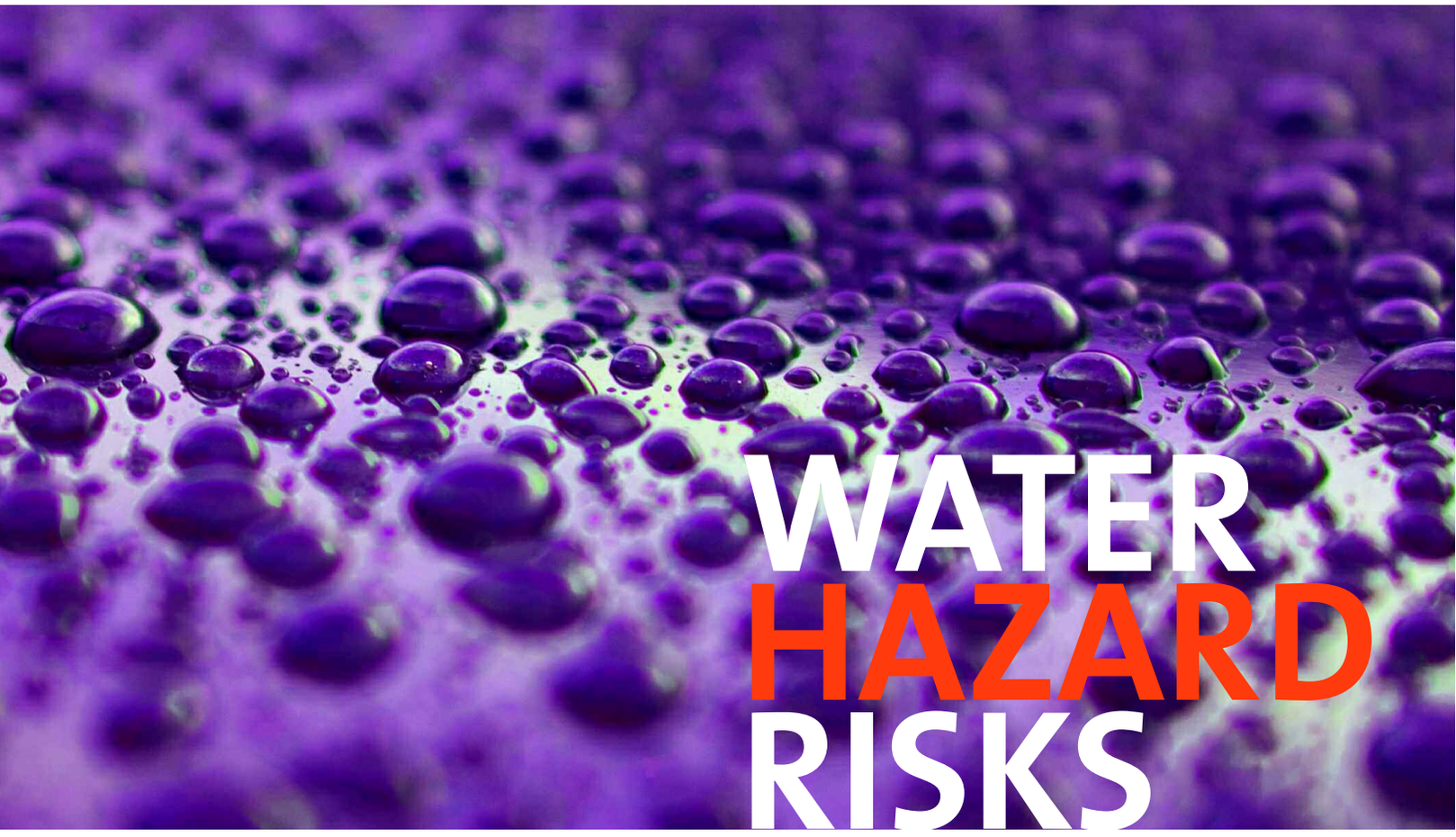
UN WATER
POLICY BRIEF 1



WATER HAZARD RISKS

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A PRIORITY FOR INTEGRATED WATER RESOURCE MANAGEMENT

UN WATER

«Communities will always face natural hazards, but today's disasters are often generated by, or at least exacerbated by, human activities. At the most dramatic level, human activities are changing the natural balance of the earth, interfering as never before with the atmosphere, the oceans, the polar ice caps, the forest cover and the natural pillars that make our world a liveable home. But we are also putting ourselves in harm's way in less visible ways. Destitution and demographic pressure have led more people than ever before to live in flood plains or in areas prone to landslides. Poor land-use planning, environmental mismanagement and a lack of regulatory mechanisms both increase the risk and exacerbate the effects of disasters.»

