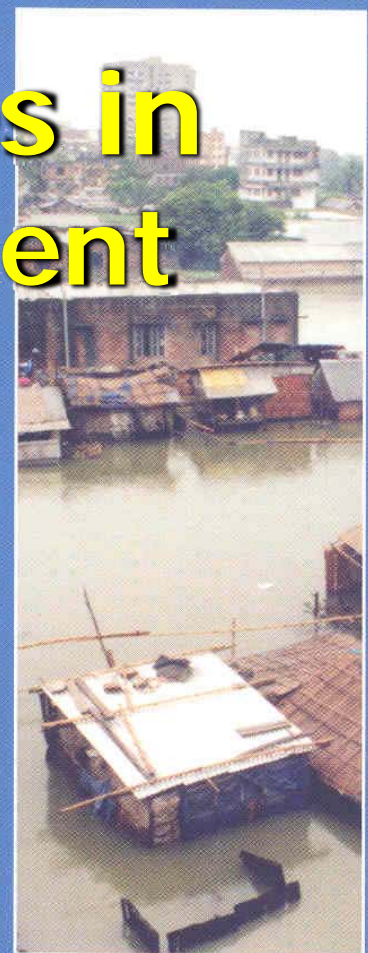
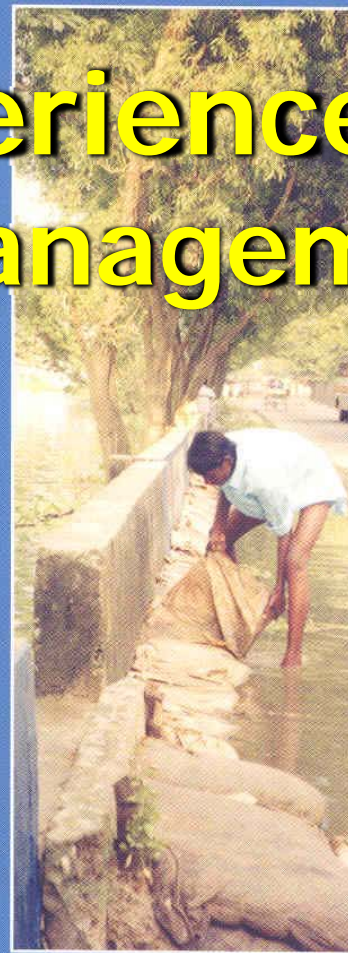


ADB's Experiences in Disaster Management



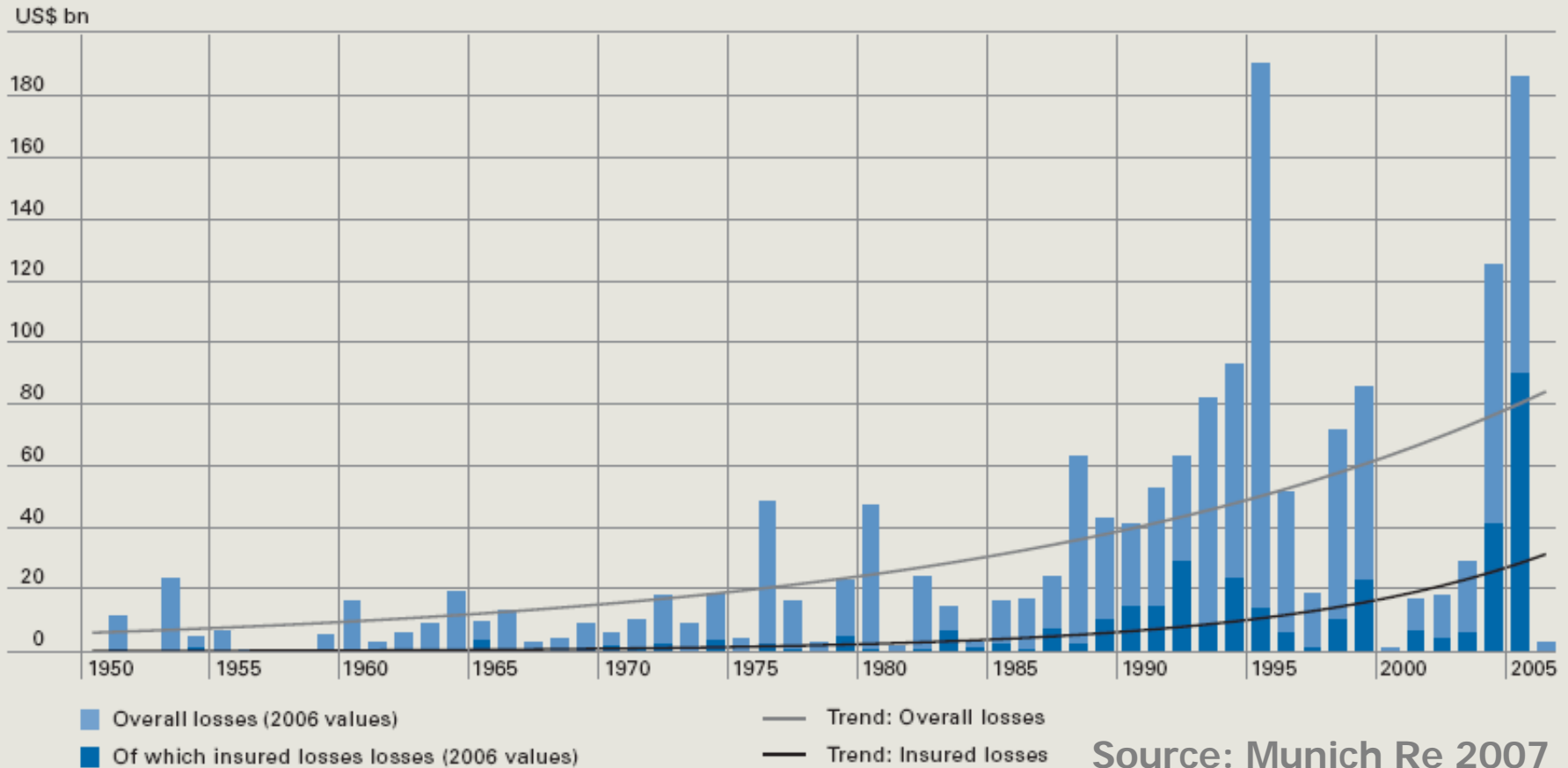
Neil Britton
Senior Disaster Risk Management Specialist
Asian Development Bank
25 November 2007

