

# **Directions of research studies for promoting the mainstreaming of disaster prevention**

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# Overview of Japan Institute of Country-ology and Engineering (JICE)

## ■ Tasks

- As the think-tank of the Ministry of Land, Infrastructure, Transport and Tourism of Japan (MLIT), JICE conducts various different surveys and research studies on the future directions of national land/transportation administrations and formulates policy recommendations and technical standards based on their results.

## ■ Categories of Surveys and Research Studies

- Independent Research (joint researches conducted by several JICE staff members and experts from universities)
- Commissioned Research (research studies commissioned by MLIT)
- Grant-in-Aids for Research and Development (annual grant-in-aids for researches on about 13 themes)
- Endowed Research Grant

## ■ Survey and Research Staff

- 85 engineering staff members (7 doctorate holders and 38 P.E.)

## ■ How disaster prevention and mitigation measures should be at a new disaster stage?

### ● The current recognition of the state

- More localized and concentrated rainfall events and intensifying disaster damage
- Storm surge following the landfall of the super typhoon to the Philippines
- A fear that a large-scale volcanic event may happen in the future.

### ● Increased vulnerabilities against disasters

- Vulnerabilities in urban areas
- Vulnerabilities of citizens and the society

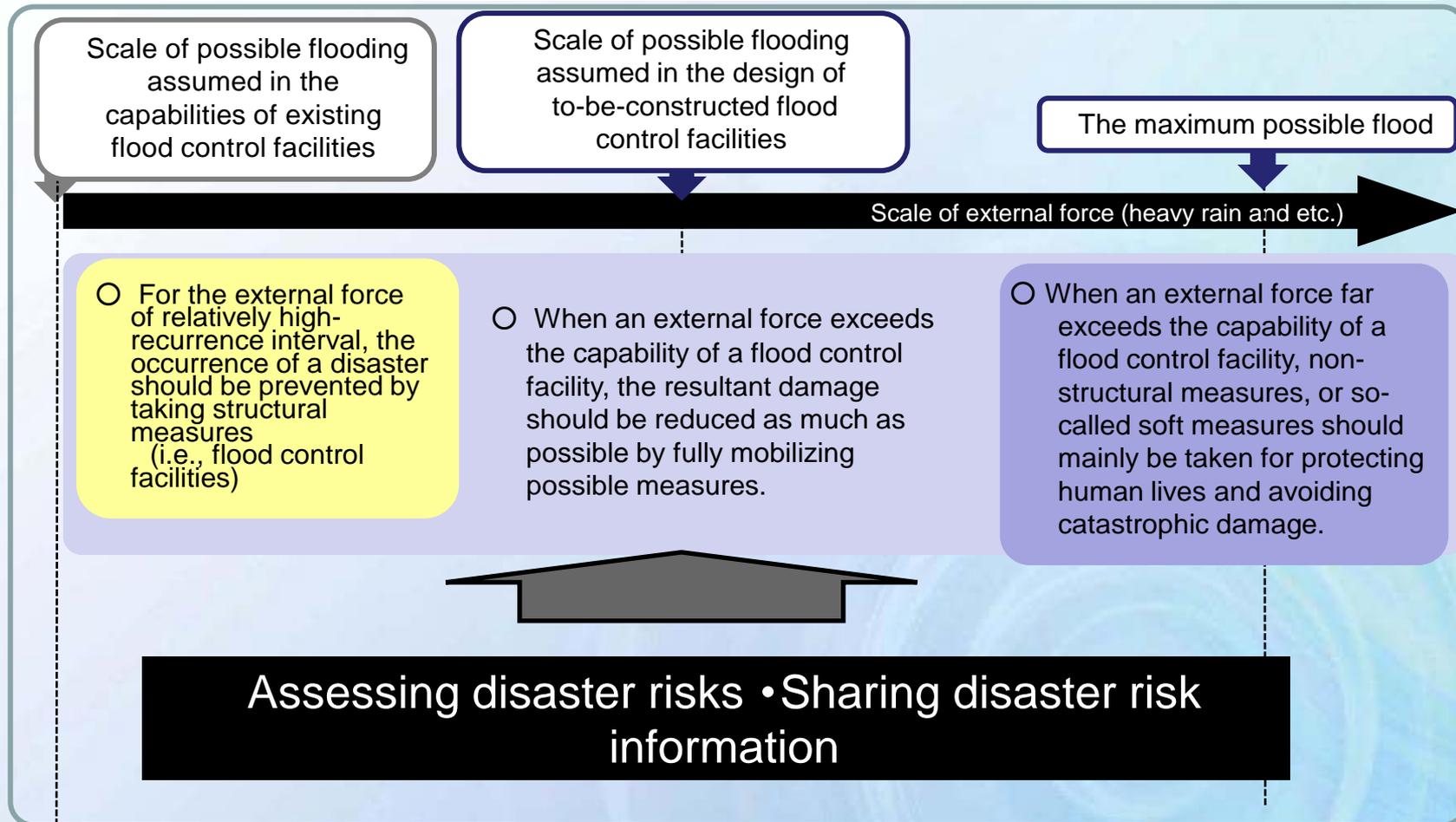
### ● Necessity to assume the worst cases

