UNFCCC Expert Meeting

Assessing Risk of Loss and Damages from Adverse Effects of Climate Change

26 March 2012

Nobuo Mimura
Institute for Global Change Adaptation Science (ICAS)
Ibaraki University

Contents of Presentation

1. Occurring climate change impacts

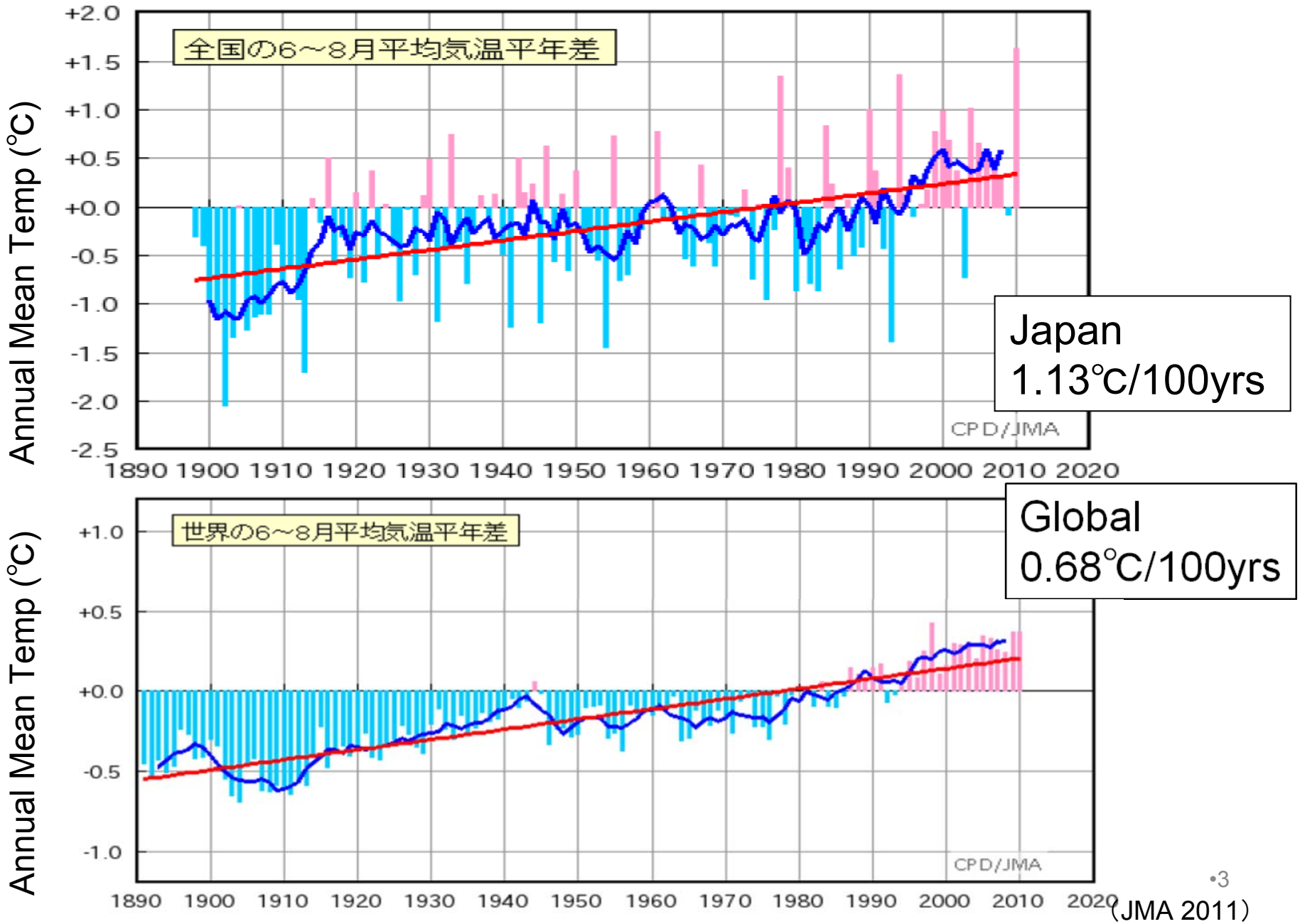
2. Why is assessing loss and damages needed?