ADB

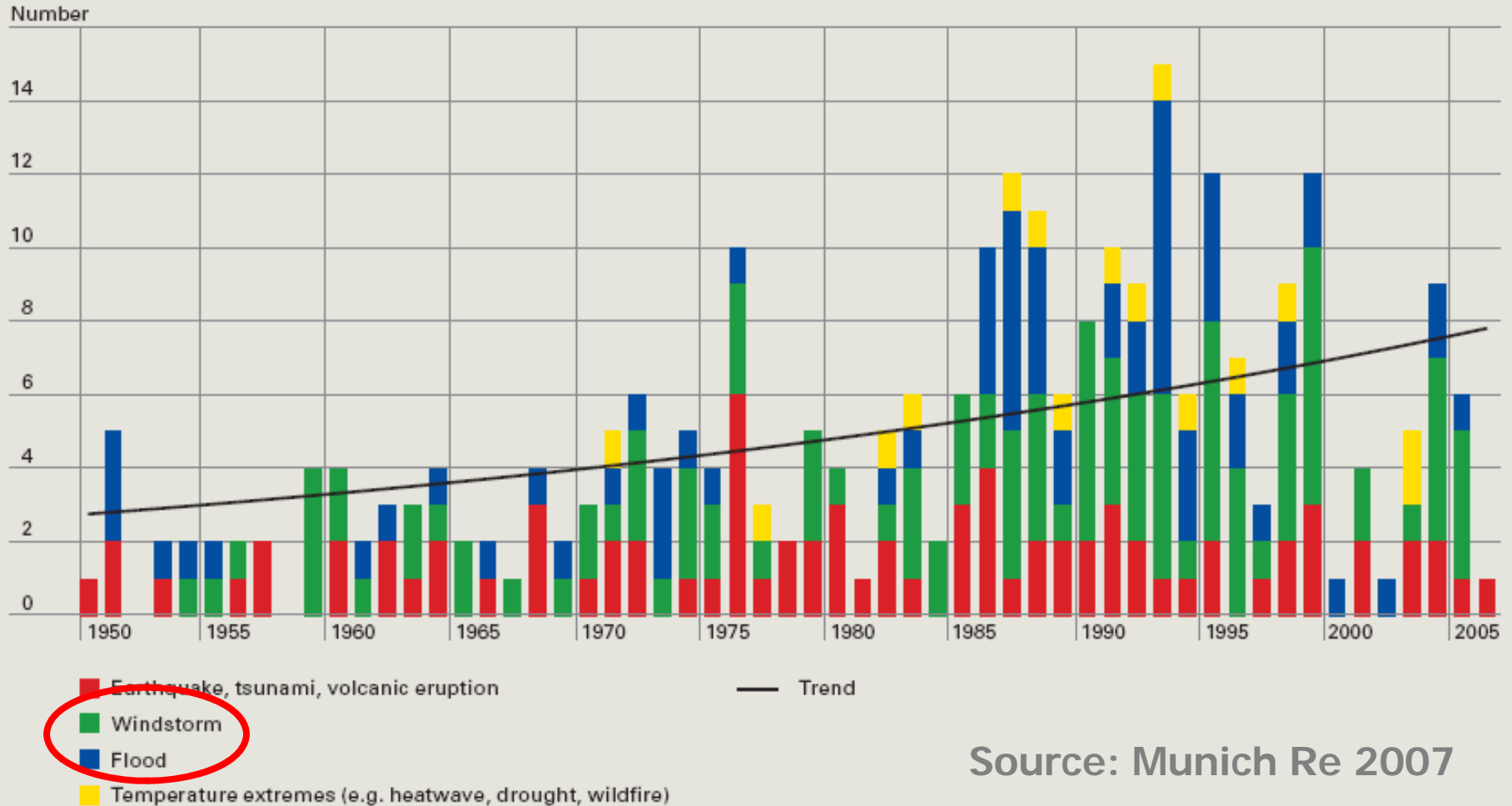
Presentation Format

- ❖ Asia's changing hazardscape and vulnerability
- ❖ Flooding in Asia
- ❖ ADB's Disaster Risk Management policy
- ❖ General lessons and challenges
- ❖ ADB's approach to flood management
- ❖ Lessons from ADB projects
- ❖ Moving forward

Disaster losses have been increasing

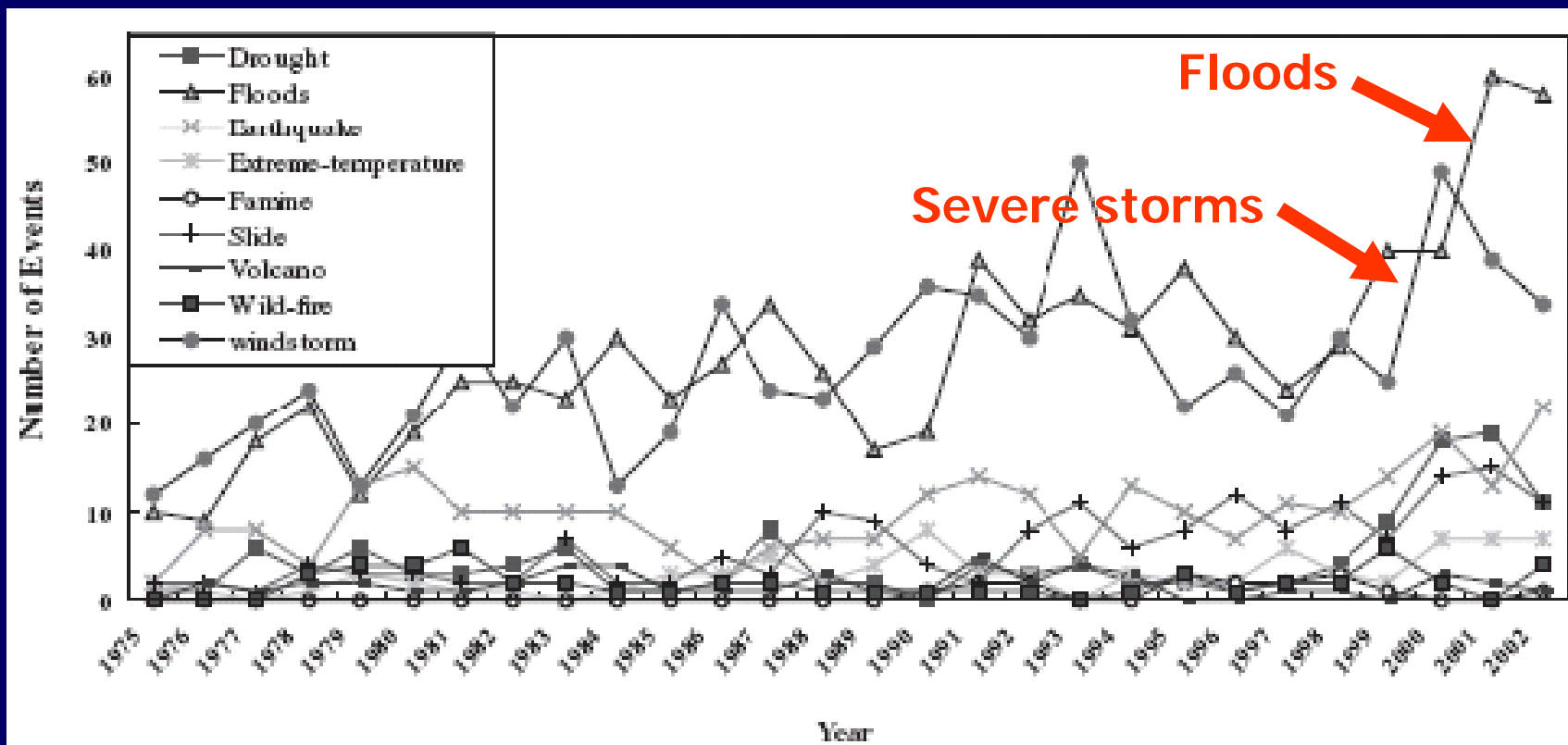


Flood and Wind Disasters Have Been Increasing Most



Source: Munich Re 2007

Trend in Number of Disasters in Asia



Source : ICUS/INCEDE April/June Newsletter (2003)

Weather Trends – IPCC 2007

Weather Trends in 20th Century and Likelihood of Trends in Future (IPCC 2007a)

Phenomenon ^a and direction of trend	Likelihood that trend occurred in late 20th century (typically post 1960)	Likelihood of a human contribution to observed trend ^b	Likelihood of future trends based on projections for 21st century using SRES scenarios
Warmer and fewer cold days and nights over most land areas	<i>Very likely</i> ^c	<i>Likely</i> ^d	<i>Virtually certain</i> ^d
Warmer and more frequent hot days and nights over most land areas	<i>Very likely</i> ^e	<i>Likely (nights)</i> ^d	<i>Virtually certain</i> ^d
Warm spells / heat waves. Frequency increases over most land areas	<i>Likely</i>	<i>More likely than not</i> ^f	<i>Very likely</i>
Heavy precipitation events. Frequency (or proportion of total rainfall from heavy falls) increases over most areas	<i>Likely</i>	<i>More likely than not</i> ^f	<i>Very likely</i>
Area affected by droughts increases	<i>Likely</i> in many regions since 1970s	<i>More likely than not</i>	<i>Likely</i>
Intense tropical cyclone activity increases	<i>Likely</i> in some regions since 1970	<i>More likely than not</i> ^f	<i>Likely</i>
Increased incidence of extreme high sea level (excludes tsunamis) ^g	<i>Likely</i>	<i>More likely than not</i> ^{f, h}	<i>Likely</i> ⁱ

