



Japan's work on methods and approaches for assessing adaptation, adaptation co-benefits and resilience in the context of the Koronivia joint work on agriculture

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Outline

Guiding questions

1. What methods and approaches do you use and apply when assessing adaptation...in projects that you support, as relevant to the Koronivia joint work on agriculture (KJWA)
2. Based on your experiences, what challenges, opportunities and lessons learned does your organization see are relevant in relation to advancing work on methods and approaches for assessing ... in the context of KJWA?



1. Climate change adaptation act (2018) of Japan
2. Example of scientific method/approach
3. Challenges, opportunities and lessons learned
4. Summary of “Agriculture is the solution! for climate change” symposium in Japan



Climate Change Adaptation Act (June 2018)

English translation of the Act

<http://www.japaneselawtranslation.go.jp/law/detail/?ft=1&re=01&dn=1&x=0&y=0&co=01&ia=03&ky=adaptation&page=1>

1. Comprehensive Adaptation Programme

- Set up clear roles of national and local governments, private sectors, and citizens to promote climate change adaptation efforts.
- National government shall formulate **National Adaptation Plan (NAP)** to promote adaptation in all sectors. The national government should develop methodologies for monitoring and evaluation (M & E) of the progress of adaptation efforts.
- MOE shall implement **climate change impact assessments, every 5 years**. The NAP needs to be revised accordingly.

Promotion of effective adaptation measures in various fields through reliable scientific information

Agriculture, Forestry, Fisheries

Human Health

Water Environment and Resources

Industries and Economic Activity

Natural Ecosystems

Life of Citizens

Natural Disasters

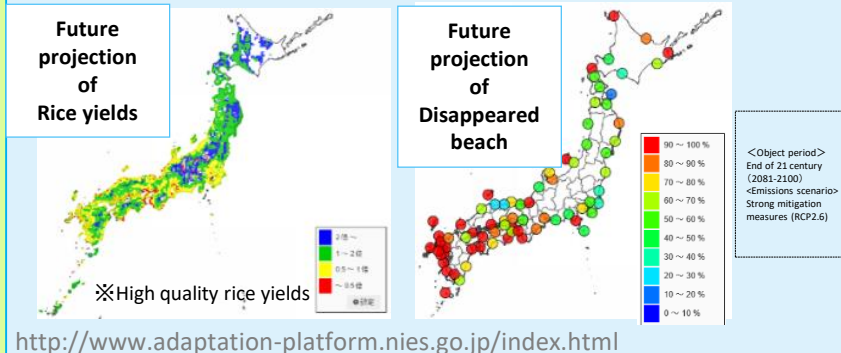
Based on scientific findings of future impact projections ...

- Develop agricultural products with high-temperature-resistant varieties
- Set up fishing grounds based on the changes of fish distribution.
- Maintain embankment and flood control facility.
- Develop flood risk maps.
- Promote heat illness prevention measures.

2. Information Platform

- The National Institute for Environmental Studies (**NIES**) operates Climate Change Adaptation Platform (**A-PLAT**) as center of excellence.

Example of the main contents of A-PLAT



3. Adaptation in Local Areas

- Local governments (Prefectures and municipalities) are asked to formulate **Local Climate Change Adaptation Plans**.
- Prefectures and municipalities should assign **Climate Change Adaptation Center** as a local climate change data collection and provision center.
- Local stakeholders can organize **Regional Councils** to promote adaptation measures locally in a cooperative manner.

4. International Actions and Business

- Promote International cooperation.
- Promote adaptation business.

Source: MOE

(1) Basic Direction of Climate Change Adaptation Policy in Japan

Objective

Prevention/reduction of Climate-related impacts



- Stabilization of people's life
- Sound development of society & economy
- Preservation of Natural environment

Society ensuring safety, security and sustainability

Period

Planning for next 5 years considering long-term perspective until the end of 21st century

Role & Responsibility of each actor

National government

- To promote the various actors' adaptation in each subject

Local government

- To promote adaptation policies in local area

Business

- To introduce adaptation action in each business sector

Citizens

- To take adaptation action

The National Institute for Environmental Studies (NIES)

- To develop information infrastructure
- To provide technical support for local authorities

Key strategies

1 Mainstreaming adaptation into government policies

2 Promotion of the Climate Change Adaptation based on scientific findings

3 Gathering information/knowledge from researchers and institutes and developing information infrastructure

4

Promotion of adaptation considering local background

5

Deepening understand of people and promoting adaptation action in each business sector

6

Contribution for capacity enhanced in the developing countries

7

Securing close relationship and collaboration among the relevant government agencies

