

Regional impact assessment in Japan

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Presentation outline

1. Comprehensive Research on Climate Change Impact Assessment and Adaptation Policies (**S-8** project)

- New development of AIM/Adaptation[Policy]
- Collaboration with CRIEPI

2. Project of Climate Change Impact Assessment in **Tokyo**

Toward to Adaptation

-Japanese Research activities-

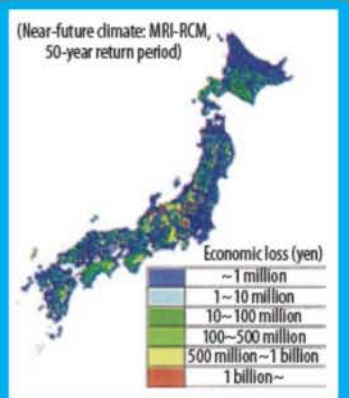
- **Environment Research & Technology Development Fund “S-8”**
 - **Ministry of Environment**, FY2010-14, **12** sub-teams, Assessment of climate change impacts and adaptation strategy on whole Japan and local government
- **Research Program on Climate Change Adaptation**
 - **Ministry of Education, Culture, Sports, Science and Technology**, FY2010-14, **12** programs, downscaling, assimilation, simulation for CC adaptation
- **Special Coordination Funds for Promoting Science and Technology**
 - **Japan Science and Technology Agency**, FY2010-14, **4** programs, Reform program for generating new social systems adapted to climate change
- **Development of mitigation and adaptation technologies to address global warming in the agriculture, forestry and Fisheries**
 - **Ministry of Agriculture, Forestry and Fisheries**, FY2010-14 , **7** programs

Environment Research & Technology Development Fund “S-8”

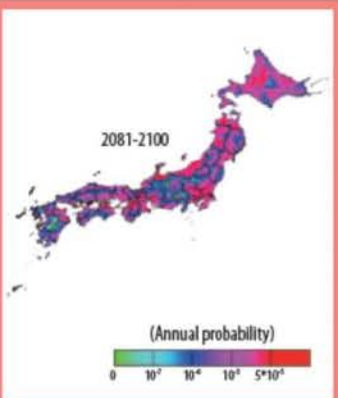
- **Ministry of the Environment**
- Targeted area : **Whole** and **regional** area in **Japan** and **Asia-Pacific region**
- Targeted fields: **Water resources, forests, agriculture, coastal zones, human health**
- Research period:
 - Period I (**2010**-2012) + Period II (20013-**2014**)
- Project leader: **Nobuo MIMURA**, Ibaraki University
- Number of sub-themes: **12**
 - Impact assessment in whole Japan: **9**
 - Impact assessment in Japanese regional area: **2**
 - Impact assessment in Asian developing countries: **1**

Objectives of S-8 project

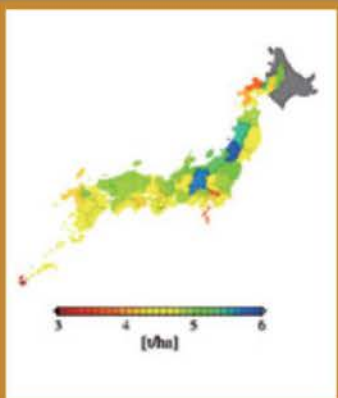
- To assess climate change **impact assessment** focusing on **whole Japan** under different GHG concentration stabilization scenarios and adaptation strategies
 - Utilization of **new climate scenario** with high accuracy and resolution
 - Development of advanced model for assessment of climate change impacts and **adaptation strategy**
- To develop a planning method for **adaptation strategy** focusing on **Japanese local government and developing countries in Asia-Pacific region**
 - Development of **simplified tool** to assess the impacts of, and vulnerabilities and adaptation to, climate change
 - Consideration of **uncertainty** in the assessment