IPCC

Virtually certain

Very likely

Likely

More likely than not

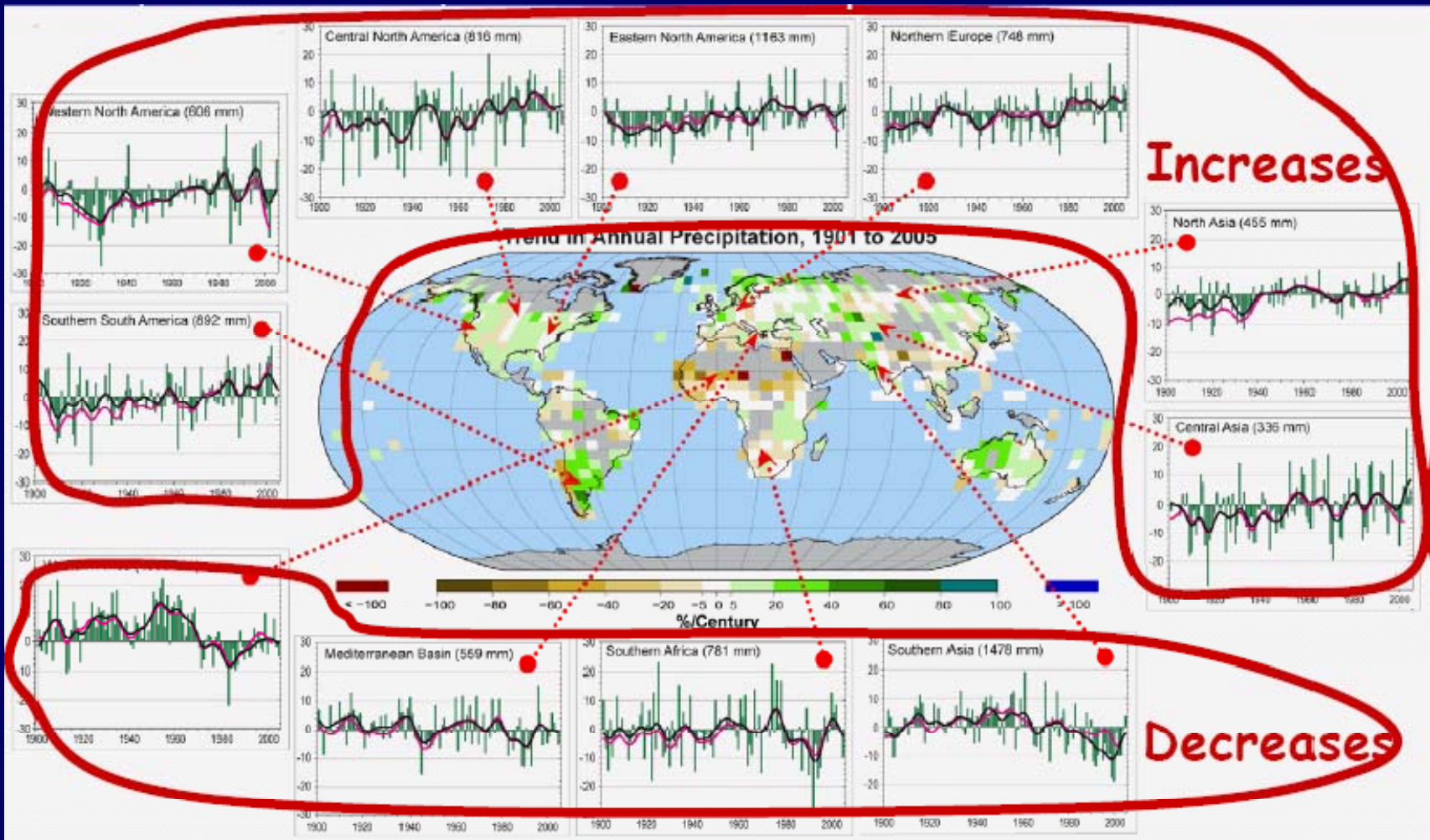
> 99% likelihood of occurrence

> 90% likelihood of occurrence

> 66% likelihood of occurrence

> 50% likelihood of occurrence

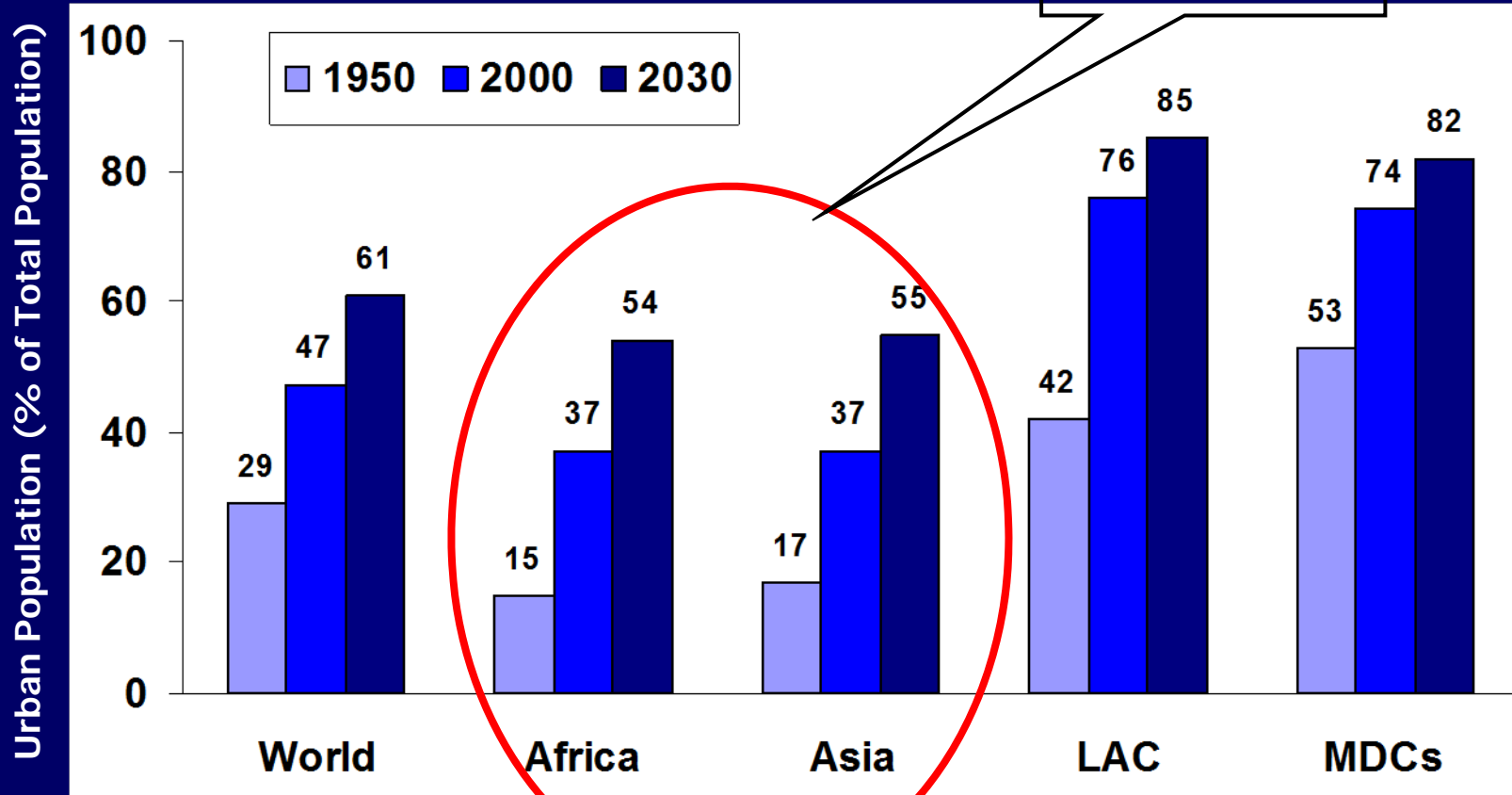
Changes in Precipitation (IPCC 2007)



