Outline of the Climate Change Adaptation Plan of the Ministry of Agriculture, Forestry and Fisheries (MAFF) [Constructed Fishing Grounds]

Impact

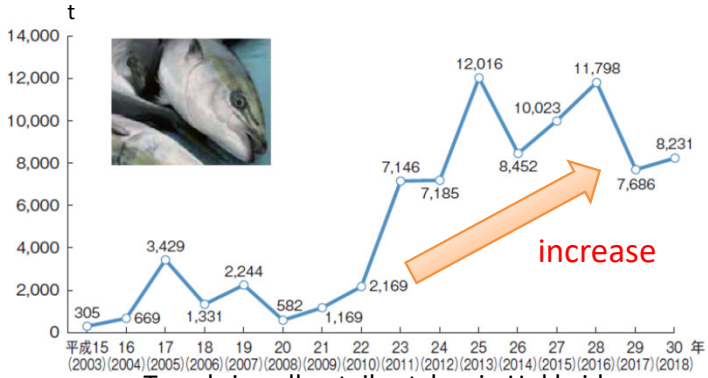
<Current status>

- ○Northward expansion of the southern limit of the distribution of algae in the family Sciaenidae
- ○Increase in feeding behavior and expansion of distribution of plant-eating fish such as lingcod
- ○Changes in the distribution of many marine organisms

A flock of Eigo and Notorious Sparrowhawk

<Future prediction>

- ○Changes in the species composition and existing amount of seaweed beds due to rising sea temperatures, and the impact on rocky root resources
- ○Northward shift of the distribution of many target species



Trends in yellowtail catches in Hokkaido

Countermeasures

adjustment measures

- ○Promotion of wide-area measures that integrate the understanding of the factors behind the decline of seaweed beds and tidal flats in each sea area, hard measures such as the creation of seaweed beds and tidal flats implemented by local governments, and soft measures such as conservation activities implemented by fishermen and local residents.
- ○Strengthen the monitoring system, develop infrastructure to cope with changes in the distribution of fish and seaweed, and promote the development of fishing grounds based on the life history of fishery organisms in cooperation with resource management efforts.

Implementation of fishing ground improvement in line with the arrival of warm-sea fish.

Arrival of yellowfin grouper

Installation of fish reefs to serve as habitats

Feeding damage caused by lice and other insects

Extermination of pests

Change of seagrass bed component species to southern seaweeds

Responding to changes in constituent species
Creation of seaweed beds

Outline of the Ministry of Agriculture, Forestry and Fisheries Climate Change Adaptation Plan [Fishing Ports and Villages]

Impact

<Current status>

○Analysis of tide level observation records shows that the sea level is on the rise.

○Regarding storm surges, it has been pointed out that there is a high possibility that the occurrence of extreme high tide levels is increasing, and regarding storm waves, it has been confirmed that the maximum value of significant wave height is also on the increase.

Storm surge damage caused by low pressure

High waves over the breakwater

<Future prediction>

○If the sea level rises, the functions of coastal disaster prevention facilities, fishing port facilities, etc. may be degraded or damaged, and coastal areas may be submerged or flooded, and coastal erosion may be accelerated.

○There is a risk that storm surges and tidal waves may cause many coastal disaster prevention facilities and structures such as fishing port facilities to become unsafe.

Wave overtopping by high waves

Coasts that need to be protected against storm surge and tidal waves

Countermeasures

Basic Concept

○Fishing ports are located in coastal areas, and it is predicted that the safety and convenience of the facilities will be greatly affected by the rise in sea level, tidal deviation, and increase in wave height due to climate change, therefore strategic and adaptive adaptation measures will be taken.

○Promote disaster prevention and disaster mitigation measures against typhoons and cyclones, which are expected to become more severe in the future and create disaster-resistant fishing communities.

