



Water –related Disaster Risk Information for Risk Reduction

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Disaster Risk Management and Information

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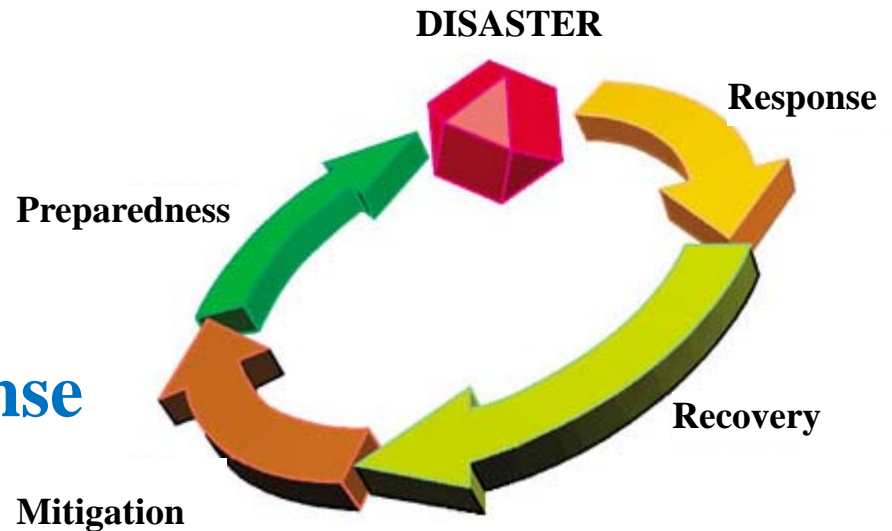
Ministry of Public Works

Republic of Indonesia

- **Information for Preventive Investment**
- **Information for Preparedness and Response**
- **Summary**

Disaster Risk Management

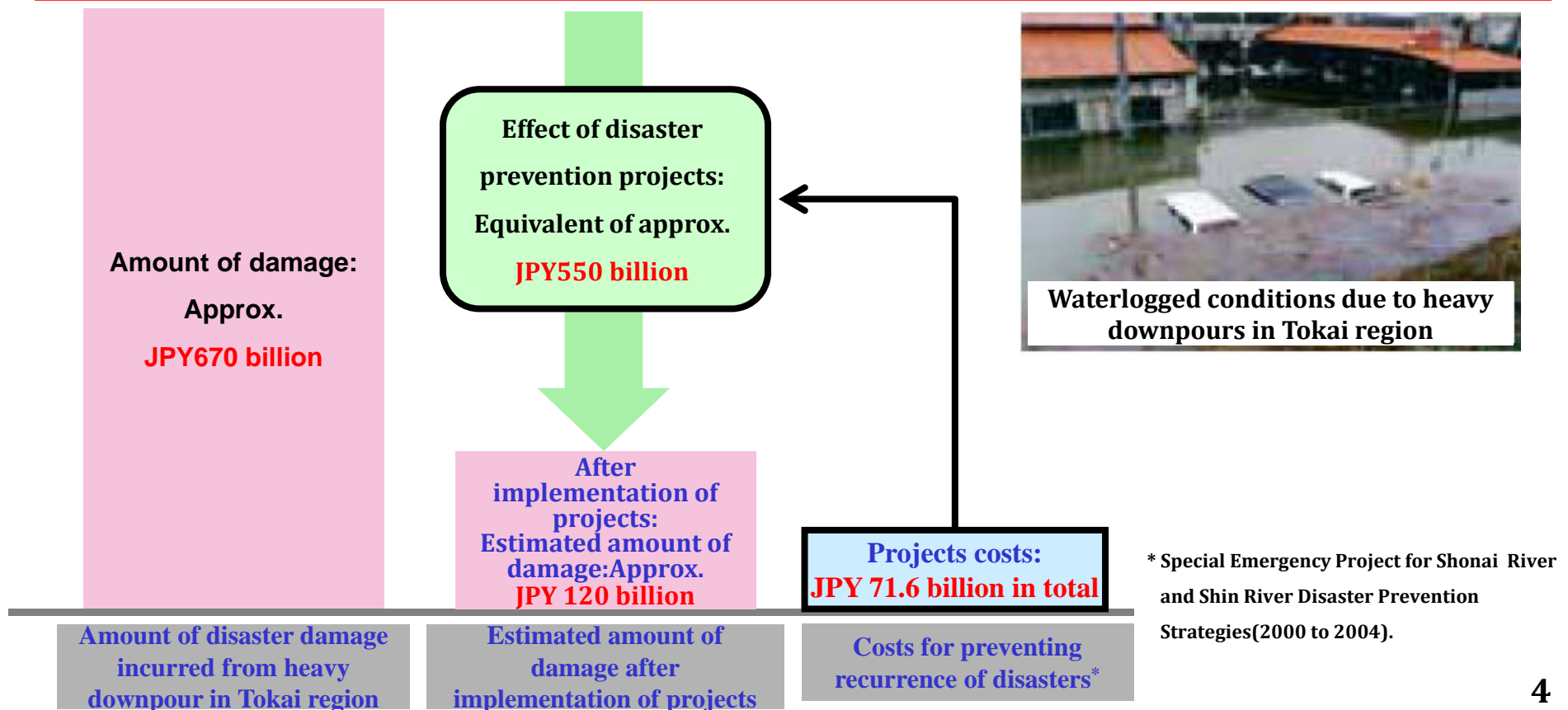
- **Mitigation**
to prevent disasters
 - **Preparedness**
to ensure effective response
 - **Response**
to reduce adverse impacts during the flooding
 - **Recovery**
to assist the affected communities to rebuild themselves
- We need to consider what information is necessary
in accordance with each stage**