- Reflecting the lesson- learned from the Great East Japan Earthquake and Tsunami.



# The trends of climate change adaptation (1)

## A basic concept of climate change adaptation in the area of a flood disaster



# The trends of climate change adaptation (2)

## ■ Necessity to expand survey/ research works and to promote technology development

e.g.

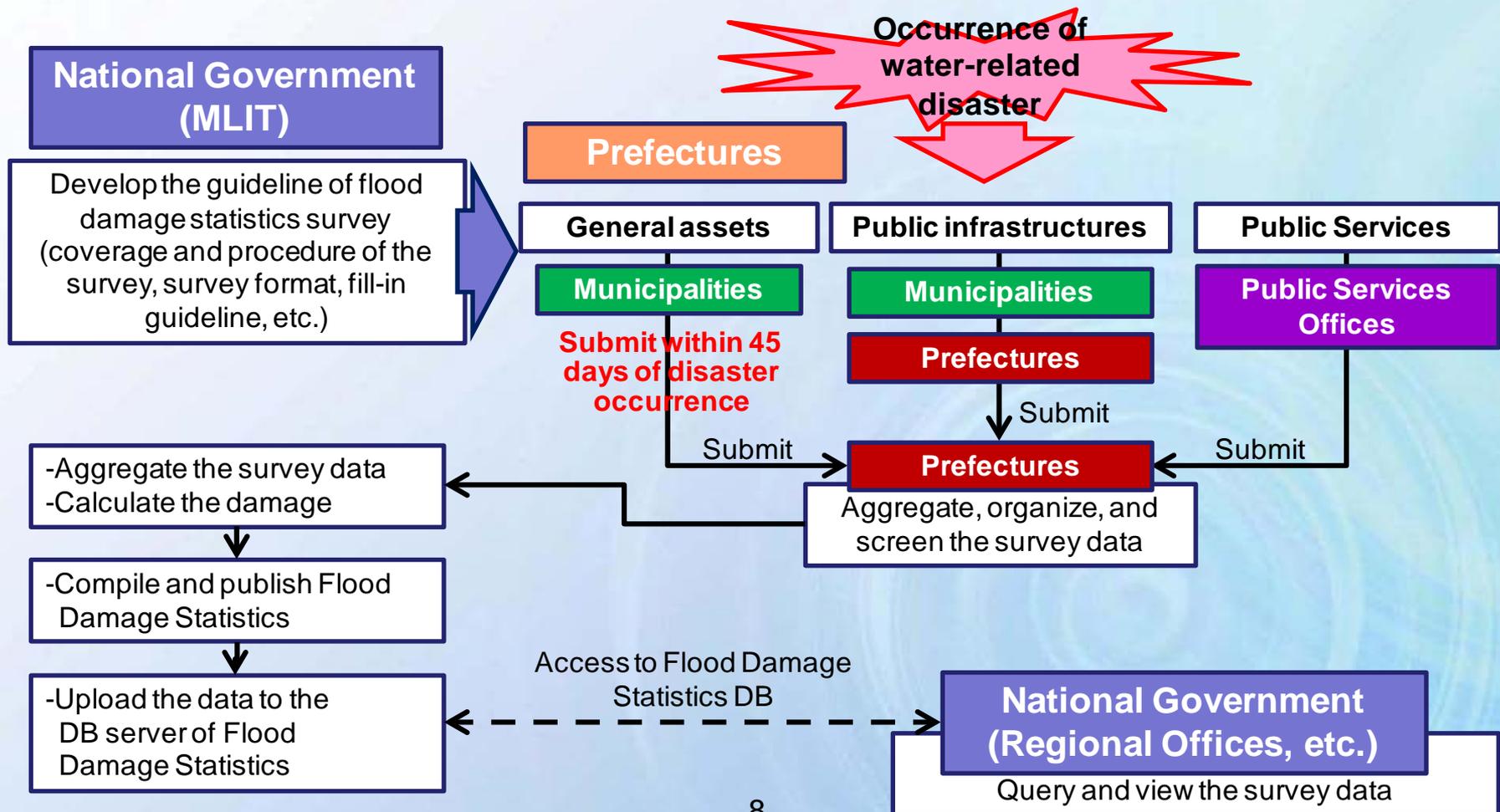
- The concepts of planning theory, designing theory and maintaining/ operating theories in relation to “hard” facilities on the assumption that the largest-class of an external force will be generated.
- Methods to estimate the largest-class of an external force
- Assessments on the reliability and economic efficiency of a “hard” facility
- As meteorological forecasts include high-uncertainty in future values and rate of change, it is necessary to narrow down the range of uncertainty and reflect it to government plans.

