

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.)

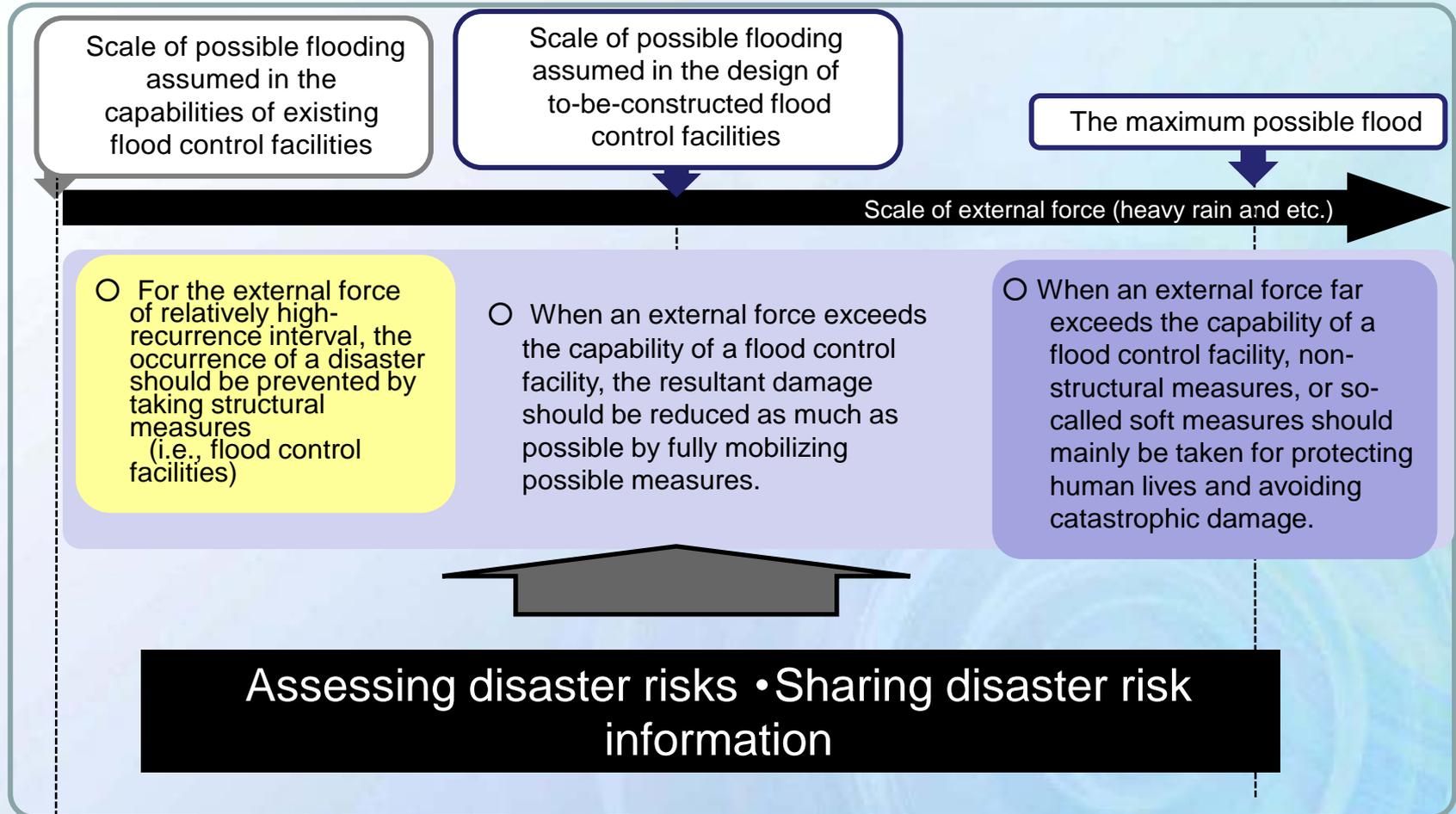
- **How disaster prevention and mitigation measures should be at a new disaster stage?**
 - **The current recognition of the state**
 - More localized and concentrated rainfall events and intensifying disaster damage
 - Storm surge following the landfall of the super typhoon to the Philippines
 - A fear 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.

