Flood disasters – A global perspective

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1. Introduction: Recent water-related disasters

Water is responsible for most natural disaster losses in the world.

2013 in particular was a year with some exceptional floods.

Examples: Typhoon Haiyan/Philippines, central Europe, Uttarakhand/India, Colorado/USA, Canada, Mexico, Indonesia, Australia, southern Africa, China, Russia, Sardinia/Italy, ...

2014: Balkan countries, Kashmir, Pakistan

Landslides in Afghanistan, India, Nepal

Ongoing drought in California

1. Introduction: Recent water-related disasters

Table 1: Water-related disasters in the period 2000–2014 in which material losses of US$ 8bn and more (original values) occurred.

Source: Munich Re NatCatSERVICE 2014

Year	Country/region	Event/basin(s)/area	Overall losses due to water (US$ bn)	Insured losses due to water (US$ bn)	% insured (-)
2005	USA	Hurricane Katrina/Gulf Coast	83	41.5	50
2011	Japan	Tsunami	55	9	16
2012	USA, CDN, Caribbean	Hurricane Sandy/Northeast	46	19.7	43
2011	Thailand	Chao Phraya	43	16	37
2012	USA	Drought	20	12	60
2002	Central, South. Europe	Elbe, Danube, Italy	16.5	3.4	21
2013	Central Europe	Danube, Elbe	12.6	3.1	25
2011	USA	Hurricane Irene/Northeast	5	3	55
2013	Philippines	Typhoon Haiyan	5	0.35	7
2002	USA	Drought	10	2	20
2004	Indian Ocean	Tsunami	10	1	10
2008	USA	Midwest; Missouri	10	0.5	5
2010	Pakistan	Indus	9.5	0.1	1
2000	Italy, Switzerland	Southern Alps	8.5	0.48	6
2010	China	East, Southeast, South	8	0.15	2
2012	China	East, Northeast, Southeast	8	0.18	2

1. Introduction: Recent water-related disasters

Table 2: Flood disasters in the period 2000–2014 in which more than 1,500 people died.

Source: Munich Re NatCatSERVICE 2014

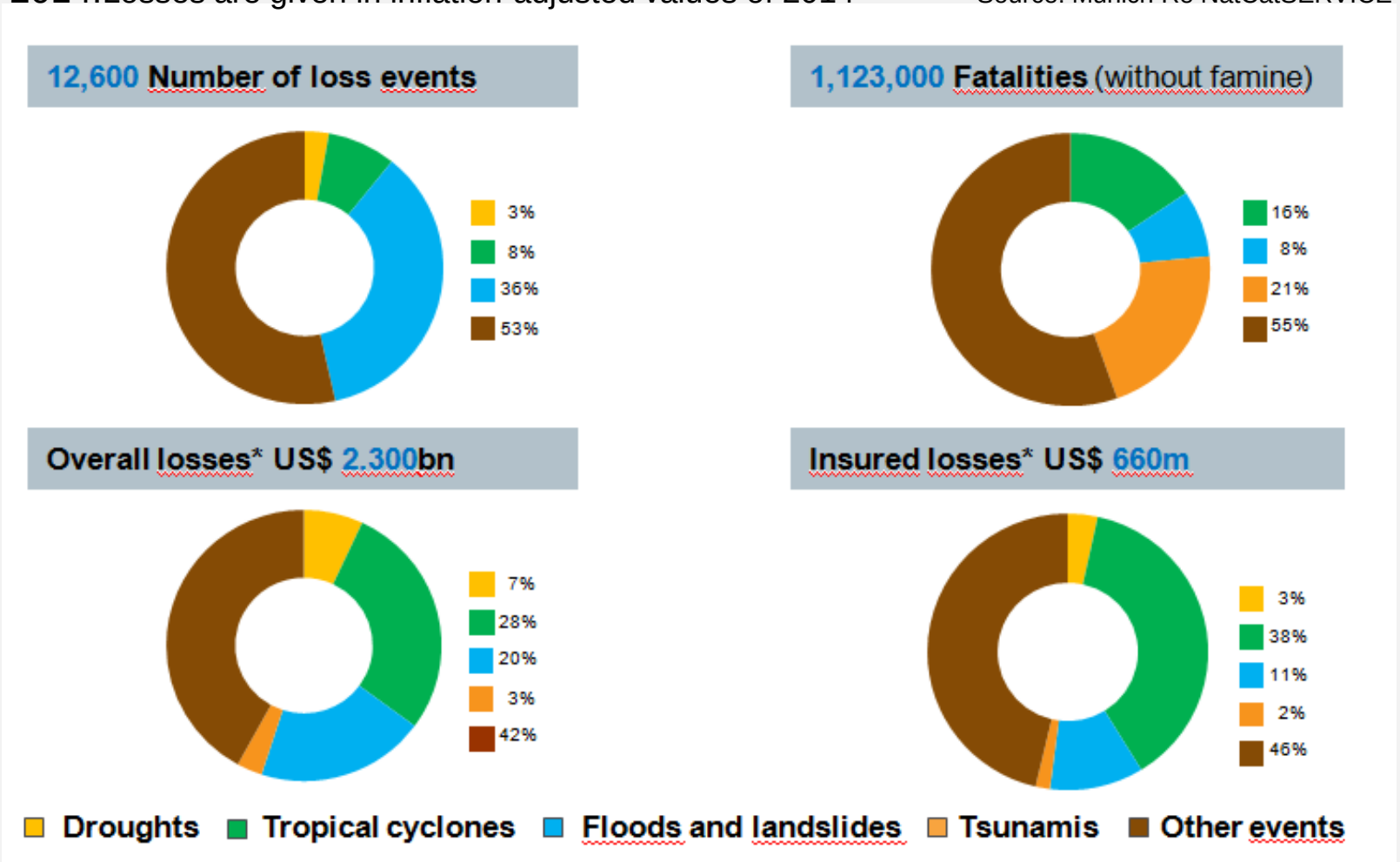
Year	Region	Event	Deaths*
2004	Indian Ocean (12 countries)	Tsunami	220,000
2008	Myanmar	Cyclone Nargis	140,000
2011	Japan	Tsunami	15,880
2013	Philippines	Typhoon Haiyan	6,334
2013	India	Flash floods	5,500
2007	Bangladesh	Cyclone Sidr	3,295
2004	India, Bangladesh, Nepal	Floods	2,200
2007	Bangladesh, India, Nepal	Floods	2,030
2004	Haiti, Dominican Republic	Floods	2,000
2004	Caribbean, USA	Hurricane Jeanne, floods	2,000
2010	Pakistan	Floods	1,760

