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# Key Points toward Reconstruction and Revitalization of the Affected Areas in Fukushima

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February 28, 2024



# 1. Environmental Restoration Efforts

- Due to the accident of TEPCO's Fukushima Daiichi NPS, large amounts of radioactive materials were released into the environment.
- Under the Act on Special Measures concerning the Handling of Environment Pollution by Radioactive Materials, **environmental restoration initiatives including decontamination and disposal of contaminated waste** have been carried out.
- To store large amounts of the soil and waste arising from off-site decontamination work in Fukushima Prefecture, **the Interim Storage Facility** was constructed, and efforts have been made to promote **recycling of removed soil** to realize final disposal outside Fukushima Prefecture.
- Full-scale decontamination was completed in all municipalities, except for the "Restricted Area". In the area, **decontamination and demolition of houses and other buildings within the Specified Reconstruction and Revitalization Base Areas** have been implemented in accordance with the Act on Special Measures for the Reconstruction and Revitalization of Fukushima.
- In addition, the "**Fukushima Regeneration / Future-Oriented Project**" has been promoted with future-oriented environmental measures (decarbonization, resource circulation and natural symbiosis) for the reconstruction of Fukushima.

## Overview of Decontamination and Waste Treatment based on the Act on Special Measures

### ➤ Evacuation Areas

#### (Decontamination)

##### National government

- Designation of the Special Decontamination Area (SDA)
- Development of decontamination implementation plan
- Implementation of decontamination

#### (Waste)

##### National government

- Designation of the Contaminated Waste Countermeasure Area
- Development of waste disposal plan within the Countermeasure Area
- Dispose of waste generated in the Countermeasure Area



\* Countermeasure Area covers the same area with Special Decontamination Area

### ➤ Other areas

#### (Decontamination)

##### National Government

- Designation of the Intensive Contamination Survey Area (ICSA)

##### Municipalities

- Development of decontamination implementation plan
- Implementation of decontamination



#### (Waste)

##### National Government

- Designation of waste with radioactivity concentration of exceeding 8,000 Bq/kg (Designated Waste)
- Disposal of the Designated Waste

##### Municipalities or waste generators

Waste other than the Designated Waste



### Key Points of FY2024 Budget (Draft)

- In the Restricted Area, MOE will carry out decontamination and waste treatment, etc. as planned, according to the Plans for Reconstruction and Revitalization of the Specified Reconstruction and Revitalization Base Areas as well as the Specific Revitalized Residential Areas.
- MOE will carry out the Interim Storage Facility-related projects as planned, with the safety-first policy and by acquiring understanding of local communities. MOE will also promote technology development related to volume reduction and recycling of removed soil, etc.
- For the former Temporary Storage Sites after transportation of removed soil, restoration of the sites to the original state and return the sites will be carried out as planned.
- Waste disposal will be conducted as planned, with the procedures of volume reduction followed by landfill.

### Details of FY2024 Budget (Draft) (Amounts in brackets: budget in the last FY)

Specified Reconstruction and Revitalization Base Areas Development Projects: 37.0 bn yen (43.6 bn yen)

Decontamination and waste treatment, etc. to be implemented according to the Plan for Reconstruction and Revitalization of the Specified Reconstruction and Revitalization Base Areas

Specific Revitalized Residential Areas Development Projects: 45.0 bn yen (5.2 bn yen)

Decontamination and waste treatment, etc. to be implemented according to the Plans for Reconstruction and Revitalization of the Specific Revitalized Residential Areas

Interim Storage Facility-related projects:  
100.8 bn yen (178.6 bn yen)

Facility development, management and operation, transportation of removed soil, etc., land acquisition, technology development for volume reduction and recycling

Projects for proper management of removed soil, etc. and restoration to original state:  
15.0 bn yen (16.9 bn yen)

Management of removed soil, etc. at the Temporary Storage Sites, restoration of the sites to the original state after completing transportation, volume reduction, monitoring and other follow-up measures

Projects for treatment of radioactive waste, etc. :  
40.7 bn yen (73.0 bn yen)

Treatment of the Specified Waste, temporary storage of the Designated Waste, promotion of treatment of waste related to agriculture and forestry, monitoring of waste treatment facilities

# **(1) Decontamination**

# Efforts toward lift of the Evacuation Orders

- Full-scale decontamination was completed in all municipalities, except for the Restricted Area, by March 2018.