Progress management

Climate Change Impact Assessment

- Submission to the Central Environment Council
- Assessment by 2020

Progress Management of NAP

- Follow-up every year by PDCA cycle

Development of Evaluation Method

- Grasp of effectiveness to bluish up the method

Climate Change Impact Assessment

Development of Evaluation Method

Plan

Action

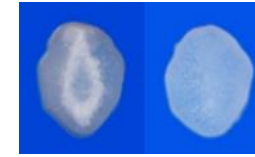
Check

Do

Source: MOE³

Paddy Field Rice

- Reduction in rice quality due to high temperature
- The ratio of first-grade grains will decrease without introduction of high-temperature-tolerant cultivars



The section of white immature grain(Left) and normal grain(Right)



High-temperature-tolerant cultivars "Koi-no-Yokan" (Hiroshima pref.)

- Development of cultivars of agricultural crops and prevail which can adapt to global Warming
- Thoroughness of recommended watering & fertilization management

Fruit Trees

- Poor coloring of apples and grapes, peel puffing and sunburn of satsuma mandarin oranges, poor sprout emergence of Japanese pears
- Possible moving northward of suitable production area for the production of satsuma mandarin oranges and apples year by year due to climate change



Poor coloring of apples



peel puffing of satsuma mandarin oranges

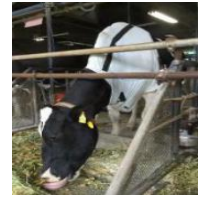
- Introduction of superior colored varieties and yellow-green-colored varieties(e.g. apples, grapes, etc.)
- Switch to medium late ripening citrus fruits (such as blood orange) which are suitable for global warming instead of "Satsuma Mandarin Orange"



The fruits preferring the high-temperature (blood orange, Ehime pref.)

Livestock Farming

- Decrease in milk yields, milk constituent and reproductive performance of dairy cows due to high temperature
- Decrease in the rate of meat gain of beef cattle, pigs, and chickens
- Summer growth depression and insect damages of forage crops due to high temperature and low rainfall



Heat measures by development of livestock closing(Kyoto pref.)

- Dissemination of summer heat measures such as ventilation and misting in the livestock barn
- Development of technologies for productivity improvement and prevention of decline rate of weight gain (e.g. adequate nutrition management, etc.)
- Establishment of a cultivating system & variety improvement of forage crops adapted to high temperature and low rainfall

Agricultural Infrastructure

- Tendencies toward fluctuation of annual average precipitation and increase of sudden heavy rainfall
- Influences on the utilization of water resources, such as changes in rice cropping season and water management
- Possibility of increasing risk for farmland flooding due to intensity of torrential rainfall



Farmland flooding by torrential rainfall

- Enhancement of function for disaster prevention & reduction in rural areas by appropriate combination of integrated measures both for hard & soft infrastructures (e.g. drainage pumping stations/canals, risk assessment, hazard map formulation, etc.)

(2) ①-3 Basic Directions for Measures in Each Sector (Agriculture, Forest/Forestry, Fisheries)

Source: Ministry of Agriculture, Forestry and Fisheries, Japan, etc.

Forest/Forestry

- Occurrence of driftwood disaster caused by the hillside collapse exceeding the functions of forests to prevent mountain disasters
- Potential for increasing risk of the mountain disasters such as hillside collapse, debris flows caused by an increase in the frequency of occurrence of heavy rainfalls
- Potential for increasing unsuitable area for growing planted cedar forests in regions with low rainfall



Large mountain disaster by heavy rain

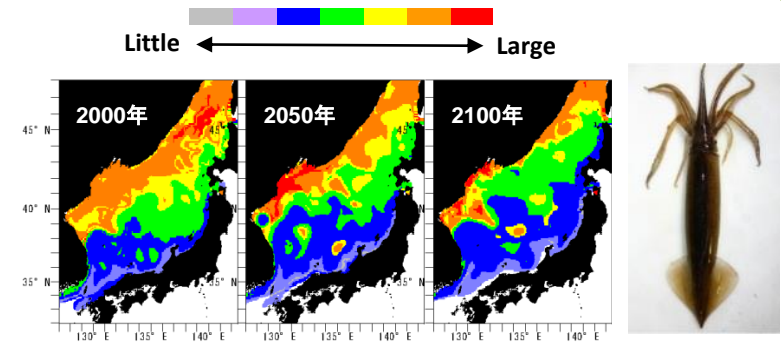


Dead cedars by dry air

- Prevention of mountain disasters by promoting implementation of forest conservation facilities and forest management works
- Research and studies on climate change impacts on forests and forestry industry