Basic Measures

○ Monitoring of tide levels and waves to accurately detect signs of climate change impacts in response to rising sea levels, tide level anomalies due to extreme weather events, and increased wave heights

○ Based on the results, systematically promote the development of fishing port facilities and coastal conservation facilities that take into account long-term changes in external forces due to the impact of climate change.

Raising of breakwaters

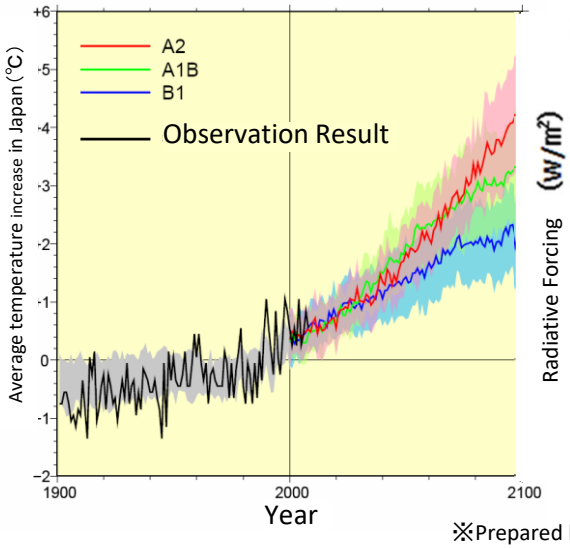
Raising the parapet

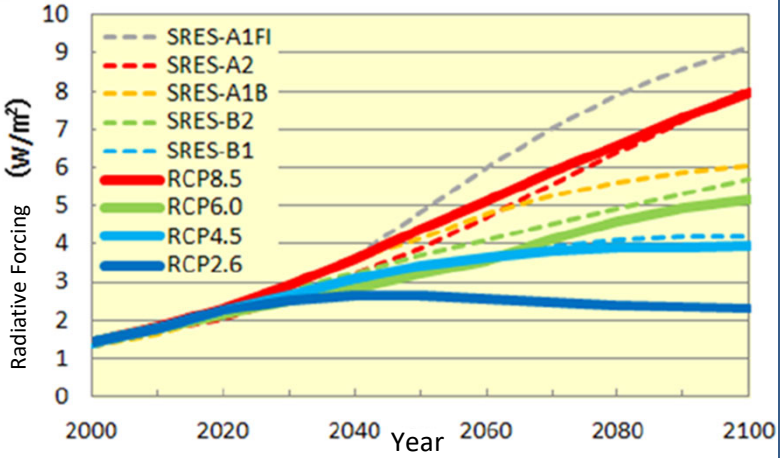
Outline of the Ministry of Agriculture, Forestry and Fisheries Climate Change Adaptation Plan [Global Warming Prediction Research, Technology Development]

temperature increase forecast

Projected increase in average temperature in Japan

○The projected average temperatures in Japan under the A2 (emphasis on economic development and regionalism), A1B (emphasis on economic development, globalization, and energy balance), and B1 (emphasis on sustainable development and globalization) scenarios of the multiple climate prediction models used in the IPCC AR4 show that the average temperatures in Japan will increase by 4.0° C, 3.2° C, and 2.1° C, respectively, from the end of the 20th century (1980-1999) to the end of the 21st century (2090-2099). 4.0° C, 3.2° C, and 2.1° C, respectively, by the end of the 21st century (2090-2099), exceeding the global average (3.4° C, 2.8° C, and 1.8° C) in all scenarios.





※Prepared based on press releases by MEXT, METI, JMA and MOE, September 27, 2013.

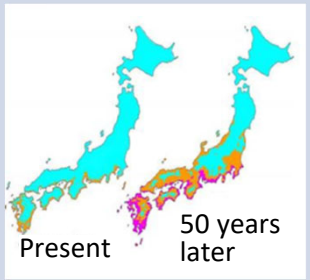
Countermeasures

predictive research

(Impact Assessment)

[Current Status]

○ Implementation of various impact assessments in the field of agriculture, forestry and fisheries



[Future vision (goal)]

○ More predictive research on needed items

○ Provide information that will serve as an opportunity for local communities to take actions on climate change

technological development

(Technology Development)

[Current Status]

○ Focusing on technological development to adapt to issues that are currently affecting rice and fruit trees, such as quality deterioration

[Future vision (goal)]

○ Development of varieties, breeding materials and stable production technologies based on medium- and long-term perspectives based on forecasting research, etc.

