness for reducing disaster risk, the Global Platform for Disaster Risk Reduction (GPDRR) was set up in 2006. The Platform provides a global forum for all actors engaged in disaster risk management; it is mainly funded by the ISDR.
- > In mid-2006 the World Bank set up the Global Facility for Disaster Reduction and Recovery (GFDRR) as a financial instrument with which to develop national risk management capaci-

ties in countries affected by natural disasters. In addition to the specific promotion of disaster risk management measures, its aim, like that of CERF, is to improve the speed and efficiency with which international aid can be provided when disasters strike. The World Bank provides the basic funding, while donor countries of the GFDRR make additional contributions. Regional development banks in Latin America and Asia support similar instruments and funding mechanisms. The GFDRR aims to achieve close coordination between donors and promotes joint measures. For example, multi-donor damage, loss and needs assessments took place in Bangladesh and Madagascar after disasters hit there.

> There are also a number of regional disaster risk management organisations which focus on inter-country communication, studies and the implementation of disaster reduction measures. Such organisations include the Asian Disaster Preparedness Center (ADPC) and the Coordination Centre for Natural Disasters Prevention in Central America (CEPREDENAC).

These international initiatives illustrate the shift of emphasis from response to prevention that is already taking place and show that increasing importance is being attached to the implementation of the HFA.



The second World Conference on Disaster Reduction (WCDR) in Kobe, Hyogo, Japan, was a milestone towards better coordination of international efforts.

## Hohenkammer Charter

In November 2005, 100 leading representatives of international government organisations and NGOs, financial experts and practitioners from 30 countries met in Hohenkammer near Munich. Their aim: to strengthen the partnership between politics, economics, science and people affected by disasters and to work together on the key issues of risk prevention. Under the slogan “Worldwide disaster prevention - Awareness is the key” the experts discussed the most urgent tasks in the optimisation of disaster risk management. At the end of the conference the experts adopted the Hohenkammer Charter, which lists the ten greatest challenges in the field of disaster reduction:

**Poverty:** People living in poverty are especially vulnerable; poverty relief is therefore a key element.

**People:** Disaster prevention efforts must reach or start with the people in the areas at risk.

**Decision-makers:** The swift implementation of viable preventative measures presupposes the committed involvement of decision-makers from communal to national government level.

**Dialogue:** The exchange of views between those concerned must be actively pursued in order to achieve a common understanding of the problems and solutions.

**Partnerships:** Politicians, trade and industry, scientists and those affected have to cooperate better and more efficiently. Alliances – public-private partnerships – have to be infused with life.

**Development policy:** Risk prevention has to be singled out as one of the central components of development cooperation and national programmes, and implemented accordingly.

**Propagation:** Promising risk prevention initiatives that currently exist at communal level must be transmitted and propagated worldwide.

**Incentives:** Political, legal and economic incentives are called for, to support investment in disaster prevention, and to accelerate the processes involved.

**Insurance:** Risk transfer, such as insurance and solidarity networks, helps reduce the vulnerability of governments and people in risk situations.

**Awareness development:** Developing awareness is the key to the implementation of adequate measures before disaster strikes.

In parallel with and complementary to the ISDR system outlined above, other international conventions and initiatives also pursue and promote better disaster risk management. For example, the Millennium Declaration adopted at the Millennium Summit of the United Nations in New York in 2000 calls for countries “to intensify cooperation to reduce the number and effects of natural and man-made disasters” (Paragraph 23 of the Millennium Declaration). Some elements of the road map towards the implementation of the United Nations Millennium Declaration are relevant to the ISDR system. They relate to the following:

- > Supporting interdisciplinary and intersectoral partnerships, improved scientific research on the causes of natural disasters and better international cooperation to reduce the impact of climate variables, such as El Niño and La Niña;
- > Developing early warning, vulnerability mapping, technological transfer and training;
- > Encouraging Governments to address the problems created by megacities, the location of settlements in high-risk areas and other manmade determinants of disasters;
- > Encouraging Governments to incorporate disaster risk reduction into national planning processes, including building codes.

Alongside poverty reduction and the Millennium Development Goals, disaster risk management is accorded increasing importance internationally through the United Nations Framework Convention on Climate Change (UNFCCC - see Section 1.1). At least since the 13th Conference of the Parties (COP13) in Bali in December 2007, at which deliberations focused on a follow-on agreement to the Kyoto Protocol, the importance

of disaster risk management in the context of adaptation to climate change is being addressed.

The German government regards tackling climate change as a global challenge. During Germany’s presidency of the G8 and the EU, participants at the G8 summit in Heiligendamm agreed to intensify cooperation with the developing countries on adaptation to climate change.

Outside the agenda of the international community there are a number of independent initiatives and NGOs that concern themselves with improving disaster risk management. One such is the Hohenkammer Charter drawn up by leading experts at a conference of the Munich Re Foundation in 2005 (see box). The charter summarises the most urgent tasks in the field of disaster risk management and calls for the private sector to demonstrate greater commitment.

At international level the involvement of the private financial sector in disaster risk management comes under the heading of “risk transfer”. Insurance models adapted to the economic strength of developing countries and their inhabitants are intended to ensure rapid assistance in the event of a disaster, helping protect the population from the financial consequences. Risk funds, set up jointly by countries which experience frequent natural disasters, such as those in the Caribbean, ensure rapid mobilisation of funds in a way that would not be possible for an individual country in an emergency.

Within German development cooperation successful involvement of the private sector in disaster risk management is increasing. Within the framework of public-private partnerships (PPPs), the government and the private sector work together to mutual benefit.

### The German Government's framework for action on disaster reduction

- > Applications-oriented implementation of the research results of specialist academic institutions on disaster prevention
- > Strengthening national and international disaster reduction committees
- > Development of intersectoral disaster reduction networks
- > Support for training and education measures at schools, universities and in adult education
- > Establishment of international coordination agencies for early warning of flooding, fire etc.
- > Participation in shaping and formulating UN disaster reduction policy

This is a way of generating additional funding and expertise for development cooperation. The private sector benefits particularly through additional public funding, sector and country-specific know-how from the development agencies, and through access to new markets for their own products and services. Within one PPP, for example, a coffee cooperative in Latin America is being given support in order to adapt its plantations to climate change and make

them more disaster-proof. Risk analyses identify measures to protect coffee production and adapt it to changed planting and harvesting times. In Indonesia, a PPP with Munich Re and Bank Indonesia is helping microfinance providers to develop sustainable and customer-oriented disaster-related insurance services, which specifically address low-income groups. The scheme is intended to enable poor sections of the population to protect themselves against threats to their livelihood, such as those posed by floods, storms and earthquakes.