3. Approaches in two directions

4. How to combine the risk information with responses -Wise adaptation approach

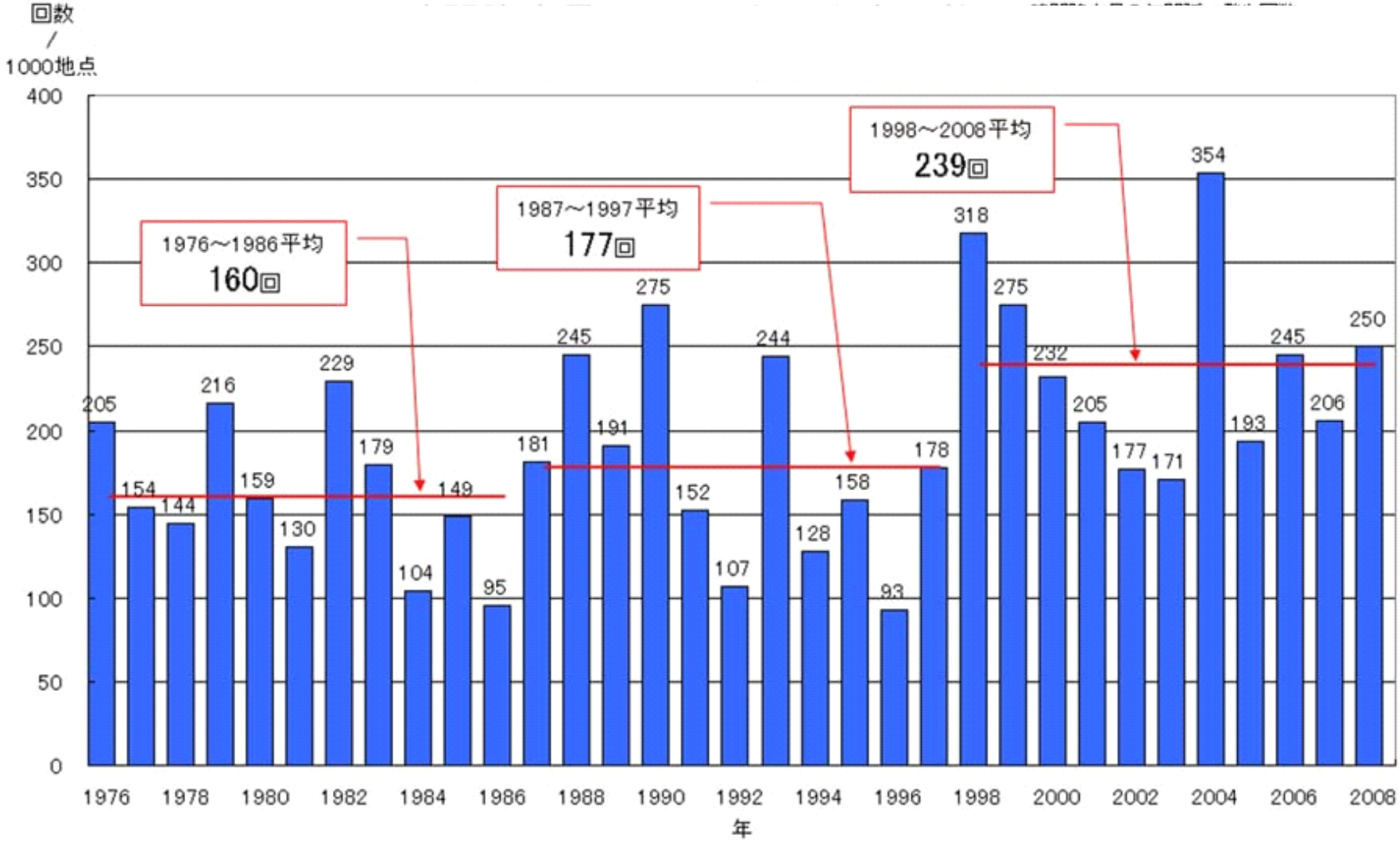
5. Summary

1. Occurring Climate Change Impacts



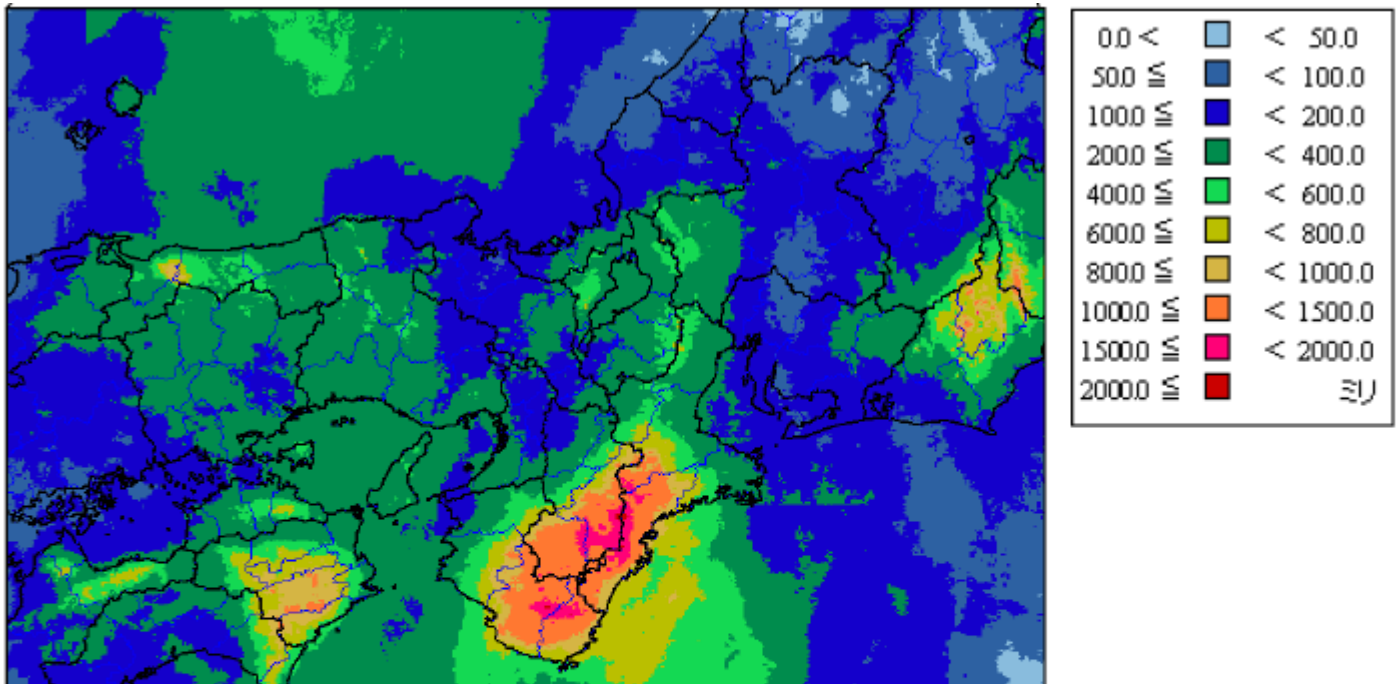
(JMA 2011)