Effect of Preventive Investment

- Investment for prevention can reduce disaster damages largely

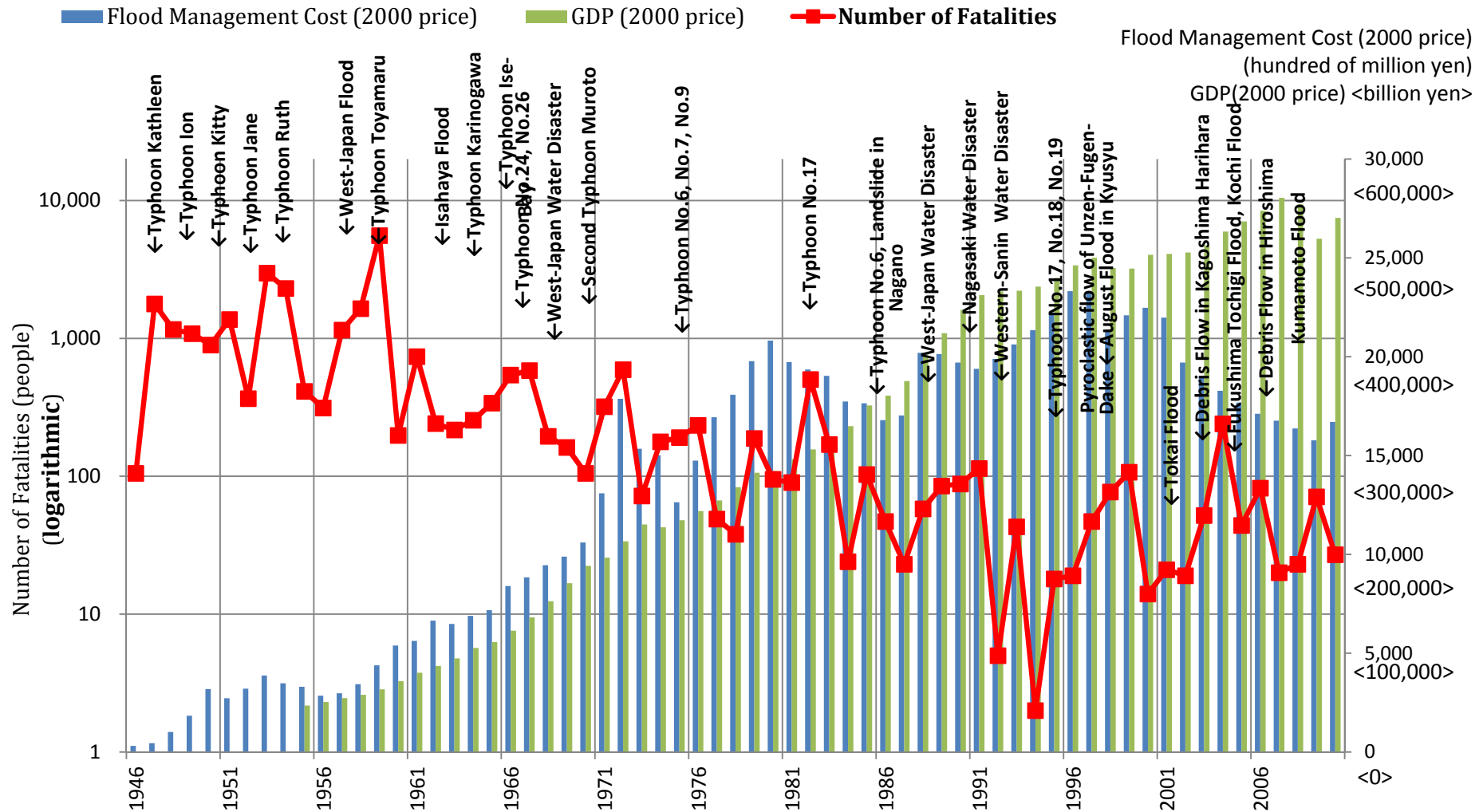
In case of “TOKAI devastating flood” in Japan 2000,
Prior investments of JPY71.6 billion made it possible to reduce disaster damage by about JPY550 billion.