Through its support for some of the initiatives presented, channelled through the Federal Ministry for Economic Cooperation and Development (BMZ) and the Federal Foreign Office (AA), the German Government is signalling just how much importance it attaches to disaster risk management. In 2003, it adopted the adjacent framework for action on disaster reduction to implement the Millennium Declaration and the Johannesburg Programme of Action.

The following section illustrates how German development cooperation, with its concept of sustainability and specific disaster reduction projects, contributes to implementation of the HFA.

### → More information?

- > **Hyogo Framework for Action (HFA):** <http://www.unisdr.org/eng/hfa/hfa.htm>
- > **International Strategy for Disaster Reduction (ISDR):** [www.unisdr.org](http://www.unisdr.org)





### 3. Disaster risk management in development cooperation – A key task of sustainable development

In our partner countries, as in Germany, the political responsibility for protecting the population from disasters and ensuring security lies with national governments. It is at national level that the statutory framework is established and the competencies of the individual sector ministries defined. National governments are contact partners in matters of international assistance or cooperation with different countries.

During the UN International Decade for Natural Disaster Reduction (see Section 2) German development cooperation began to help partner countries set up disaster reduction structures. The majority of disaster risk management projects arise as a direct consequence of emergency aid measures in the wake of a disaster. This is because awareness of the need for prevention and mitigation is greatest after a disaster – as is the demand from our partner

countries. In connection with the UN International Decade for Natural Disaster Reduction and the Hyogo Framework for Action, and as a result of direct experience, there is also a growing awareness, both in our partner countries and within German development cooperation, that disaster risks must as a matter of principle be taken into account in all projects in countries regarded as particularly vulnerable. In order to protect development investments from the consequences of disasters, German development cooperation aims to mainstream disaster risk reduction as a standard task in high-risk countries. In addition to specific projects with our partner countries, disaster risk reduction must be anchored within the instruments and structures of German development cooperation itself. As part of this, procedures and guidelines need to be adapted so that projects are designed to be more disaster-preventive. Overall, German development cooperation strives to ensure that



Using an earthquake simulation, local communities are informed about earthquake resistant building techniques.

- > projects reduce the disaster risk rather than amplify existing risks;
- > projects and programmes help to limit the impacts on people;
- > the projects themselves are protected against natural events;
- > proactive steps are taken wherever possible to reduce the existing risk of natural disasters.

This approach offers an important interface with development cooperation's goal of reducing poverty and building capacity. Disaster risk management, when seen as the responsibility of

different sectors at local, national and international level, can therefore have a long-term effect.

There is thus a growing trend for disaster risk management, or individual elements of it, to be included in programmes concerned with decentralisation and municipal development, the environment, water, rural development, urban development and education (see Figure 5). For example, if risks posed by natural hazards are considered at the outset in land use and urban planning, certain types of use at high-risk locations will be automatically excluded and the vulnerability of the resident population will be correspondingly reduced.

**Disaster risk management as a standard task in German development cooperation**

Within German development cooperation, disaster risk management in disaster-prone countries is seen as a standard task that is incorporated into various sectors and programmes. Planning is undertaken in collaboration with local partners, and affected groups are

involved in implementation. This means that local knowledge is effectively combined with technical know-how and used to maximum effect to reduce vulnerability and improve resilience.

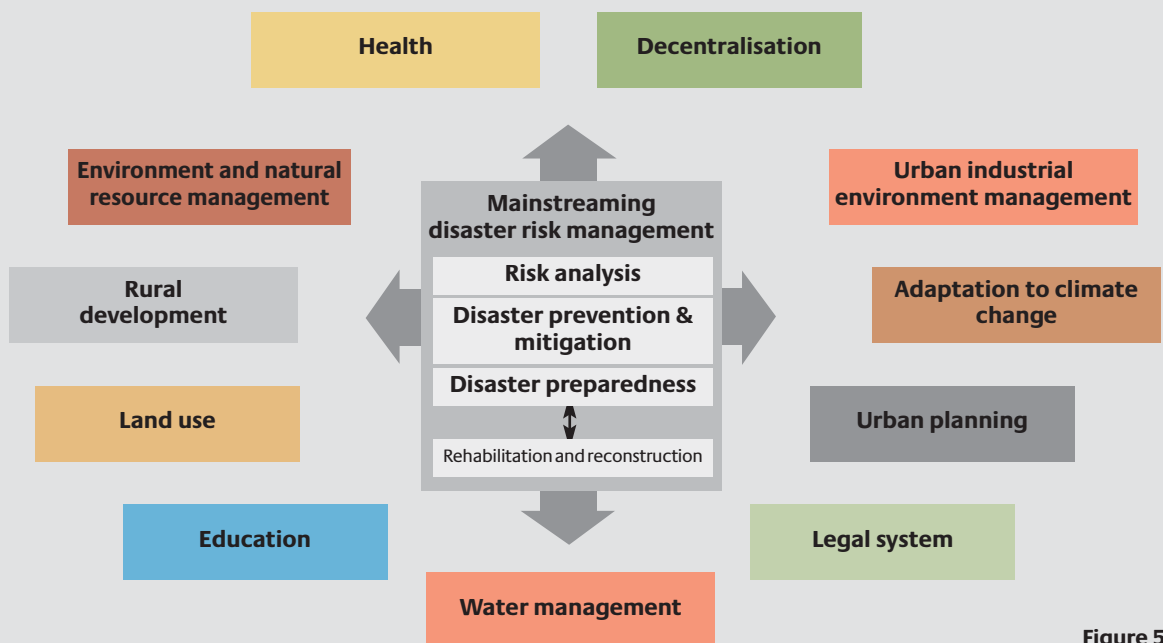


Figure 5



In the field of education, many people can be reached through work done in schools to raise awareness of disaster risks; evacuation exercises and emergency drills can also be carried out in schools (see Section 3.4).

The issue of dealing with disasters is often reduced in terms of content to disaster response and in organisational terms to state civil protection institutions. Such institutions are indeed indispensable for the response to and management of disasters: one of their key tasks is to prepare the population for a disaster through emergency exercises and evacuation plans. However, the bodies charged with disaster response are not normally in a position to address the long-term reduction of disaster risks. They have no authority to issue instructions with regard to the appropriate inclusion of disaster risk considerations in regional planning, urban planning, education or budget planning at different levels. Central interfaces are needed here to effectively prevent and mitigate disasters. German development cooperation therefore supports anchoring disaster risk management in various sector ministries and correspondingly in various development policy projects.

