Disaster Reduction Conference
King's College London
3 October 2005

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Natural Sciences Sector
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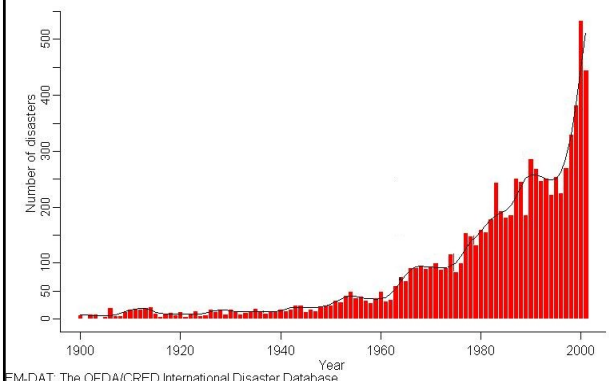
The United Nations system engaged in disaster reduction

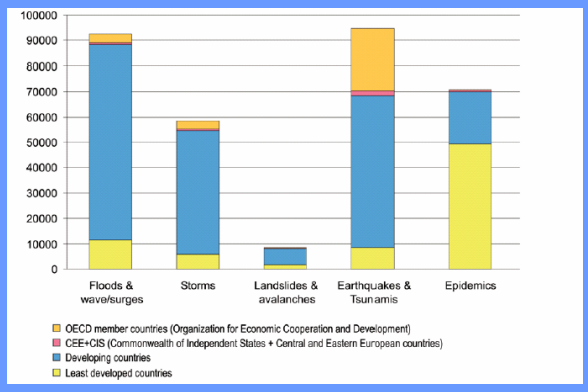
UNESCO
International Strategy ISDR for Disaster Reduction
FAO
UNEP
World Health Organization
World Meteorological Organization
UNDP
For every child Health, Education, Equality, Protection ADVANCE HUMANITY unicef
WORLD BANK
UN-HABITAT United Nations Human Settlements Programme

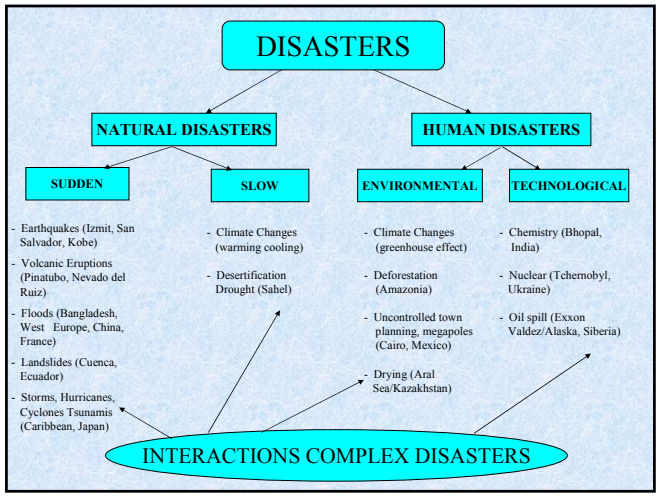
Natural disasters reported



EM-DAT: The OFDA/CRED International Disaster Database
(http://www.cred.be)

People affected by natural and technological disasters (Period 1994-2003)





DISASTER EVENT

A manifestation of an interaction between extreme physical or natural phenomena and a vulnerable human group that results in general disruption and destruction, loss of life and livelihood and injury (which exceed the ability of the affected society to cope using only its own resources)

(O 'keefe and Westgate, 1976)

Projections of Intergovernmental Panel on Climate Change (IPCC)

- Rise in global temperature in 21st century: 1.4 – 5.8 °C
- Sea Level Rise in 21st century: 0.09 – 0.88m

Increase in extreme weather events (windstorm, floods,drought)

Hazard (H) =

probability of occurrence within a specific period of time in a given area, of a potentially damaging phenomenon