Effect of Preventive Investment

Number of Fatalities by water-related disasters in JAPAN

GDP and Budget for Flood Management in JAPAN (2000 year price)



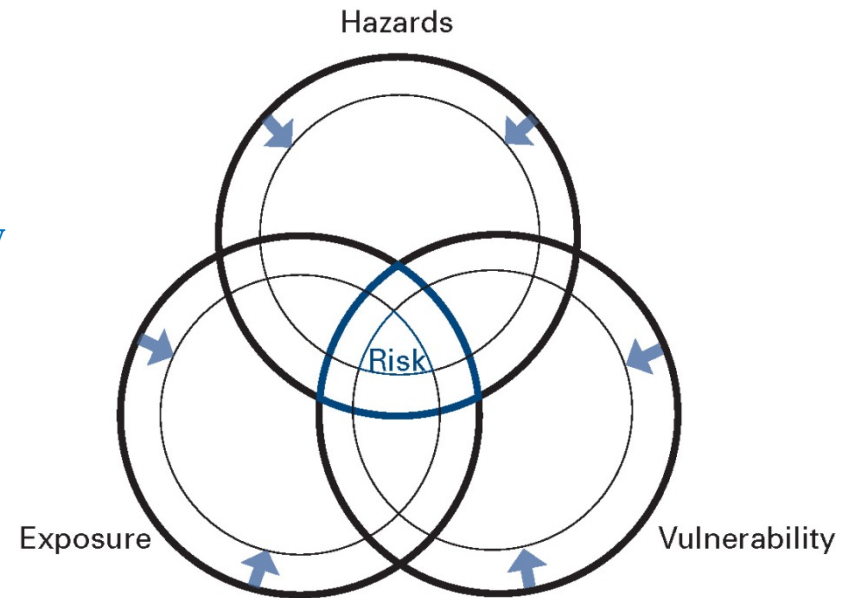
Water-related Disasters Statistics in Japan

*Number of fatalities exclude those who dead by tsunami

*GDP : 1980-2011(2000 price), 1946-1979(1990 price)