Fisheries

- Increase of yellowtails and Japanese Spanish mackerels and decrease of Japanese common squids in the Sea of Japan
- Possibility of increase of the southern species and decrease of the northern species
- As for cultured laver, decrease of annual crop yields in some regions due to delay in seeding
- Possibility of marine production decrease



Prediction of distribution of squid in the Sea of Japan(July)

- Marine environmental surveys in spawning sea areas and the major fishing grounds, and estimation and prediction of fisheries resources
- Development of high-water-temperature-tolerant breeds for aquaculture

Method for assessing climate change adaptation and impact

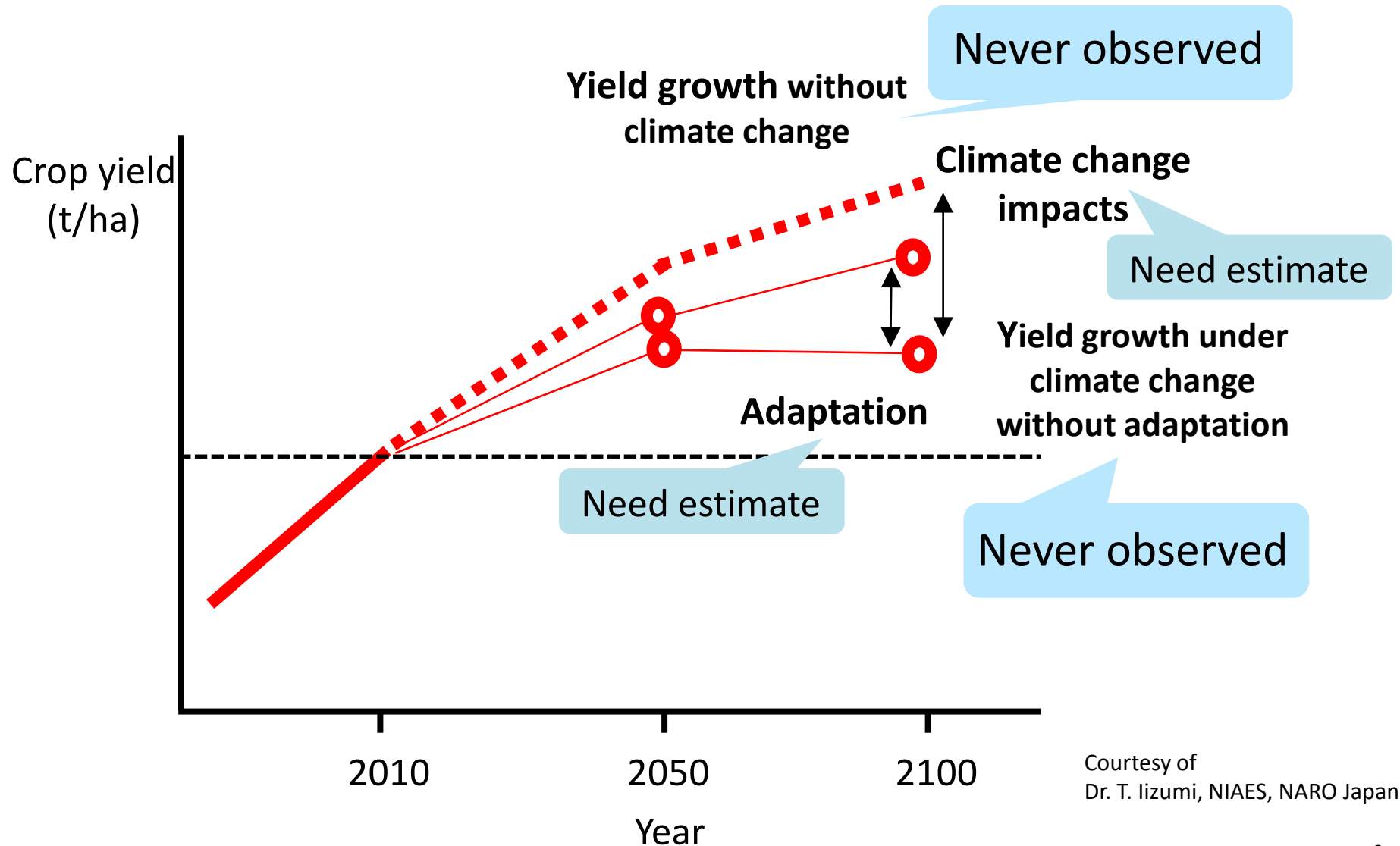
An example from Japan's submission topic 2(b)

“Assessment of crop production losses associated with relevant climate change”