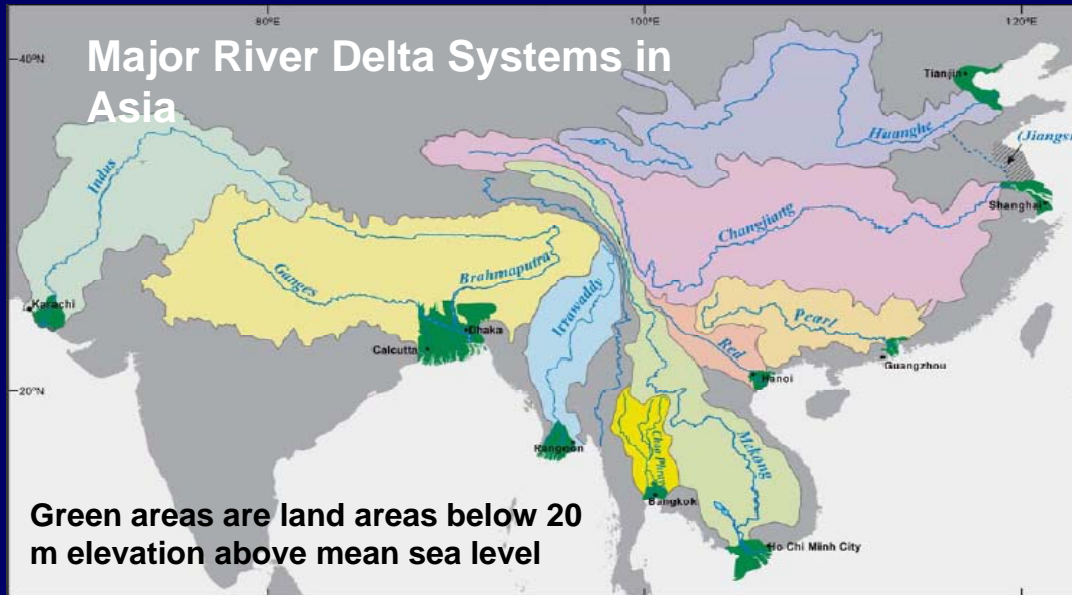
Precipitation has increased in eastern parts of North and South America, northern Europe and northern and central Asia – and decreased in the Sahel, Mediterranean, southern Africa and parts of southern Asia.

Urban Population (%) by Region

Asia and Africa are lagging in urbanisation

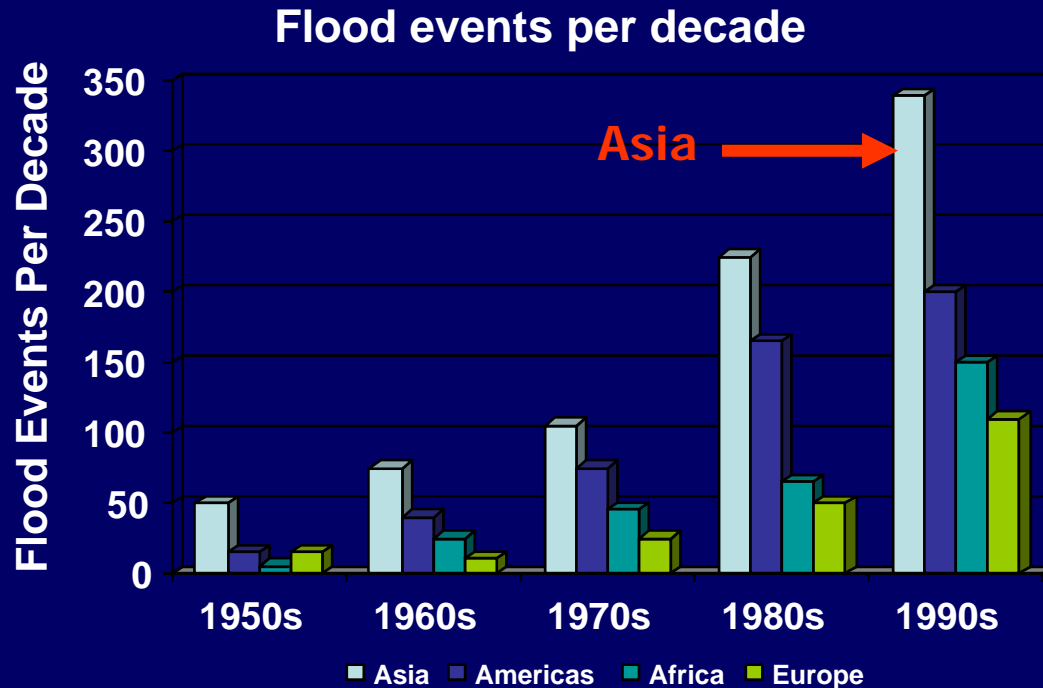


Major Asian Cities Located in Low-Lying Deltas



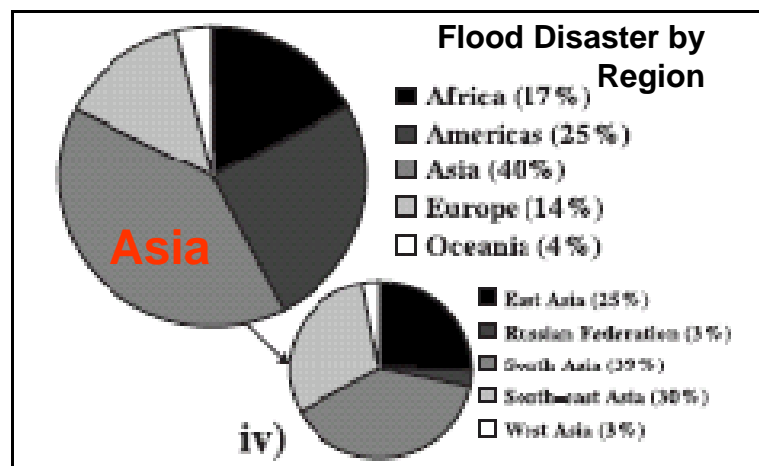
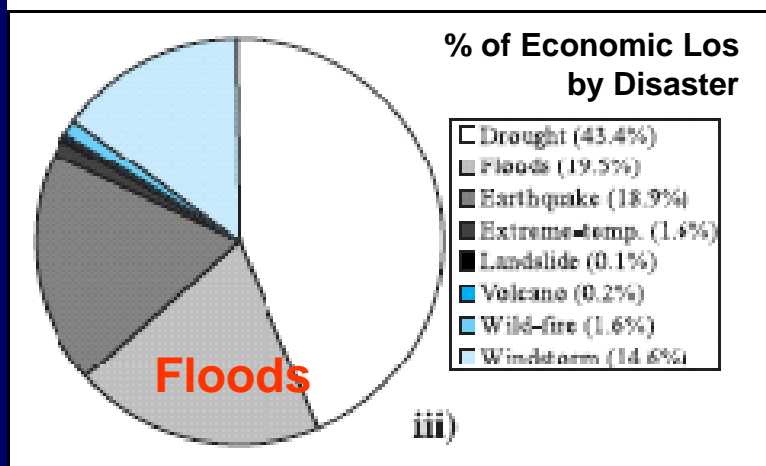
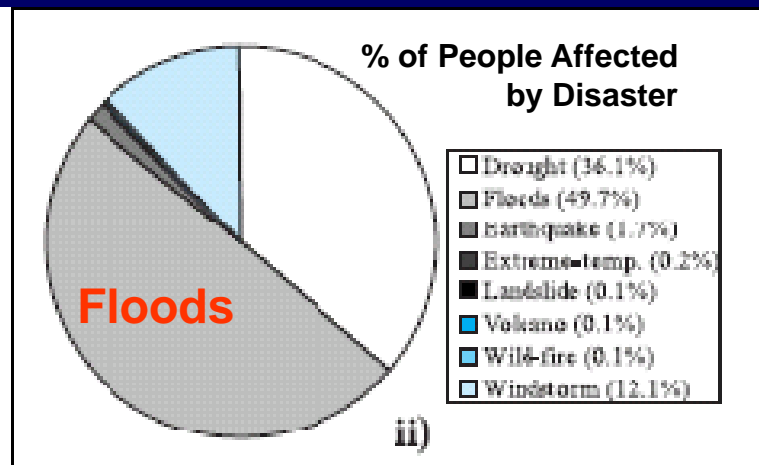
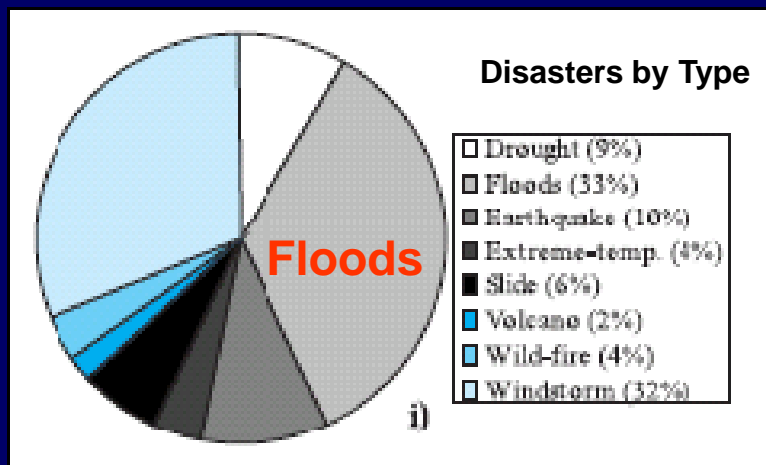
High susceptibility to any flood regime change from land and/or ocean