For disaster risk management structures to be comprehensive and viable, responsibilities for specific tasks should be allocated on the subsidiarity principle, i.e. responsibility should be vested in the least centralised level possible. After all, disasters take place locally, and when a disaster occurs access routes are often severed. The necessary capacities for prevention and mitigation, preparedness and response must therefore be available locally.

Many countries that are particularly vulnerable to disasters are already attempting to develop disaster risk management structures them-

selves. German development cooperation supports them in a wide variety of ways.

In the wake of disasters, for example, and following the provision of humanitarian aid by the German Government, medium and long-term reconstruction programmes are funded by the BMZ through financial and technical cooperation. Disaster risk management is a key element of these programmes. Development-oriented emergency and transition aid is intended to ease the transition between emergency relief and longer-term programmes, enable people to regain their independence and safeguard a minimum level of social and infrastructural provision. It is thus the starting point for the subsequent process of sustainable development.

Since the UN International Decade for Natural Disaster Reduction there has been an overall increase in the number of German development cooperation projects that either quote disaster risk management as an objective in its own right or incorporate it in their work within a different sector. Very precise use is made of the expertise already available in-country, and this is combined with external knowledge to achieve an optimum blend. As the following examples show, German development cooperation projects take account of the specific details of the situation and of the needs of local partners, and they often form part of a multilateral approach.

But one principle always applies: we must learn from the past if we are to do better in future. Regular and independent monitoring of the impact and cost-effectiveness of the projects we support enables their progress and success to be evaluated.

**3.1 Risk analysis – forward-looking investment planning in Peru's public sector**

Since 2006 risk analysis has been used throughout Peru to examine the disaster risk implications of public investment decisions. This is a completely new approach to investment planning within the country.

Peru is frequently struck by earthquakes, droughts, landslides and cold snaps. In addition, every five to ten years the phenomenon known as the El Niño Southern Oscillation (ENSO) brings devastating rainfall to the otherwise dry coastal regions of northern Peru. This natural event is being further exacerbated by global climate change. For example, in 1998 – an El Niño year – northern Peru received 2,272 millimetres of precipitation during

the year, instead of the 60 millimetres recorded in normal years. This heavy rainfall led to floods, harvest losses and the destruction of irrigation channels and houses. In 1998 100,000 people lost their homes. Landslides and floods destroyed roads, so that for many months supplies could not reach the population by land. The total damage was put at EURO 2.5 billion.

However, the enormous damage is not attributable only to the heavy rain; inappropriate and non-sustainable planning and implementation of public investment projects are partly responsible for the scale of the damage.

As a result of this realisation, German development cooperation, through GTZ, is helping the Peruvian Ministry of Economy and Finance to

**Risk analysis for public investments in Peru**

Analysis of project area
Development and analysis of hazard scenarios for the project area - Types of hazard - Duration, intensity, frequency and likely damage - Scenarios for future likelihood of occurrence
Risk analysis of the various alternatives - Location of the individual project elements and their vulnerability - Fragility - Level of resilience
Risk analysis of the various alternatives - Estimation of vulnerabilities and possible damage
Analysis of disaster reduction measures for different alternatives - Cost-benefit analysis of the different disaster reduction measures - Inclusion of the cost-benefit analysis in assessment of the alternatives



Figure 6

routinely evaluate investments for their disaster risk implications. To this end a disaster risk analysis process has been incorporated into the national planning system for public investment: the Sistema Nacional de Inversión Pública (SNIP). The SNIP is intended to help rationalise the planning of public investment, improve the way public funds are used and compare costs with benefits. This takes place at local, regional and national levels and in various sectors. The risk-related evaluation of project proposals enables investments to be assessed and selected for their relevance, appropriateness and significance in reducing disaster vulnerability.

The central instrument used is the risk analysis, which aims to identify and assess potential damage and loss associated with an investment before the investment takes place. To ensure that the risk analysis was properly integrated into the SNIP, national and regional technical working parties were set up in Peru, priority sectors were identified, mechanisms for coordinating activities between the different levels of administration were put in place and training in the use of the risk analysis was provided. These processes are also intended to simplify the ongoing systematisation and validation of the individual integration steps.

As a result of this work, regional risk zones have now been established for all major hazards. In addition the most urgently needed measures have been identified and have been incorporated into the budget in the form of project proposals at various levels. In the pilot communities of Castilla and Condesuyos, on average more than 50 percent of the budget is now linked to disaster risk management criteria. Previously these criteria were considered only sporadically.

The findings from Peru demonstrate that there is much room for improvement in the interaction between different political and administrative levels – interaction that is essential for efficient disaster risk management. Statutory requirements are also more readily accepted if they have been drawn up using a participatory process and are based on concrete, practical experience. The integration of risk analysis into investment projects therefore fosters the sustainability of these projects and reduces costs.



Using risk maps, zones can be identified that are unsuitable for infrastructural measures or require specific protection measures.



### 3.2 Disaster prevention – the example of Mozambique

Mozambique is one of the world's poorest countries. It is also one of the African states most frequently and most severely struck by floods, cyclones and droughts. People living in the catchment area of the Buzi River, in particular, are often the victims of floods and storms. The flooding in 2000 claimed 700 lives and destroyed the houses and crops of farming families. In all 4.5 million people were affected. In the wake of the disaster, the Mozambican government, officials and the population were unanimous in their desire for prevention and mitigation measures. At the time of the floods local organisational structures were unprepared. There was no awareness of the actual hazard or its implications.



Since then there has been a great rethinking in Mozambique. The country has made major progress in setting up a disaster risk management system that operates at national, regional and local levels. German development cooperation has supported this process. After the flood disaster in 2000 German development cooperation provided humanitarian aid and reconstruction assistance. In order to prepare the population and the responsible authorities for future cyclones and floods and to reduce the disaster risk in the long term, disaster risk management was in 2003 incorporated into a new rural development programme being undertaken by German development cooperation. Elements of disaster risk management have also been introduced in the fields of decentralisation and education. Experience gained is now being transferred to other districts and institutionalised within the National Institute for Disaster Management (Instituto Nacional de Gestão de Calamidades or INGC).

In the catchment area of the Buzi River in Mozambique, simple methods are used to warn the population of floods.



Together with villagers, a risk analysis is carried out, with equal participation by women and men.