## **Building the awareness of the importance of investments in DRR**

- **Necessity to make ex-ante investments  
in disaster prevention**
- **Methodology and framework of  
economic evaluation on disaster  
damage**
- **Necessity of highly-reliable disaster  
statistics**

# Discussions at OECD HLRF Meeting and other related meetings (Input from Japan)

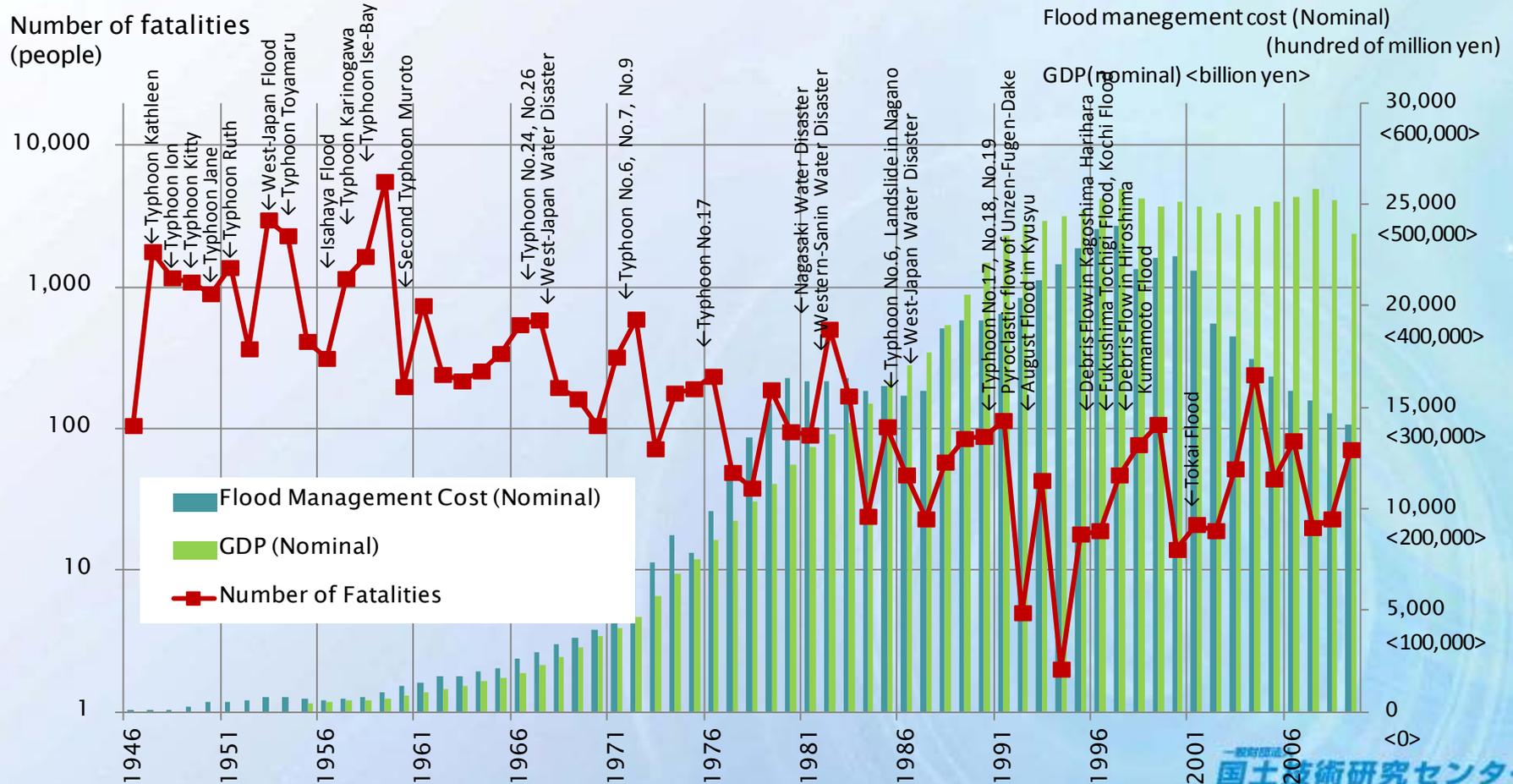
- A general statistics survey based on the article 19 of the Statistics Act (approved by Minister for Internal Affairs and Communications)
- Carried out by MLIT's Water and Disaster Management Bureau in collaboration with prefectures and municipalities.



