Disaster Risk Reduction: International and Regional Perspectives

Julie Dekens, ICIMOD

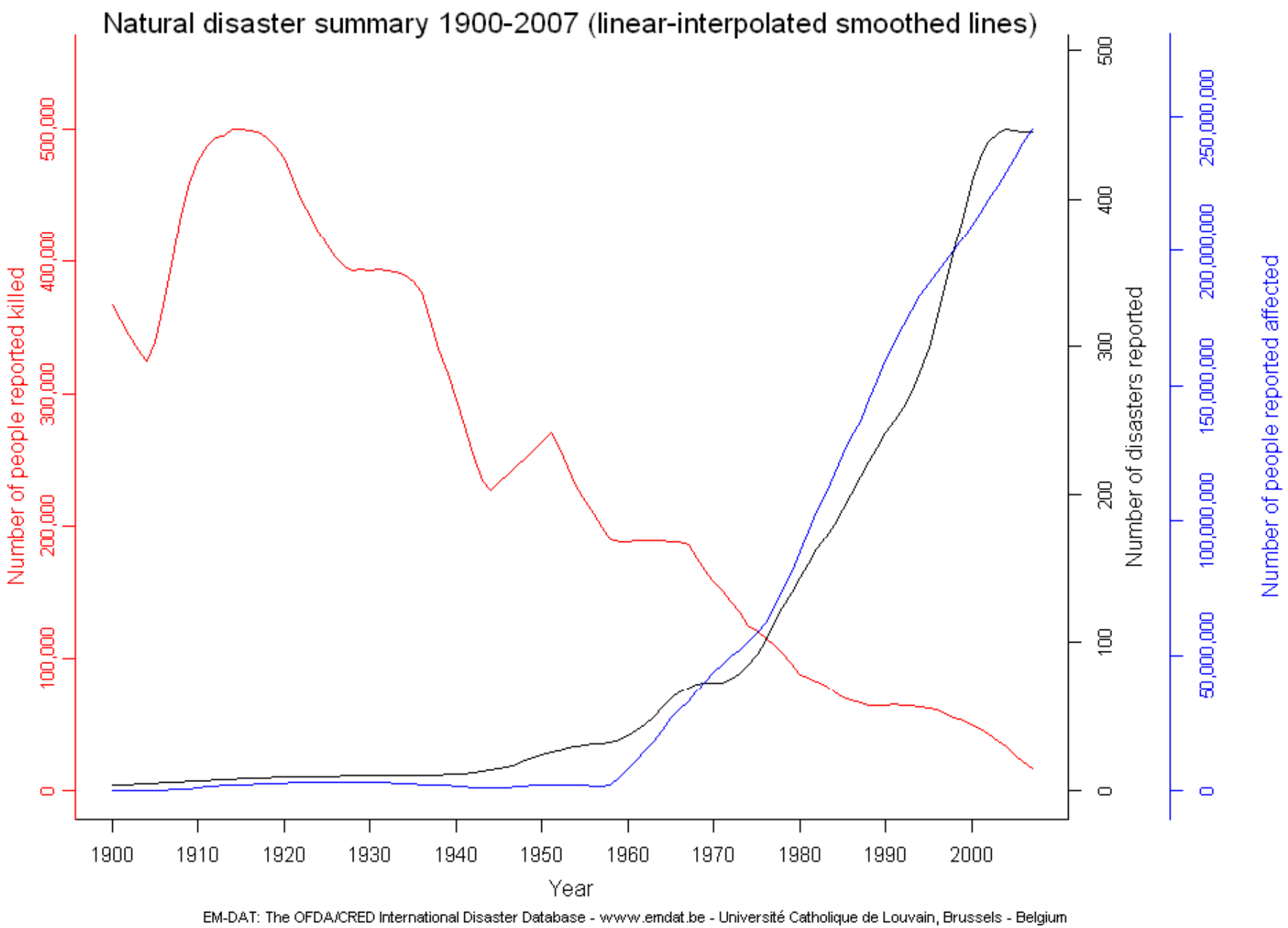
Prepared for regional training course on

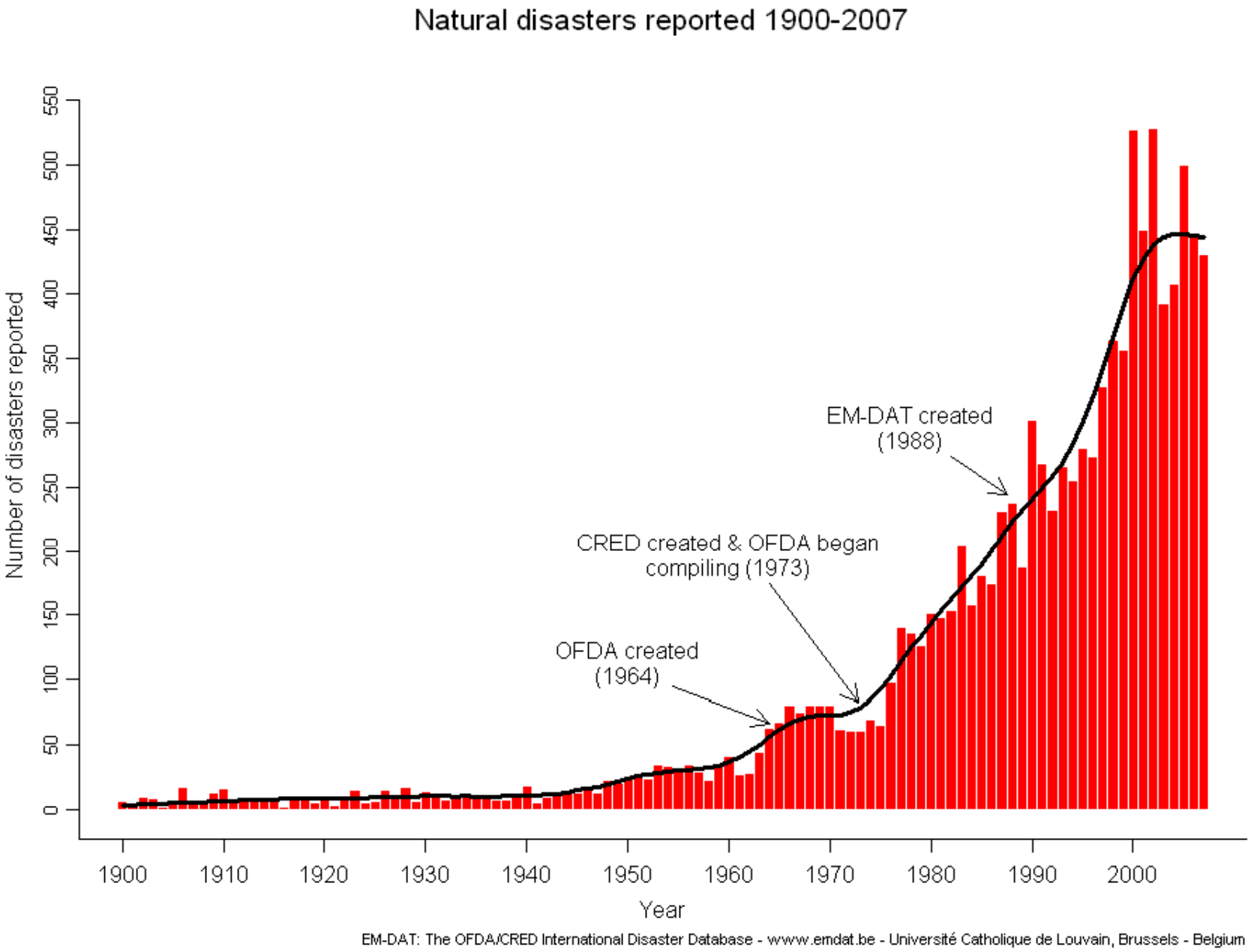
"Recent Developments in geo-hazard disaster management; focusing on earthquake vulnerability reduction in mountain regions."