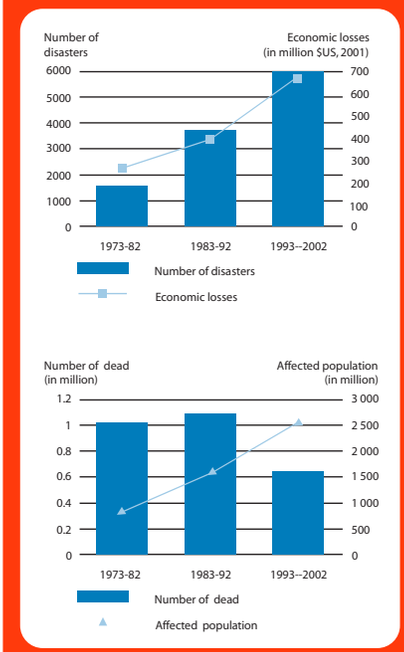
Kofi Annan

WATER HAZARD RISKS

A Priority for Integrated Water Resource Management

This document was developed by UN-WATER in support of the World Conference on Disaster Reduction (WCDR), 18–22 January 2005, and the envisaged programme Outcome Document tentatively entitled Building the resilience of nations and communities to disasters: elements for a programme of action, 2005–2015.

Economic and human impacts of disasters*, 1973–2002



Source: EM-DAT: The OFDA/CRED International Disaster Database, Université Catholique de Louvain, Brussels, Belgium, 2004, www.em-dat.net

** Includes drought, earthquake, epidemic, extreme temperature, famine, flood, industrial accident, insect infestation, miscellaneaous accident, land/debris-slides, transport accident, volcano, wave/surge, wildfire and windstorm.*

BOX 1

CURRENT TRENDS

Water related hazards affect millions of people, jeopardizing human security and hampering socioeconomic activities. Both the Johannesburg Plan of Implementation (JPoI) and the Millennium Development Goals (MDGs) have stressed the need for closer interaction between hazard risk reduction and sustainable development. In addition, hazard risk reduction is increasingly recognized as an integral part of water policies and agendas.

Water-related hazards are major features of natural disasters worldwide. At almost any point in time, a hazard is threatening communities in terms of both the lives of the inhabitants and their properties. Few of these events are reported in the international media due to their relatively small impact. However, events like floods in Bangladesh and Haiti and tsunami in Asia during 2004 drew significant international attention.

Floods, droughts and other water related hazards have major impacts on the socioeconomic well-being of countries (see Box 1). In some cases, different parts of a country can experience extreme conditions like floods and droughts simultaneously.

Between 1991 and 2000, over 665 000 people died in 2557 natural disasters of which 90% were water-related events. In 2003 alone, over 254 million people were affected by natural hazards. During the two El Niño events of 1991–1992 and 1997–1998, floods in China affected over 200 million people in each event. Losses stemming from disasters have greater impact in developing countries as compared to developed countries. More than 95% of all deaths caused by disaster occur in developing countries.

According to the Intergovernmental Panel on Climate Change (IPCC), the trend is probably leading to worse scenarios, as the magnitude and frequency of floods and droughts might increase during the 21st century due to climate change. Other factors, such as population growth, increased wealth, demographic shifts, and changes in land use and the value of various goods might also result in an increased level of damage and loss of life associated with water-related disasters.

UNDERLYING CAUSES

Hazards, such as floods and droughts, occur naturally and are associated with excess or insufficient rainfall, river overflow and other related phenomena. Their effects and severity depend on a host of other factors and a combination of local and sometimes external influences, many of which are a result of human intervention. The vulnerability of a society is a key factor.

The following are some of the main underlying causes of vulnerability, which are integrally linked and mutually reinforcing.