Vulnerability (V) =

elements exposed

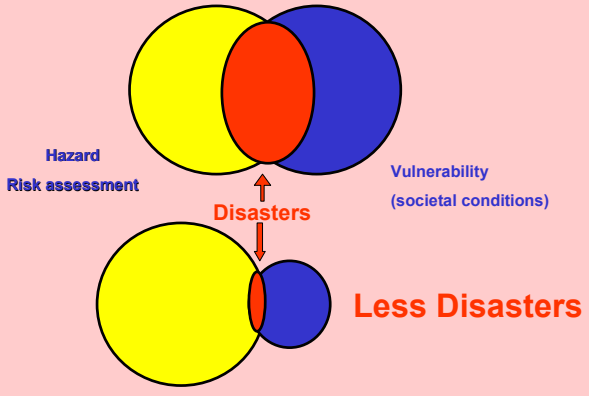
Risk (R) =

expected losses as the result of the occurrence of hazard

HAZARD x **VULNERABILITY** = **RISK**

H x **V** = **R**

Hazards Confronting Vulnerable Communities Cause Disasters



TRADITIONAL FUNDAMENTAL CAUSES OF VULNERABILITY

- **Lack of access to resources (material vulnerability)**
- **Disintegration of social patterns (social vulnerability)**
- **Degradation of the environment (ecological vulnerability)**
- **Lack of strong institutional structures (organizational vulnerability)**
- **Lack of access to info and knowledge (educational vulnerability)**
- **Lack of public awareness (attitudinal and motivational vulnerability)**
- **Certain beliefs and customs (cultural vulnerability)**
- **Limited access to political power (political vulnerability)**
- **Weak buildings and critical facilities and lifelines, unplanned settlements (physical vulnerability)**

21st century:

Increasing complexity

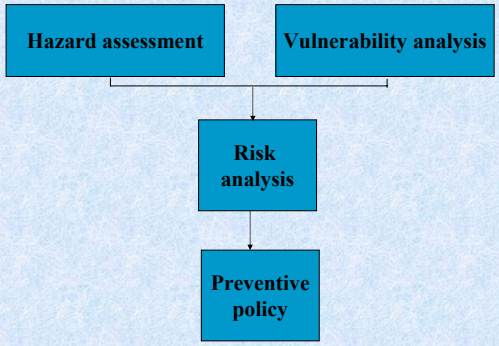
- Development of megacities
- Growing inter-connection natural /technological disasters
- Technological dependance (power, computers, communication systems)
- Growing globalization = growing interdependency = growing vulnerability from distant disasters
- « Inconceivable » events

21st century:

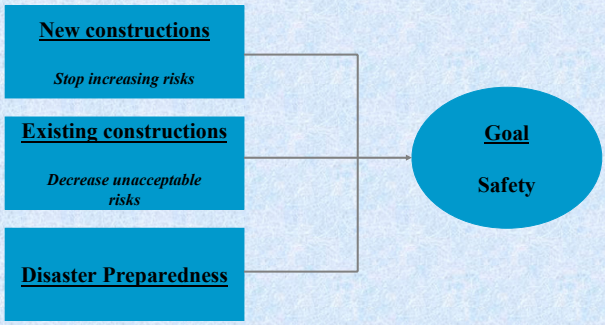
challenges

- Disaster issues at the top of the political agenda
- Reinvented strategic and operational capacities
- Strong clear large scale initiatives

RISK MANAGEMENT



RISK REDUCTION



- Development of global meteorological models
- Accurate forecast
- Warning of violent storms and volcanic eruptions
- Design and Construction engineering
- Earthquake resistant structures
- Capacity to control or modify the disasters events themselves

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Mitigation Measures

(Risk already assessed)

1) land use planning and management,
2) engineering codes, standards and practices,
3) control and protection works,
4) prediction, forecasts, warning,
5) insurance
6) legislative and regulatory measures
7) education, information and training
8) Disaster preparedness

Barriers to disaster reduction

- perception of inevitability; fatalism
- prevention measures neglected
- information about natural disasters and disaster reduction techniques is not disseminated
- planning divorced from hazard management