## and other related meetings (Utilization of Flood Damage Statistics)

### Identification of Long-term Effects of flood Management Investment

#### Number of Fatalities by Floods , GDP and Budget for Flood Management (2000 price)



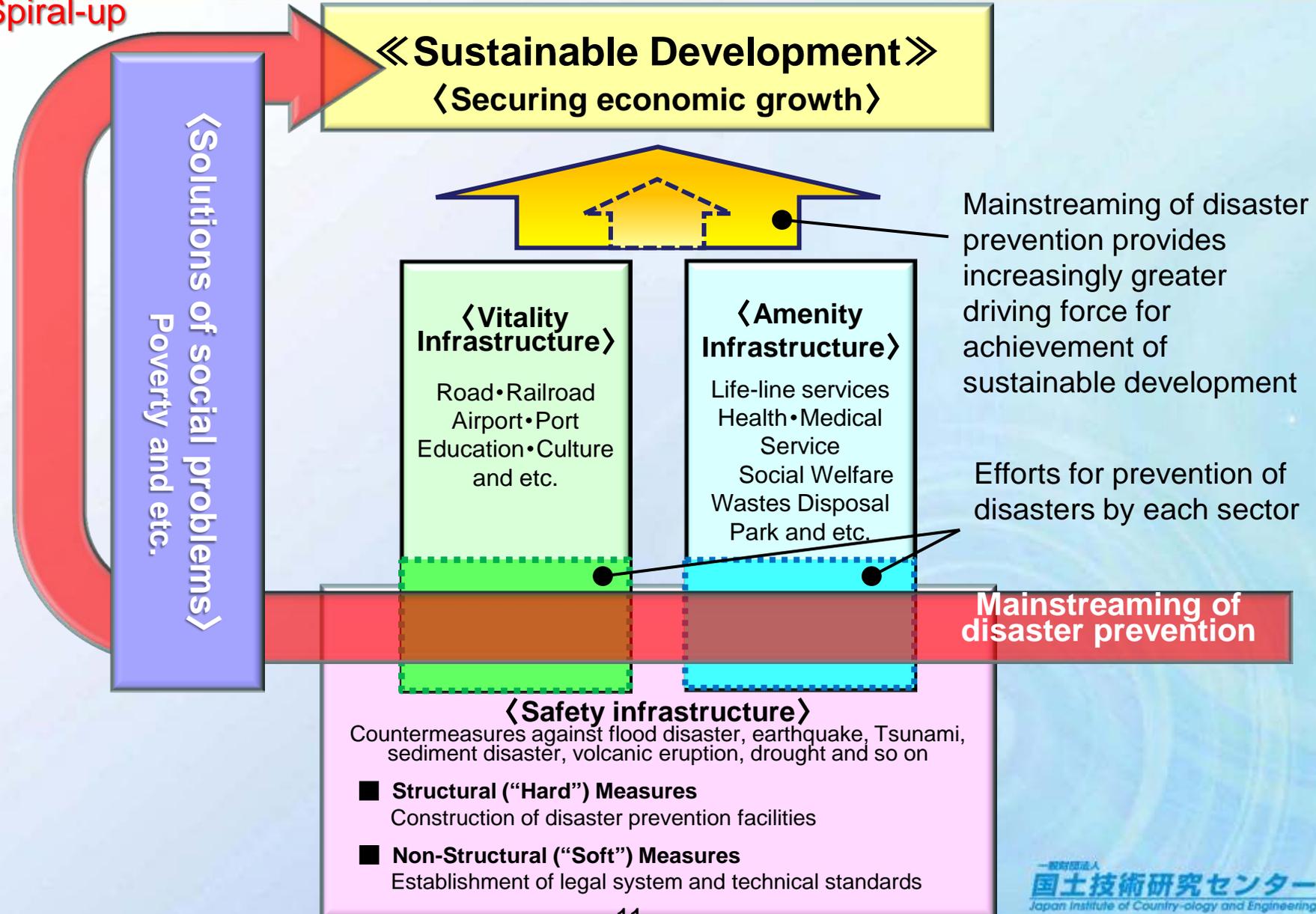
# The course of events for mainstreaming disaster prevention JICE