With German support, the Mozambican villages, districts and national bodies affected by floods have improved their disaster risk management in the following ways:

- > Disaster risk management is a central element of the Mozambican Poverty Reduction Strategy Paper (PRSP).
- > The National Institute for Disaster Management (INGC) ensures the competent and effective management of measures to be taken in an emergency.
- > A smoothly functioning disaster risk management system involving early warning systems, emergency centres and coordination bodies has been set up in the affected provinces. It includes risk and disaster management committees in which men and women are represented. They operate an early warning system for flooding set up in conjunction with the Munich Re Foundation; the committees also conduct evacuation measures.
- > Districts provide training for their staff in the significance of climate change and the possibilities of disaster risk management.
- > In the affected districts, disaster risk management and climate change are included in the primary and secondary school curricula and teachers are given appropriate in-service training. The schools work closely with the village communities. There are plans to transfer the positive results obtained with local curricula and teaching materials to the national level and subsequently to the regional context of southern Africa.
- > Disaster risk management measures have been included in local development plans. For example, disaster risks have been taken into account in connection with agricultural production, the securing of natural resources, the development of protection measures and settlement location decisions.
- > Community representatives from Central America and Mozambique have shared information on their experience of local early warning systems. Mozambique's neighbour, Madagascar, is now making use of the experience of disaster risk management gained in Mozambique.

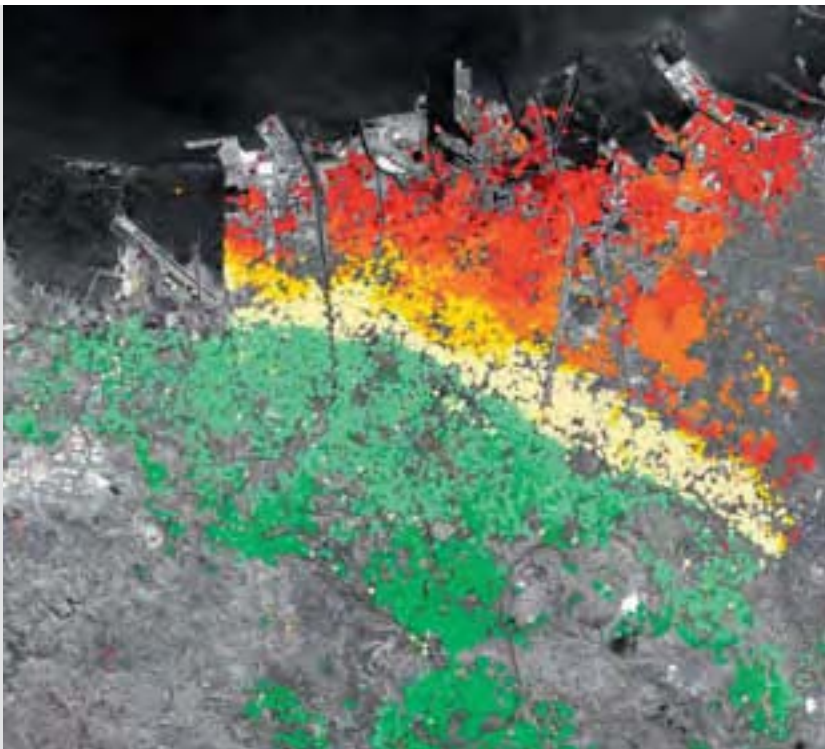
### 3.3 Disaster risk management in reconstruction in Indonesia

As a result of its geographical position, Indonesia is one of the countries most frequently affected by natural disasters caused by geological factors. The tsunami on 26 December 2004 claimed more than 160,000 lives in Indonesia alone. Between 2000 and 2008 49 floods, 30 earthquakes, 24 landslides, 9 volcanic eruptions and 2 tsunamis were recorded (EM-DAT 2008). When such natural disasters occur, both the urban population and the infrastructure (especially buildings, utilities, roads and bridges) are at high risk. Time and again major damage is inflicted on the country's economy. At Indonesia's request, German development cooperation is helping the Indonesian government to reduce the disaster risk. Disaster risk management measures are being implemented both in the context of reconstruction and emergency aid projects and in long-term education, decentralisation and business development programmes. Some notable examples will be mentioned here:

#### Managing geological risks in Yogyakarta

In May 2006 an earthquake with a magnitude of 6.2 (USGS) caused major destruction in Yogyakarta and parts of Central Java. More than 5,000 people lost their lives and 200,000 were made homeless. The fact that settlements had been constructed on unstable sediments (loose coastal sands) made the impact of the earthquake significantly more severe.

In order to be able to reduce the geological risks countrywide on the basis of a standardised set of procedures, the Indonesian government called upon the Geology and Mineral Resources Agency (Badan Geologi dan Sumberdaya Mineral) to assess the potential of these geological risks and draw up guidelines for risk reduction at local authority administrative level and elsewhere. At the request of Indonesia's Ministry of the Interior, the Federal Institute for Geosciences and Natural Resources (BGR) and the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) have since 2006 supported the Geology and Mineral Resources Agency in this task on



#### Modelling of land subsidence in Semarang (Central Java):

Different colour codes show the degrees of subsidence in Semarang, Central Java, and thus the potential vulnerability to flooding.

- no subsidence
- 0-0.5 cm
- 0.5-2 cm
- 2-3 cm
- 3-4 cm
- 4-5 cm
- > 5 cm

Source: Bundesanstalt für Geowissenschaften und Rohstoffe / German Federal Institute for Geosciences and Natural Resources (BGR)

Figure 7



behalf of German development cooperation. The risk reduction work is one component of GTZ's Good Local Governance Programme. The aim is reduce overall vulnerability to natural hazards and make settlement areas more sustainable.

The project has involved carrying out comprehensive studies of soil properties and the associated impacts of earthquakes, and displaying the results in risk maps. Municipal authorities, provincial governments and various local interest groups have received advice on ways in which they can improve their disaster preparedness and increase earthquake resistance in high-risk areas, working with disaster preparedness organisations, specialist institutes and representatives of civil society. In addition, administrative guidelines relating to regional planning have been evaluated and modified in

order to identify safe settlement areas and evacuation shelters. The risk maps and planning guidelines provide a basis for taking geological risks into account in regional and development planning at local and provincial level.

In the context of reconstruction aid in the wake of the earthquake, GTZ, on behalf of the BMZ, supported the planning of settlement-related infrastructure in the light of known geological risks. It also assisted the reconstruction, most of which took the form of self-help among the population. Steps were then taken to set up and strengthen a disaster reduction area association for the districts around the Merapi volcano, and to reach large sectors of the population with measures to raise awareness and rehearse procedures to follow in the event of an earthquake or other natural disaster.

In Indonesia, local groups learn about the early warning system.