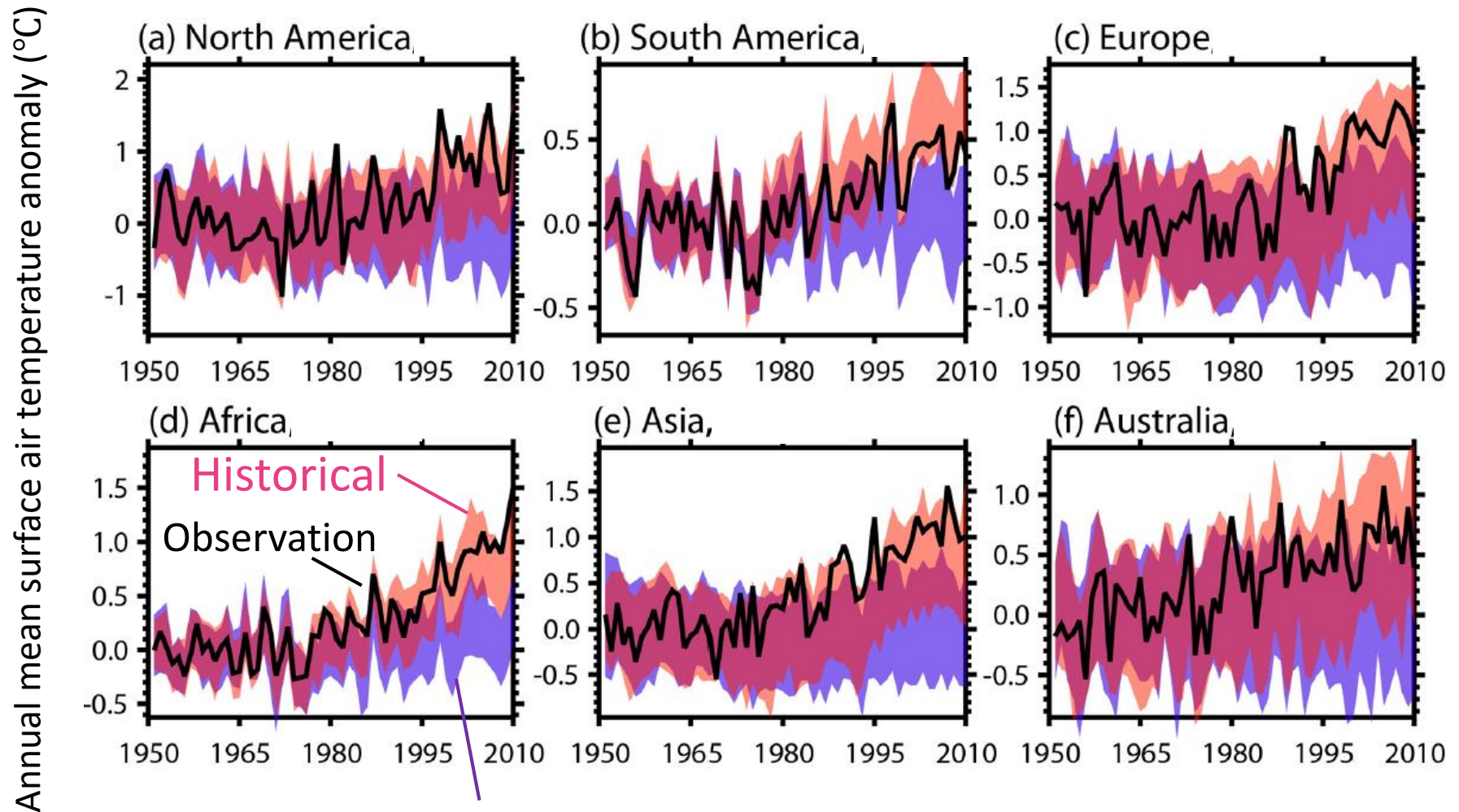


Source: Dr. T. Iizumi,
NIAES, NARO Japan

Assessment of climate change impacts and adaptation effects require scientifically-sound estimates