*
- death figures include all causes (such as earthquake, windstorm, landslides, etc.) not only flood;
- those missing are not included

1. Introduction: Recent water-related disasters

Figure 1: Percentage distributions of number of events, fatalities, overall loses and insured losses for water-related loss events and other types of natural disasters. Period 2000–2014. Losses are given in inflation-adjusted values of 2014

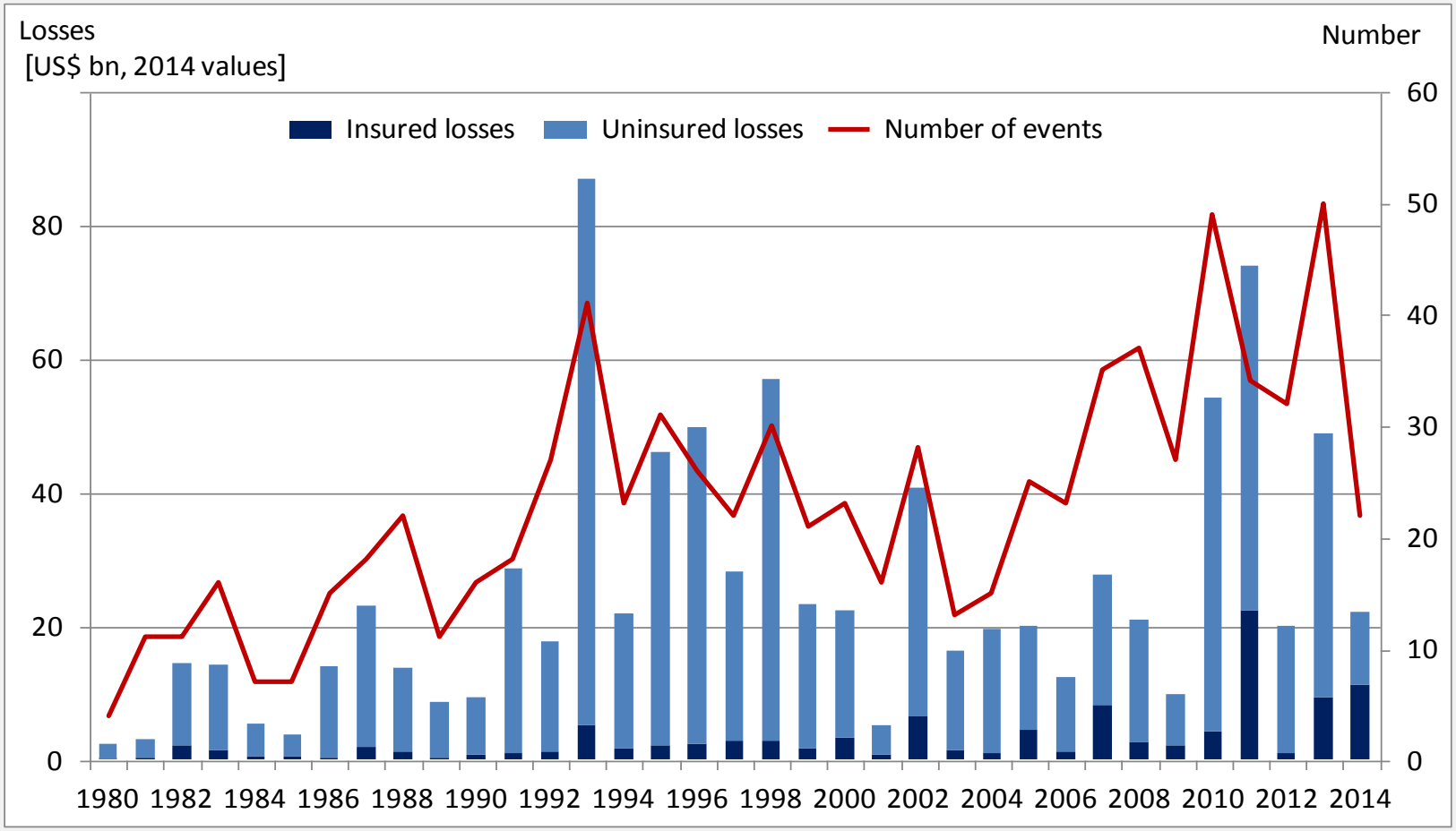
Source: Munich Re NatCatSERVICE 2014



1. Introduction: Recent water-related disasters

Figure 2: Overall and insured annual inland flood losses (bars) and number of flood events per year (line) from 1980 to 2014, derived from all **events with losses exceeding US$ 50m** (inflation-adjusted in 2013 values). Only floods that are not associated with named tropical cyclones are included in the analysis.