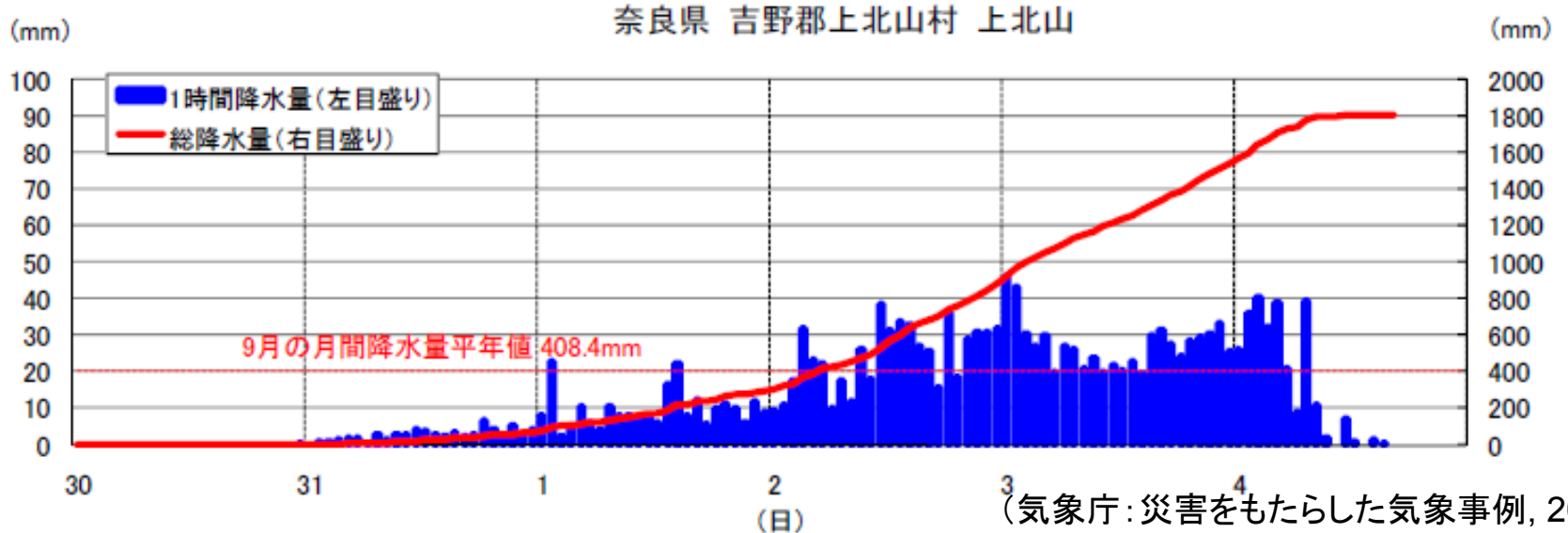
Increased Frequency of Heavy Rainfall
（over 50mm/h）



（気象庁：気候変動監視レポート2009）

Record High Rainfall due to Typhoon No.12 in 2011



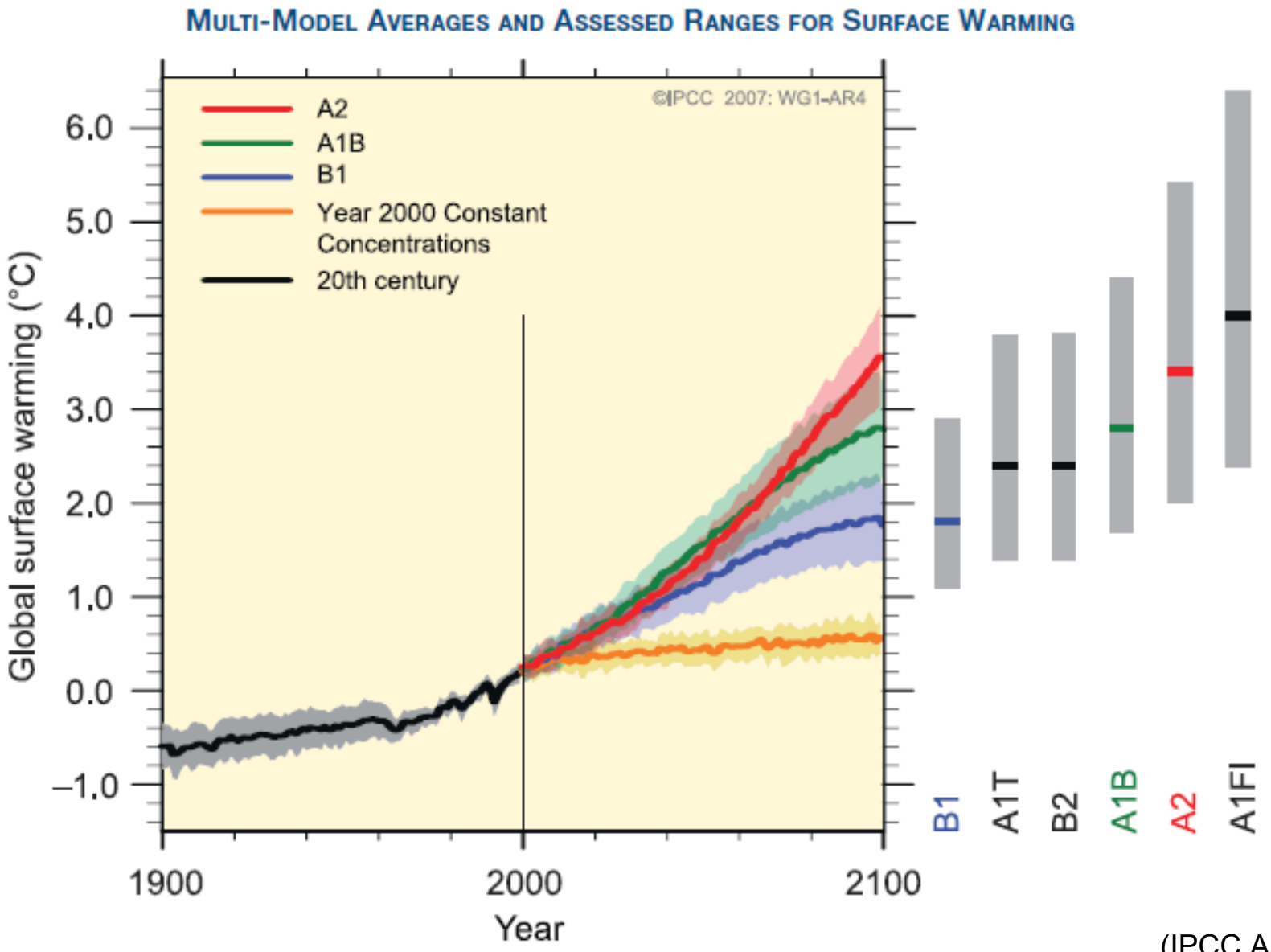


(気象庁:災害をもたらした気象事例, 2011)

Heavy Rain Disasters in 2010 and 2011

(毎日新聞Web, 2010;
地盤工学会等合同調査団,2011)

Climate Change Projection



(IPCC AR4, 2007)

2.Why is assessing loss and damages needed?