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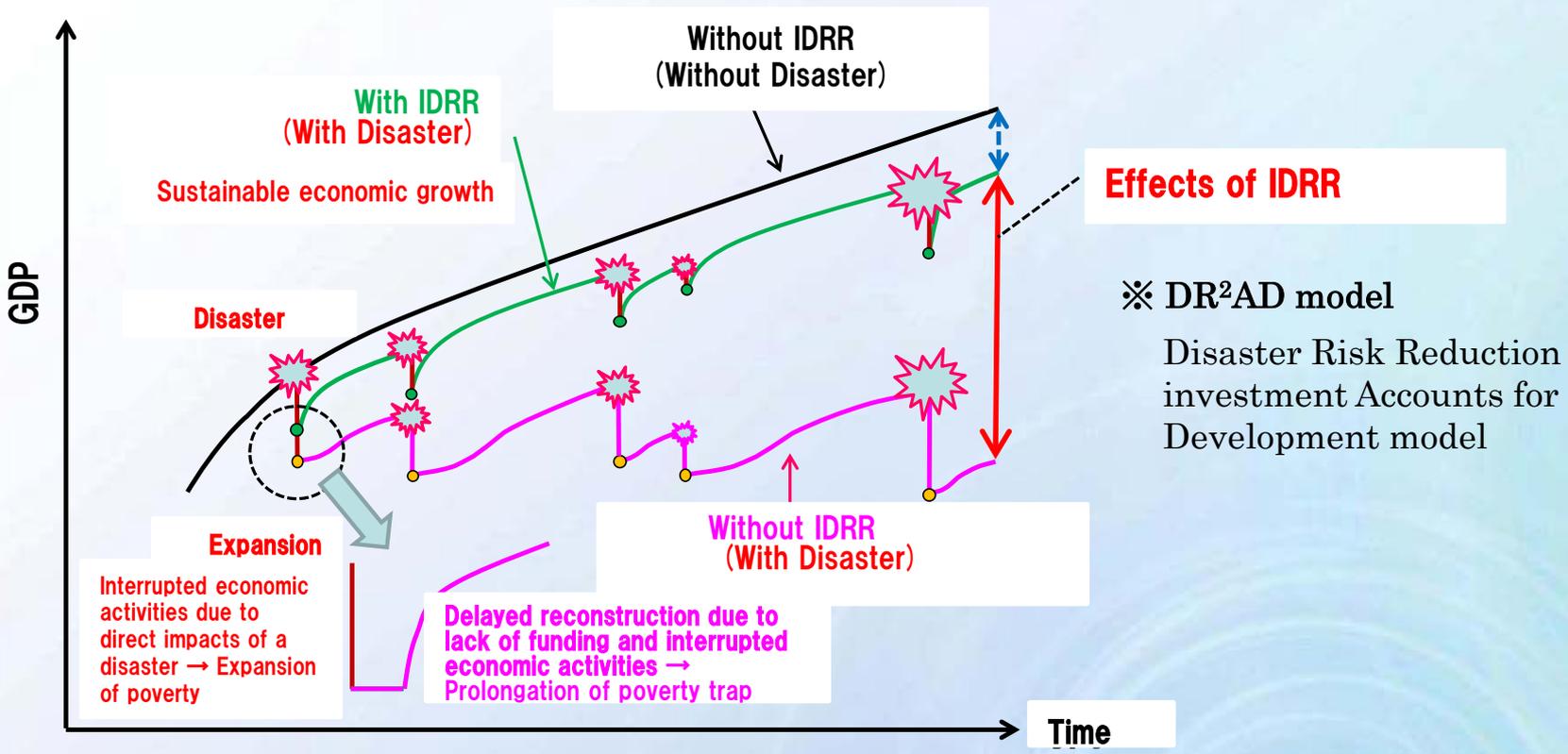
- **The course of events for mainstreaming disaster prevention**
- **Demonstrating the effectiveness of ex-ante investments in disaster prevention**
  - Necessity to introduce the model for analysis of disaster prevention investments
- **Promotion of the countermeasures that anticipate multi-hazard threats**