Coping with Killer Cyclones in Bangladesh

- *1970* : around 500, 000 deaths

Storm warning system

- *1985* : 10, 000 deaths
- *1997*: 193 deaths

Badaoui Rouhban, UNESCO Section for Disaster Reduction, 2005

FACTS

- **Aug 2005: Sendai (Japan); magnitude 7.2 earthquake: no deaths**
- **2003: Bam (Iran); magnitude 6.5 earthquake: 25,000 deaths**
- **1993: Latur (India); magnitude 6.4 earthquake: 25,000 deaths**
- **1989: Loma Prieta (California); magnitude 7.1arthquake: 75 deaths**
- **1988: Spitak (Armenia); magnitude 6.8 earthquake: 25,000 deaths**

Earthquake Engineering

- *1976* : Magnitude 7.8 earthquake, Tangshan, China: more than 300, 000 +deaths
- *1985* : Magnitude 7.8 earthquake, Valparaiso, Chile: 150 deaths

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Katrina (2005)
1,121 fatalities (29/9/05)

Mitch (1998)
11,000 fatalities

KOBE 's EARTHQUAKE

Table 3: Comparison of Damage State of Piers Designed under Codes of Different Ages

Damage state	As	A	B	C	D	total
Pre-1971 design	68 (5.8%)	92 (7.8%)	119 (10.1%)	358 (30.5%)	538 (45.8%)	1175 (100%)
Post-1980 design	0 (0%)	0 (0%)	14 (5.6%)	40 (16.1%)	195 (78.3%)	249 (100%)

As: Heavy damage (completedly collapsed)
A: Heavy damage (to be demolished)
B: Moderate damage (considerable structural deterioration)
C: Slight damage (cracking)
D: No damage

(from Kaneda)

A Blend of Approaches :

- Science and Technology
- Traditional knowledge
- Interdisciplinarity

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Cost-effectiveness of Prevention

A dollar spent on disaster preparedness can prevent $7 in disaster-related economic losses

1/7 Ratio!

United
Nations
Educational
Scientific natural, social, human sciences
Cultural culture, communication,information
Organization

Badaoui Rouhban, UNESCO Section for Disaster Reduction, 2005

Within the **International Strategy for Disaster Reduction**

UNESCO provides a unique intellectual setting linking:

Natural sciences
Social and human sciences
Education
Culture
Communication and information

The purposes of UNESCO in the field of natural disasters are

- To promote a better understanding of the distribution in time and space of natural hazards and of their intensity
- To help set up reliable early warning systems
- To encourage the adoption of suitable building design
- To protect educational buildings and schools in hazard-prone areas
- To protect and repair cultural monuments
- To enhance preparedness and public awareness through education and training, communication and information

UNESCO programmes in Disaster Reduction

- Natural hazards programme
- International Geoscience Programme (IGCP)
- International Hydrological Programme (IHP)
- Man and Biosphere (MAB) Programme
- Programmes of UNESCO's Intergovernmental Oceanographic Commission (IOC)
- Engineering programmes
- UN Decade on Education for Sustainable Development

UNESCO's response to natural disaster

To protect educational buildings and cultural heritage

Landslides, Machu Pichu, Peru

International Programme on Landslides supported by UNESCO

UNESCO's response to natural disaster

To strengthen environmental protection for the prevention of natural disasters

Planting a tree, St Vincent in the Grenadines, 2003

UNESCO CSI project

UNESCO's response to natural disaster

And, when catastrophes do strike, to foster post-disaster investigation, recovery and rehabilitation

UNESCO post earthquake mission, Bam, Iran 2003

Towards a Tsunami Warning and Mitigation System in the Indian Ocean

IOC of UNESCO

World Conference on Disaster Reduction
18-22 January 2005, Kobe, Hyogo, Japan

Follow-up

"Knowledge, Innovation and Education" : a Priority for action for Action

promotion of the integration of disaster risk reduction as anintrinsic element of the UN Decade of Education for Sustainable Development (2005-2015)

Launching of the International Flood Initiative coordinated at the Centre for Water Hazard and Risk Management (CHARM)Tsukuba, Japan

A new warning system for tsunami in the Indian Ocean that makes use of the existing coordination mechanism of the IOC

Hyogo Framework for Action 2005-2015

United Nations Decade on Education for Sustainable Development 2005-2015

Initiative on ***Education for Disaster Reduction***

- The integration of education and sensitisation for disaster reduction into the educational programmes
- Ensuring that school and educational buildings are safe during the occurrence of disasters