1. Effects of climate change has been experienced. Even if climate stabilization target is achieved, proceeding of CC to a certain extent will be inevitable.

2. Many developing countries are not safe even for today's climate risks, such as floods, droughts, landslides etc. Given the future projection, risks associated with CC will be higher especially in these countries.

3. Effects of CC impacts will be exacerbated or modified though interactions with other future risks, including natural disasters, ecosystem change, population growth and aging trend etc.

4. Our target is how to avoid, reduce and mitigate the adverse CC impacts.
To this end, assessing the risks of loss and damages of CC is a key component to motivate and design the responses to CC.

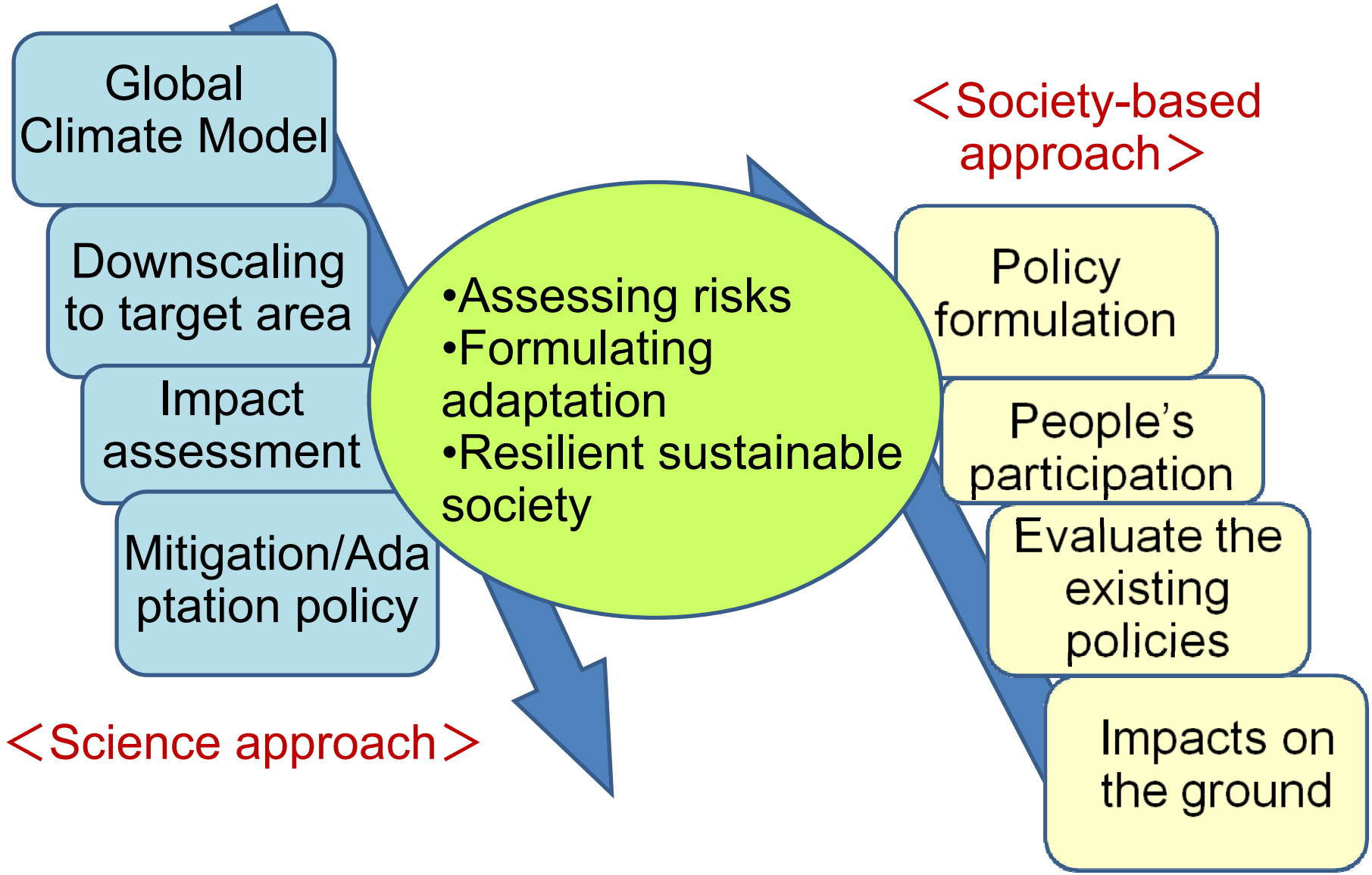
New Role of Assessing Loss and Damages
(Impact/Vulneraility assessment)

1. Global assessment of climate change impacts
   - Understanding the extent and degree of the impacts in a global scale as a foundation of climate policy
   - These pictures have been given by IPCC

2. Adaptation planning and implementation
   - The extent and degree of of climate change are different with locations and time.
   - Geographical, social and cultural settings are also different with locations (exposure and vulnerability).

→ requested assessment of loss and damages are in national, sub-national and local scales.