  - Promotion of comprehensive disaster prevention and mitigation measures
  - Increased efficiency and awareness by use of multi-purpose facilities

# Structure of the mainstreaming of disaster prevention

Spiral-up



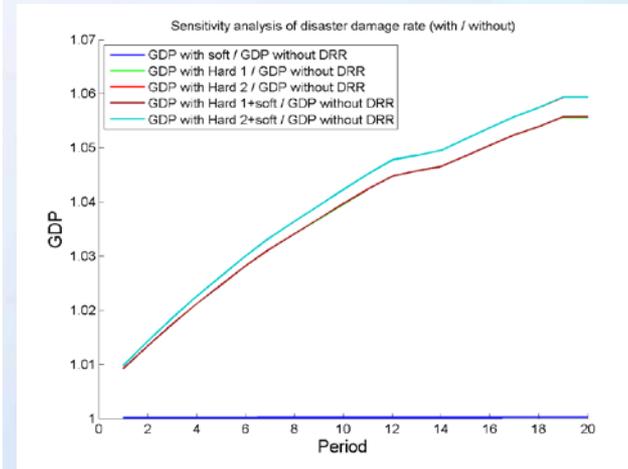
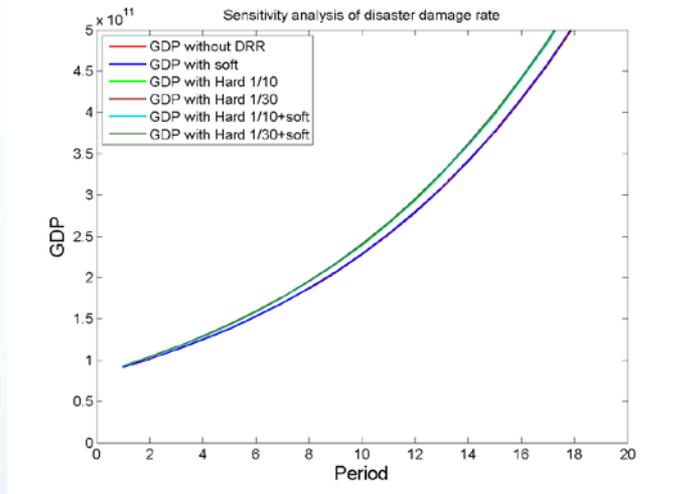
# Demonstrating the effectiveness of ex-ante investments in disaster prevention (1)



