Disaster Risk Management and Information

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• Information for Preventive Investment

• Information for Preparedness and Response

• Summary
Disaster Risk Management

- **Mitigation** to prevent disasters
- **Preparedness** to ensure effective response
- **Response** to reduce adverse impacts during the flooding
- **Recovery** to assist the affected communities to rebuild themselves

We need to consider what information is necessary in accordance with each stage.
In case of “TOKAI devastating flood” in Japan 2000, Prior investments of JPY71.6 billion made it possible to reduce disaster damage by about JPY550 billion.

Effect of Preventive Investment

- **Investment for prevention can reduce disaster damages largely**

Amount of damage:
- Approx. JPY670 billion

After implementation of projects:
- Estimated amount of damage: Approx. JPY120 billion
- Projects costs: JPY 71.6 billion in total

Effect of disaster prevention projects:
- Equivalent of approx. JPY550 billion

Waterlogged conditions due to heavy downpours in Tokai region

*Special Emergency Project for Shonai River and Shin River Disaster Prevention Strategies (2000 to 2004).
Effect of Preventive Investment

Number of Fatalities by water-related disasters in JAPAN
GDP and Budget for Flood Management in JAPAN (2000 year price)

Water-related Disasters Statistics in Japan

*Number of fatalities exclude those who dead by tsunami

Disaster Risk Management Information for Preventive Investment

• **Evaluate the Risk**
  - **Hazard** expressed in terms of frequency
  - **Exposure** of human activities
  - **Vulnerability** of elements at risk

• **Show**
  (1) the **Current level of Risk**
  (2) the **Effect of Preventive Investment**

• **Monitor the Progress**
Current level of Risk and Effect of Preventive Investment

- Necessary to be understandable for Public and Policy-makers

- Case of YAHAGI river in JAPAN
  
  Goal of mid-term improvement plan (Return period): about 50 years

  Current Level of Risk (as of 2009):
  - Area under possibility of inundation: 7,300 ha
  - Population in the above area: 130,000
  - Houses in the above area: 50,000

  Effect of Preventive Investment: Zero

Propose Solutions

Total Cost for Investment: 39.9 billion JPY
Total Benefit:
- (assets and properties which are protected from flood by investment)
- 752.2 billion JPY (as of 2009)
Monitor the Progress

- **Indicators to monitor progress**

- **Sample Indicators (The 3rd five-year plan on infrastructure development)**
  
  - **Increase in rate of river improvement to the mid-term goals**
    (equivalent to about 50-year floods)

  - **Reduction of the number of houses which will be still under possibility of inundation in case of flood recurrence**

<table>
<thead>
<tr>
<th>Current (end of JFY 2011)</th>
<th>Goal after 5 years (end of JFY 2016)</th>
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</thead>
<tbody>
<tr>
<td>Rivers managed by Central Gov. : 72%</td>
<td>Rivers administrated by Central : 76%</td>
</tr>
<tr>
<td>Rivers managed by Prefecture Gov.: 57%</td>
<td>Rivers administrated by Prefectures: 59%</td>
</tr>
<tr>
<td>Current (end of JFY 2011)</td>
<td>Goal (end of JFY 2016)</td>
</tr>
<tr>
<td>about 61,000 houses</td>
<td>about 41,000 houses</td>
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Economic Losses Caused by Floods

- Inundation area decreasing, but Density of Flood Damage increasing, due to urbanization

Water-related Disasters Statistics in JAPAN

- Total Inundated Area (10,000ha)
- Area of Inundated (Residential & Other Property) (10,000ha)
- Density of Flood Damage to General Assets
- Damage to General Assets (2000 Price)
Information at Preparedness and Response Stage

- **Natural Dam in Way Ela River, Ambon, Indonesia**

  Natural Dam (H=170m, V=25mil m³) by large-scale landslides in July 2012

Approximately 5,000 local residents lived 2 km downstream from natural dam
Information at Preparedness and Response Stage
Case of Natural Dam in Indonesia

What is necessary information in this case?

• **Real-time Water level**

  Because...

  - major mechanism of natural dam collapse is erosion caused by overflow from reservoir
  - local community needs criteria for the effective evacuation by water level
Information at Preparedness and Response Stage
Case of Natural Dam in Indonesia

- **Installation of Real-time Water level gauge**

  ![Installation in Feb. 2013](image1.png)

- **Decision of Warning Water level for Evacuation Order**

  ![Water Level in Reservoir in July 2013](image2.png)

- 191m (Level for Evacuation order)

- 25th: overflow and collapse
Case of Natural Dam in Indonesia

- Houses of 422 households, 2,600 residents, were destroyed
- Most residents evacuated to safe places before debris flood reached the village (3 persons dead and missing)

Source: Ministry of Public Works
Summary

• Necessary information differs in accordance with stages

• Information is necessary to be understandable to the public as well as decision-makers

• Preventive Investment (Mitigation) is quite effective to reduce disaster risk

• Collaboration and Information Sharing among related stakeholders is quite significant at Preparedness and Response Stage
Thank you

ありがとうございます

Terima Kasih