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

Akiko Nagano
Environment Policy Office

KJWA Workshop 2(b)  June 17, 2019, Bonn
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
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.

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.

**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 embarkment and flood control facility.
- Develop flood risk maps.
- Promote heat illness prevention measures.

**Example of the main contents of A-PLAT**

- Future projection of Rice yields
- Future projection of Disappeared beach

**Source:** MOE

**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](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)

**Future projection of Rice yields**

- High quality rice yields

**Future projection of Disappeared beach**

- End of 21 century (2081-2100)
- Climate scenarios: Strong mitigation measures (RCP2.6)
- Source: MOE
# 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

## Key strategies

<table>
<thead>
<tr>
<th>No.</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mainstreaming adaptation into government policies</td>
</tr>
<tr>
<td>2</td>
<td>Promotion of the Climate Change Adaptation based on scientific findings</td>
</tr>
<tr>
<td>3</td>
<td>Gathering information/knowledge from researchers and institutes and developing information infrastructure</td>
</tr>
</tbody>
</table>

## Role & Responsibility of each actor

<table>
<thead>
<tr>
<th>Role &amp; Responsibility of each actor</th>
</tr>
</thead>
<tbody>
<tr>
<td>National government</td>
</tr>
<tr>
<td>- To promote the various actors’ adaptation in each subject</td>
</tr>
<tr>
<td>Local government</td>
</tr>
<tr>
<td>- To promote adaptation policies in local area</td>
</tr>
<tr>
<td>Business</td>
</tr>
<tr>
<td>- To introduce adaptation action in each business sector</td>
</tr>
<tr>
<td>Citizens</td>
</tr>
<tr>
<td>- To take adaptation action</td>
</tr>
<tr>
<td>The National Institute for Environmental Studies (NIES)</td>
</tr>
<tr>
<td>- To develop information infrastructure</td>
</tr>
<tr>
<td>- To provide technical support for local authorities</td>
</tr>
</tbody>
</table>

## Progress management

- Submission to the Central Environment Council
  - Assessment by 2020
- Follow-up every year by PDCA cycle
- Grasp of effectiveness to bluish up the method

Source: MOE
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

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

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

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

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
- 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
- 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

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

Yield growth under climate change without adaptation

Climate change impacts

Need estimate

Never observed

Yield growth without climate change

Adaptation

Need estimate

Never observed

Courtesy of Dr. T. Iizumi, NIAES, NARO Japan
Non-warming climate simulation makes a distinction between anthropogenic climate change and natural climate variability

Shiogama et al., 2016, SOLA, doi:10.2151/sola.2016-045
Estimate global crop production loss associated with climate change for 1981-2010 accounts for 42.4 $B per year.

Non-warming climate simulation can be used to assess climate change impacts and adaptation to date.


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

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