### **Early warning and disaster-preventive reconstruction after the tsunami**

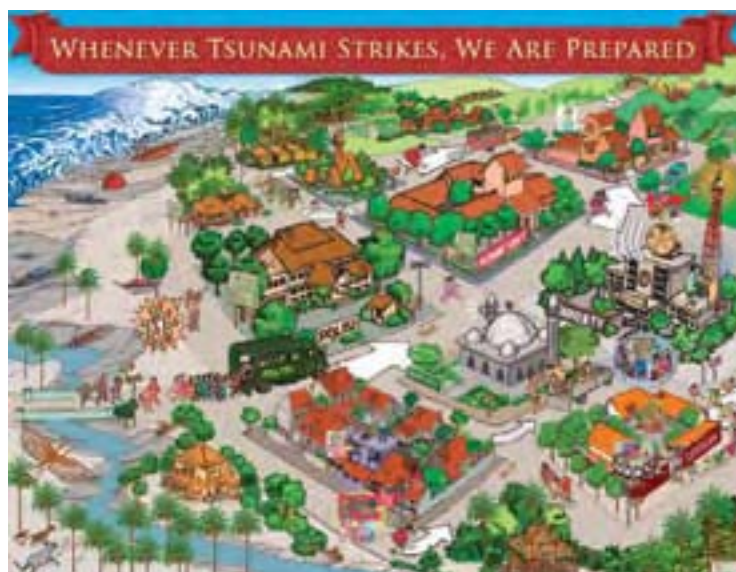
Once emergency humanitarian aid had been delivered after the tsunami of 26 December 2004, the focus shifted to the reconstruction of housing and the social infrastructure and the restoration of key social and economic functions. In an attempt to ensure that the frequent extreme weather events in the region will never again claim so many lives, the German government – through its financial, technical and scientific cooperation – is strengthening local, regional and national disaster risk management structures.

- > Natural hazards are taken into account in participatory regional planning for reconstruction.
- > Risk-reducing building codes and building methods are used and mainstreamed.
- > Disaster reduction is incorporated into the education system.
- > A tsunami early warning system is being set up.

An important component of disaster-preventive reconstruction is community action planning (CAP), which involves the affected population directly in planning processes. In workshops and working groups men and women learn about sustainability and together draw up proposals for adoption by the village community. Families who are particularly at risk are offered safer land for reconstruction, buildings are adapted to the level of risk and escape routes and shelters are set up. Through CAP, municipal and state institutions are enabled to provide swift, appropriate and coordinated essential public services with the active participation of the population.

Because CAP meets with ready acceptance among the population and with planning partners, CAP services are now being requested from many other organisations, such as the Red Cross and Caritas. This means that local CAP teams can now formalise their services by setting up an NGO.

The development of the German Indonesian Early Warning System (GITEWS), which is supported by the German Government, will help the region to be better equipped in future to predict tidal waves and to enable the authorities and the population to react promptly. It is part of a warning system coordinated by UNESCO's Intergovernmental Oceanographic Commission (IOC) and a praiseworthy example of international cooperation in disaster risk management. German development cooperation has particular responsibility for what is known as the “last mile” i.e. ensuring that a tsunami warning actually reaches the at-risk population and that they and the responsible civil protection organisations can react appropriately.



Posters and warning signs, together with disaster exercises (“dry runs”), enable local communities to reach a defined place of safety quickly in the event of a tsunami warning.

### 3.4 Disaster risk management in schools – the action of Sri Lanka’s Ministry of Education after the tsunami

The example of Sri Lanka illustrates how a country’s education system can raise the level of awareness of disaster risks. Not only can children and teachers be prepared to respond correctly in emergencies. They can also be given psychological counselling if necessary.

Sri Lanka is frequently at risk from floods, landslides, cyclones and drought. The devastating tsunami of 2004 left the country unable to assure primary education. Schools had been destroyed or were being used as emergency shelters. Children, who were already suffering as a result of ethnic conflicts, were left alone with their traumatic memories of the disaster.

The experience of the tsunami highlighted the fact that schools and children, in particular, are at high risk. This led Sri Lanka’s Ministry of Education to incorporate disaster risk management

into the education system and make it a component of its sector-wide Education Sector Development Framework and Programme. A number of donors were involved in this (e.g. JICA, UNICEF, UNDP).

Since the issue of disaster risk management had not previously formed part of the educational curriculum in Sri Lanka, there was a lack of suitably qualified teachers. German technical cooperation, which before the tsunami was the only organisation working at all intervention levels in the education system, was therefore asked by Sri Lanka’s Ministry for Disaster Management and Human Rights to support the creation of a safe environment for all school children. The aim was to improve the planning and implementation competencies of staff involved with disaster risk management in schools, and to facilitate the provision of psychosocial care for children and young people affected by the tsunami. Thanks to our partner’s commitment and the motivation of children and teachers alike, much has been achieved since 2005.



- > Elements of disaster risk management have been included in the curricula for pre- and in-service teacher training. Teachers throughout the country are being made aware of disaster risk management issues and learning civil protection drills.
- > As part of a reform of the school curriculum, elements of disaster risk management are being integrated into school subjects.
- > Schools carry out civil protection drills in conjunction with local authorities.
- > National guidelines for safety in schools have been drawn up in cooperation with the disaster management centre and local authorities and have been implemented in pilot schools.
- > A school psychology service has been set up that care can be provided for traumatised schoolchildren; it has so far operated mainly in the areas affected by the tsunami and other crises.

Having a shared goal – that of providing a safe environment for all schoolchildren – has also enabled the different ethnic groups to engage in dialogue and work together.

So that the content of the new curriculum can be implemented, teaching and learning materials have been developed and distributed in all three languages used in the country (Sinhalese, Tamil, English). The involvement of all ethnic groups in civil protection exercises promotes the awareness that a disaster can only be dealt with as a communal effort.

In the long term it is hoped that the intercultural cooperation will have a positive impact on the behaviour of the schoolchildren and their families and will contribute to greater cohesion within society.



Trainee teachers are taught the correct and safe response in schools. Aspects of disaster risk management now feature on the curriculum of teacher training colleges across the country.