Source: Munich Re NatCatSERVICE 2014



2. Types of water-related disasters

- River flood
- Flash flood
- Storm surge
- Tsunami
- Mass movement
- Drought

3. Reasons for increasing losses

- People (global population increase)
- Land use (settling on river plains, coasts, hillsides)
- Risk awareness (*(false)* feeling of safety if protected by a dyke)
- Complexity (modern lifeline and infrastructure systems)
- Wealth (practically everywhere in the world people own more items)
- Susceptibility (electronic components of items)
- Urban concentration (megacities)
- Environmental changes (development areas, land degradation, etc.)
- Climate change (more extreme events)

4. From hazard to risk

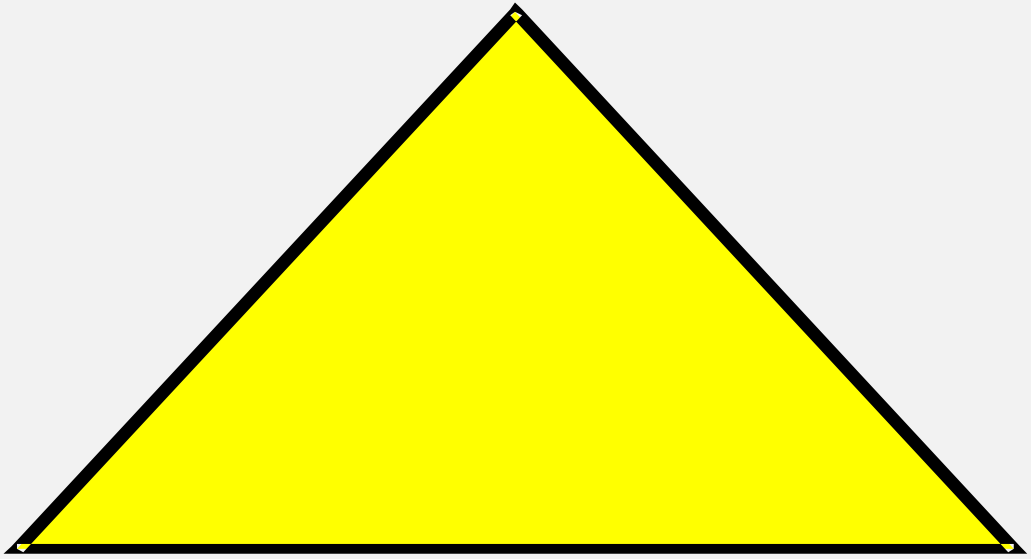
- Phenomenon/hazard vs. Risk
- Event vs. Disaster