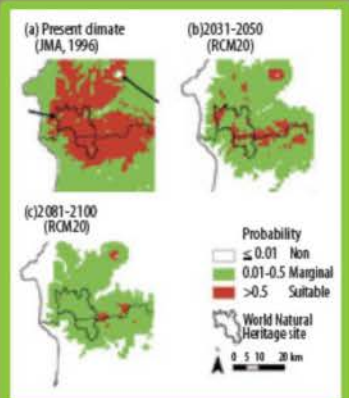
Water resources



Human health



Agriculture



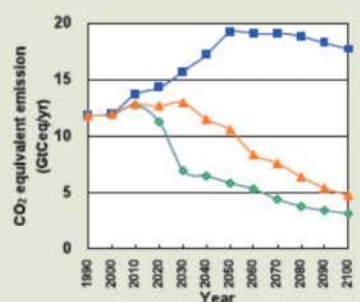
Forests



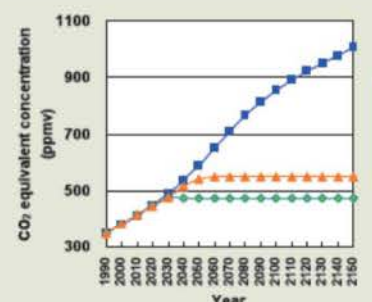
Coastal zones

Climate change impact assessment by field
Economic assessment of climate change impacts

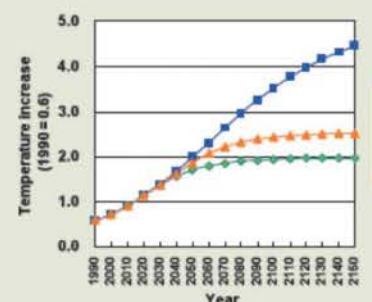
Impact response functions



GHG emissions



Stabilization target of GHG concentrations



Temperature increase



Climate change impacts by field under stabilization target

Transmitted effect: Contribution to S-6, IPCC, UNFCCC, and Post-Kyoto Protocol

Socio-Economic Scenarios

Climate Scenarios

【Theme 1】 Research on highly reliable quantitative assessment of climate change impacts throughout Japan



Climate Scenario downscaler

Economic assessment

Integrated assessment model

Simplified assessment method

Regional assessment method

Feedback from local government

Feedback from developing country

【Theme 2】

Research on impact assessment and comprehensive adaptation policies at the local government level



Local government consortium

【Theme 3】

Research on indexes of vulnerability and adaptation effects in the Asia-Pacific Region



Various impact and adaptation studies in the Asia-Pacific region

Transmission of research results to domestic and international policymaking

AIM/Adaptation[Policy]