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 - Area under possibility of inundation: 7,300 ha

(as of 2009) - Population in the above area : 130,000

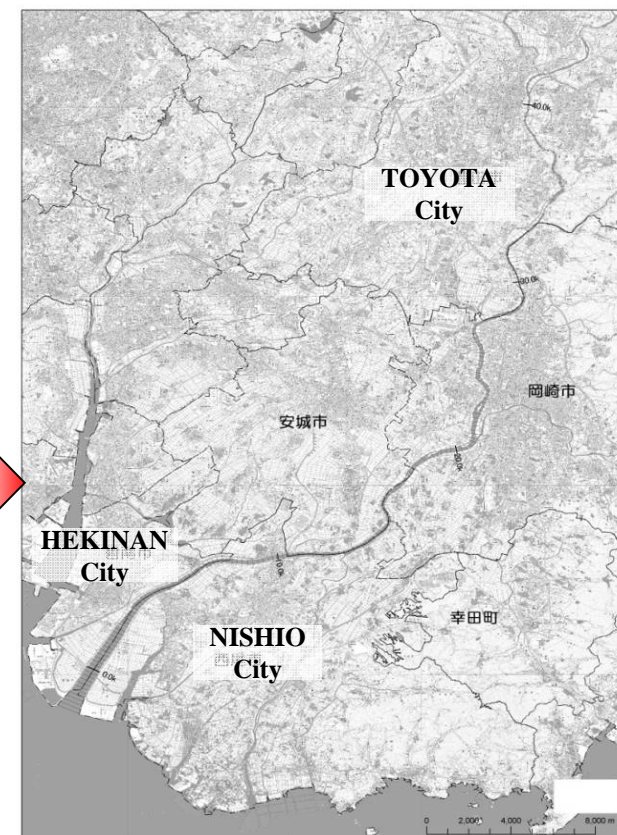
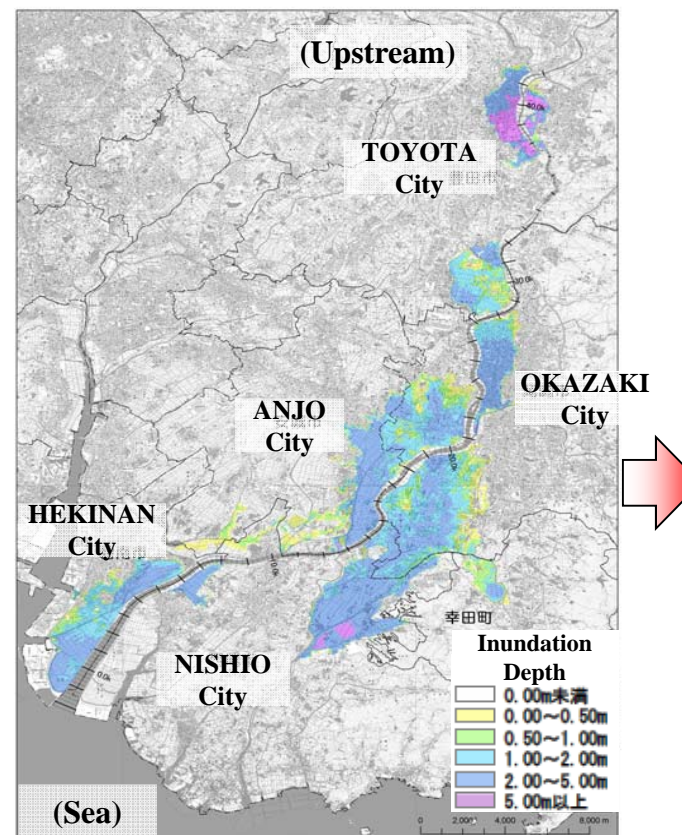
- Houses in the above area : 50,000

Effect of Preventive Investment : **Zero**

Propose Solutions

Total Cost for Investment:
39.9 billion JPY

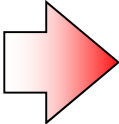
Total Benefit
(assets and properties which are
protected from flood by investment)
752.2 billion JPY
(as of 2009)