Peshawar University, 21st August 2008

Natural hazards

GLOBAL AND REGIONAL TRENDS

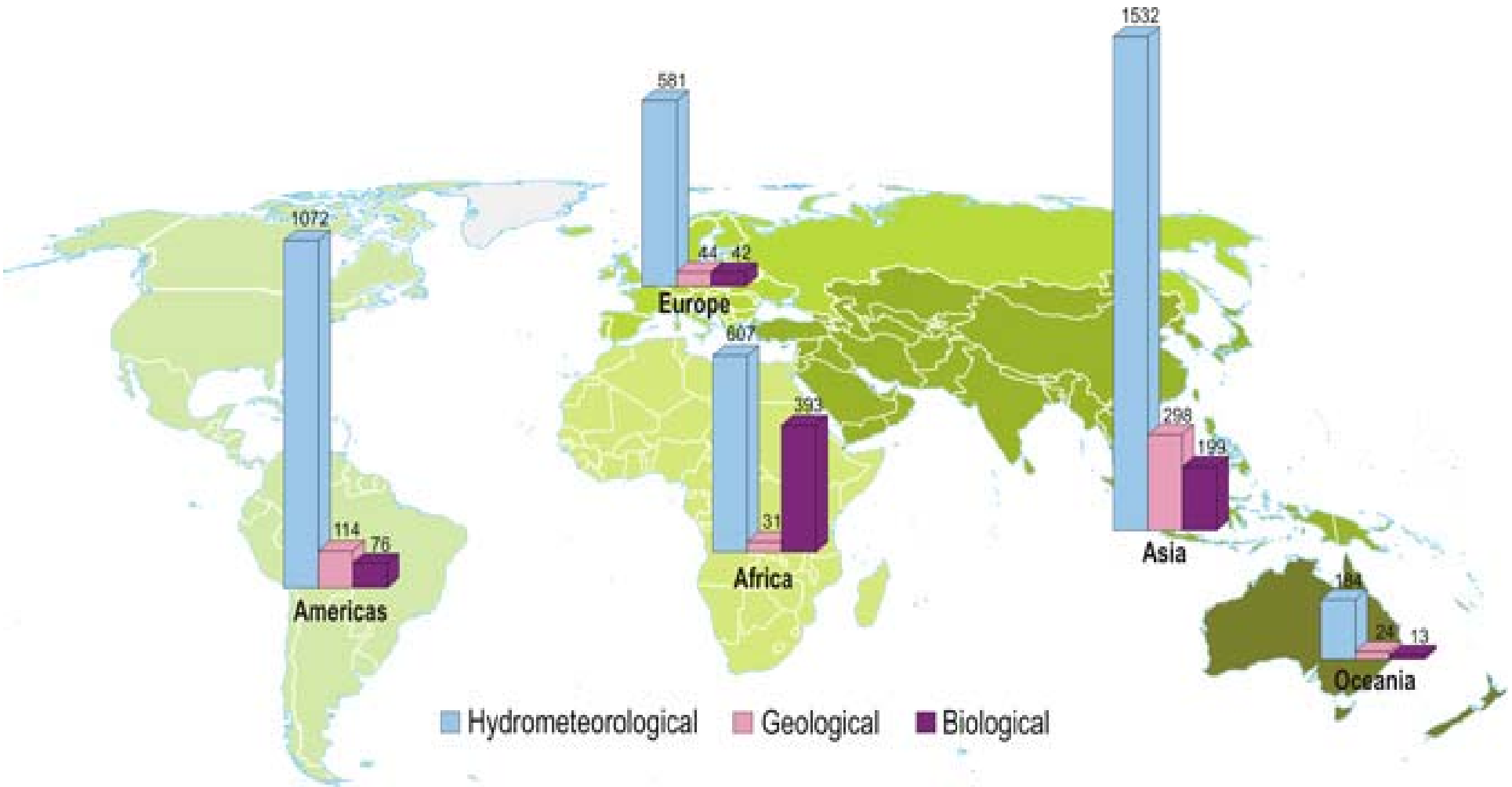

Natural disaster summary 1900-2007 (linear-interpolated smoothed lines)
Number of people reported killed
0
100,000
200,000
300,000
400,000
500,000
Number of disasters reported
0
100
200
300
400
500
Number of people reported affected
0
50,000,000
100,000,000
150,000,000
200,000,000
250,000,000
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year
EM-DAT: The OFDA/CRED International Disaster Database - www.emdat.be - Université Catholique de Louvain, Brussels - Belgium


Natural disasters reported 1900-2007
Number of disasters reported
0
50
100
150
200
250
300
350
400
450
500
550
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year
EM-DAT created
(1988)
CRED created & OFDA began
compiling (1973)
OFDA created
(1964)
EM-DAT: The OFDA/CRED International Disaster Database - www.emdat.be - Université Catholique de Louvain, Brussels - Belgium

1900 – 1999 Cause of death Estimates from *At Risk* 2nd edition	Numbers killed (millions)	%
Political violence	270.7	62.4
Slow-onset disaster	70.0	16.1
Epidemics	50.7	11.6
Road, rail, air & industrial incidents	32.0	7.6
Rapid-onset disaster	10.7	2.3
TOTAL	**434.1**	**100**