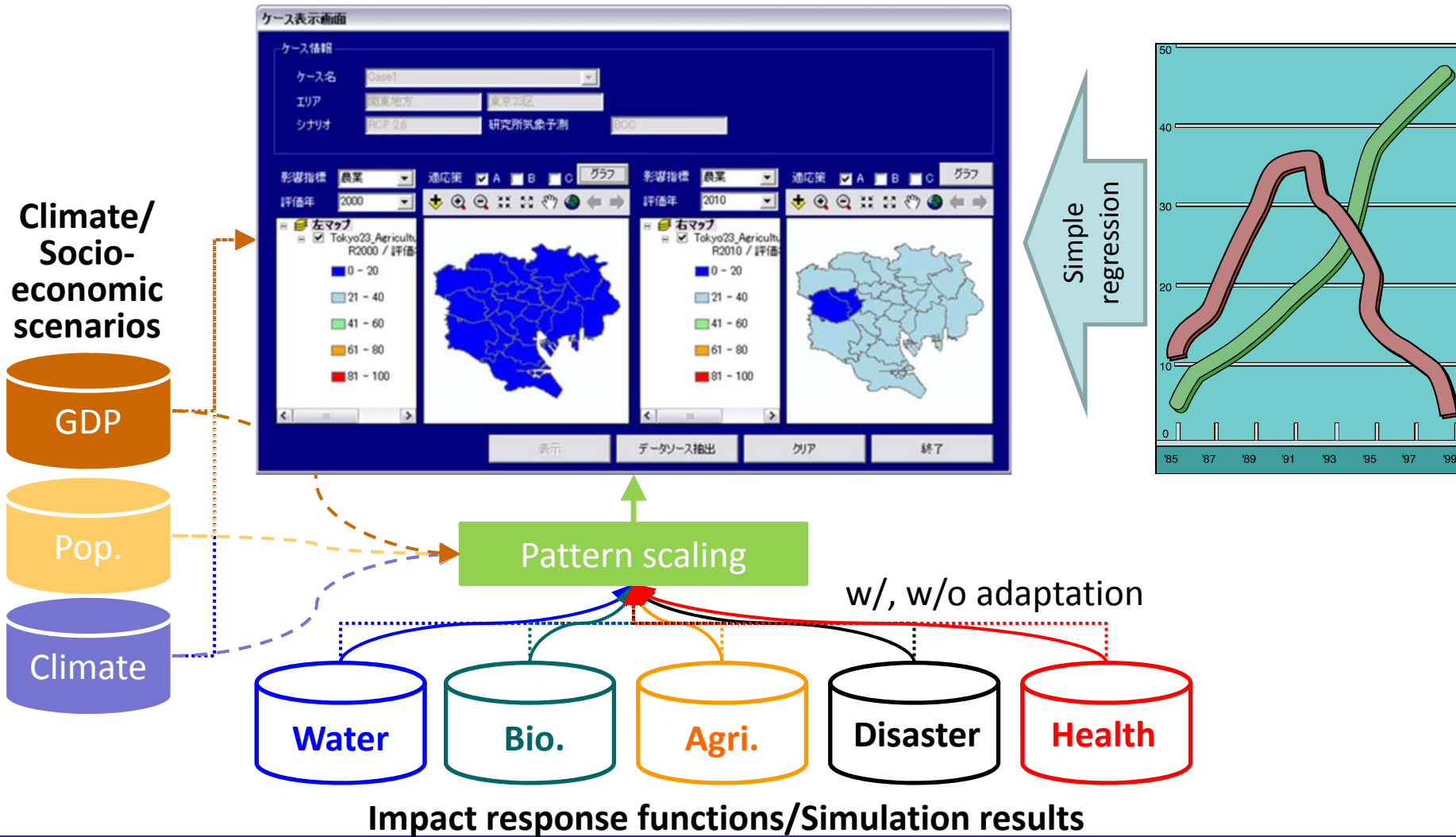
- **AIM/Impact[Policy]**

- Objective: To assess levels of impacts and effects of adaptation measures according to different climate stabilization levels and adaptation policies.
- Energy-economic model + Simple climate model + Climate scenario database + Impact response functions + User interface
- Country-wise in global, prefectural level in Japan

- **AIM/Adaptation[Policy]**

- Objective: To integrate research outcomes by other teams in S-8
- Database type tool including socio-economic scenarios, Climate scenarios, Results of impact assessment
- Prefectural and municipal levels.

AIM/Adaptation[Policy]