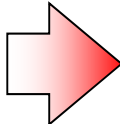
Monitor the Progress

- 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)

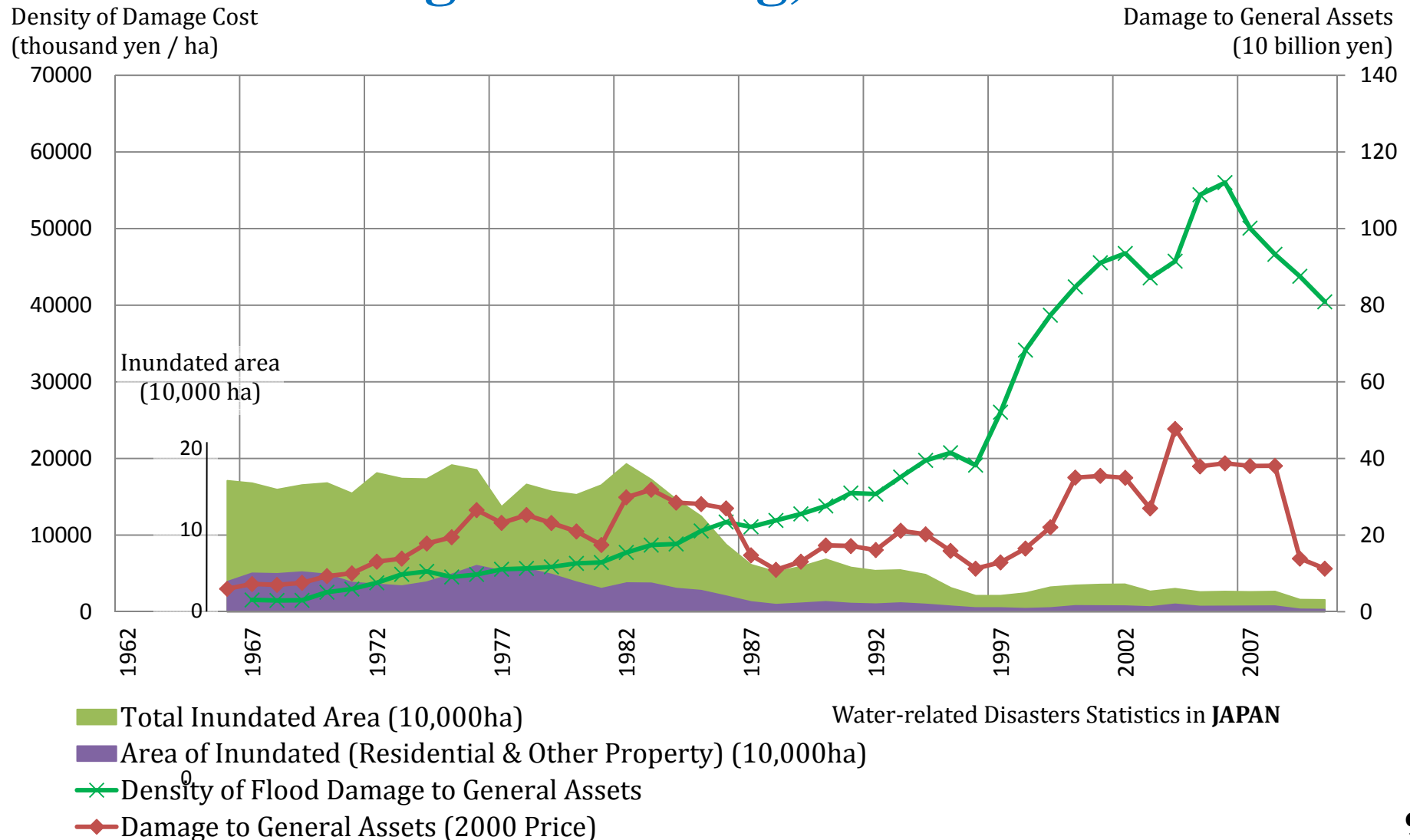
$= \frac{\text{Length of improved rivers}}{\text{Length of rivers which are to be improved for the mid-term goals}}$													
<table border="1"> <tr> <th colspan="2">Current (end of JFY 2011)</th></tr> <tr> <td>Rivers managed by Central Gov.</td><td>: 72%</td></tr> <tr> <td>Rivers managed by Prefecture Gov.:</td><td>57%</td></tr> </table>	Current (end of JFY 2011)		Rivers managed by Central Gov.	: 72%	Rivers managed by Prefecture Gov.:	57%	 <table border="1"> <tr> <th colspan="2">Goal after 5 years (end of JFY 2016)</th></tr> <tr> <td>Rivers administrated by Central</td><td>: 76%</td></tr> <tr> <td>Rivers administrated by Prefectures:</td><td>59%</td></tr> </table>	Goal after 5 years (end of JFY 2016)		Rivers administrated by Central	: 76%	Rivers administrated by Prefectures:	59%
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- Reduction of the number of houses which will be still
under possibility of inundation in case of flood recurrence