3. Approaches in Two Directions

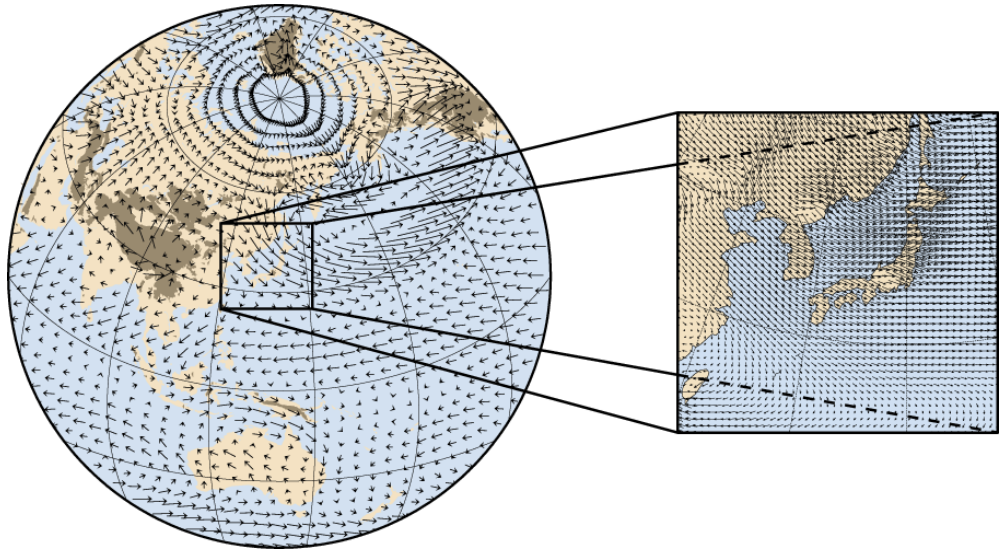


Components of Science Approach

GCMs(Climate Models)

Downscaling

1) Dynamic downscaling
2) Statistical downscaling
3) Direct calculation



Impact models

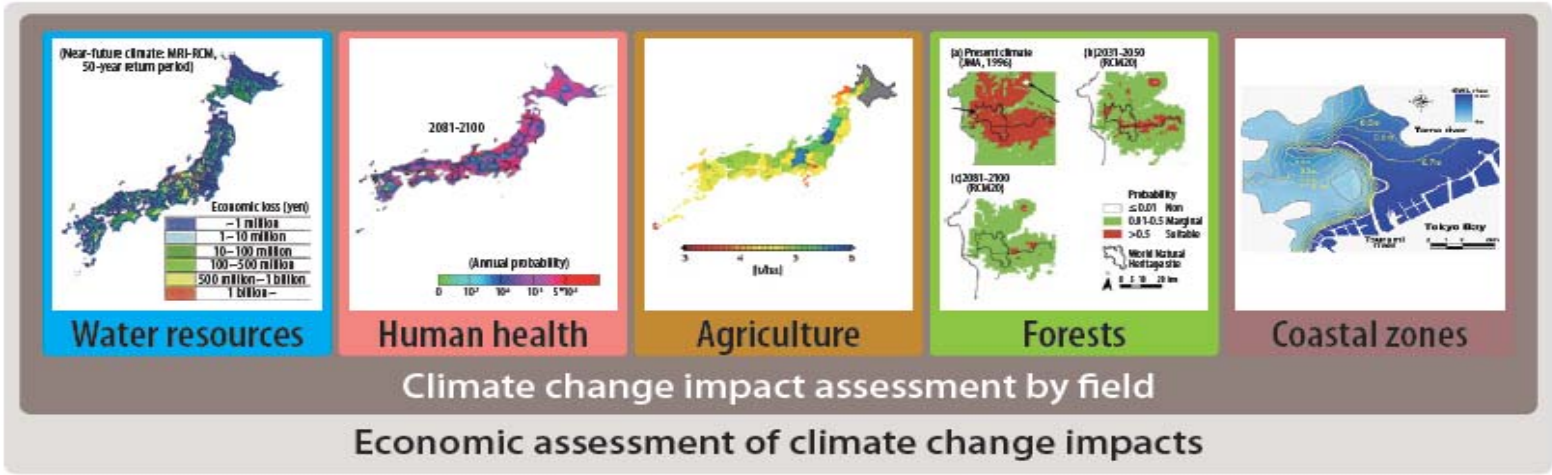
1) Models for physical impacts
2) Measures for economic impacts
3) How to incorporate the changes in society
4) Effects of adaption