Flood Disasters By Decade by Continent



Source : ICUS/INCEDE April/June Newsletter (2003)

Flood Disaster – Global Perspective



Source : ICUS/INCEDE April/June Newsletter (2003)

Disaster, defined as per CRED definition, if one or more criteria met

- 10 or more people killed
- 100 or more people affected
- a declaration of state of emergency
- a call for foreign assistance

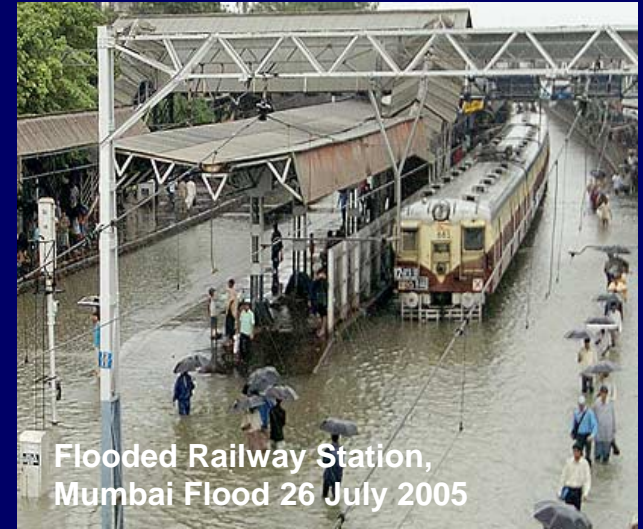
Common Causes of Flooding

❖ Inland Flooding

- Riverine Flooding
- Flash Flooding
- Other Causes – Levee failure, Dam failure,....

❖ Coastal Flooding

- Storm Surge from Tropical Cyclones , Extratropical Cyclones
- Flooding from Tropical Cyclone Precipitation
- Flooding from Tidal Action and Relative Sea Level Rise
- Flooding from Tsunamis

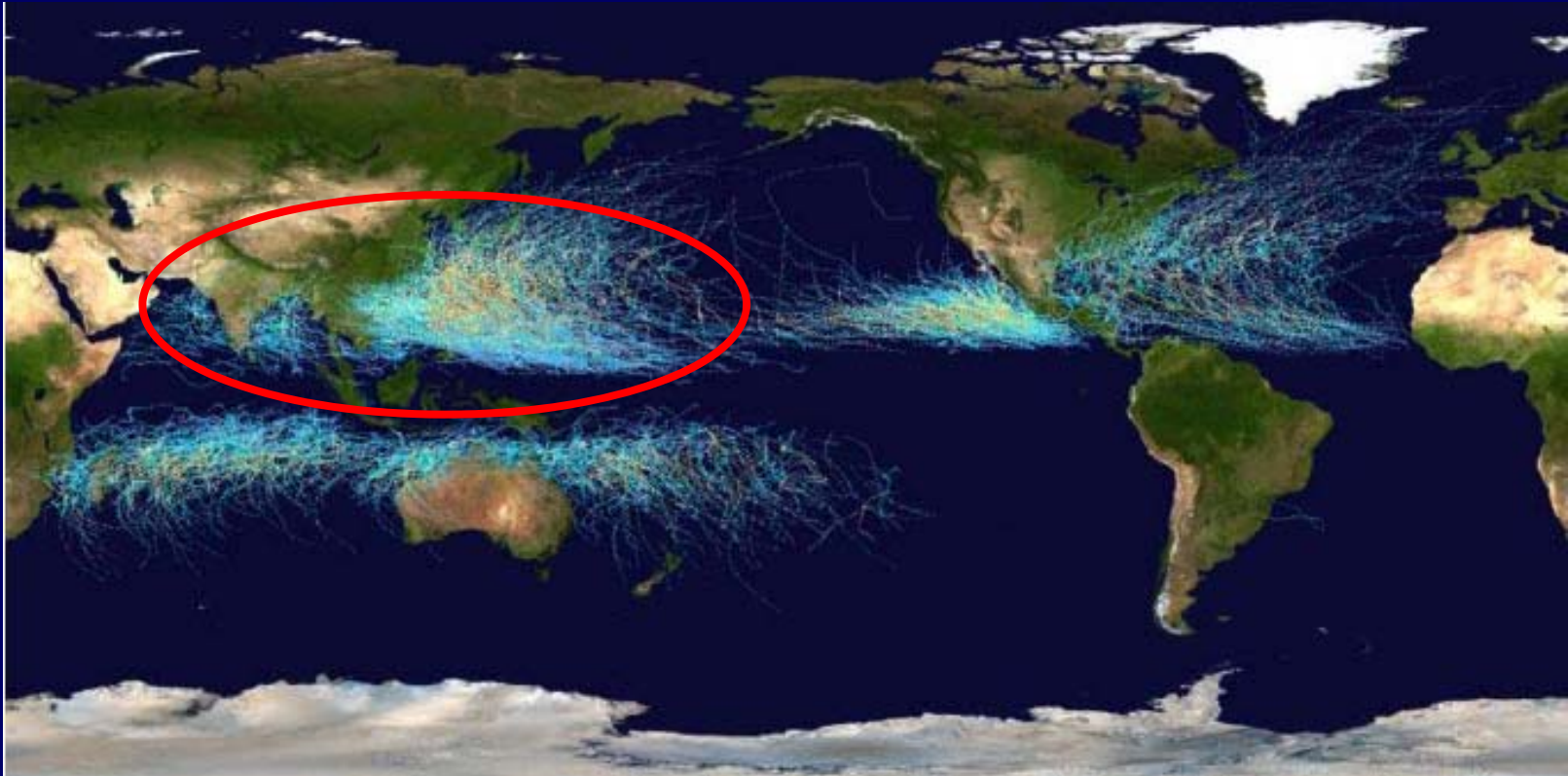


Flooded Railway Station,
Mumbai Flood 26 July 2005



Photo of the Flooded Area in
Matsui Ward
(Kumamoto Daily News, 9/25/99)

