Disaster Reduction for Sustainable Development

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The Challenge we face in 21st Century Disaster Reduction is a MUST for Sustainable Development

- A single disaster can wipe out annual GDP of a country.
- Natural Disasters can be the biggest obstacle to social security of a country.
<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Disaster</th>
<th>Number of Dead and Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>Afghanistan</td>
<td>Earthquake</td>
<td>4,700</td>
</tr>
<tr>
<td></td>
<td>PNG</td>
<td>Tsunami</td>
<td>2,600</td>
</tr>
<tr>
<td>1999</td>
<td>Turkey</td>
<td>Earthquake</td>
<td>15,500</td>
</tr>
<tr>
<td></td>
<td>Taiwan</td>
<td>Earthquake</td>
<td>2,300</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>Cyclone</td>
<td>9,500</td>
</tr>
<tr>
<td>2001</td>
<td>India</td>
<td>Earthquake</td>
<td>13,805</td>
</tr>
<tr>
<td>2002</td>
<td>Afghanistan</td>
<td>Earthquake</td>
<td>More than 800</td>
</tr>
<tr>
<td></td>
<td>Korea</td>
<td>Typhoon</td>
<td>246</td>
</tr>
<tr>
<td>2003</td>
<td>Sri Lanka</td>
<td>Landslide</td>
<td>236</td>
</tr>
<tr>
<td></td>
<td>Iran</td>
<td>Earthquake</td>
<td>26,200</td>
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<tr>
<td>2004</td>
<td>Bangladesh</td>
<td>Flood</td>
<td>628</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>Flood</td>
<td>1,195</td>
</tr>
<tr>
<td></td>
<td>Philippines</td>
<td>Typhoon</td>
<td>1,692</td>
</tr>
<tr>
<td></td>
<td>Indian Ocean</td>
<td>Tsunami</td>
<td>More than 150,000</td>
</tr>
</tbody>
</table>
### Ratio of Amount of Damage to GDP (Asia)

(1975-2002)

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Disaster Type</th>
<th>Damage as % of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia</td>
<td>1988</td>
<td>Earthquake</td>
<td>908%</td>
</tr>
<tr>
<td>Mongolia</td>
<td>1996</td>
<td>Wild Fire</td>
<td>192%</td>
</tr>
<tr>
<td>Mongolia</td>
<td>2000</td>
<td>Wind Storm</td>
<td>97%</td>
</tr>
<tr>
<td>Lao, PDR</td>
<td>1993</td>
<td>Wind Storm</td>
<td>27%</td>
</tr>
<tr>
<td>Nepal</td>
<td>1987</td>
<td>Flood</td>
<td>26%</td>
</tr>
<tr>
<td>Georgia</td>
<td>1991</td>
<td>Earthquake</td>
<td>22%</td>
</tr>
<tr>
<td>Mongolia</td>
<td>1990</td>
<td>Wild Fire</td>
<td>21%</td>
</tr>
</tbody>
</table>

Source: ADRC, Japan, based on EM-DAT, CRED, and WDI, World Bank 2003

Source: ADRC, Japan and CRED-EMDAT, Universite Catholique de Louvain, Brussels, Belgium, 2002
What if Istanbul is hit by major earthquake?

- Human loss estimated to 73,000 ~ 87,000 deaths!
- Economic loss estimated to 24.5 ~ 27.8% of annual GDP of TURKEY!

Great threat to social stability of TURKEY

Source: JICA report Dec. 2002
JBIC report Feb. 2003
Hazards Confronting Vulnerable Communities Cause Disasters

Hazard (risk assessment)  Vulnerability (societal conditions)

Disasters
Less Disasters

Hazard
(risk assessment)

Vulnerability
(societal conditions)

Disasters
How?
The Disaster Reduction Cycle

Pre-Disaster Phase
- Prevention
- Mitigation
- Preparedness

Preparedness Phase
- Preparedness

Response & Immediate Relief Phase

Post Disaster Phase
- Rehabilitation
- Reconstruction

With viewpoint of
Risk Information

- Early Warning
- Hazard Mapping

is vital for action
Information is Vital!

Risk Perception Gap

Actual Risk → Big Gap → Recognized Risk

Need for Generating Realistic Disaster Scenario

Information is Vital!
Development of Early Warning Tech.

Flood Warning!

Tsunami Warning!

Volcanic Eruption Warning!

Less Community Awareness

What to do?

Where to go?

Which way to be taken?

Information is Vital!
Information is Vital!

Hazard Mapping as a Tool for Effective Early Warning

Safe Evacuation Route

Understanding of Hazardous Areas

Appropriate Risk Awareness of Local Communities

Early Warning

Safe Evacuation

Where is our evacuation area?

Information is Vital!
Information via Media

(Source: Japan Weather Association)
NHK (Japan’s Public Broadcasting) TV Screen Image - 1

showing Seismic Intensity by Miyagi-ken Earthquake on 26 July 2003

within 5 minutes after the Earthquake with/without Tsunami Warnings
Vital Information

- Effective Use of Hazard Map
- Appropriate Risk Awareness of Local Communities
- Development of Early Warning
- Risk Communication Using Local Knowledge and Structure

Reduce Damage by Disasters
How can we really reach the people at risk?

Anti-Seismic Structural Engineering

Satellite Imagery of Typhoon by Meteo-Sats

Tsunami-Warning by PTWC

The Critical Link

Local Housing

People in Low Basins

Fishing Villages
Proverb by Japanese Physics Scientist
Dr. Torahiko TERADA (1878-1935)

「天災は忘れた頃にやってくる」

“Natural Disasters will hit us by the Time people have forgotten about it”
THANK YOU