Poor development practices

According to a United Nations Development Programme (UNDP) publication, the process of development itself has a huge impact, both positive and negative, on disaster risk in many countries. Countries that face similar patterns of natural hazards, from floods to droughts, often experience widely differing impacts when disasters occur. The impact depends in large part on the kind of development choices they have made previously.

Source: *Reducing disaster risk: a challenge for development, Bureau for Crisis Prevention and Recovery, UNDP Publications on Disaster, 2004, New York.*

BOX 2

► POVERTY

Factors such as low income, poor housing and public services along with lack of social security and insurance cover force the poor to behave in ways that expose themselves to greater risk. The poor make use of vulnerable environmental resources for their survival, thereby increasing both the risk and exposure to disasters, in particular those triggered by floods, droughts and landslides.

Lack of capital or wealth accumulation over the long run tends to undermine sustainable development. The infrastructure built within the economic constraints might not be able to withstand the hazard. Recurrent floods and windstorms, for example, not only destroy national wealth, but also hinder efforts to accumulate physical and human capital.

► UNPLANNED URBANIZATION

With an increasing population, more and more people are forced to occupy hitherto uninhabited areas, often with greater risk of exposure to hazards. The situation is aggravated due to the trend of migration towards urban areas as the new and often poor settlers occupy areas often at risk in peri-urban informal settlements.

In addition, urbanization is influencing the hydrological processes and accentuating flood peaks. Various land-use changes like elimination of natural flood retention coupled with interference with natural drainage conditions due to infrastructure development might also increase the flood hazard both in downstream and upstream reaches. The development activities have to be coordinated in such a way that they do not contribute to an increase in the intensity of the hazard or spread them out, exposing new areas (see Box 2).

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► ENVIRONMENTAL DEGRADATION

Failure to limit environmental degradation resulting from human intervention can increase the vulnerability to risks posed by natural hazards. The 2004 catastrophic floods in Haiti highlighted the lack of effective land management, the exploitation of charcoal as a domestic fuel and consequent deforestation, which combined to enhance the country's vulnerability to floods and mudslides. By contrast, neighbouring Dominican Republic depends entirely on natural gas for cooking and as a consequence does not have similar problems.

► FRAGMENTED INSTITUTIONAL STRUCTURES

Lack of coordination among institutions at national and local levels is a major constraint to effectively implementing disaster risk reduction, as it results in narrow sectoral approaches and poor planning. It is increasingly recognized that reducing the vulnerability to water-related disasters involves far more components than just the water sector.

► IMBALANCE BETWEEN PREVENTION AND RESPONSE RESOURCES

Although there is a growing political awareness of the constraints to national development caused by floods and droughts, such consciousness has not resulted in an adequate balance in allocation of resources (see Box 3).

Traditionally, disaster management has essentially been response driven. The response action frequently does not address all the involved factors and might cause problems. For instance, after a severe flood a project might be quickly implemented without giving enough thought to the impact the selected solution would have on upstream and downstream areas.

International, national and local resources are still predominantly used for emergency response operations after a disaster occurs. A recent study shows that it is up to eight times cheaper to invest in longer-term prevention, mitigation and preparedness than in post-disaster emergency response.

According to the World Water Development Report, Water for people, water for life, the traditional planning approach of the water sector has limited the effective consideration of disaster risk reduction concerns. There remains a lack of understanding of the intrinsic links between disaster risk reduction and the broader water agenda, and in particular relevant policies and strategies related to the emerging Integrated Water Resource Management (IWRM) approach.

Drought – 'the silent killer of the rural poor'

Vulnerability to drought is dynamic and influenced by a multitude of factors, including population growth and regional shifts in populations, urbanization, technology, government policies, land use and other natural resource management practices, desertification processes that reduce the productivity of the natural resource base, water use trends and increasing environmental awareness.

Identified shortcomings and needs include predominately data and information products and capacity building in the application of this information in decision-making.
As droughts have a strong connectivity to climate variability and climate extremes such as El Niño, clearer seasonal forecasts are needed, including drought monitoring tools and integrated drought and climate monitoring systems based on multiple indicators to fully understand the magnitude, spatial extent and impacts.