Tropical Cyclone Tracks



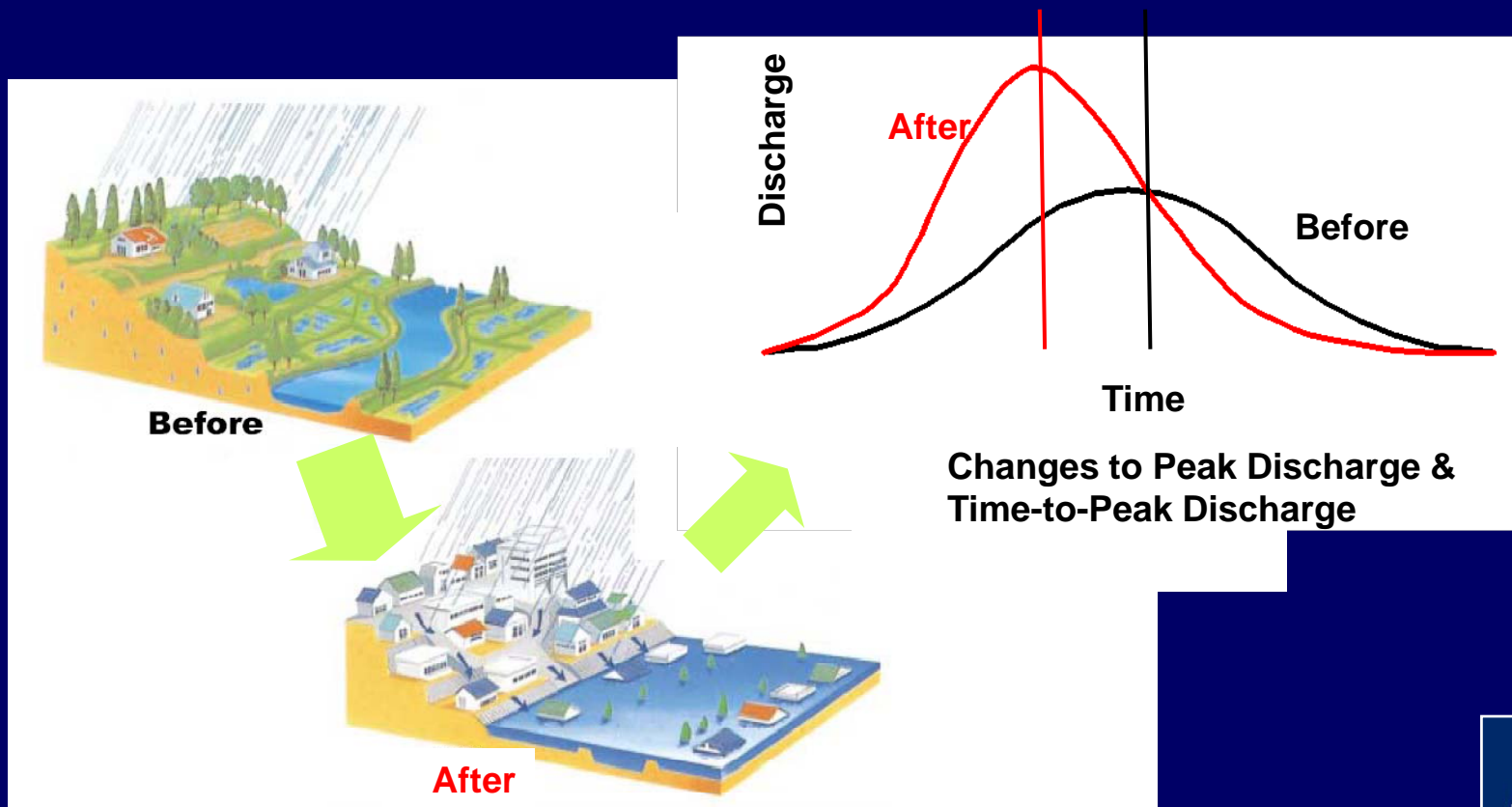
**North West Pacific Basin and North Indian Basin -
Get ~40% of Global TC Activity**

Human Induced Drivers of Flood Risk

❖ Changes in Land Use, Land Cover in Urban Areas

➤ Urbanization Leads to Ground Surfaces Being Covered with Pavement

- Increases surface runoff which could lead to increased flash floods in urban settings



Human Induced Drivers of Flood Risk

❖ Poor Governance → Weak Planning

- Made even more difficult by rapid pace of urbanisation and lack of awareness of hazard in population and governing institutions
- Infrastructure incapable of handling demands as growth of urbanisation exceeding by far growth of infrastructure
 - Existing infrastructure not properly maintained

❖ Weak Zoning Laws

- Settlement and/or commercial/industrial utilisation of floodplains, low-lying river banks and low-lying coastal areas
- Not enough consideration of flood taken into account in layout of buildings and streets – flooding of roadways/expressways common

❖ Elimination of natural inundation areas (wetlands, mangroves, floodplains)

- Buffers no longer available

❖ Over-reliance on *ad hoc* hard measures such as river regulation – channel straightening, embankments, etc. – without due consideration of total effects of measures

Flood Risk in Coastal Cities of Asia – Trends

- ❖ Human utilization of coast increased dramatically during second half of 20th century
- ❖ Trend expected to continue through 21st century
- ❖ Number of people and assets exposed to flood risk near coast has increased exponentially
- ❖ Flood risk at coast are subject to additional stresses by land-use and hydrological changes in catchments, including dams that reduce sediment supply to the coast,
- ❖ Climate Change adds another level of stress as sea-level rise that will affect heavily populated low-lying areas of Asia

Flood Management

- ❖ Implies willingness to “live with floods”
- ❖ Means taking measures to avoid floods from becoming disasters
- ❖ Includes:
 - anticipation of worst-case scenarios
 - identification of options for conveying floods in a safe and predictable way

Flood control, on the other hand, is a structural mean to keep a river within its channel. It reflects the idea that floods are bad.

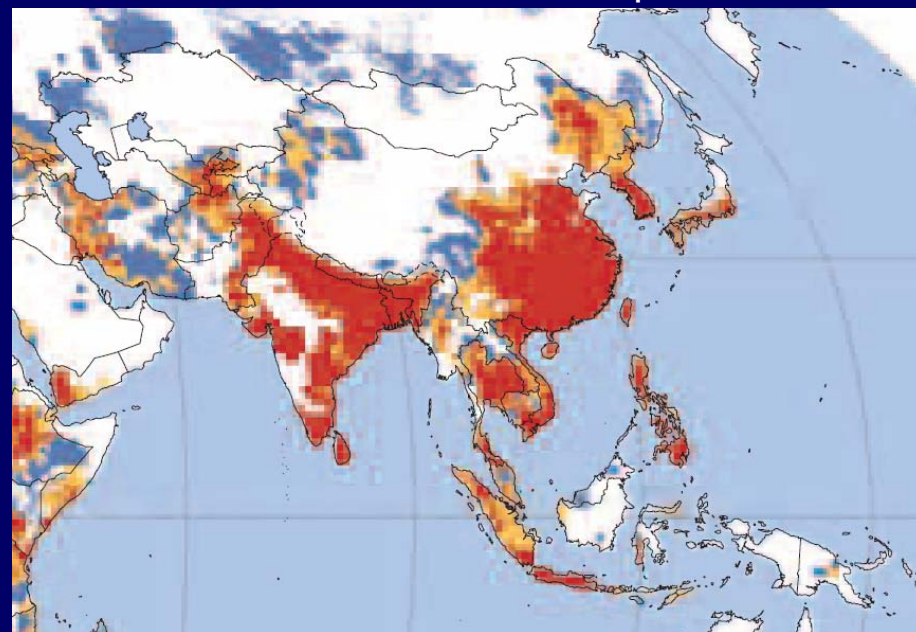


Disaster Risk Management As an ADB Priority

- ❖ ADB was one of the first MDBs to incorporate disaster risk reduction into development planning in Asia.
- ❖ ADB recognizes the major social risk disasters impose on the poor or near-poor^[1] and the risks from disasters destroying the physical and social infrastructure required for economic growth.