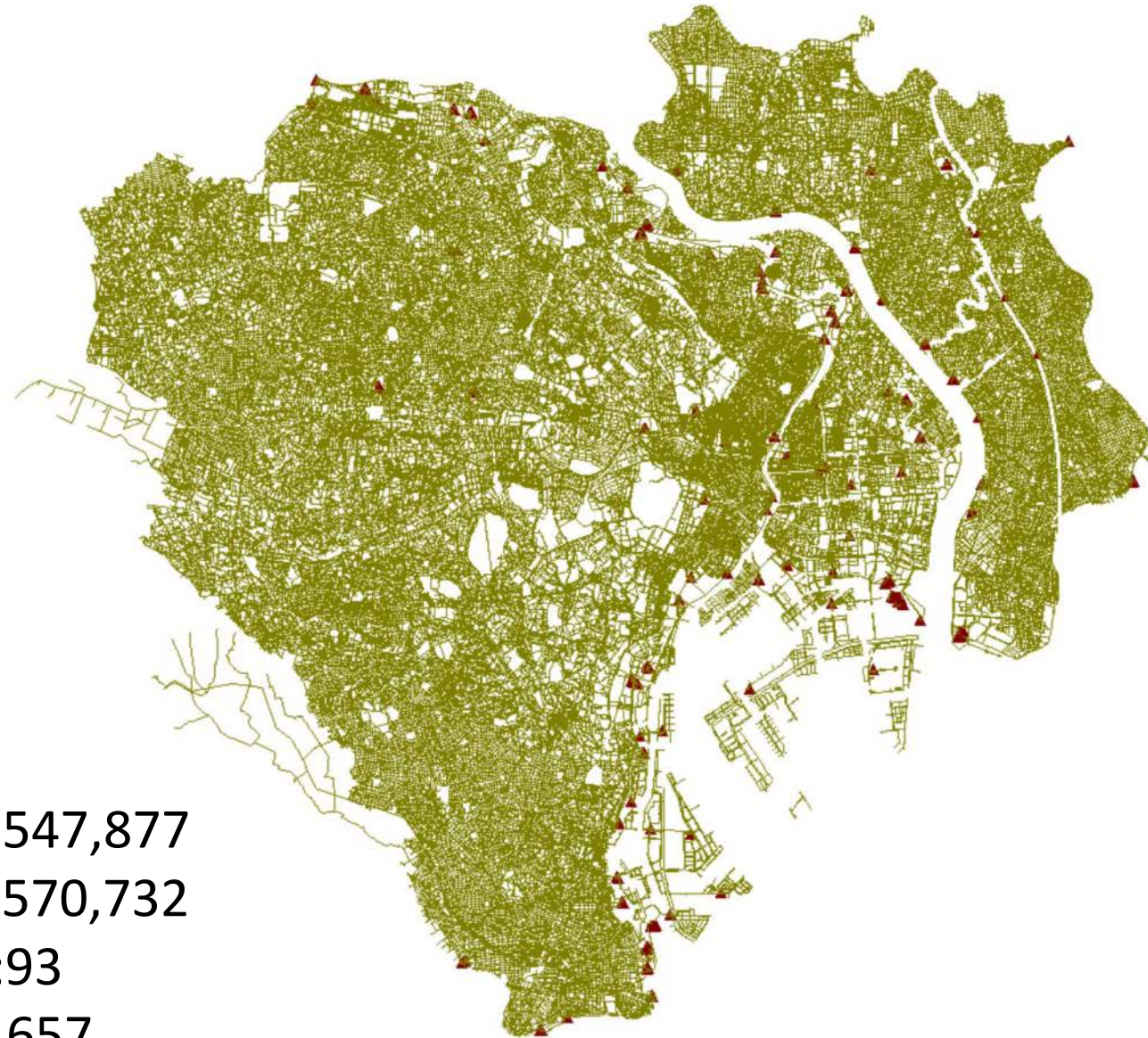
Collaborative research with CRIEPI

- Collaboration with an S-8 research group in Central Research Institute of Electric Power Industry
 - Started from October 2010 –
- Objective
 - **Expert mental models** on the climate change risks and risk management covering scientific knowledge to the adaptation practice
 - **Structure of stakeholders** based on expert perspectives
 - **Considerable factors**, which obstruct or facilitate the adaptation practice
- Method
 - **Individual interviews** to 10 multidisciplinary experts: climate change impacts research in agricultural production, economics, engineering, policy, and so on
 - **Influence diagram** which summarize the relevant expert knowledge
- Status
 - **Individual interviews** --- finished
 - **Preliminary data classification** --- finished
 - **Developing the influence diagram of expert perception**

Project of Climate Change Impact Assessment in Tokyo

- To assess climate change **impact assessment** focusing on **whole administrative area of Tokyo**
 - Utilization of **new climate scenario** with high resolution
 - Development of advanced model for assessment of climate change impacts
- Research period: 2009.11-2012.3
- Targeted fields: **Water resources, forests, disaster, human health**
 - Water resources: quantity, quality
 - Forests: *F. crenata*, Conifer tree species, Japanese cedar
 - Disaster: River flooding, Inundation by sewer system, Land slide failure, Tidal flood
 - Health: Heat stress, Heatstroke, Air pollution, Infection diseases

Modeling of sewer networks in Tokyo



Manhole:	547,877
Sewer:	570,732
Pumping station:	93
Pump:	657

Future Plan

- ERTDF S-8
 - Distributing AIM/Adaptation[Policy] (ver. 1) to the researcher in the S-8
 - Coordination of Climate Scenarios and Socio-economic scenarios watching the progress of CMIP 5 and SSPs
- Finishing the impact assessment project in Tokyo