Recent topics on DRR of Japan (2)

- On the assumption that the largest-class of natural disaster could happen in the near future, DRR should be pursued under the integrated strategy that represents the optimum combination of Structural (“Hard”) Measures and Non-Structural (“Soft”) Measures.
 - So as to prevent high-recurrence interval disasters (more than 1/100), structural disaster prevention measures, i.e., the construction of “hard” facilities, should be mainly taken.
 - Construction of “hard” facilities durable against L1 external force
 - So as to prevent low-recurrence interval disasters (1/100 or less than 1/100), the whole-society approach should be taken with the goals of “protecting human lives” and “avoiding catastrophic damage to the society as well as the economy”.
 - Setting L2 external force
 - Organizing disaster prevention and mitigation systems and deciding division of roles in advance so that the sense of self-help and mutual-assistance will be exhibited properly among citizens and public-assistance will be used adequately during a disaster event.

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.

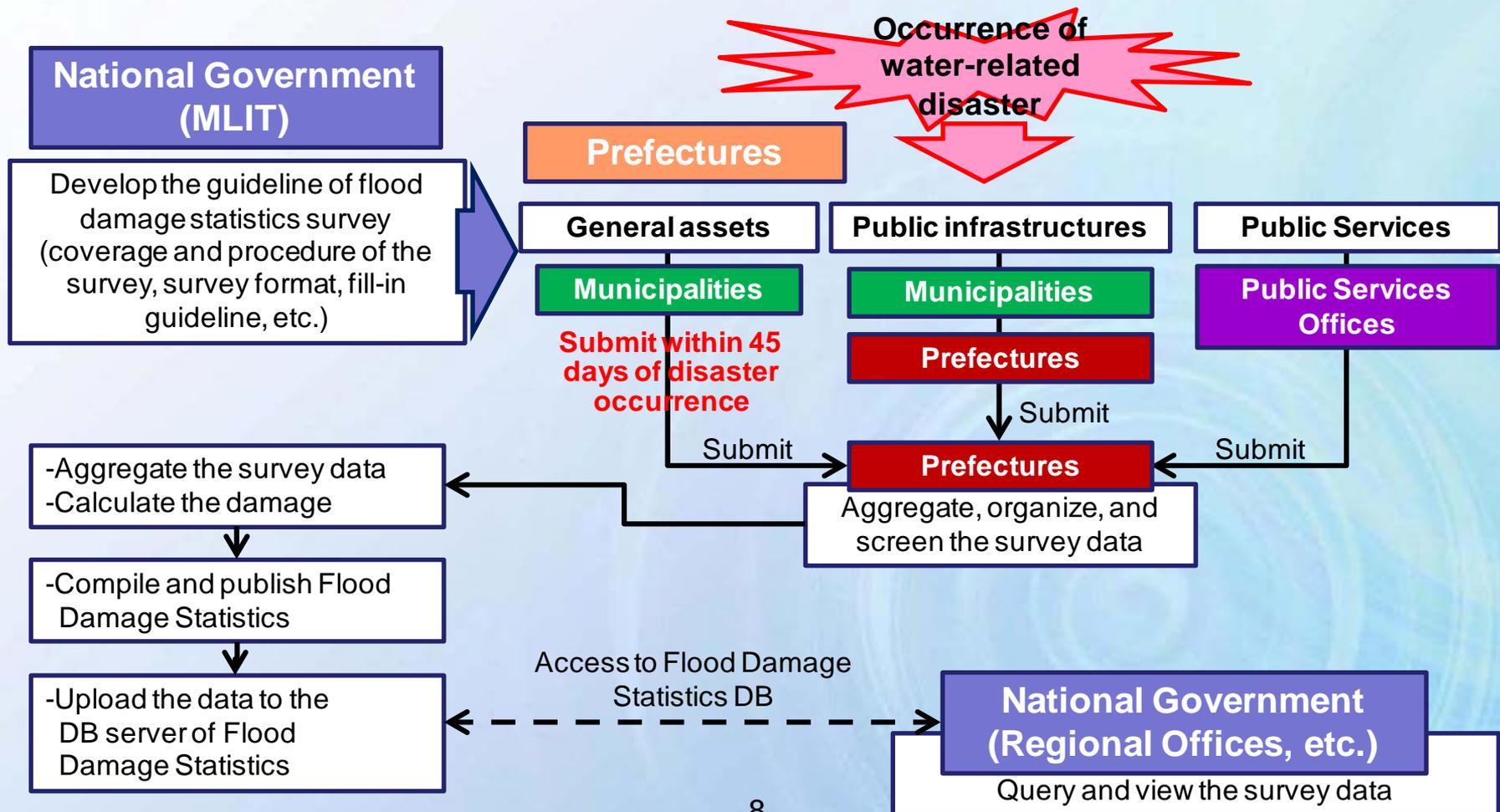
- The concepts of planning theory, designing theory and maintaining/ operating theories in relation to “hard” facilities on the assumption that the largest-class of an external force will be generated.
- Methods to estimate the largest-class of an external force
- Assessments on the reliability and economic 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)