- ❖ ^[1] ADB. 2001. *Social Protection Strategic Framework*.

Global Distribution of Disaster (Flood)
Risk Hotspots: (Based on Mortality)
Red=Top three deciles



Source: Dilley, M. et al. 2005.
Hotspots. World Bank.

Selected Disaster Experiences

- ❖ 1982 Tonga (tropical cyclone)
- ❖ 1988 Bangladesh (floods)
- ❖ 2001 India (earthquake)
- ❖ 2004 Indian Ocean Tsunami
- ❖ 2005 Pakistan (earthquake); Viet Nam (typhoons/floods); Cook Islands (cyclone)
- ❖ 2006 Indonesia (earthquake); Philippines (typhoons, landslides); 2007 Solomon Islands (earthquake/tsunami), Pakistan (cyclones/floods), Bangladesh (cyclones/floods)
- ❖ Also:
- ❖ Conflict assistance: Sri Lanka, Nepal, Afghanistan, Timor-Leste
- ❖ Health emergencies (SARS, HIV/AIDS – region-wide)
- ❖ Environment emergencies (1997 smoke haze – Indonesia); climate change adaptation

ADB's Disaster & Emergency Policy: Historical Perspective

Date	Title	Description	Trigger
June 1987 (R74-87)	Rehabilitation Assistance to Small DMCs Affected by Natural Disasters	Simple repair to pre-disaster status. Projects completed within 3 years	South Pacific proposal to establish special facility to assist DMCs affected by tropical cyclones
Feb 1989 (R191-88)	Rehabilitation Assistance After Disasters	R74-87 extended to all DMCs.	IDNDR (1990), BAN floods, NEP e/q, PHIL typhoon, SRI conflicts
May 2004 (R71-04)	Disaster and Emergency Assistance Policy (DEAP)	All DMCs. Strategic intervention. Disaster & post-conflict. 2 or 3 year completion	ADB Long-Term Strategic Framework (2001-15) - poverty reduction focus

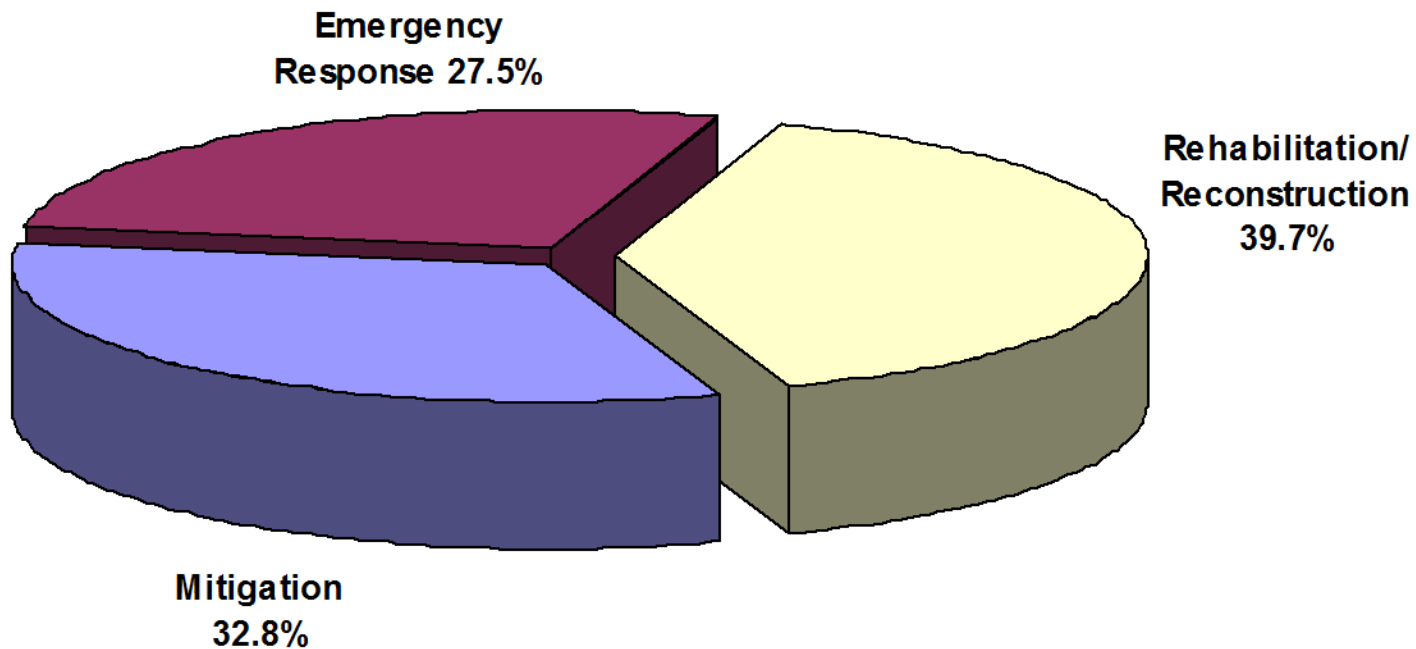
Disaster and Emergency Assistance Policy (2004):

- ❖ Incorporates DRM principles + disaster cycle
- ❖ Includes post-conflict + disaster
- ❖ Brings in Disaster Risk Management (DRM)
- ❖ Maintains DRM is integral to development
- ❖ Seeks to minimize Member Country risk
- ❖ Supports partnerships to maximize synergies
- ❖ Better resource utilization for DRR support
- ❖ Improves ADB internal arrangements