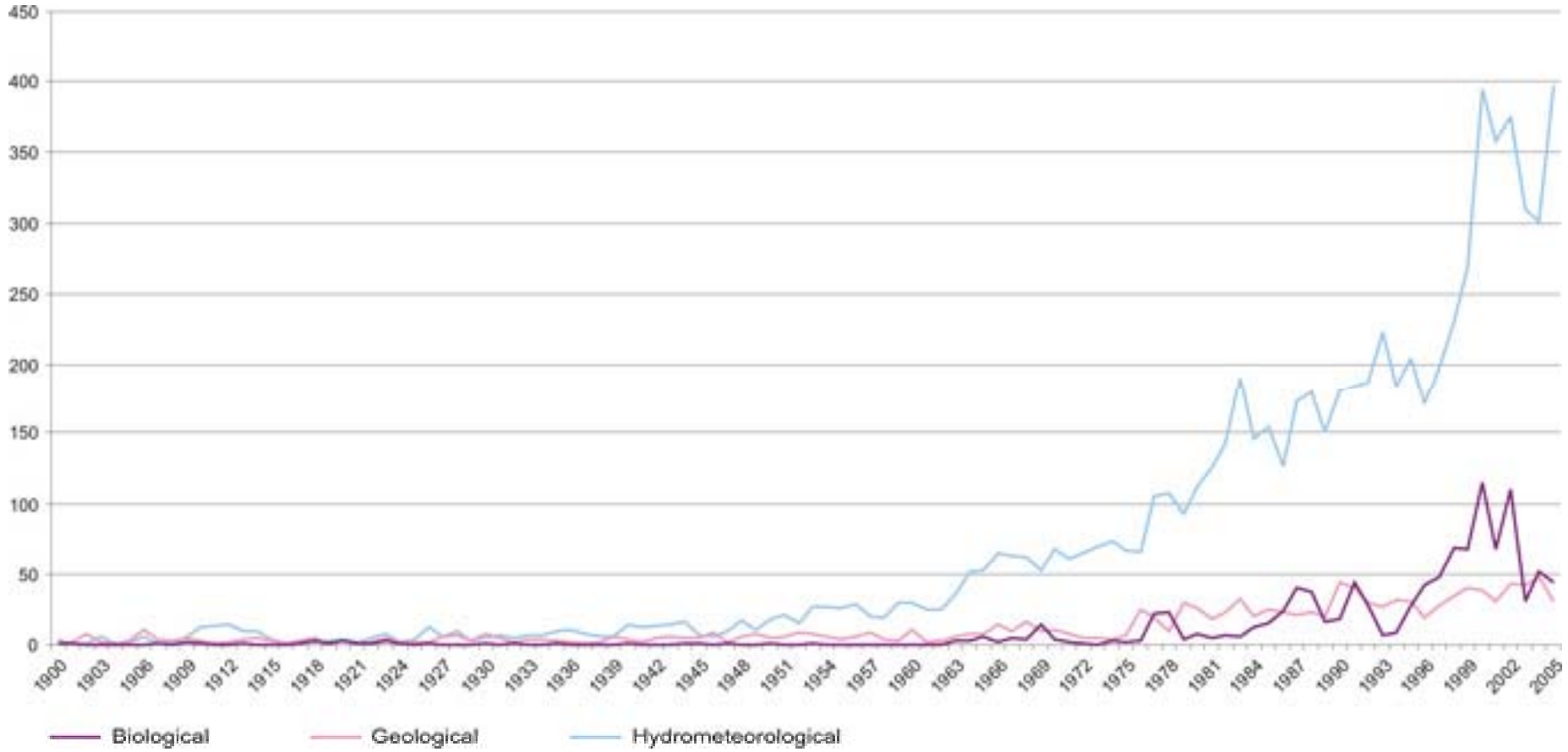
Source: Terry cannon, University of Greenwich, UK

Regional distribution of natural disasters by origin 1991 – 2005 (UNISDR)

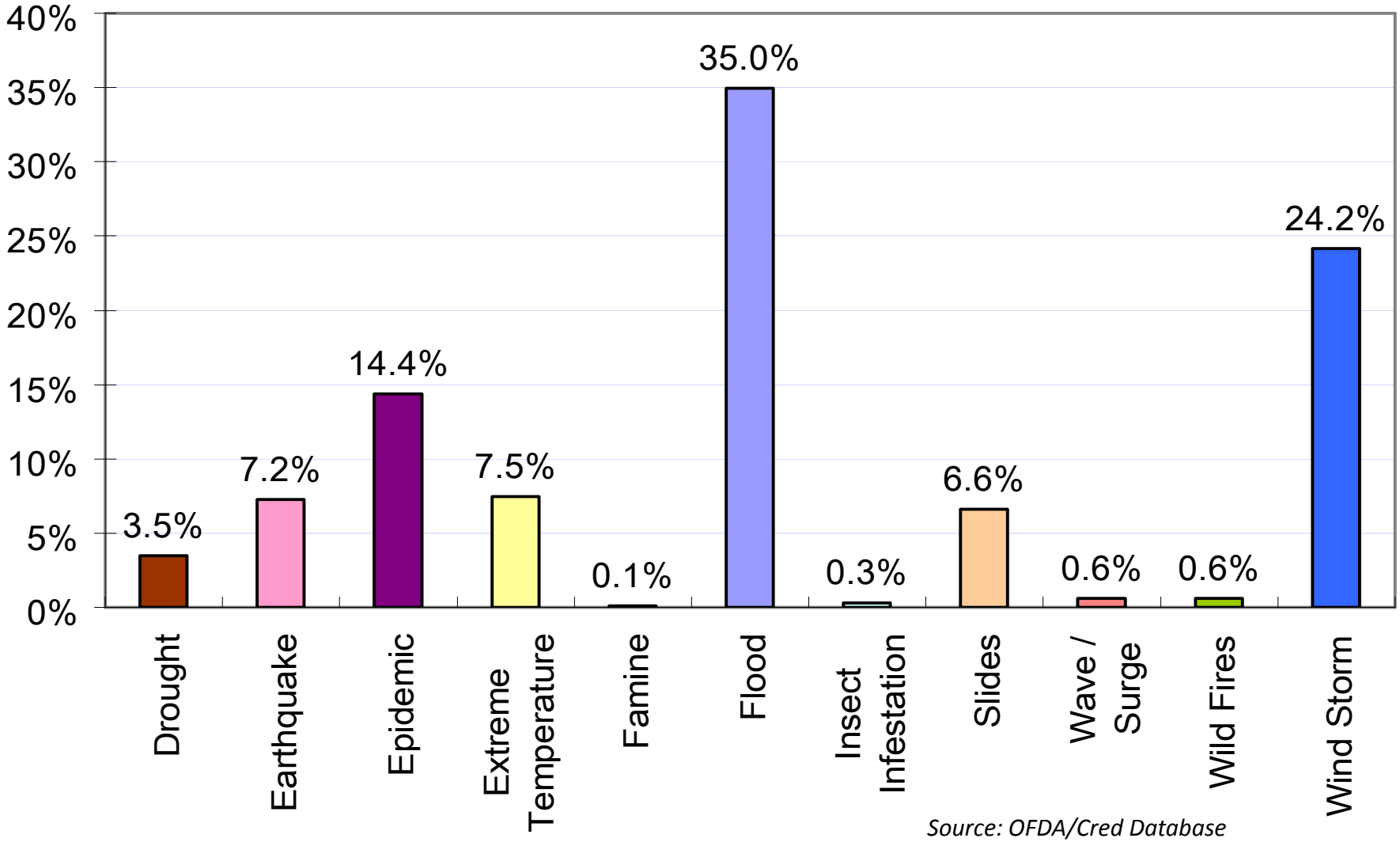


Asia is the most disaster prone continent in the world. Within Asia, the Himalayas is one of/the most complex and intensive risk hotspots.