Assessment of the risk of loss and damages

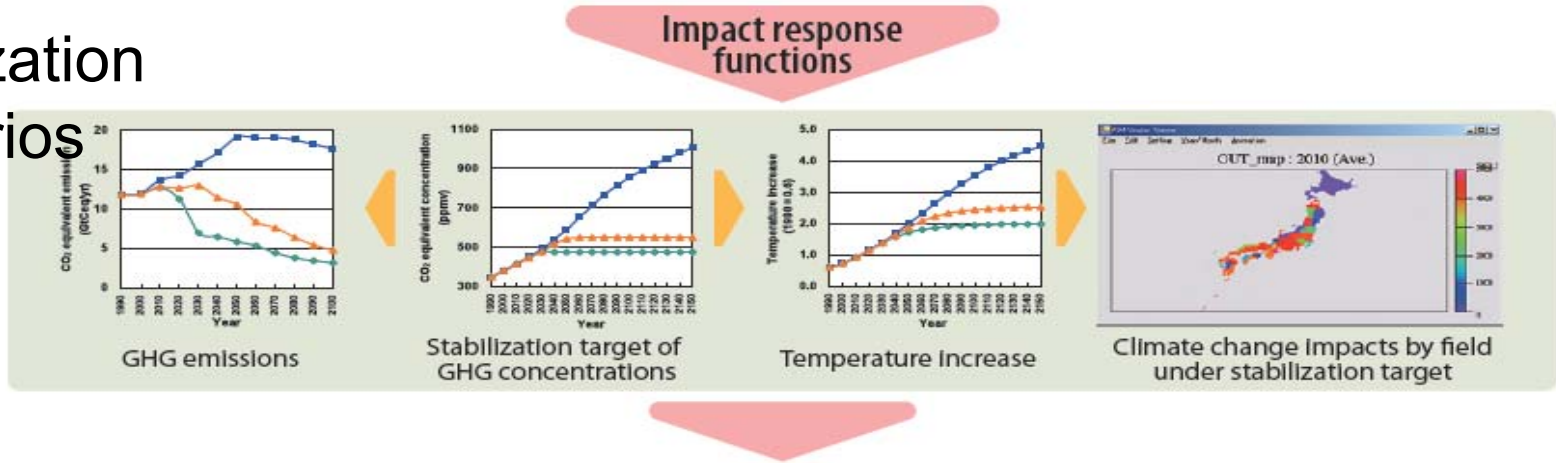
Adaptation planning

Comprehensive Assessment in S-4 and S-8

Target Areas



Stabilization Scenarios

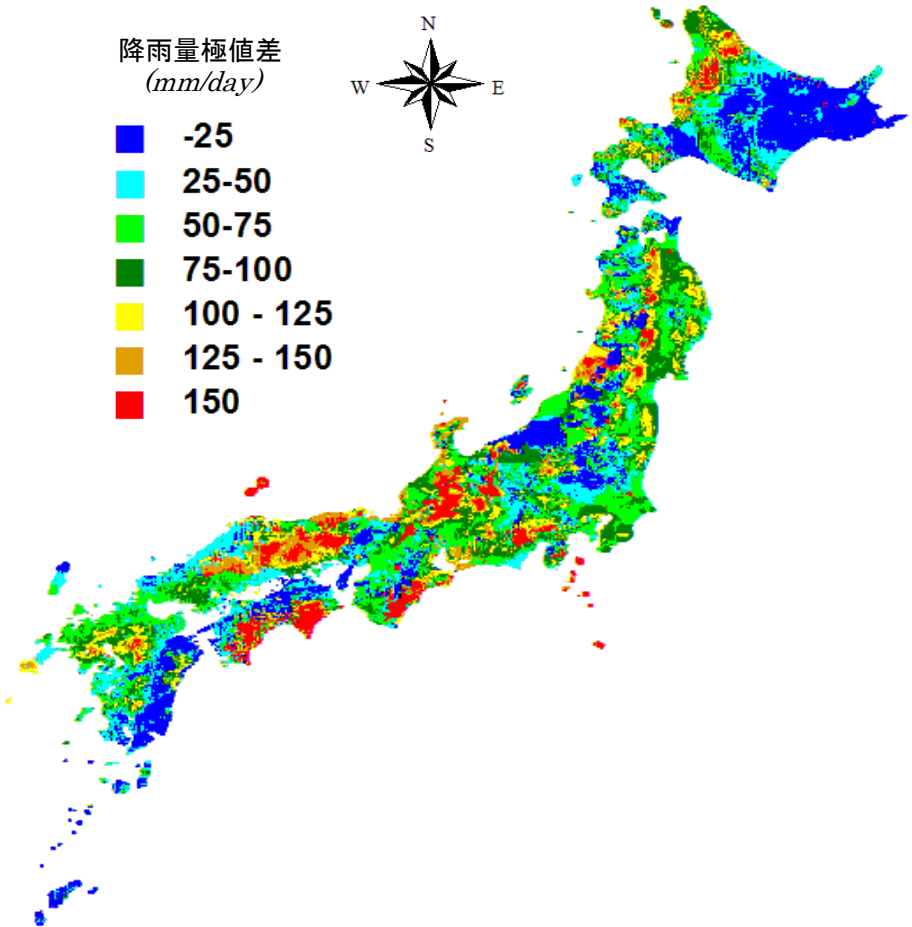


- Distribution of damages
- Damage costs for different emission pathways
- Foundation for national CC policy