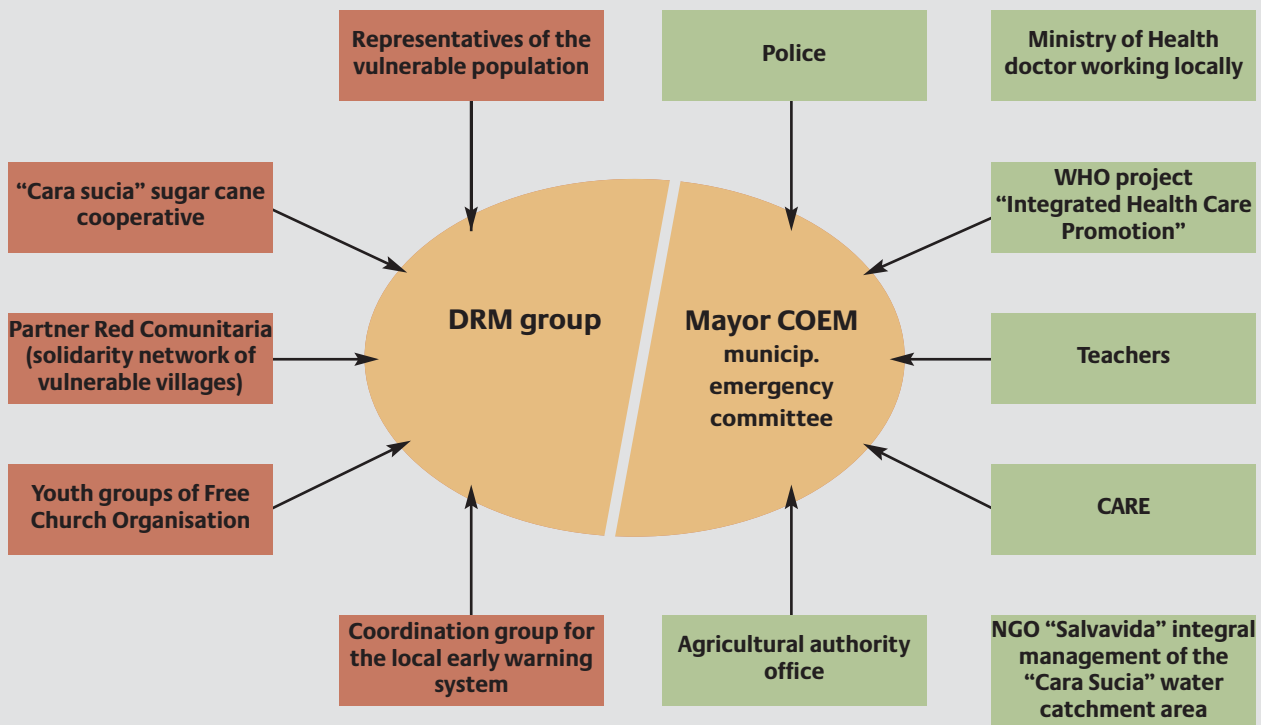
**3.5 Disaster preparedness – examples from Central America**

**Strengthening decentralised structures to reduce disaster risk in Central America**

After South-East Asia, Central America ranks as the most disaster-prone region in the world: it is regularly struck by droughts, storms, floods, landslides and earthquakes. When Hurricane Mitch caused major floods and landslides in 1998, claiming the lives of more than 10,000 people, the German Government, aided by European Commission funds (ECHO), supported the Coordination Centre for Natural Disaster

Prevention in Central America (CEPREDENAC) in a range of awareness-raising, training and advisory activities aimed at improving disaster preparedness. In pilot communities in Guatemala, Honduras, Nicaragua and El Salvador the establishment of community-based disaster risk management groups and participatory early warning systems using very simple technology is still proving its worth today. These facilities strengthen the population’s self-help capacity who can assess risks and receive timely warnings of floods; the population is prepared for an emergency and in a position to evacuate communities promptly and in a coordinated manner.

**The various actors in the local disaster management group in the village of San Francisco Menéndez/Cara Sucia, El Salvador**



(Source: GTZ, 2004b)

**Figure 8**



Early warning systems are a key component of good preparedness. German development cooperation specifically involves local communities in this field of activity.

A major factor in this success is the involvement of all relevant public-sector and civil society actors at all levels, from the outset, in planning processes and in the establishment and operation of early warning systems and disaster risk management structures. Municipal administrations are responsible for facilitating and coordinating the multi-sectoral disaster risk management groups. The groups plan their own risk reduction measures and implement these as far as possible, given their limited financial resources.

The involvement of civil protection bodies and dialogue with them gives rise to learning processes; groups and individuals at local and national level learn from each other about the opportunities and requirements of community-based disaster risk management.

Through cooperation with CEPREDENAC this successful approach has now been extended to other communities in Central America and to other natural hazards.

### **Community-based disaster risk management and early warning in northern Nicaragua**

A project of Deutsche Welthungerhilfe (DWHH) in the department of Estelí in the north of Nicaragua illustrates how a long-term disaster management system can be established cost-effectively, rapidly, and with the participation of the local population. Site surveys were carried out, measurements taken and aerial photographs evaluated in order to assess the risks of drought, floods and landslides to which the community of San Juan de Limay was exposed. The vulnerability of each territorial unit was then calculated on the basis of the pertinent social, economic, environmental and physical factors. The level of vulnerability of each village could thus be identified and a profile of the various natural hazards and the corresponding risk reduction measures was drawn up. The success of these efforts was demonstrated during the 2005 hurricane season: thanks to the functioning early warning system no one was injured, even in the 15 villages with

particularly high disaster risk. It therefore comes as no surprise to see the system now snowballing in neighbouring regions and other developing countries.

### Community-based disaster risk management and inter-municipal cooperation in Honduras

The Honduran communities of La Masica, Arizona, Esparta, San Francisco and El Porvenir are regularly struck by heavy rain events and floods. Individual communities are unable to cope with the consequences or bear the associated costs. These problems were recognised by

the communities and as a result an intermunicipal association, the Mancomunidad de los Municipios del Centro de Atlántida (MAMUCA) was set up with German support at the end of 2001.

Since then the process of preparing for a disaster has involved cooperation between local authorities, networking, information exchange and reciprocal learning processes. The combined efforts are significantly improving evacuation measures when heavy rainfall once again hits the region. The inter-municipal flood early warning system speeds up the flow of information and facilitates prompt and coordinated action.

#### Criteria for participatory planning

##### Relevance

of the activities for the safety of the population and the social and economic development of communities

##### Efficiency

of communities with regard to implementation of the planned preventive measures

##### Transparency

in decision-making, in the awarding of public and private funding and in technical support

##### Sustainability

in organisation, administration and financing



Participatory planning is based on four criteria: relevance, efficiency, transparency and sustainability. In Honduras, for example, action plans were drawn up with designated intervention zones.

Figure 9

The bundling of available resources has reduced vulnerability, and the direct involvement of the affected population has significantly improved their self-help capacity and laid better foundations for them to secure their livelihood. However, the positive impacts go further. Since the project included cross-sectoral elements, such as water management and land use planning, local approaches were developed further and sustainable solutions were extended to the fields of environmental protection, local business support and regional tourism development. Here

again the focus was on participatory planning, training local actors and improving the local availability of financial and human resources. This has reduced costs, prompted innovation and promoted transparency and good governance. For these reasons MAMUCA has been recognised by a range of national bodies as a model project, and when German support came to an end it was able to access new funding independently.