<u>Definition of risk:</u>

Risk = Hazard x Values at risk x Vulnerability

= Hazard x Consequences

Public authorities
(state, community, NGOs)



People concerned
(private persons, companies)

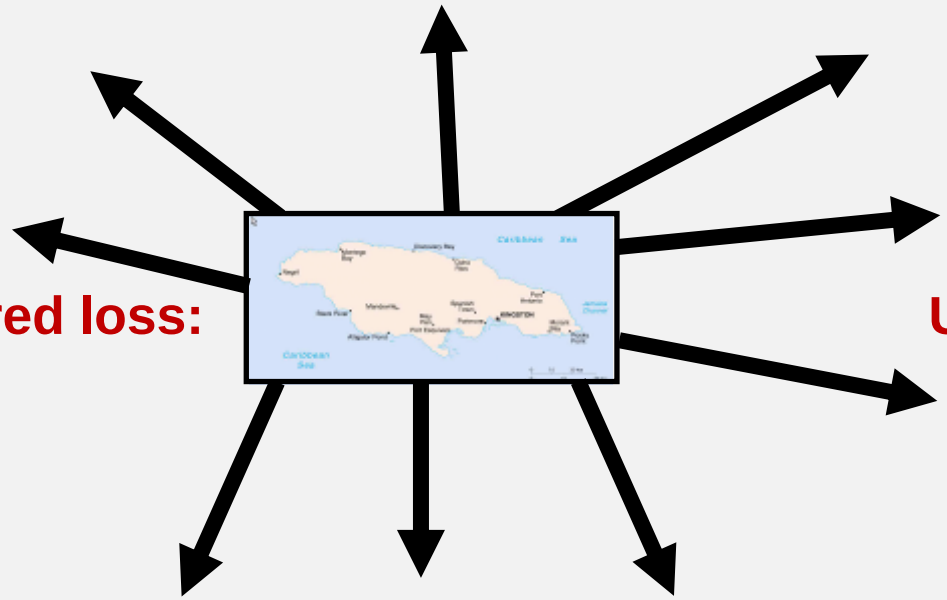
Finance industry
(insurance and capital market)

6. Flood insurance

- General benefits
- Hazard zoning and premiums
- Aspects of premium calculation (pricing)

- Worldwide spread of the risk
- Examples of reinsurance shares (Typhoon Haiyan/Philippines; Flood/Thailand; Hurricane Gilbert/Jamaica)

Hurricane Gilbert (Jamaica 1988): economic loss: US$ 2,000m
insured loss: US$ 700m



reinsured loss: **US$ 690m (99 %)**

7. The role of reinsurance

- Worldwide spread of the risk
- Examples of reinsurance shares (Typhoon Haiyan/Philippines; Flood/Thailand; Hurricane Gilbert/Jamaica)
- Loss modeling
- Disaster loss databases (MRNatCatSERVICE)
- Expertise in natural hazards
- Source for information