Number of natural disasters registered in EMDAT 1900 - 2005

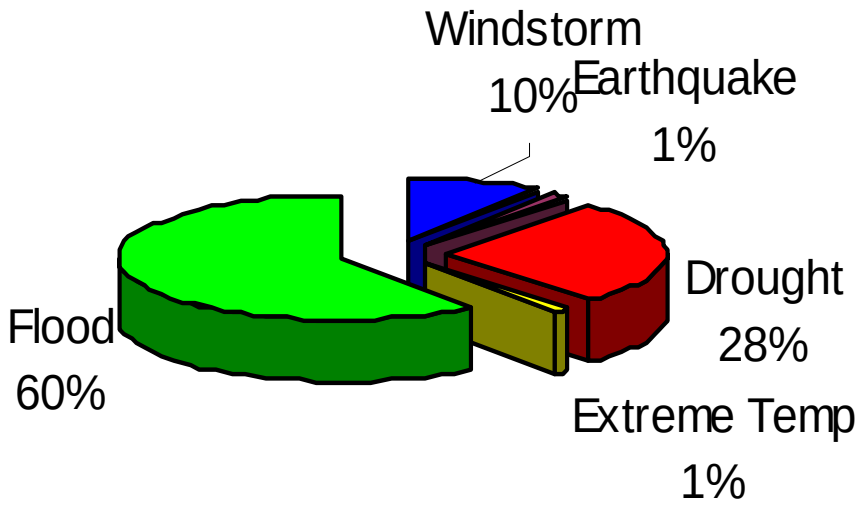


Disasters in South Asia (1975-2005)
Number of reported events



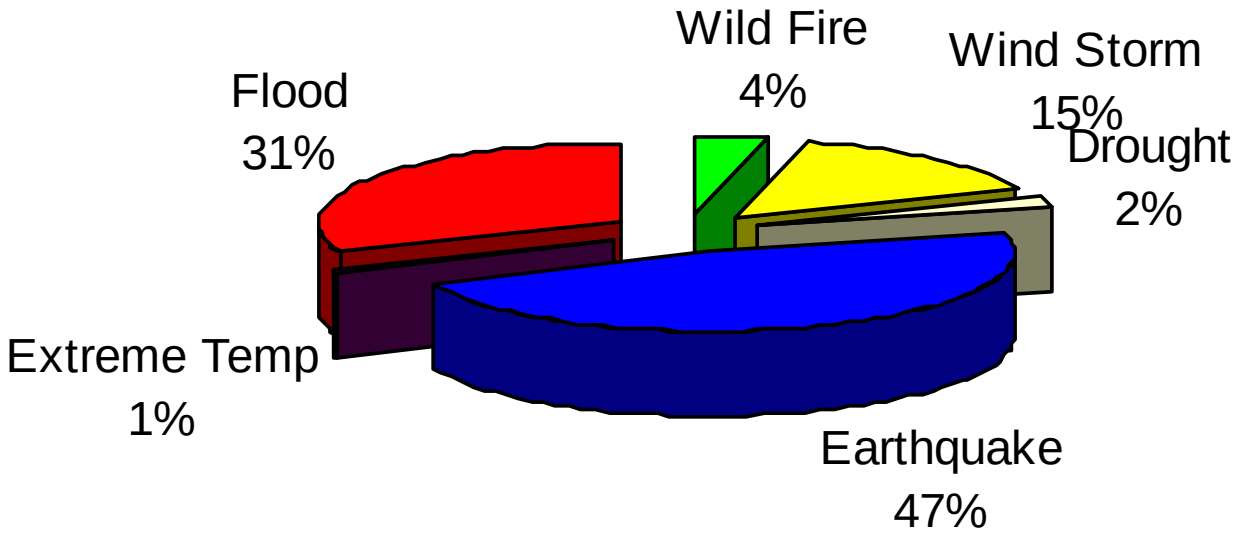
Source: OFDA/Cred Database

Number of Totally Affected People in Asia (1975-2000)

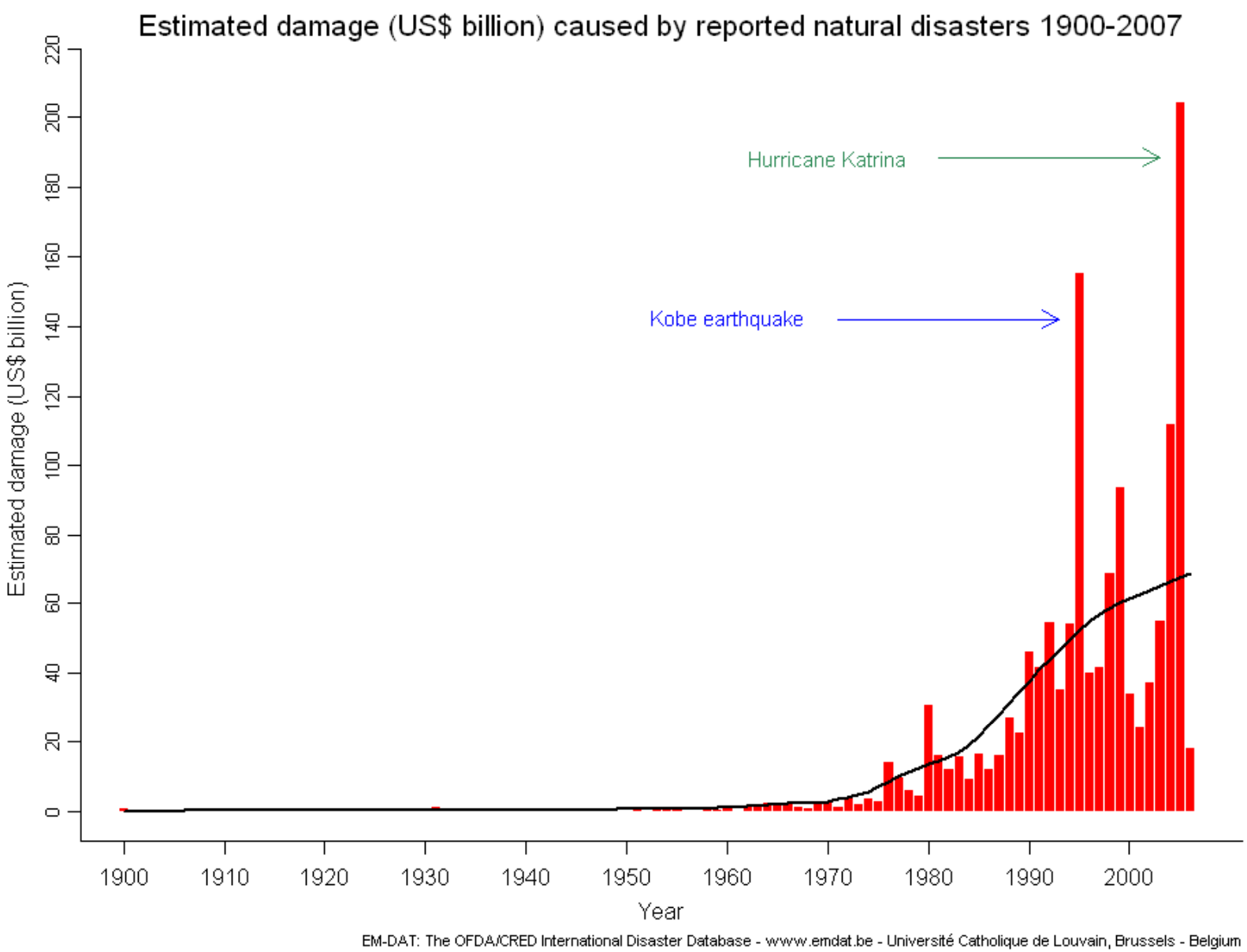


Source: ADRC, Data Book on Asian Natural Disasters

Amount of Damage in Asia (1975-2000)



Source: ADRC, Data Book on Asian Natural Disasters


Estimated damage (US$ billion) caused by reported natural disasters 1900-2007
Estimated damage (US$ billion)
0
20
40
60
80
100
120
140
160
180
200
220
Hurricane Katrina
Kobe earthquake
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year
EM-DAT: The OFDA/CRED International Disaster Database - www.emdat.be - Université Catholique de Louvain, Brussels - Belgium

Changing risk factors

- Fast expanding urbanization and development within high-risk environment
- Demographic changes
- Rapid technological and socio-economic changes
- Environmental change, climate change
- Economic and cultural globalization…

Global interdependence

- The scale of natural disasters is greater than ever due to the indirect losses.
  - A devastating quake in the Tokyo region could now generate losses amounting to between US$ 1,000bn and 2,000bn - staggering dimensions that would impact not only on every single national economy but on the entire financial world. (source: Munich Re Group)

In the past 50 years more than 94,000 people have been killed by building collapse and avalanches associated with Himalayan earthquakes. […] Several M>8 earthquakes may be overdue. Due to increased populations and urbanization in the Ganges plain, the death toll from any one of these earthquakes could now exceed 1 million.