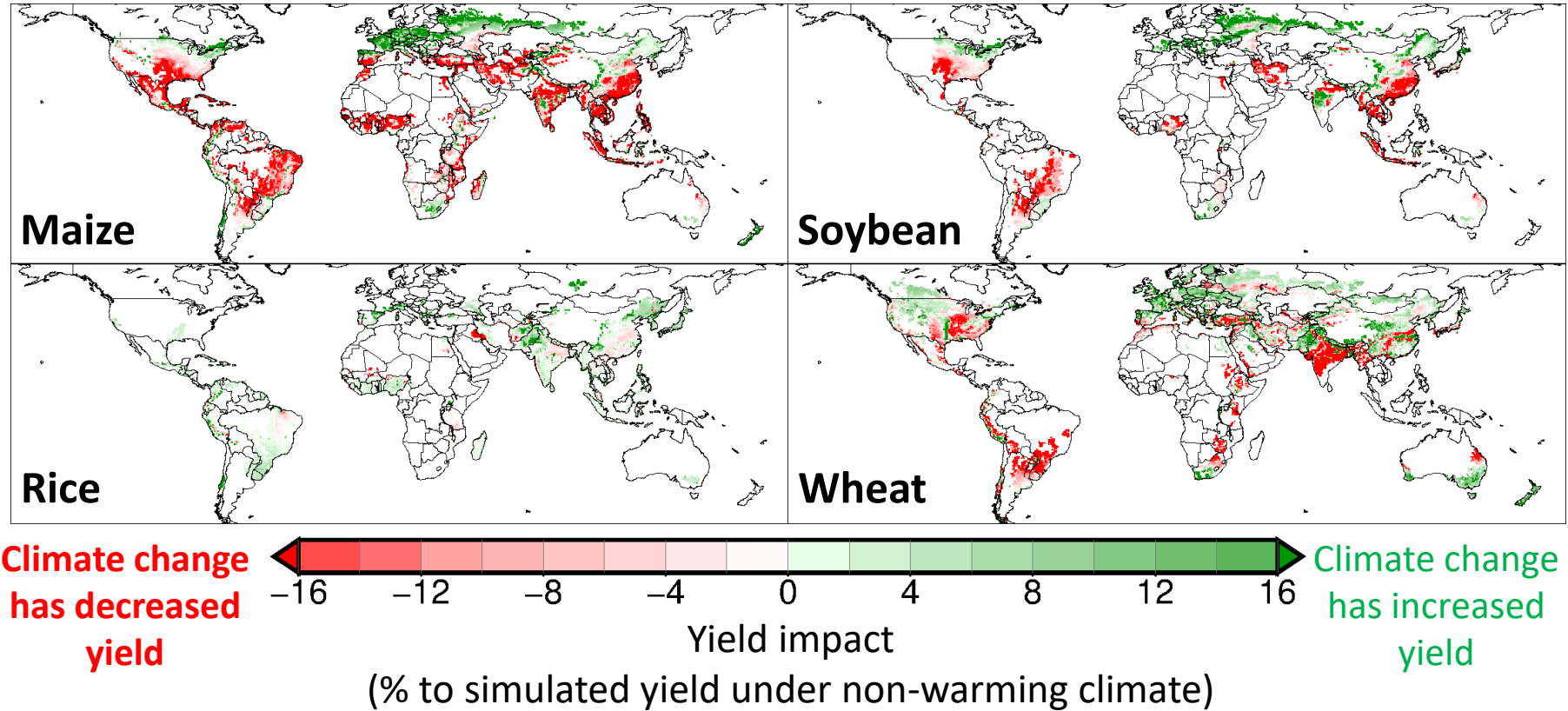
Non-warming climate simulation makes a distinction between anthropogenic climate change and natural climate variability



Non-warming (climate without human effects)

Courtesy of
Dr. T. Iizumi, NIAES, NARO Japan

Estimated global crop production loss associated with climate change for 1981-2010 accounts for 42.4 \$B per year



Non-warming climate simulation can use to assess climate change impacts and adaptation to date

Challenges, opportunities, lessons learned

For successful adaptation in **agriculture**,

1. Impact assessment as the basis for planning,
2. Need for measurement and long-term data
3. Adaptation and mitigation cannot be separated



Koronivia joint work on agriculture is the key vehicle to advance work by connecting science to the broader community

Agriculture is the Solution! for climate change

International symposium, May 2019 in Shiga, Japan

All participants highlighted the extreme vulnerability of agriculture to climate change and the urgency of accelerating **action** before it is too late.

Key messages

1. **Multi-stakeholders exchanges** are fundamental for inclusive decision making and successful uptake of actions on the ground.
2. **Farmers are at the center of addressing climate change** and are key to scaling up proven solutions.
3. **Consumers, governments and all stakeholders** in this common challenge must recognize the valuable role of farmers.

The symposium was organized by MAFF with support from Shiga Prefecture, the Food and Agriculture Organization, the World Bank and the 4per1000 initiative.

Opening by
H.E. Minister
Takamori
Yoshikawa



Field trip



Program and presentations available at
<http://www.maff.go.jp/e/policies/env/agsol.html>