Current (end of JFY 2011)		Goal (end of JFY 2016)
about 61,000 houses		about 41,000 houses

Economic Losses Caused by Floods

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



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



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

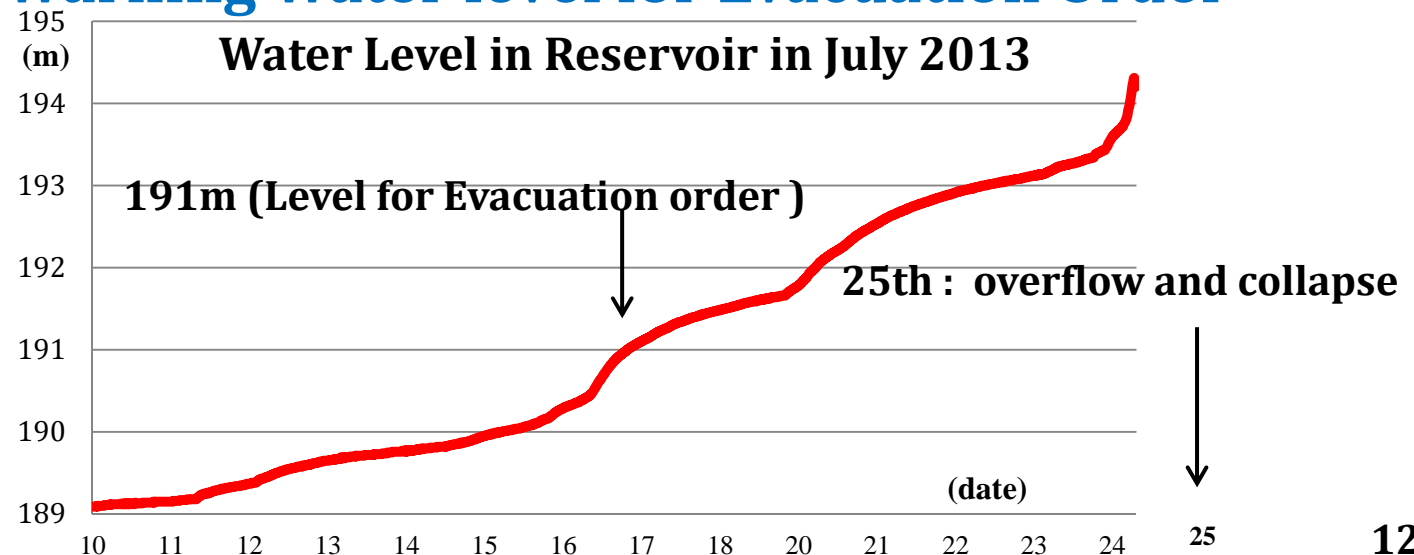
- **Installation of Real-time Water level gauge**



Installation in Feb. 2013



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



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)



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