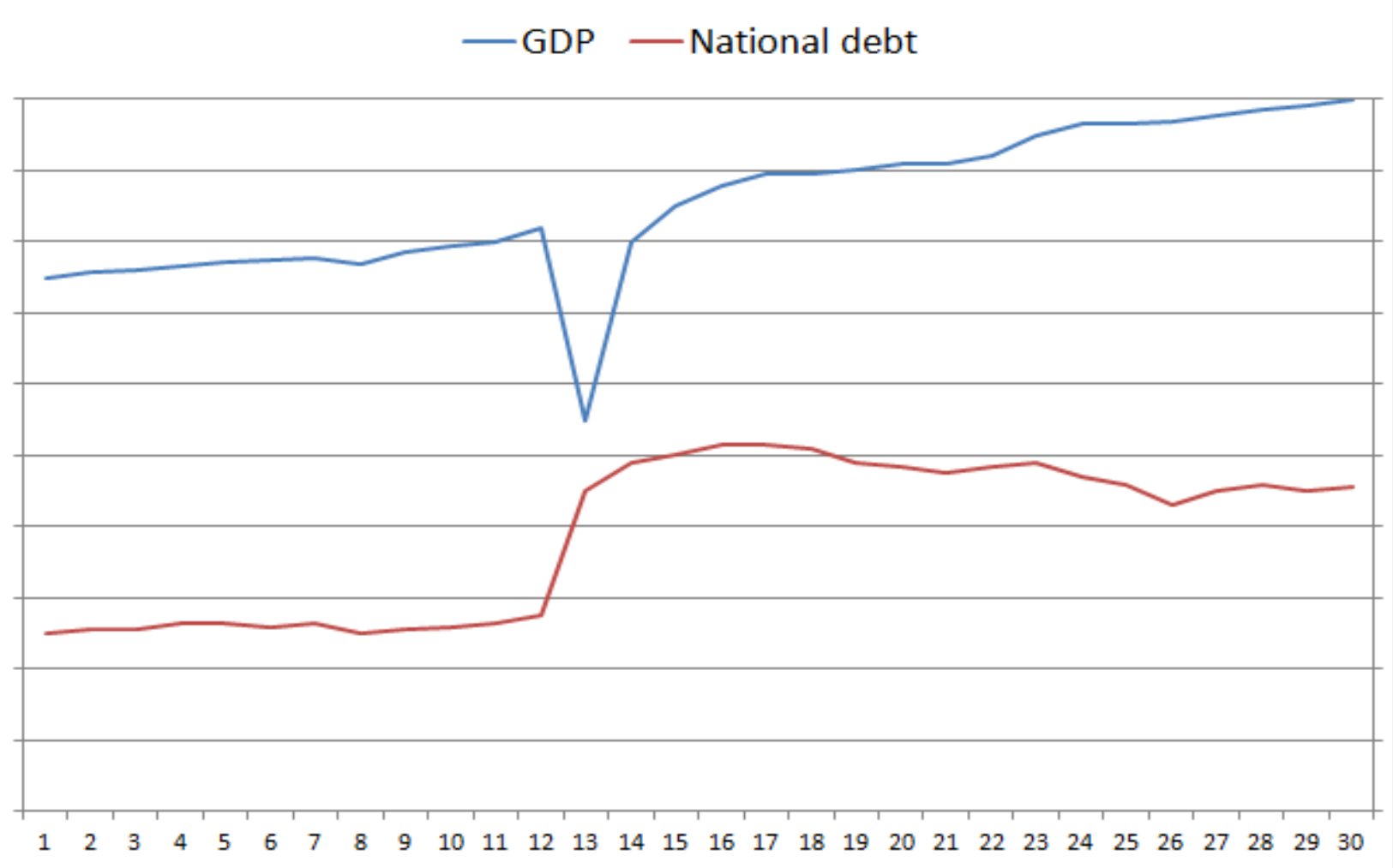
8. Economic consequences of natural disasters

- Impacts from water disasters are more devastating in less developed parts of the world than to rich societies.
- Natural disasters can have a positive effect on an economy (via reconstruction).
- But the indirect positive effects on GDP can usually not offset the losses.
- National debt and "destroyed capital" must be considered in the context of disaster impact on a country (not only the direct losses)
- Countries with higher insurance cover will be better able to withstand natural disasters.

- **RESILIENCE** (= the “bouncing back” to normal)

8. Economic consequences of natural disasters

Figure 3: Typical example of the impact of a natural disaster on GDP and national debt of a low-resilience country tropical cyclones are included in the analysis.



9. What can and should be done?

- Examples of successful prevention/protection/preparedness measures
  - *Flood shelters in Bangladesh*
  - *Protection of Hamburg/Germany against storm surges*
  - *Dutch Delta Programme*
  - *Mississippi River and Tributary Project (MR&T)*
  - *Flood protection strategy after 1998 floods in China*

- Increase awareness
- Enable people/enterprises to take financial precautions

10. Insuring the poor

- Microinsurance schemes
- MI has huge development potential, but still very few schemes set up
- Example: MCII (Caribbean: “Livelihood Protection Policy”)

11. The role of the global financial markets

- Huge amounts of money available in the international financial markets
- Cat Bonds
  - *. high-interest, but also high-risk investments*
  - *. geared to very large potential losses*
  - *. exclusively used in developed countries*

12. Conclusions

- The rising number of severe weather-related natural disasters will cause higher loss burdens for economies in the future.
- Trends of disaster losses can only be lessened by a package of integrated counter-measures:
  - *strict land-use regulations*
  - *warning systems*
  - *education and information*
  - *(financial) motivation*
  - *insurance*
- For no other peril are protection measures as effective with respect to risk and loss reduction as for floods.
- Stakeholders must have a long-term perspective, not plan on a day-to-day basis.

12. Conclusions: Messages

Great natural events are not avoidable. Great disasters are.

Disasters are inevitably the net result of the effects of extreme natural events and the response to those events.

Effective safeguards are both achievable and indispensable, but they will never provide complete protection.

The determining factor is awareness that nature can always come up with events against which no human means can prevail.

If we are willing to tackle the risk from frequent events in a joint effort involving governments and the people, and if we are sufficiently prepared for the residual risk from rare events by involving the finance industry, we are headed for a world that becomes a safer place to live in.

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Thank you for your attention