(Roger Bilham, University of California)

Urban seismic risks

More than half of the world's super cities (2-16 million people) are located near seismic zones, and more than half of these are in the developing nations. The total population at risk exceeds 500 million and it is growing daily.

(Roger Bilham, University of California)

- Earthquakes and Megacities Initiative (1998, Philipines)

http://www.emi-megacities.org/

Urban seismic risks

With few exceptions (Tokyo 1923; Tangshan, 1976), recent large earthquakes (M>7.5) have spared the world's major urban centers, but this will not persist indefinitely. In the next millennium several megacities will be damaged by significant earthquakes.

(Roger Bilham)

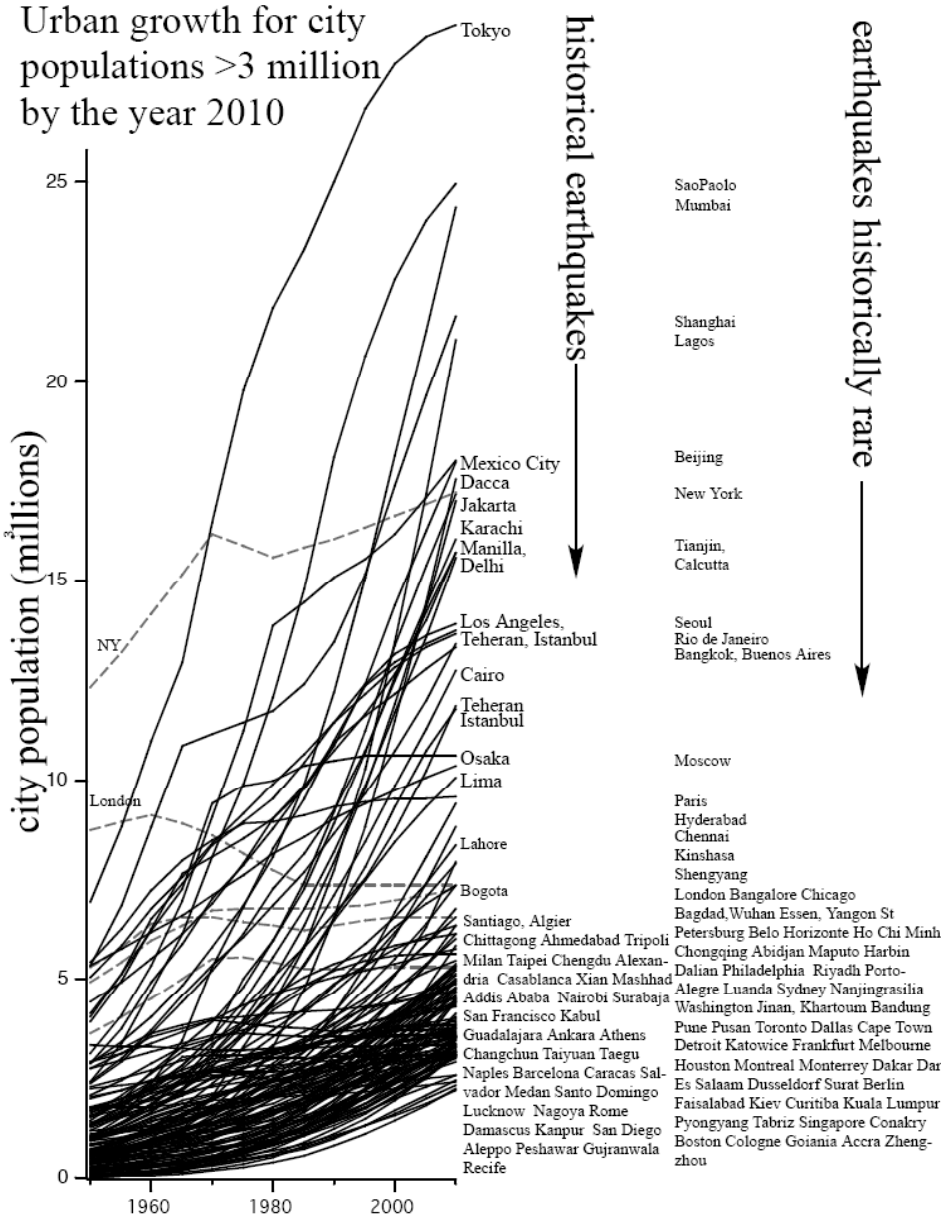


Figure 13.9 Growth of supercities (2030 population exceeding 3 million) from United Nations sources. Dashed shows slow growth in developed nations. Approximately 40% of these 120 cities are in earthquake prone regions (center column). More than 70% of these vulnerable cities are in the developing nations where earthquake resistant construction is often of low priority.

Earthquake and Climate Change

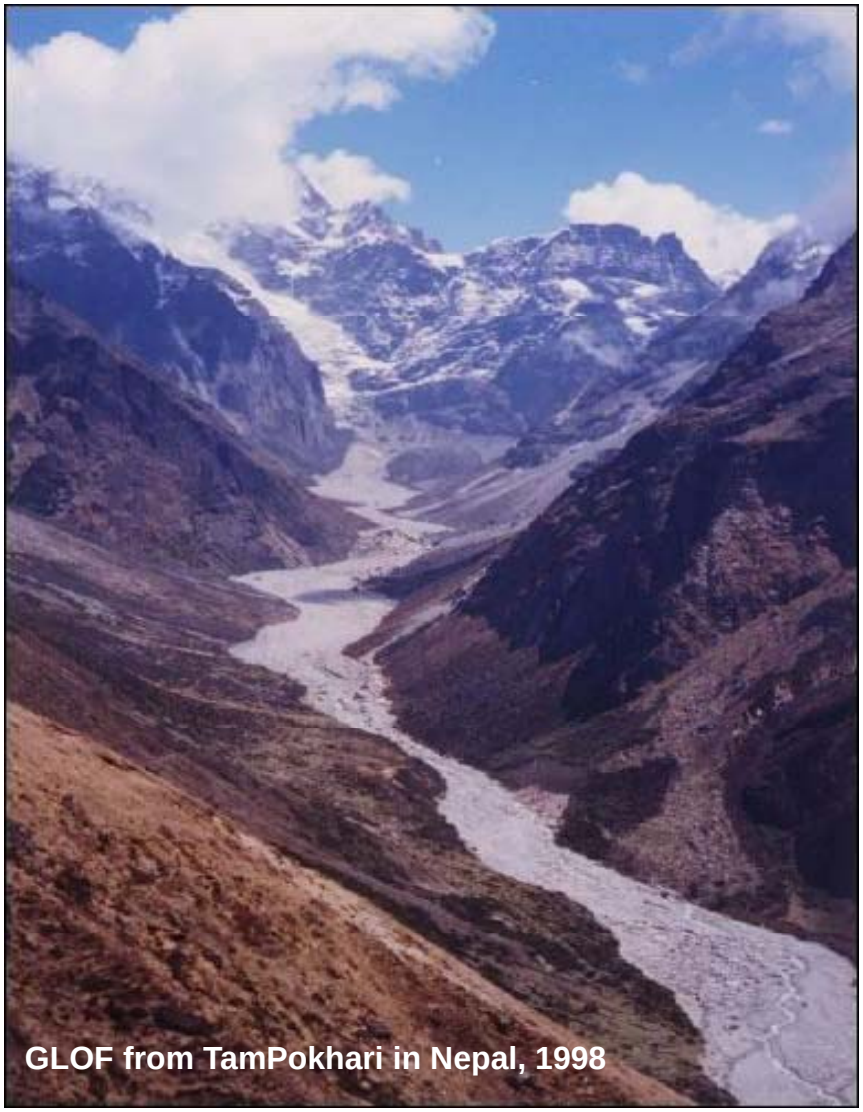
(Source: MacGuire, Benfield Hazard Research Centre)

- Past and recent evidences suggest that changes in global climate affect the frequencies of earthquakes, volcanic eruptions and catastrophic sea-floor landslides due to the changing mass of water and ice that is shifted around the planet
- The pressure of water and ice on the crust is considerable: 1 cubic metre of water weighs 1 tonne, while the same volume of ice weighs slightly less, up to 0.9 tonnes.