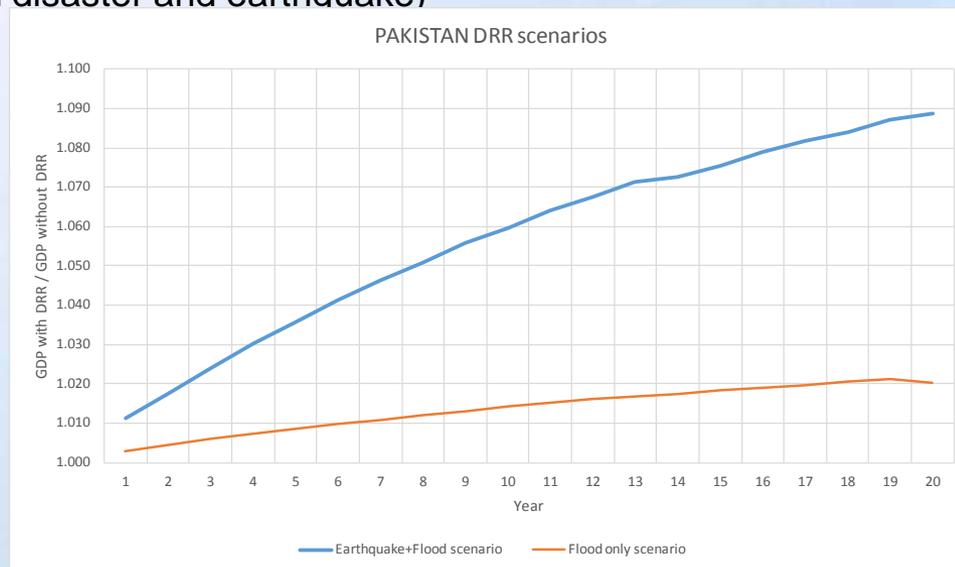
- ① Expressing the difference in economic growth with presence and absence of IDRR
- ② Expressing the changes in social structure following IDRR

# Analysis results based on the model (the example of Pakistan)

① It becomes possible to calculate the difference in economic growth with presence and absence of IDRR.



② It becomes possible to calculate the effects of a countermeasure against a compound disaster (e.g., flood disaster and earthquake)



It was confirmed that IDRR is an effective measure to prevent a compound disaster (flood disaster + earthquake). But it is still required to improve the accuracy of data to be used for the analysis.

**Objective: Practical application of study results for development of specific countermeasures and policies**

- ① Reasonable thinking about the division of the roles among planning theory, designing theory and maintaining/ operating theories in a comprehensive disaster prevention/ mitigation**
- ② Risk communication**
- ③ The best mix of structural measures and non-structural measures in a comprehensive disaster prevention measures**
- ④ Demonstrating the effectiveness and contribution of the investments in disaster prevention to economic growth**
- ⑤ Measures to improve the accuracy of fundamental data including disaster statistics**
  - Establishing the common research bases in the field of disaster studies
- ⑥ Improved accuracy of metrological forecasts on natural phenomena**
  - Estimation of the maximum possible rainfall

- Trying to form organic affiliation between universities, private research institutions, the government and consultants by taking advantage of features of various sectors involved in research studies on disaster prevention