○ Develop technologies to take advantage of the opportunities presented by climate change

○ Development of technologies that contribute to international contributions to the Asian monsoon region, where climatic conditions and production structures are different from those in Europe and the United States, such as the technology development towards building a new food system with improved productivity, sustainability and resilience.

Regional Deployment of Adaptation Measures Based on Future Prediction

(Image of Cooperation, Division of Roles, and Information Sharing among related Parties)

National government (Ministry of Agriculture, Forestry and Fisheries)

- ○ Implementation of current and future impact assessment
- ○ Research and development of basic response technologies
- ○ Provide support measures to facilitate on-site efforts

  (Introduction of an early warning system
  Introduction of new varieties and demonstration of adaptation technology
  Introduction of weather-resistant greenhouses and adaptive materials)
- ○ Collection and dissemination of domestic and international information

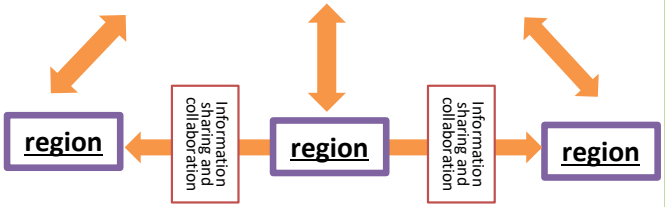
  (Provision of information through global warming impact study reports, etc.)

Regional deployment of adaptation measures based on future prediction

- ○ Provide more precise impact predictions and adaptation measures in this plan to regions with similar climatic conditions by analyzing and organizing them in an easy-to-understand manner.
- ○ Production areas in the region will implement and promote adaptation measures based on their own judgment and choice.

Region (local government, etc.)

- ○ **Independent selection of adaptation measures** offered as options
- ○ **Planning and promotion as a region**



- ○**Implementation of adaptation measures**

  e.g., introduction of new varieties, introduction of adaptive technology in cultivation management, etc.

Provide information, analysis and support to the community

Information sharing on the status of adaptation efforts in the region.

Dissemination and enlightenment to all segments of the public (users and consumers of agricultural, forestry and marine products, etc.)

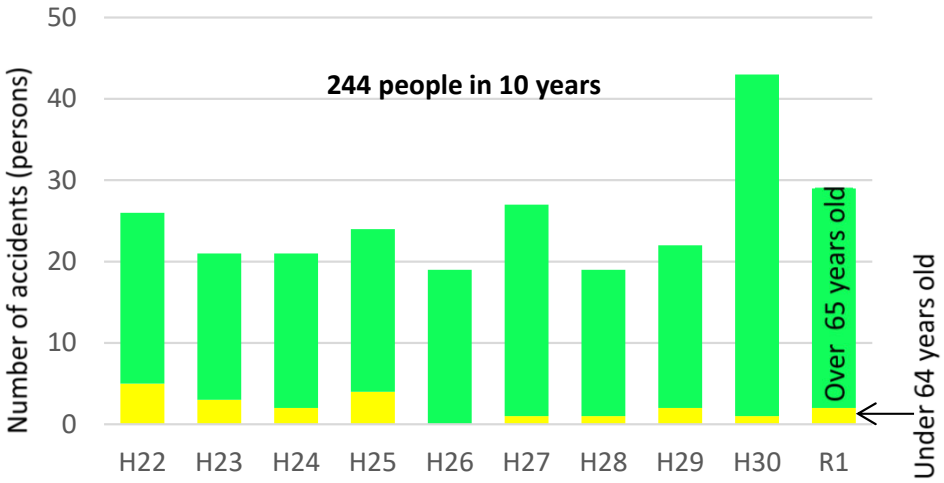
Outline of the Ministry of Agriculture, Forestry and Fisheries Climate Change Adaptation Plan [Heat Stroke]

Impact

<Current status>

○The number of deaths due to heat stroke during work in the agriculture, forestry, and fisheries industries has been on the rise in recent years.