### → More information?

- > **Federal Institute for Geosciences and Natural Resources (BGR):** [www.bgr.bund.de](http://www.bgr.bund.de)
- > **Centrum für internationale Migration und Entwicklung (CIM):** [www.cimonline.de](http://www.cimonline.de)
- > **Deutscher Entwicklungsdienst (German Development Service):** [www.ded.de](http://www.ded.de)
- > **Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German Technical Cooperation):** [www.gtz.de](http://www.gtz.de)
- > **Deutscher Caritasverband:** [www.caritas.de](http://www.caritas.de)
- > **Deutsches Rotes Kreuz (German Red Cross):** [www.drk.de](http://www.drk.de)
- > **Deutsche Welthungerhilfe:** [www.deutsche-welthungerhilfe.de](http://www.deutsche-welthungerhilfe.de)
- > **Diakonie Katastrophenhilfe:** [www.diakonie-katastrophenhilfe.de](http://www.diakonie-katastrophenhilfe.de)
- > **GFZ German Research Centre for Geosciences:** [www.gfz-potsdam.de](http://www.gfz-potsdam.de)
- > **Inwent - Capacity Building International, Germany:** [www.inwent.org](http://www.inwent.org)
- > **KfW Entwicklungsbank:** [www.kfw-entwicklungsbank.de](http://www.kfw-entwicklungsbank.de)
- > **Technisches Hilfswerk:** [www.thw.de](http://www.thw.de)





#### 4. The outlook – Disaster risk management as a long-term commitment for development cooperation



Natural disasters have always posed a threat to development. Developing countries are usually far less well placed than industrialised ones to deal effectively with hazards that occur out of the blue. The first priority must be to reduce people's (men, women and young people) vulnerability to natural hazards such as earthquakes, floods and storms and to avoid the emergence of new risks, in order to secure the progress of development. Disaster risk management is therefore crucial to sustainable development. It is closely linked with the overarching Millennium Development Goal of reducing poverty (MDG 1); in many parts of the world this goal cannot be achieved without it.

In its report "Towards Halving Poverty" the German Government again emphasised this link:

"Disaster relief on its own is not enough. In order to save human lives effectively and protect individuals and economies from physical damage in the long term, everything possible must be done before a natural disaster occurs to minimise the impact. Disaster prevention is therefore an important part of any sustainable development strategy". (BMZ, 2004: p.32)

In recent years the need for disaster risk management has increased as a result of the rise in the number of damaging natural events.

Some global trends (such as increasing population pressure on natural resources in some regions, urbanisation and widening economic disparities) are likely to further amplify the risks arising from an increase in the number and intensity of hazardous natural events. As a result of climate change, disaster risk management is facing challenges on an unprecedented scale. In conjunction with these developments, we are seeing a growing risk of crises and conflicts, in particular those arising from competition for vital resources. By dealing appropriately and gender-sensitively with natural disasters and

climate change, however, we can go some way to defusing the conflict potential.

Disaster risk management is first and foremost the responsibility of the affected country. It is particularly important in countries exposed to major natural risks. In such countries, elements of disaster risk management should increasingly be incorporated as standard practice into national development strategies (such as poverty reduction strategies) and other local, regional and national plans. This presupposes that the statutory and institutional framework required is in place. Entry points for effective action must be identified for each sector. The examples presented in this publication have shown that the reduction of disaster risks can be addressed at many levels. However, it is always important that the people potentially affected are sensitised and given the information they need, so that they can react promptly; they are directly involved at the scene of the event.

Development cooperation can support these multi-layered processes in a variety of ways. German development cooperation recognises the following principal entry points:

- a) On the basis of the joint international action plan (Hyogo Framework for Action) it works within the international donor community and the EU for the further development of joint approaches to disaster reduction in partnership with the developing countries.
- b) In order to pilot suitable procedures and test their viability, it promotes pilot projects in particularly risk-prone countries, in the context of emergency and transitional aid. These specifically promote the establishment of appropriate structures at national, regional and local level and ensure that long-term reconstruction is designed with disaster prevention in mind.

c) Since different risk situations call for different measures, German development cooperation overall seeks to provide for disaster preventive aspects, particularly in the fields of the environment, rural development, education and health. The aim is to incorporate disaster risk management systematically in the relevant country and sector strategies, and to carry out a risk assessment at the planning stage of a new project in particularly high-risk countries, so that suitable risk reduction measures can be included.

The goal of disaster reduction can only be attained if everyone involved works together to achieve it. Development cooperation with its various instruments has a special part to play in this. The endeavours being made must be seen not as fixed entities but as processes, and hence in need of systematic and ongoing further development.

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## Abbreviations

<b>AA</b>	Auswärtiges Amt / German Federal Foreign Office
<b>ADPC</b>	Asian Disaster Preparedness Center
<b>BCPR</b>	Bureau for Crisis Prevention and Recovery
<b>BGR</b>	Bundesanstalt für Geowissenschaften und Rohstoffe / German Federal Institute for Geosciences and Natural Resources
<b>BMZ</b>	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung / German Federal Ministry for Economic Cooperation and Development
<b>BRR</b>	Badan Rehabilitasi dan Rekonstruksi (Indonesian reconstruction agency)
<b>CAP</b>	Community action planning
<b>CEPREDENAC</b>	Centro de Coordinación para la Prevención de los Desastres Naturales en América Central / Coordination Centre for Natural Disaster Prevention in Central America
<b>CERF</b>	Central Emergency Response Fund
<b>COEM</b>	Comité de Emergencias Municipal / Municipal Emergencies Committee, El Salvador
<b>DIPECHO</b>	Disaster Preparedness ECHO
<b>DKKV</b>	Deutsches Komitee Katastrophenvorsorge / German Committee for Disaster Reduction
<b>DWHH</b>	Deutsche Welthungerhilfe
<b>ECHO</b>	European Commission Humanitarian Aid Department
<b>EEA</b>	European Environment Agency
<b>ENSO</b>	El Niño Southern Oscillation
<b>EU</b>	European Union
<b>EWC</b>	Early Warning Conference
<b>GEF</b>	Global Environment Facility
<b>GFDRR</b>	Global Facility for Disaster Reduction and Recovery
<b>GHG</b>	Greenhouse gases
<b>GPDRR</b>	Global Platform for Disaster Risk Reduction
<b>GITEWS</b>	German-Indonesian Tsunami Early Warning System
<b>GTZ</b>	Deutsche Gesellschaft für Technische Zusammenarbeit GmbH / German Technical Cooperation
<b>HDI</b>	Human Development Index
<b>HFA</b>	Hyogo Framework for Action
<b>IDNDR</b>	International Decade for Natural Disaster Reduction
<b>INGC</b>	Instituto Nacional de Gestão de Calamidades / National Institute for Disaster Management, Mozambique
<b>InWent</b>	Internationale Weiterbildung und Entwicklung GmbH / Capacity Building International, Germany
<b>IOC</b>	Intergovernmental Oceanographic Commission
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>ISDR</b>	International Strategy for Disaster Reduction
<b>JICA</b>	Japan International Cooperation Agency
<b>KfW</b>	Kreditanstalt für Wiederaufbau Entwicklungsbank / KfW Development Bank
<b>MAMUCA</b>	Mancomunidad de los Municipios del Centro de Atlántida / Federation of Municipalities of Central Altantida, Honduras
<b>MDG</b>	Millennium Development Goals
<b>NGO</b>	Non-governmental organisation
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>OECD</b>	Organisation for Economic Co-operation and Development