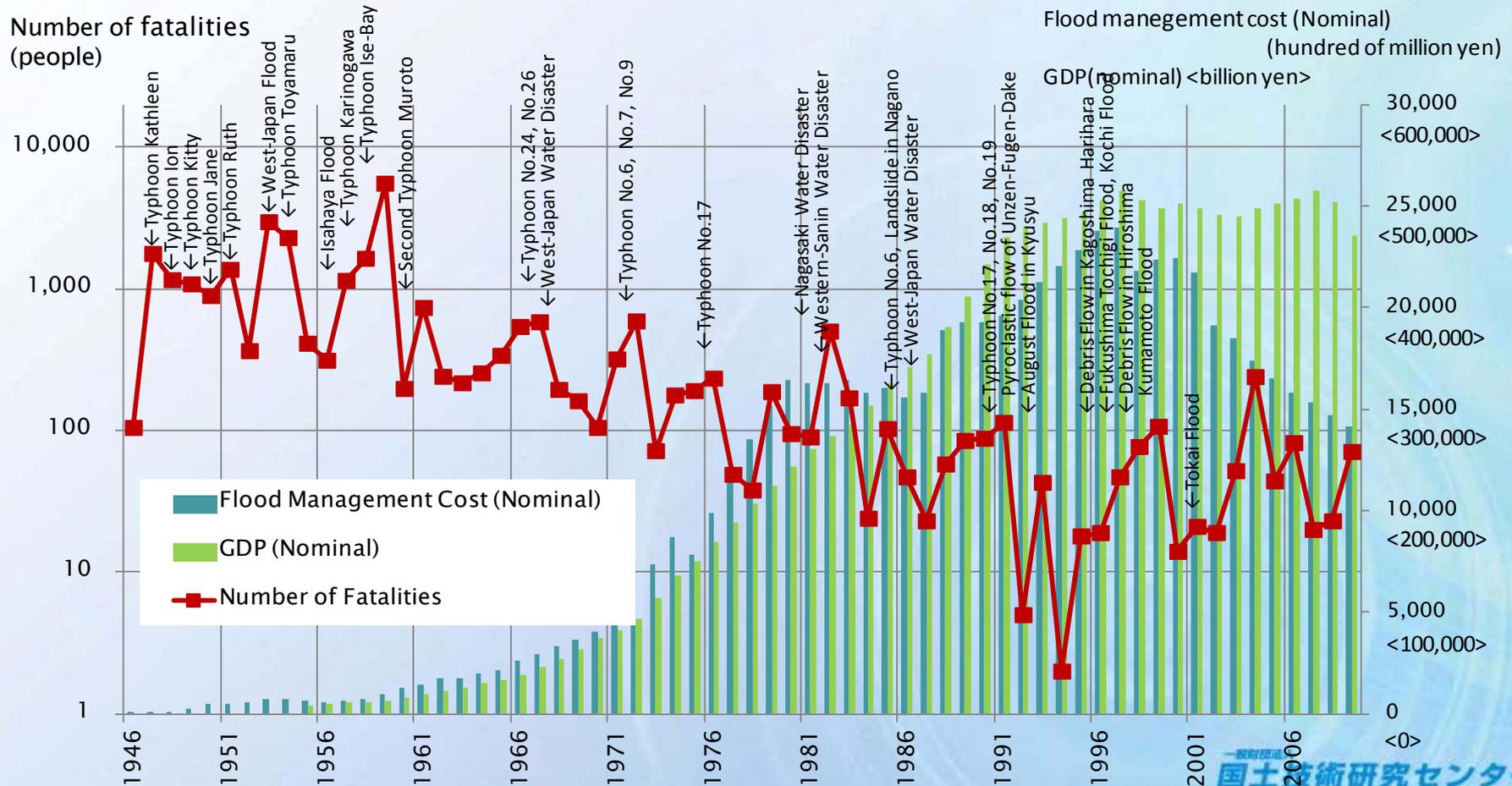
- A general statistics survey based on the article 19 of the Statistics Act (approved by Minister for Internal Affairs and Communications)
- Carried out by MLIT's Water and Disaster Management Bureau in collaboration with prefectures and municipalities.