➔ **No consensus and little research yet**

- More geological disasters to come as a direct and indirect result of dramatic changes to our environment

➔ **Growing consensus**



GLOF from TamPokhari in Nepal, 1998

Development in the Himalaya

… new opportunities and constraints!!

Increase in accessibility (the establishment of infrastructure)

Intensification of resource use

Monetisation of the economy

Commercialisation of resources

Conversion of agricultural land to industrial and commercial

Restriction over people's access to land and other resources they used to fall back on before, during, and after disasters

Creation of new (natural hazard) risks for local communities

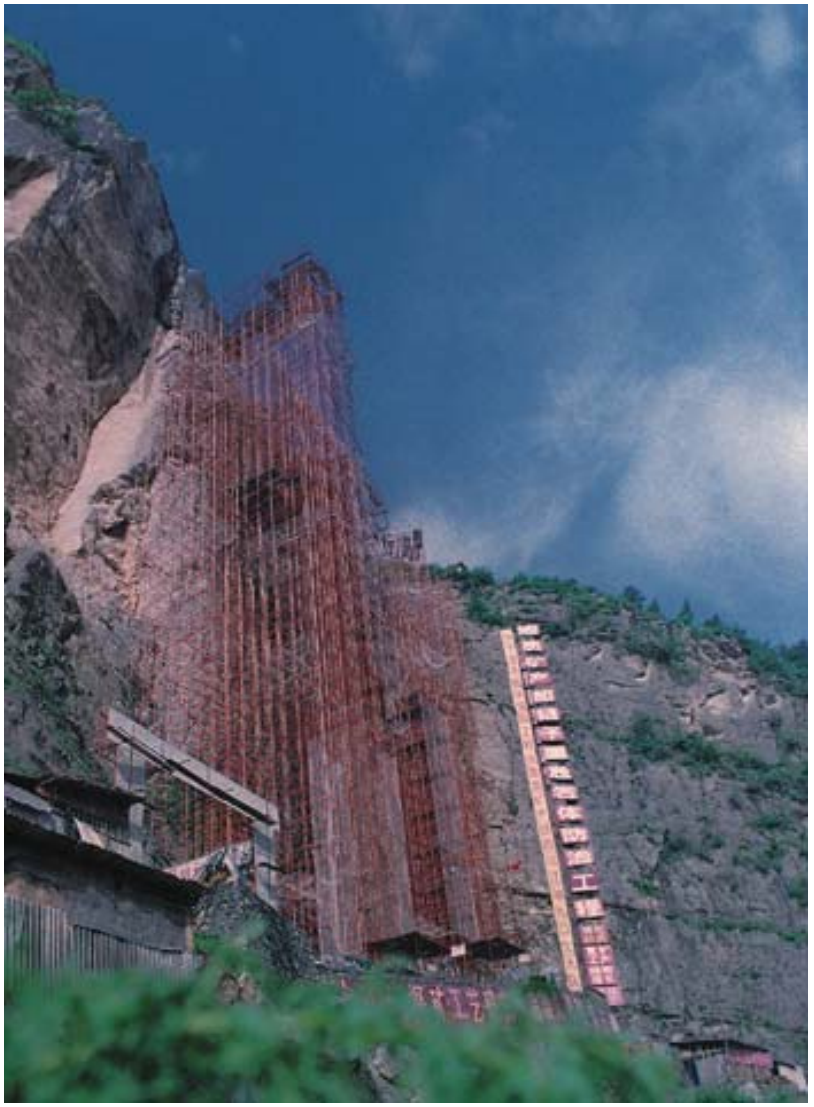
Ex: China Three Gorges reservoir

(Source: MacGuire, Benfield Hazard Research Centre)

- Concerns about the potential for China's Three Gorges reservoir, the world's biggest hydro-electric project, to trigger earthquakes (in what has always been an earthquake-prone region) has led the government to establish a monitoring system

➔ The relation between artificial water reservoir and triggered seismicity is controvertial

➔ BUT! The impact of possible failure of this dam due to earthquake is much higher than the impact of a possible earthquake due to the dam.



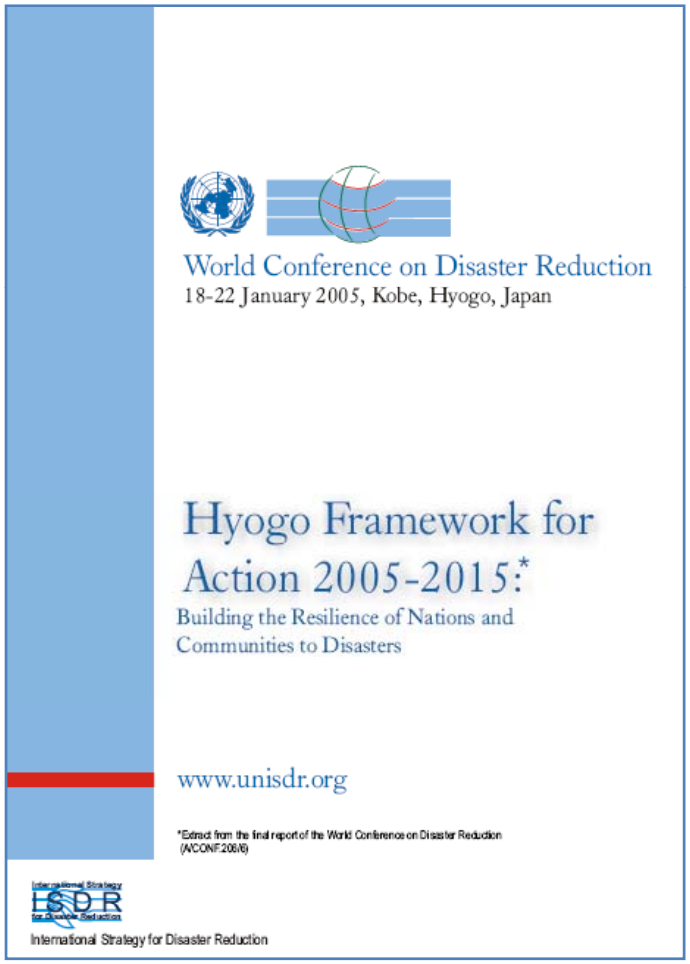
Disaster Risk Reduction:

INTERNATIONAL AND REGIONAL RESPONSE

	Key DRR events (international events in bold, regional events in italic)
2008	▪ *3rd Asian Ministerial Conference on DRR* ▪ *UNDP/ERRRP project - "1st regional initiative on earthquake" (initiated by SAARC)*
2006	▪*SAARC Comprehensive Disaster Management Framework*
2005	▪**Second World Conference on Disaster Reduction (WCDR II), Kobe** ▪ **Hyogo Framework for Action (HFA)** ▪*SAARC Disaster Management Center* ▪ *Pakistan Earthquake*
2004	▪ *Indian Ocean Tsunami*
2000	▪ **International Strategy for Disaster Reduction (UN/ISDR)**
1998	▪ *Asian Disaster Reduction Center (ADRC, Japan)*
1995	▪ **Kobe EQ**
1994	▪ **Yokohama Strategy - United Nations World Conference on Natural Disaster Reduction (WCDR I)**
1989	▪ **International Decade for Natural Disaster Reduction proclaimed (1990-2000)**
1986	▪ *Asian Disaster Preparedness Center (ADPC, Bangkok)*

Hyogo Framework for Action (2005-2015)

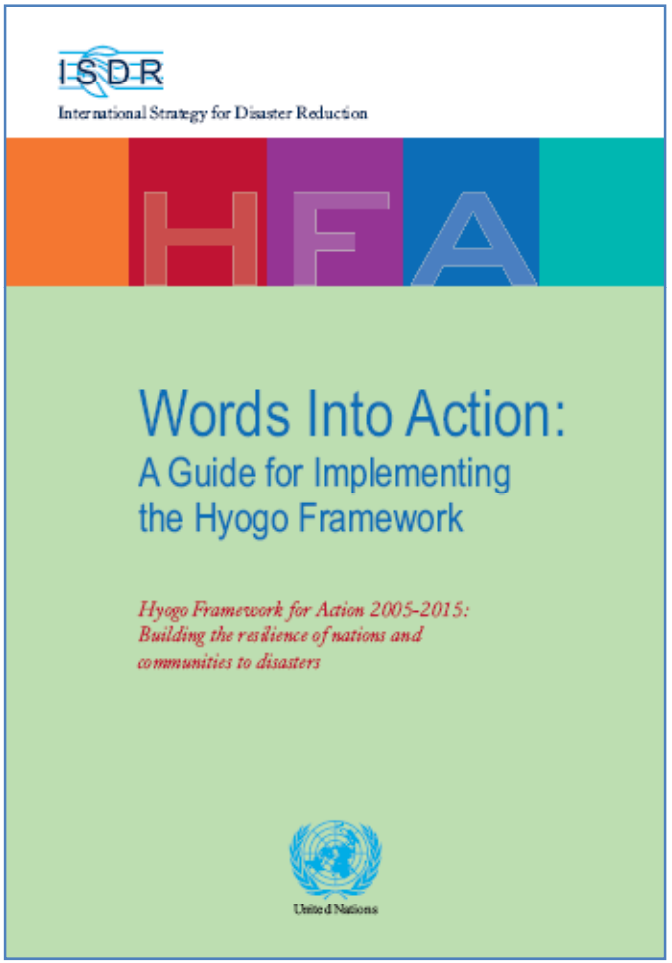
- A strategic approach to reducing vulnerabilities and risks to hazards
- Core reference document for activity in the field of DRR
- Almost 170 governments agreed on five priorities for action in order to reduce disaster risk between 2005 and 2015



HFA cont… 5 priorities

Implementation of HFA

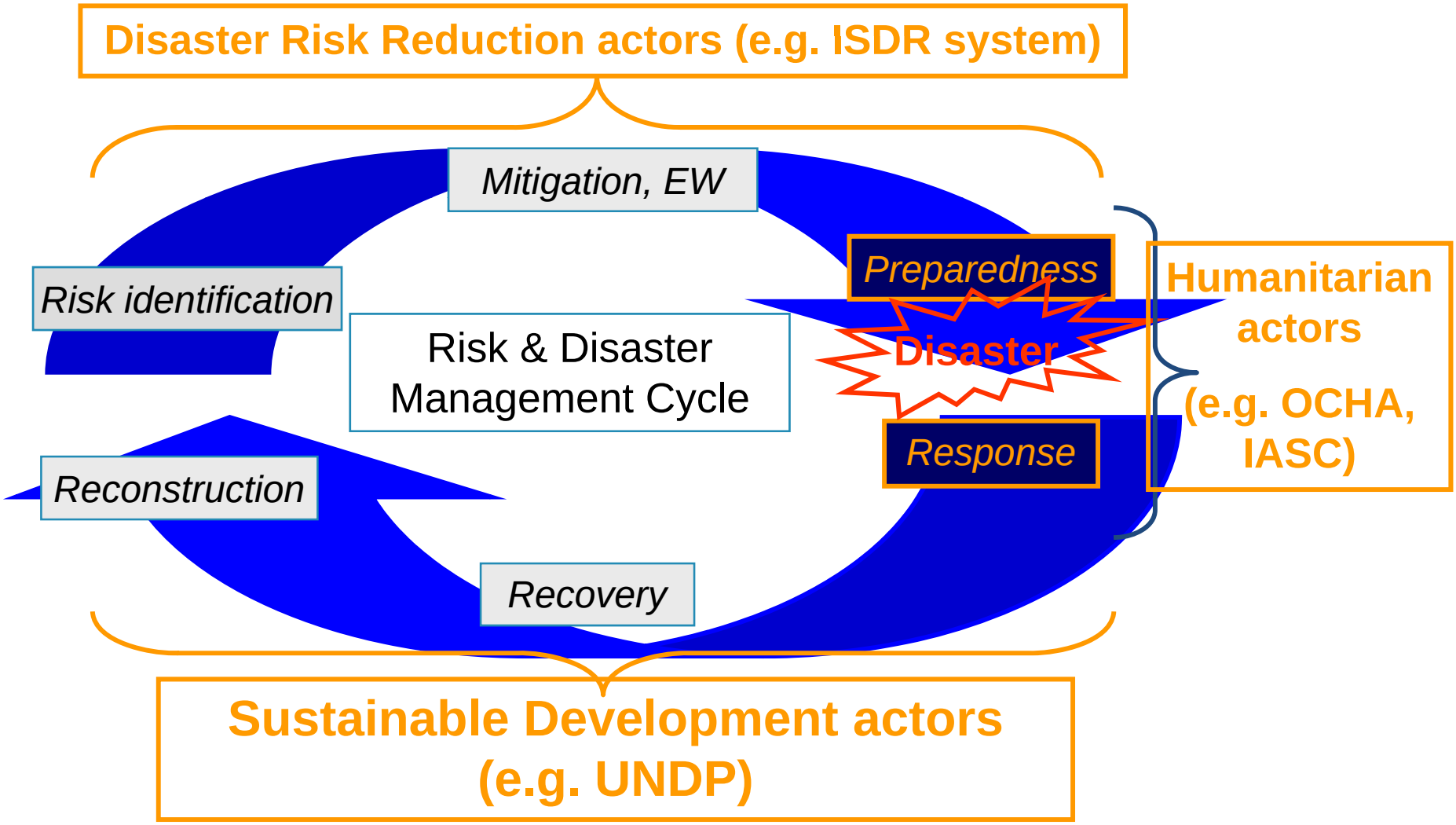
- HFA implementation is discussed in many countries, institutions and forums
  - Upcoming event: 3rd Asian ministerial conference on DRR
- 45 countries have already launched National Platforms for Disaster Risk Reduction. Several other countries are in a process of establishing them.