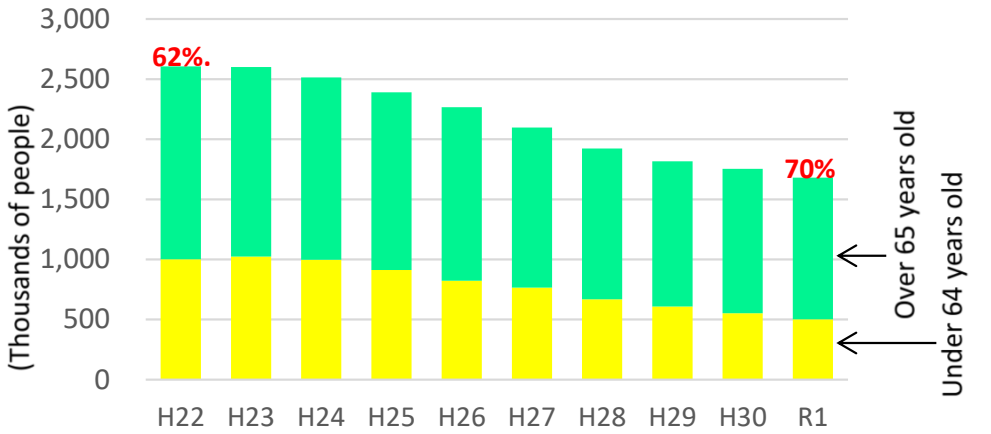
Number of fatalities due to heat stroke during agricultural work



<Future prediction>

○ The proportion of people aged 65 and over is increasing, and the incidence rate is also increasing

Changes in the agricultural workforce



(According to the MAFF)

Countermeasures

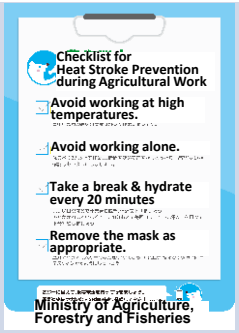
Basic measures

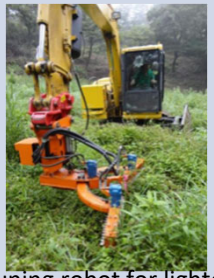
○In accordance with the Action Plan for Prevention of Heat Stroke, public information on heat stroke prevention will be disseminated by strengthening cooperation among relevant government ministries and agencies during the period of the "Campaign for Strengthening Prevention of Heat Stroke" from April to September every year.

○ Requesting prefectures and related organizations to inform workers in the agriculture, forestry, and fisheries industries about precautions such as frequent intake of water and salt, and use of sweat-absorbent and quick-drying clothing, as well as creating posters and flyers to raise awareness.

○ Promote awareness and guidance on heat stroke prevention measures for workers in the agriculture, forestry, and fisheries industries, including promotion of the use of the MAFF application, which has an additional function to notify workers of "heat stroke alert," in cooperation with relevant ministries and agencies, prefectures, and related organizations.

○ Promote the development of automated technologies for agricultural work conducted outdoors during the hot season, and actively introduce robotic technologies and ICT to lighten the workload.