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)

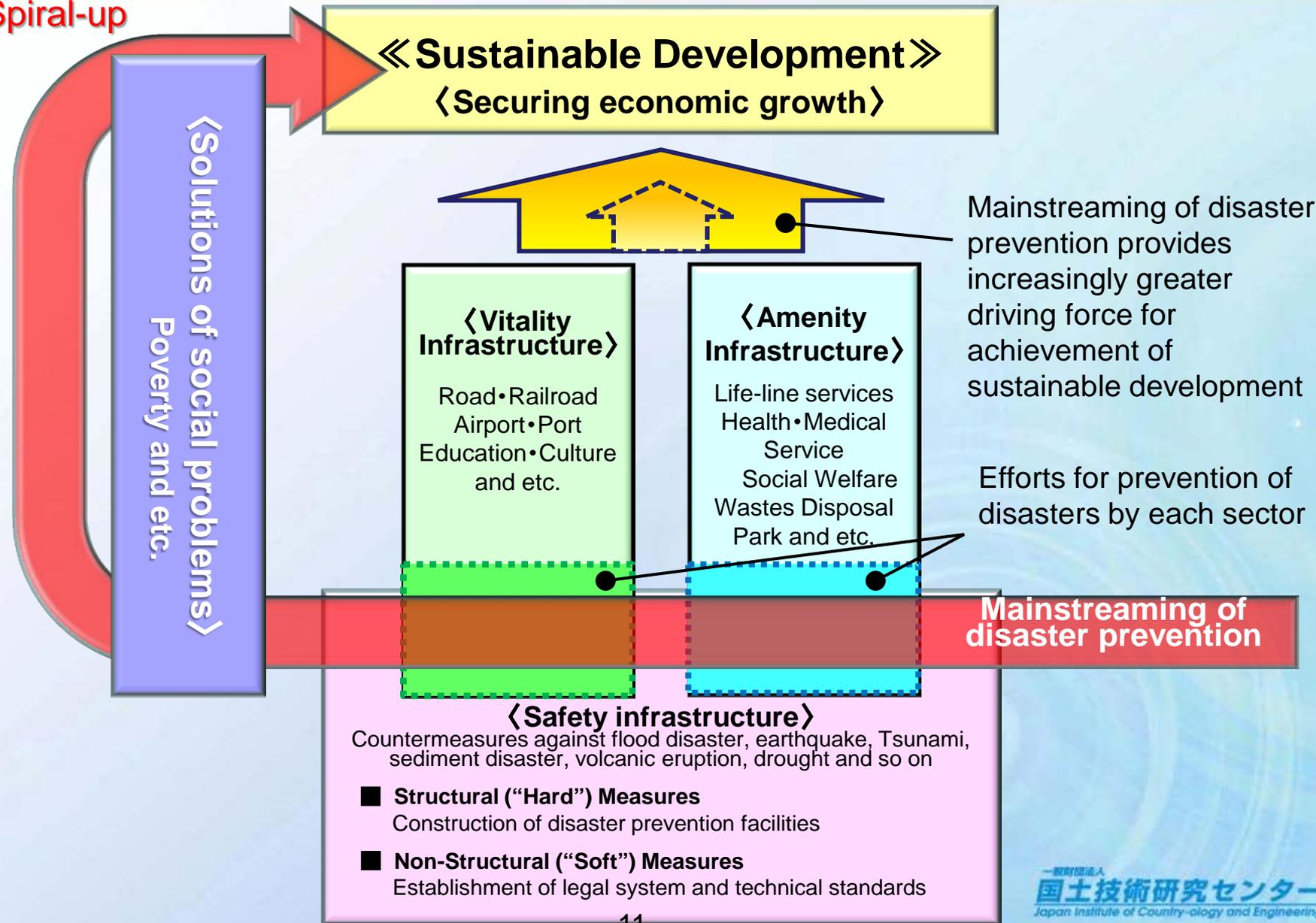


The course of events for mainstreaming disaster prevention JICE

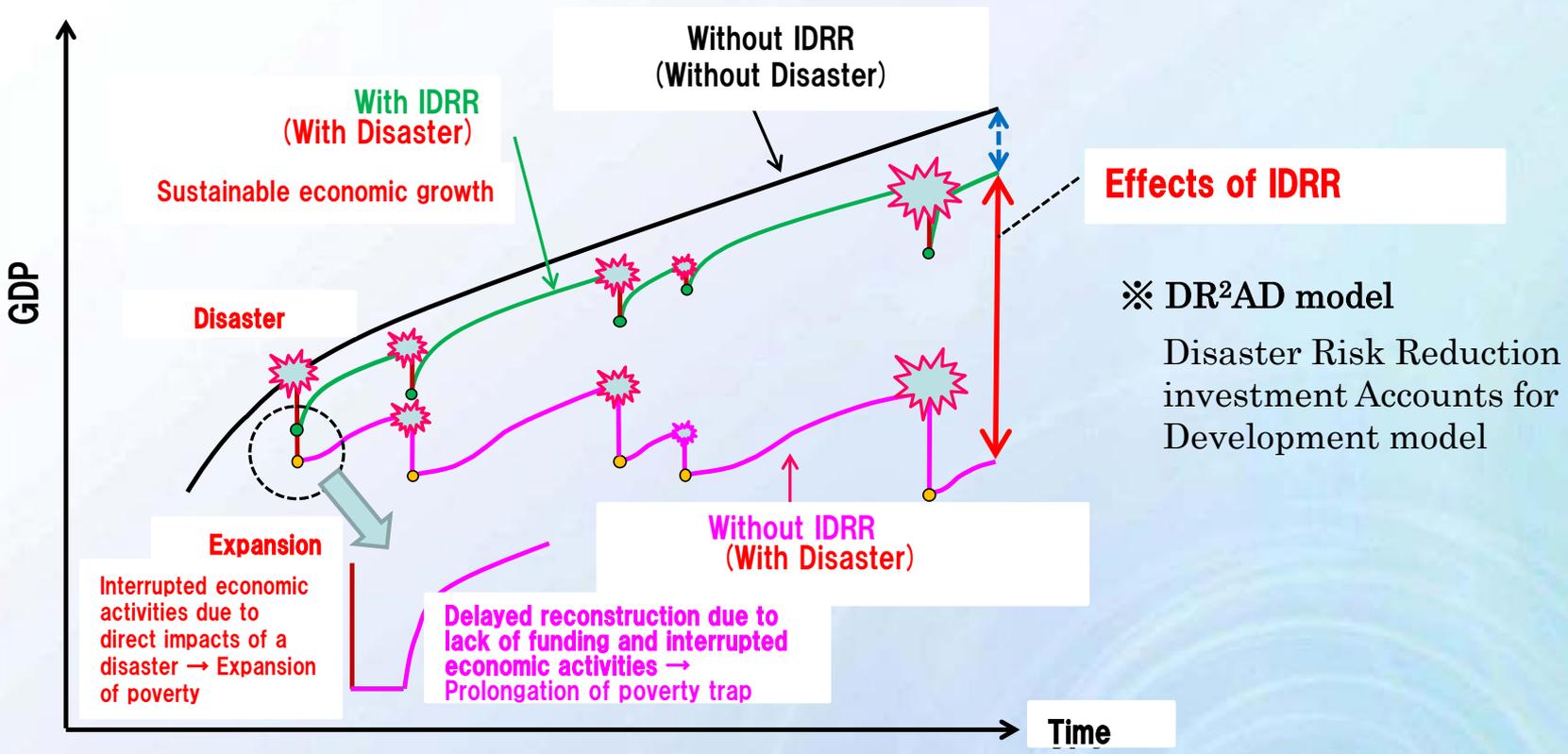
- **The course of events for mainstreaming disaster prevention**
- **Demonstrating the effectiveness of ex-ante investments in disaster prevention**
 - Necessity to introduce the model for analysis of disaster prevention investments
- **Promotion of the countermeasures that anticipate multi-hazard threats**
 - 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