Source: Report from the Ad-hoc discussion group on drought, Inter-Agency Task Force on Disaster Reduction, 11-13 March 2003, Geneva

BOX 3

RECOMMENDED AREAS FOR ACTION

Disaster risk reduction and related strategies, such as integrated flood management, are comprehensive processes that go beyond traditional response to the impact of individual events and hazards. These strategies need to be multisectoral and interdisciplinary in nature and comprise a wide range of interrelated activities at the local, national, regional and international levels (see Box 4).

They involve the adoption of suitable regulatory and other legal measures, institutional reform, improved analytical and methodological capabilities, appropriate technologies, capacity building, financial planning, public education, community involvement and awareness.

In order to ensure the effective integration of disaster risk reduction concerns into the IWRM and related development policies, particular focus is required in the following areas.

► STRENGTHENING INSTITUTIONAL ARRANGEMENTS

Disaster risk reduction and management policies should take highest priority in development plans at all levels.

Authorities need to ensure an institutionalized dialogue mechanism and adopt an integrated, comprehensive and multihazard strategy for disaster risk reduction, including prevention, mitigation, preparedness, response, recovery and rehabilitation. This can most appropriately be provided through multidisciplinary and intersectoral actions, taking into consideration socioeconomic and cultural factors and actively involving the civil society, from international to the local level. Wherever possible, the existing institutions and those used for the IWRM should be involved.

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Effective institutional strengthening involves elements such as:

- *appropriate legal frameworks that address integrated flood management approaches based on risk management strategies with due consideration to the development processes;*
- *informed decision-making based on sound scientific knowledge, as well as local, indigenous knowledge using tried and tested techniques and evaluating all promising innovations;*
- *an information base that supports planning and a proactive response to disaster mitigation and reduction;*
- *a participatory and transparent approach that includes a representative range of stakeholders in the decision-making process;*
- *regional and subregional approaches, strategies and cooperation arrangements where rivers span two or more national boundaries for a harmonized approach;*
- *partnerships among different levels of government, civil society, private sector groups and communities;*
- *decentralized decision-making through local authorities and basin committees, including the provision of adequate resources and clarifying the division of responsibilities at various levels;*
- *effective policies to regulate further growth of human settlements in risky areas including appropriate economic policies, such as fiscal incentives for orientation of economic activities away from disaster-prone areas;*
- *shifting from top-down, predominantly engineering approaches for flood management to a more integrated and proactive approach (see Boxes 5 and 6).*

► UNDERSTANDING RISK AND VULNERABILITY

Risk and vulnerability assessments, involving all sections of society, are a prerequisite to identifying the areas at greatest risk and the most appropriate risk management measures for a given region or community. Risk maps should be used to notify all development authorities of areas exposed to hazards.

It is vital to understand the interplay between hazards, the development process and poverty in order to ascertain how current and future development planning and implementation can increase vulnerability and risk.

Continued collaboration between climate scientists and water managers is crucial to make available the best prediction and forecasting tools to water managers.

► PUBLIC AWARENESS PROGRAMMES

The process starts with formal educational programmes including curricula revision, teacher training and development of resource centres. However, the process needs to expand to training activities for all levels of society, especially targeting professionals and community-based leaders and organizations. However, training is just one element and consideration should be given to the development of awareness-raising material such as pamphlets and fliers.

Strengthening mechanisms for sharing of information, knowledge and experiences, in particular on good practice in reducing the risk of vulnerable communities to floods and droughts, at the international, regional and national level are also required.

Emphasis should be on the adoption of flexible strategies tailored to each region recognizing the importance of evaluating differing options and their relative advantages and disadvantages.

International Strategy for Disaster Reduction (UN-ISDR)

The loss of human lives and the rise in the cost of reconstruction efforts and loss of development assets has forced the issue of disaster reduction and risk management higher on the policy agenda of affected governments as well as multilateral and bilateral agencies and non-governmental organizations (NGOs). This trend led to the adoption of the UN-ISDR) by governments. The aim of the UN-ISDR is to mobilize governments, UN agencies, regional bodies, the private sector and civil society to unite efforts in building resilient societies by developing a culture of prevention and preparedness.

The UN-ISDR has recently established a Platform for the Promotion of Early Warning (PPEW) based in Bonn, Germany.