A pruning robot for lightening the workload of pruning in forestry

Awareness-raising posters and flyers

Weeding Robot for Lightening the Workload of Weeding

Outline of the Ministry of Agriculture, Forestry and Fisheries Climate Change Adaptation Plan [Bird and Animal Damage]

Impact

<Current status>

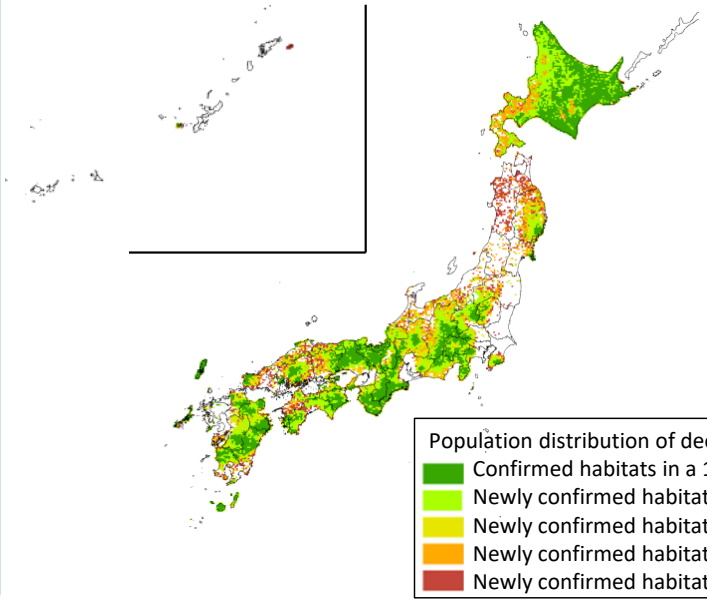
○Although the direct causal relationship with climate change is not clear, it has been reported that the expansion of the distribution of wild birds and animals has caused damage to agricultural crops, forestation trees, and fishery resources, as well as soil erosion.

<Future prediction>

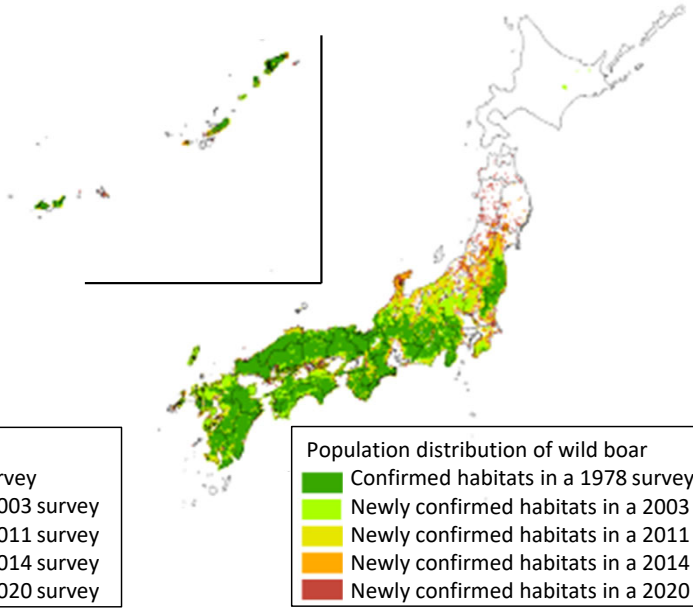
○ As for Japanese deer, it is predicted that the suitable habitat for Japanese deer in 2103 will increase to more than 90% of the national territory due to the decrease in snow cover caused by climate change. (Similar findings have not been confirmed for wild boar, etc.)

<A comparison of habitat distribution meshes across Japan (partially modified from data published by the Ministry of the Environment)>

deer (Cervus nippon)



wild boar



A radish field ravaged by wild boars

Standing trees damaged by deer stripping

Countermeasures

[Bird and animal damage prevention]

○ Since there are concerns about the expansion of the habitat area and the number of wild birds and animals, we will continue to promote the installation of intrusion prevention fences, the reinforcement of trapping activities including wide-area measures, the upgrading of techniques for trapping and damage control, and human resource development.

[Survey]

○ Grasping information on the habitat conditions of wild birds and animals

○ Continued monitoring of damage to agriculture, forestry and fisheries caused by wild birds and animals