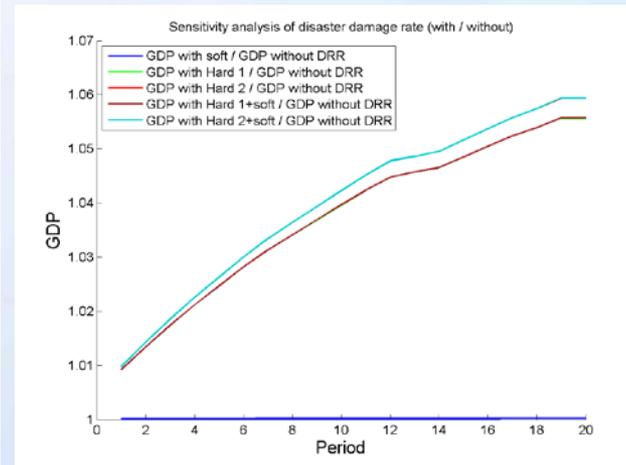
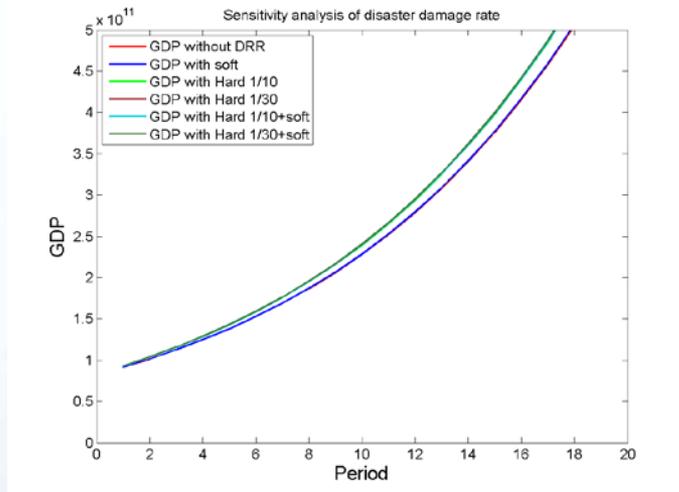
Demonstrating the effectiveness of ex-ante investments in disaster prevention (1)



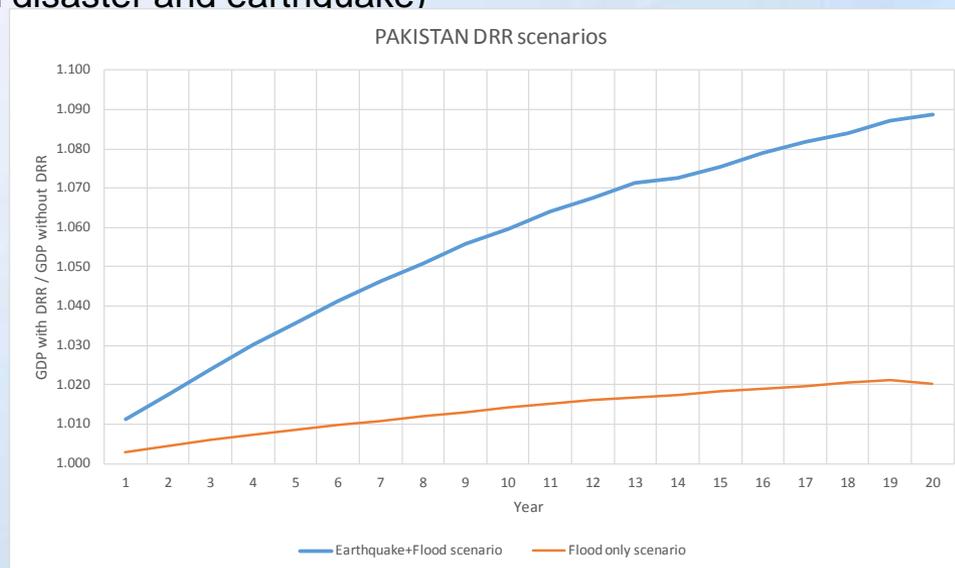
- ① Expressing the difference in economic growth with presence and absence of IDRR
- ② Expressing the changes in social structure following IDRR

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