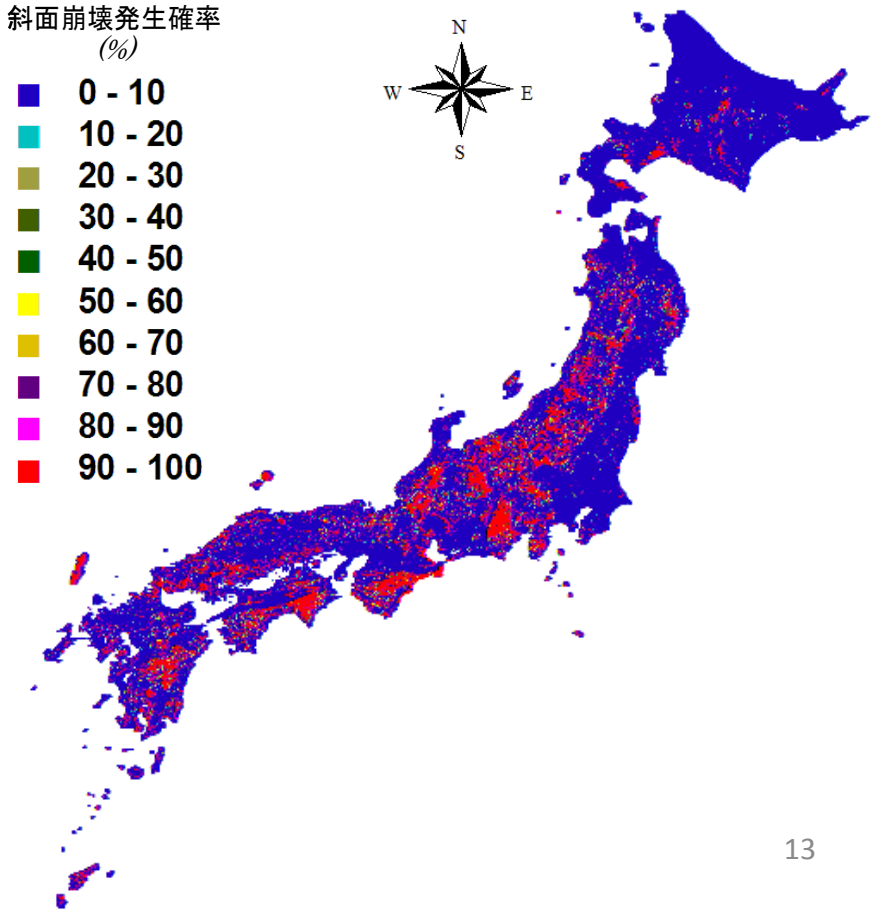
Distribution of Disaster Risks

Changes in Precipitation In 2030

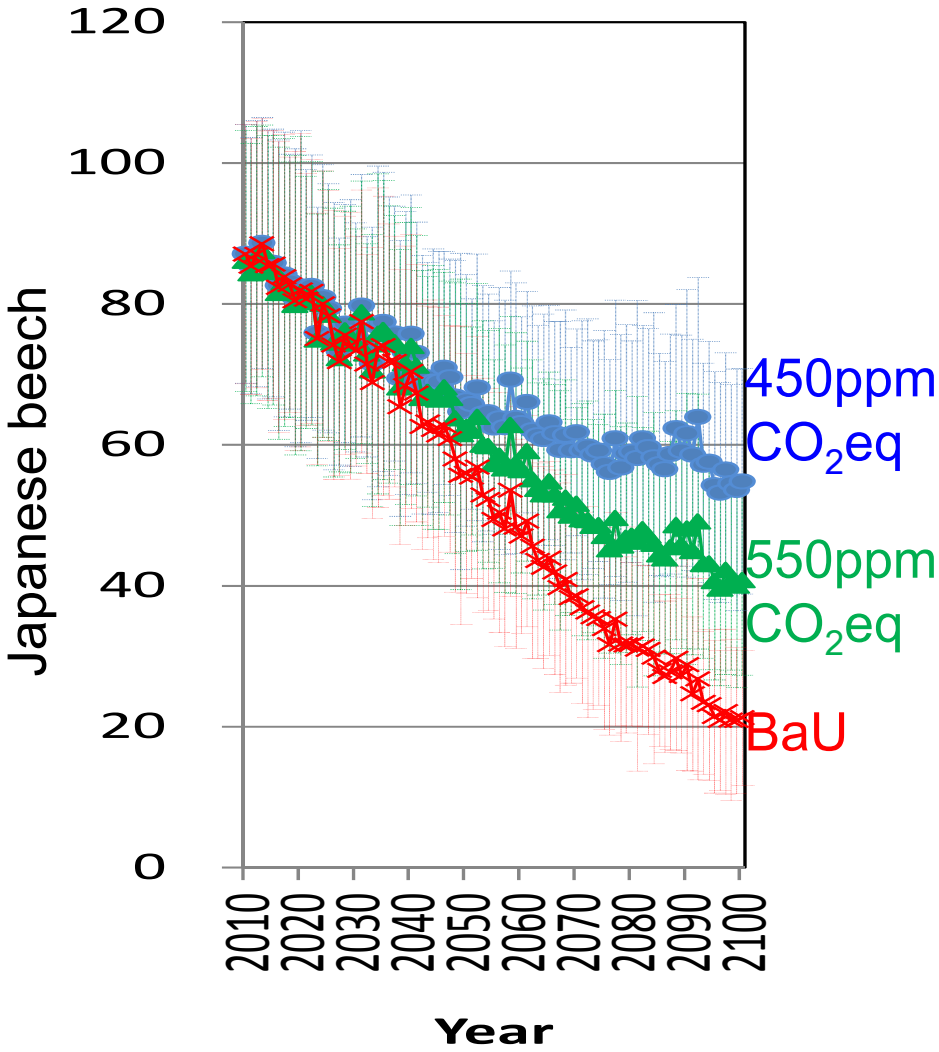
- 1/50 present becomes 1/30

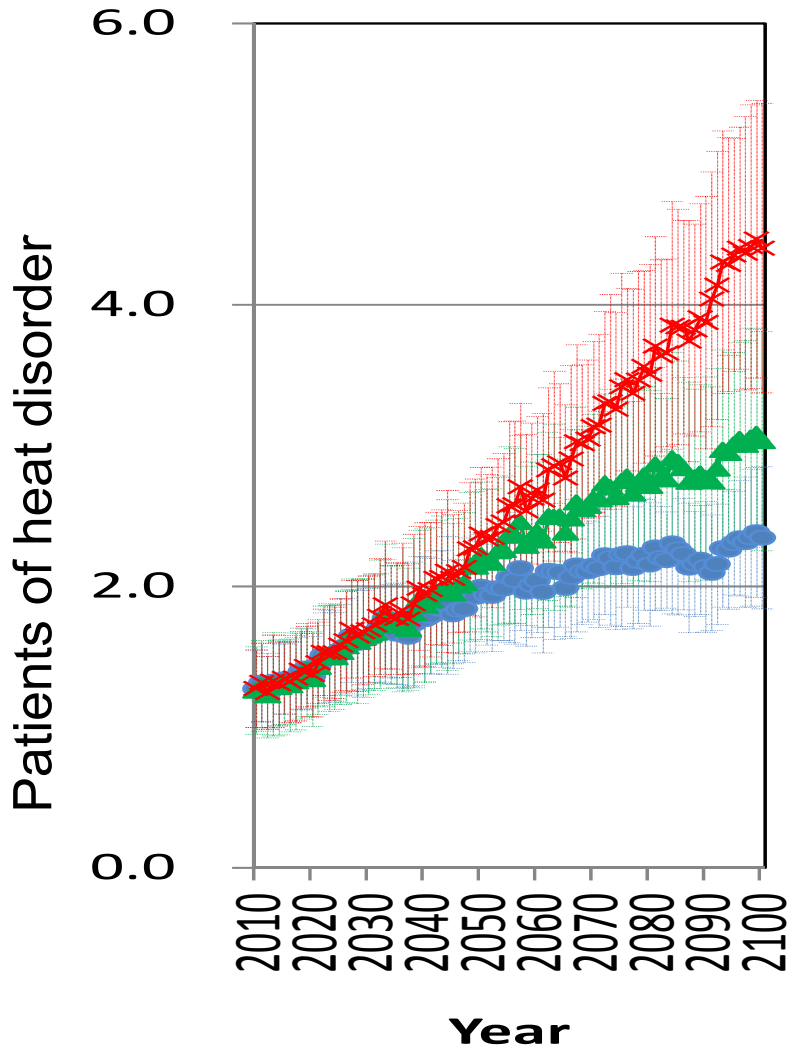


Increased land slide probability in 2050



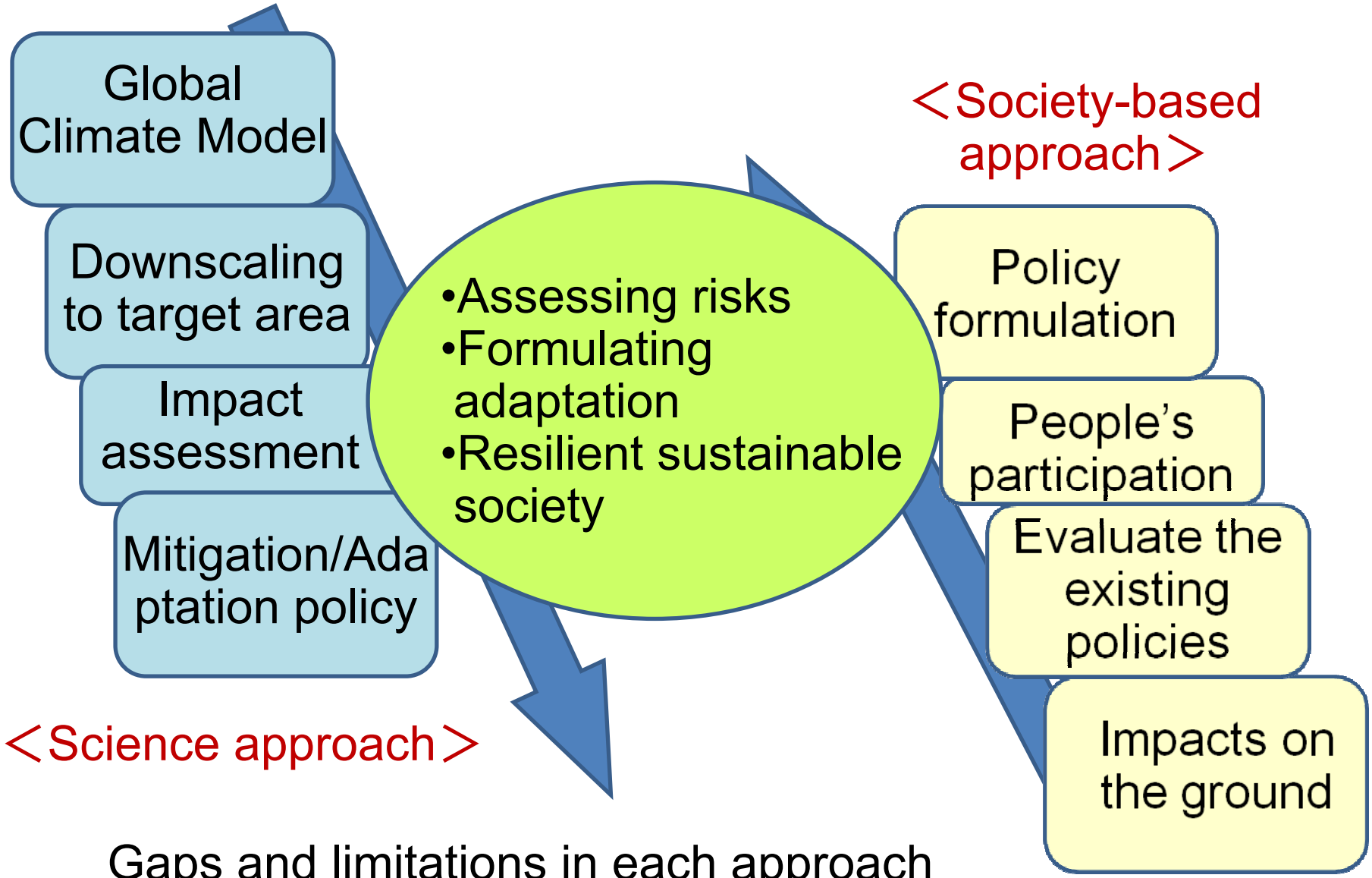
Range of Impacts due to Climate Models -Japanese Beech and Heat Disorder





(From Dr Hijioka, NIES)

Approaches in Two Directions



Gaps and limitations in each approach

4.How to combine the risk information with responses - Wise adaptation approach

- How to plan adaptation under uncertainties in climate projection, effects of mitigation, social changes etc?
- Introduce effective, efficient, flexible adaptation.

- Short-term and long-term planning

1) Short-term adaptation
   - respond to occurring climatic extremes e.g. DRM
   - monitoring/early warning, evacuation, rehabilitation
   - strengthen the existing policies and institutions
   → "real time adaptation"

2) Long-term adaptation
   - flexible adjustment of adaptation planning
   - incorporate the latest scientific information and GPs
   → "adaptive adaptation"

5. Summary

1. Impacts of climate change has already been occurring. More significant impacts are estimated for the future.

2. Our target is how to avoid, reduce and mitigate the adverse CC impacts. To this end, assessing the risks of loss and damages of CC is a key component to motivate and design the responses to future CC.

2. Short-term
For a framework and guidelines for the loss and damages assessment, multiple measures of both science and society-based approaches should be used.

3. Medium- and long-term
Develop of the own capacity to monitor the occurring changes and project future risks of loss and damages is essential. To this end, human resources is a key factor.
In the present practice under Cancun Adaptation Framework, participation and education should be emphasized. Formal education such as universities are also strengthened.

Thank you very much.