Evolution of DRR thinking

FROM	TO
Relief & response focus	Disaster preparedness focus
Single hazard approach	Multi-hazard approach
Hazard management	Risk management
Technical issue	Governance issue
Human security	Human development
Centralized, top-down approach	Multi-stakeholders, community based DRR
Single sector	Multi-sectoral national coordinating mechanisms

Holistic approach: combine efforts to reduce disaster impacts (source: ISDR)



Relief/response

The provision of assistance or intervention during or immediately after a disaster to meet the *life preservation and basic subsistence needs* of those people affected.

Recovery: rehabilitation, reconstruction

Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk.

Recovery: rehabilitation, reconstruction

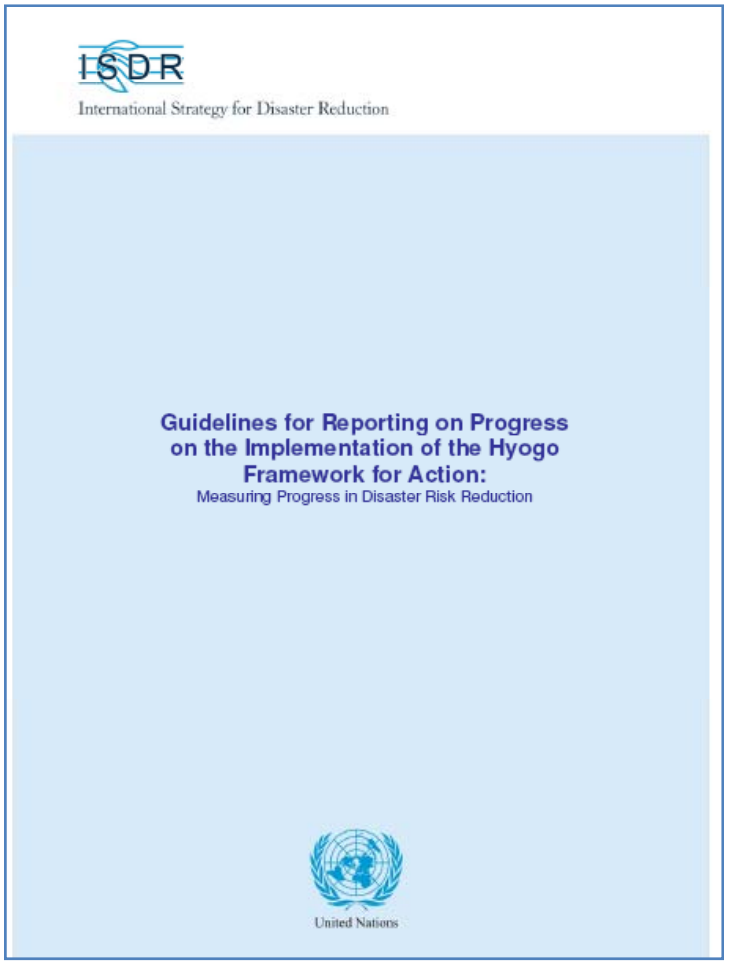
- A window of opportunity to develop and apply DRR measures
- Automatically restoring pre-disaster livelihoods will not always be adequate. E.g., fishing livelihoods after Tsunami in Sri Lanka (source: Provention Consortium)
- Recovery is not neutral: they can increase, reinforce, or reduce existing inequalities

Mitigation

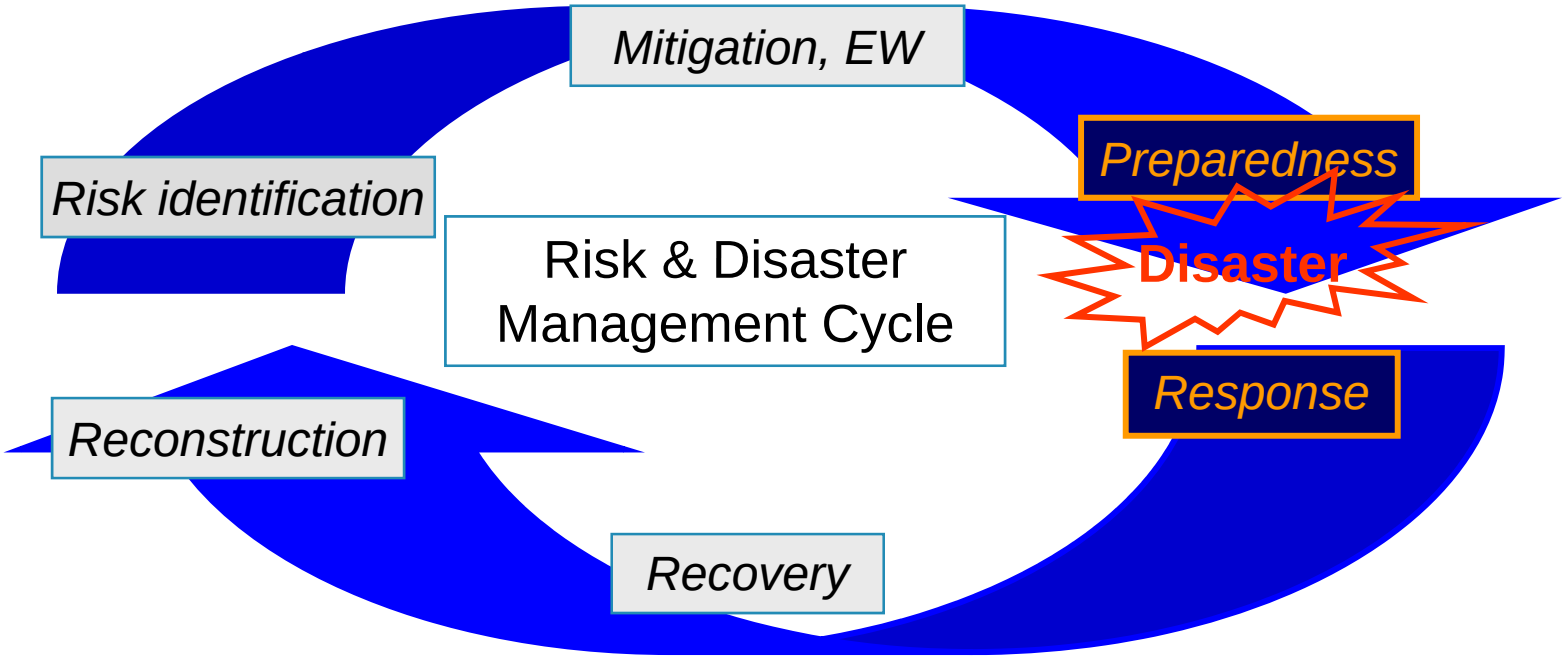
- Structural and non-structural measures undertaken to limit the adverse impact of natural hazards
- Addressing the cause of earthquake vulnerability (source: Chakrabarti):
  1. Earthquake resistant construction of new structure
  2. Retrofitting of public buildings
  3. Awareness and sensitization
  4. Capacity development/training
  5. Regulation and enforcement (E.g., planning restrictions in high risk zones) …but people commonly return to forbidden zones…

Preparedness

- Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.
- E.g., training, practice drills, evacuation plans, “ready to go” kit,



Risk and Disaster Management Cycle (source: ISDR)



Disaster Management

The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters.

Disaster Risk Reduction

The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development.

- *Risk awareness and assessment*
- *Knowledge development*
- *Public commitment and institutional frameworks*
- *Application of measures, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments*
- *Early warning systems*

Some concluding points

- Increased international and regional preoccupation in DRR
- In EQ management, we have the knowledge and technology, and in many cases the policies and laws BUT dissemination and application and implementation and enforcement are lacking
- More data and new technologies alone cannot contribute to improve DRR: need to understand local context and needs