## A N N E X

<b>PPEW</b>	Platform for the Promotion of Early Warning
<b>PPP</b>	Public-private partnership
<b>PRSP</b>	Poverty Reduction Strategy Paper
<b>SNIP</b>	Sistema Nacional de Inversión Publica / National Public Investment Planning System, Peru
<b>UN</b>	United Nations
<b>UNDP</b>	United Nations Development Programme
<b>UNEP</b>	United Nations Environment Programme
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organisation
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UNFPA</b>	United Nations Population Fund
<b>UN HABITAT</b>	United Nations Human Settlements Programme
<b>UNHCR</b>	United Nations High Commissioner for Refugees
<b>UNICEF</b>	United Nations Children's Fund
<b>UNOCHA</b>	United Nations Office for the Coordination of Humanitarian Affairs
<b>USGS</b>	United States Geological Service
<b>WBGU</b>	Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen / German Advisory Council on Global Change
<b>WCDR</b>	World Conference on Disaster Reduction
<b>WHO</b>	World Health Organization
<b>WMO</b>	World Meteorological Organization
<b>WSSD</b>	World Summit on Sustainable Development

## Links

- > Asian Disaster Preparedness Center – ADPC: [www.adpc.net](http://www.adpc.net)
- > Bureau for Crisis Prevention and Recovery – BCPR: [www.undp.org/cpr/disred/rdr.htm](http://www.undp.org/cpr/disred/rdr.htm)
- > Central Emergency Response Fund – CERF: [www.cerf.un.org](http://www.cerf.un.org)
- > Coordination Centre for Disaster Prevention in Central America: [www.ceprendenac.org](http://www.ceprendenac.org)
- > Disaster reduction in GTZ's development cooperation: [www.gtz.de/disaster-reduction/english](http://www.gtz.de/disaster-reduction/english)
- > European Community Humanitarian Office – ECHO: [www.ec.europa.eu/echo](http://www.ec.europa.eu/echo)
- > European Environment Agency – EEA: [www.eea.eu.int](http://www.eea.eu.int)
- > Federal Foreign Office: [www.auswaertiges-amt.de](http://www.auswaertiges-amt.de)
- > Federal Ministry for Economic Cooperation and Development (BMZ): [www.bmz.de](http://www.bmz.de)
- > Gender and Disaster Network: [www.gdnonline.org/](http://www.gdnonline.org/)
- > German Advisory Council on Global Change: [www.wbgu.de](http://www.wbgu.de)
- > German Advisory Council on the Environment: [www.umweltrat.de](http://www.umweltrat.de)
- > German Committee for Disaster Reduction: [www.dkkv.org](http://www.dkkv.org)
- > German-Indonesian Tsunami Early Warning System: [www.gitews.de](http://www.gitews.de)
- > German Foundation for World Population (DSW): [www.weltbevoelkerung.de](http://www.weltbevoelkerung.de)
- > Global Facility for Disaster Reduction and Recovery – GFDRR: [www.worldbank.org/hazards/gfdr](http://www.worldbank.org/hazards/gfdr)
- > Global Platform for Disaster Risk Reduction – GPDRR: [www.preventionweb.net/globalplatform](http://www.preventionweb.net/globalplatform)
- > GTZ pages: Climate Check: [www.gtz.de/en/themen/laendliche-entwicklung/23930.htm](http://www.gtz.de/en/themen/laendliche-entwicklung/23930.htm)
- > GTZ's Climate Protection Programme (CaPP): [www.gtz.de/climate](http://www.gtz.de/climate)
- > International Committee of the Red Cross: [www.icrc.org](http://www.icrc.org)
- > International Human Dimensions Programme on Global Environmental Change: [www.ihdp.unu.edu](http://www.ihdp.unu.edu)
- > International Strategy for Disaster Reduction – ISDR: [www.unisdr.org](http://www.unisdr.org)
- > ISDR Risk Reduction and Gender: [www.unisdr.org/eng/risk-reduction/gender/rd-gender-eng.htm](http://www.unisdr.org/eng/risk-reduction/gender/rd-gender-eng.htm)
- > Munich Re: [www.munichre.com/georisiken](http://www.munichre.com/georisiken)
- > Organisation for Economic Co-operation and Development – OECD: [www.oecd.org](http://www.oecd.org)



## A N N E X

- > **Platform for the Promotion of Early Warning – PPEW:** [www.unisdr.org/ppew](http://www.unisdr.org/ppew)
- > **PRSP processes worldwide:** [www.bmz.de/en/issues/Poverty/poverty\\_reduction\\_worldwide/index.html](http://www.bmz.de/en/issues/Poverty/poverty_reduction_worldwide/index.html)
- > **United Nations Development Programme – UNDP:** [www.undp.org](http://www.undp.org)
- > **United Nations Educational, Scientific and Cultural Organization – UNESCO:** [www.unesco.org](http://www.unesco.org)
- > **United Nations Environment Programme – UNEP:** [www.unep.org](http://www.unep.org)
- > **United Nations High Commissioner for Refugees – UNHCR:** [www.unhcr.ch](http://www.unhcr.ch)
- > **United Nations Office for the Coordination of Humanitarian Affairs – UNOCHA:** [www.ochaonline.un.org](http://www.ochaonline.un.org)
- > **United Nations Population Fund – UNFPA:** [www.unfpa.org](http://www.unfpa.org)

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