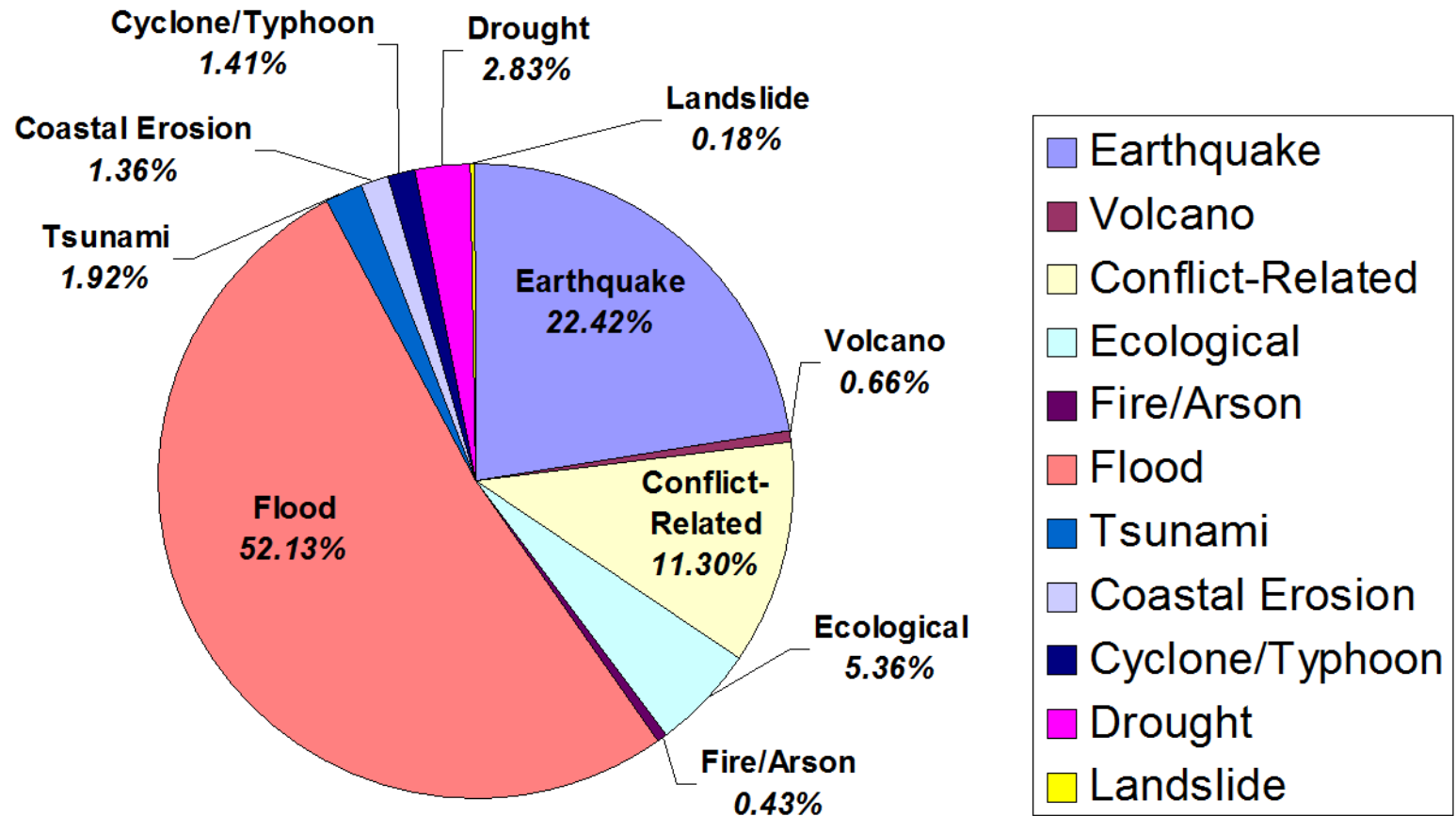
Nature of assistance

- ❖ Emergency assistance after a natural disaster and conflict event
- ❖ Post-disaster rehabilitation projects
- ❖ Disaster mitigation and preparedness projects
- ❖ Development projects with mitigation features (e.g., flood protection schemes)

ADB Assistance by DRM Area (June 1987–August 2007)



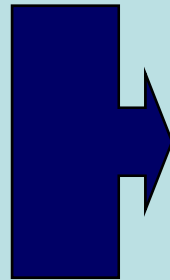
Disaster-Related Loans (June 1987-August 2007)



Two Important General Lessons from ADB's Disaster Experiences

1. Disaster Risk Reduction strategies have to be comprehensive
 2. Clear linkages between international agreements, national strategies, local actions, and partner support
- = Capacity development at organizational and institutional levels is essential!**

- Communication
- Cooperation
- Coordination



Horizontal
and vertical
integration

Other General Lessons

- ❖ Community consultations are valuable, especially for livelihood/community infrastructure projects
- ❖ Incorporate into project design capacity building for local government & community
- ❖ Don't establish *ad hoc* systems – give lead function to existing agencies
- ❖ Establish a steering committee with all key players
- ❖ Keep all coordinating groups to a manageable level
- ❖ Initiate joint Damage and Needs Assessments under government leadership

Challenges from past experiences

- ❖ Disaster assistance is development not relief
- ❖ Equity issues need to be worked out
- ❖ Conflict-affected countries open up additional issues

Key Lessons from Flood Projects

- ❖ Floods can be most effectively addressed through an optimal combination of structural and nonstructural measures; and through a more comprehensive flood management approach
- ❖ Adequate operation and maintenance of project assets is a big concern in the long term
- ❖ Engineering investigations before and during detailed design should be increased to avoid very costly structural failures

Key Lessons from Projects cont'd

- ❖ Severe flooding is often due to the effects of denuded forested uplands and watersheds – sound watershed management is important
- ❖ In project design, an integrated and coordinated approach involving upper watershed management and conservation must be simultaneously and effectively carried out
- ❖ No quick technical fixes can resolve flood problems once and for all – an effective approach:
 - examines the complexity of environmental factors in an integrated manner over the river basin
 - balances trade-offs to achieve the greatest benefit for the majority of people

Key Lessons from Projects cont'd

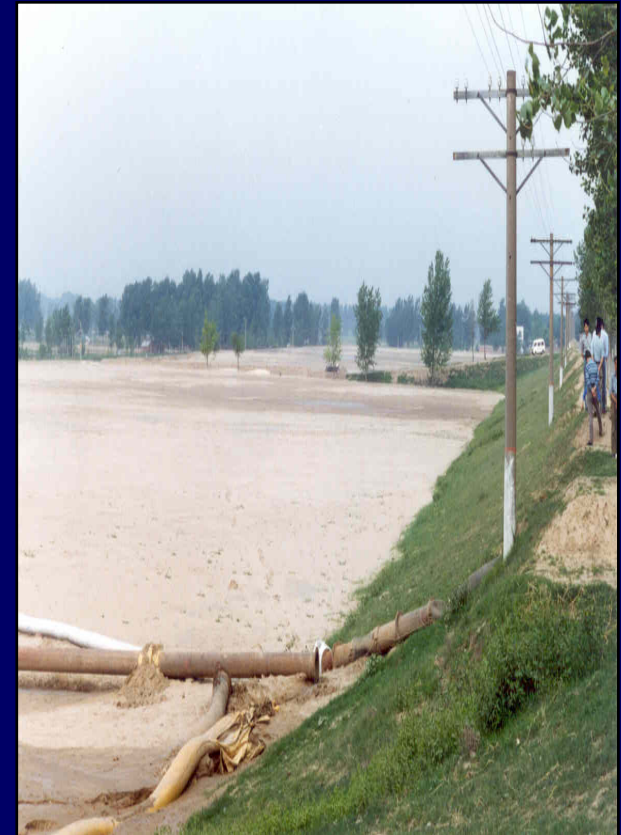
- ❖ Getting out on the ground and talking with people affected by floods is important
- ❖ Learning to appreciate the duality of floods - their *benefits* as well as *disadvantages* - will help moderate the over-reliance on quick-fix, engineering solutions
- ❖ Some effective measures of reducing flood hazards are the simplest and least intrusive:
 - e.g., effective emergency assistance is provided by local communities, including friends and neighbors of victims

Key Lessons from Projects cont'd

- ❖ Enlist the aid of the media to communicate the concepts of flood management to the public so that more informed choices may be made
- ❖ For areas at risk of flooding, compulsory flood insurance for property damage should be considered:
 - this creates an awareness of risk amongst the general public and builds appropriate incentives to restrict development in high-risk areas.

ADB's approach to flood management

- ❖ Manage rather than react to floods
- ❖ Provide emergency evacuation measures for vulnerable communities
- ❖ Use affordable flood control embankments, mindful of risk and long-term maintenance costs
- ❖ Protect urban areas to high standards
- ❖ Protect rural areas to minimum standards



ADB's approach to flood management

cont'd

- ❖ Incorporate traditional coping mechanisms in project design
- ❖ Make provisions for releasing excess water in consultation with residents of receiving areas
- ❖ Consider flood insurance to protect vulnerable communities and discourage development in flood zones



Going Forward/Proactive Measures

- ❖ Mainstreaming disaster risk reduction (DRR) into development planning
- ❖ Encourage consolidation of the “bottom-up/top-down” approach
- ❖ Help ensure the basics are in place:
 - e.g., public awareness programs, disaster legislation, building code compliance, land-use management, vulnerability assessments, risk analysis, etc.