For more information:
http://www.unisdr.org and
www.unisdr-earlywarning.org

BOX 4

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Integrated Flood Management

Integrated Flood Management is a process promoting an integrated — rather than fragmented — approach to flood management. It integrates land and water resources development in a river basin, within the context of the IWRM. The objective is not only to reduce the losses from floods but also to maximize the efficient use of flood plains — particularly where land resources are limited — and improve the quality of life while mitigating the risks. In turn, increases in flood losses can be consistent with an increase in the efficient use of flood plains in particular and the basin in general.

Source: Concept paper on integrated flood management, The Associated Programme on Flood Management (APFM) Technical Document No 1. Global Water Partnership, World Meteorological Organization (WMO), 2003, Geneva. www.apfm.info.

BOX 5

► MONITORING, FORECASTING AND EARLY WARNING

Monitoring hazards is a vital part of the equation. Local hydrological and meteorological data are the basis for risk assessment, effective building standards, planning controls and other regulations that enable houses and other infrastructure to meet adequate safety criteria for the users and the occupants. Such planning initiatives should ensure the continuity of economic activities. Data and information need to be government-funded and made available as a public good. The extent to which a hazard becomes a disastrous event has much to do with the planning, early warning and protective measures taken.

An efficient early warning system should deliver accurate information on likely events in a timely manner. It requires a rapid, dependable and people-centred distribution system for forecasts, advisories and warnings to all interested parties, and a prompt and effective response to warnings from both the government and public.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Meteorological Organization (WMO) agreed to launch a joint initiative on floods to synergize the activities of the two organizations. The United Nations University (UNU) has also expressed interest in becoming a partner organization of UNESCO and the WMO in developing the initiative. Accepting the wider participation of other entities such as the United Nations International Strategy for Disaster Reduction (UN-ISDR) and the International Association of Hydrological Science (IAHS), this joint venture on floods has become a truly international flood initiative, contributing to meeting the Millennium Development Goals and to the International Decade "Water for Life" 2005–2015.

The initiative will focus on the overall objective to minimize the loss of life while enabling maximizing of the social, environmental and economic benefits of floods.

The launch of the initiative was declared at the World Conference on Disaster Reduction (WCDR) held at Kobe, Japan, in January 2005.

BOX 6

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- promoting coherence in, and coordination of, UN-system actions;
- involving partners and stakeholders;
- supporting countries in meeting the Millennium Declaration Goals (MDGs) on water;
- acting at global, regional and local levels.

For further information

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UN Agency members

Food and Agriculture Organization (FAO)
International Atomic Energy Agency (IAEA)
International Fund for Agricultural Development (IFAD)
United Nations Children's Fund (UNICEF)
United Nations Conference on Trade and Development (UNCTAD)
United Nations Convention on Biological Diversity (UNCBD)
United Nations Department of Economic and Social Affairs (DESA)
United Nations Department of Economic and Social Affairs: Gender and Water Task Force (DESA:GWTF)
United Nations Development Programme (UNDP)
United Nations Economic and Social Commission for Western Asia (ESCWA)
United Nations Economic Commission for Africa (ECA)
United Nations Economic Commission for Asia and the Pacific (ESCAP)
United Nations Economic Commission for Europe (ECE)
United Nations Economic Commission for Latin America and the Caribbean (ECLAC)
United Nations Economic, Scientific and Cultural Organization (UNESCO)
United Nations Environment Programme (UNEP)
United Nations Environment Programme Global Environment Monitoring System (UNEP/GEMS)
United Nations High Commissioner for Refugees (UNHCR)
United Nations Human Settlements Programme (UNHABITAT)
United Nations Industrial Development Organization (UNIDO)
United Nations International Strategy for Disaster Reduction (UN-ISDR)
United Nations University (UNU)
United Nations Water World Water Assessment Programme (WWAP)
World Bank (WB)
World Health Organization (WHO)
World Meteorological Organization (WMO)

Partners

Global Water Partnership (GWP)
International Association of Hydrogeologists (IAH)
International Association of Hydrological Sciences (IAHS)
International Programme for Technology and Research in Irrigation and Drainage (IPTRID) International Water Association (IWA)
Public Services International (PSI)
Ramsar Convention on Wetlands Secretariat
Word Water Council (WWC)