## Restricted Area

Areas with the estimation of an annual radiation dose of more than 50 mSv as of 2011, and off-limits area in principle.

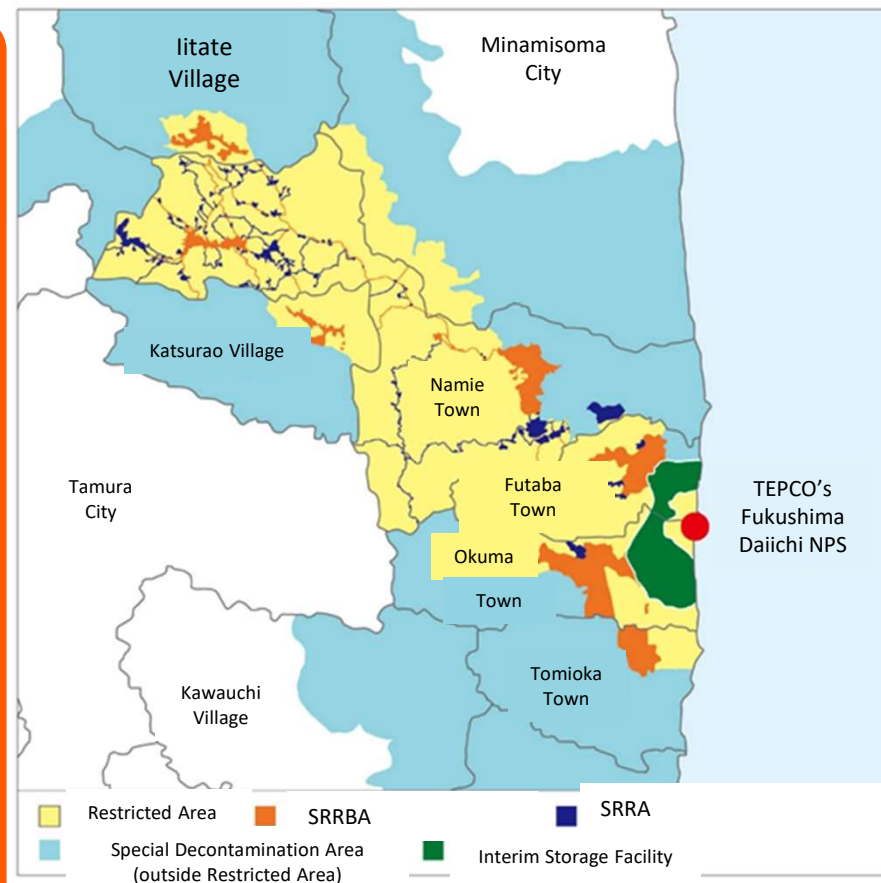


Government policy to **lift the evacuation orders in all areas, even if it takes long time**, and to achieve the reconstruction and revitalization (FY2016)

- **Specified Reconstruction and Revitalization Base Areas (SRRBA)** (indicated in orange, designated in FY2017-2018)
  - Part of the Restricted Area aiming at **lifting the evacuation orders within about five years to allow residents to return**
  - Decontamination started in December 2017 and evacuation orders were lifted in the Specified Reconstruction and Revitalization Base Areas in all six municipalities by the end of November 2023.
- **Outside the Specified Reconstruction and Revitalization Base Areas**
  - Act on Special Measures for the Reconstruction and Revitalization of Fukushima was amended in the 211th ordinary National Diet session with the aim of allowing residents to return **over the course of the 2020s according to their willingness**.

### **【Specific Revitalized Residential Areas (SRRRA)】** (indicated in blue)

- To be set outside the Specified Reconstruction and Revitalization Base Areas under the authority of the mayor of municipality with the aim of allowing residents to return and rebuild their lives after the lift of evacuation orders.
- **Some regions in Okuma Town and Futaba Town were designated in September 2023 ahead of other regions.** Decontamination and house demolition were started on December 20, 2023.
- **In other regions, decontamination and house demolition will be started from FY2024 promptly after approval of plans** (Namie Town: approval of plan on Jan. 16, Okuma Town: approval of change of plan on Feb. 2, Tomioka Town: approval of plan on Feb. 16)

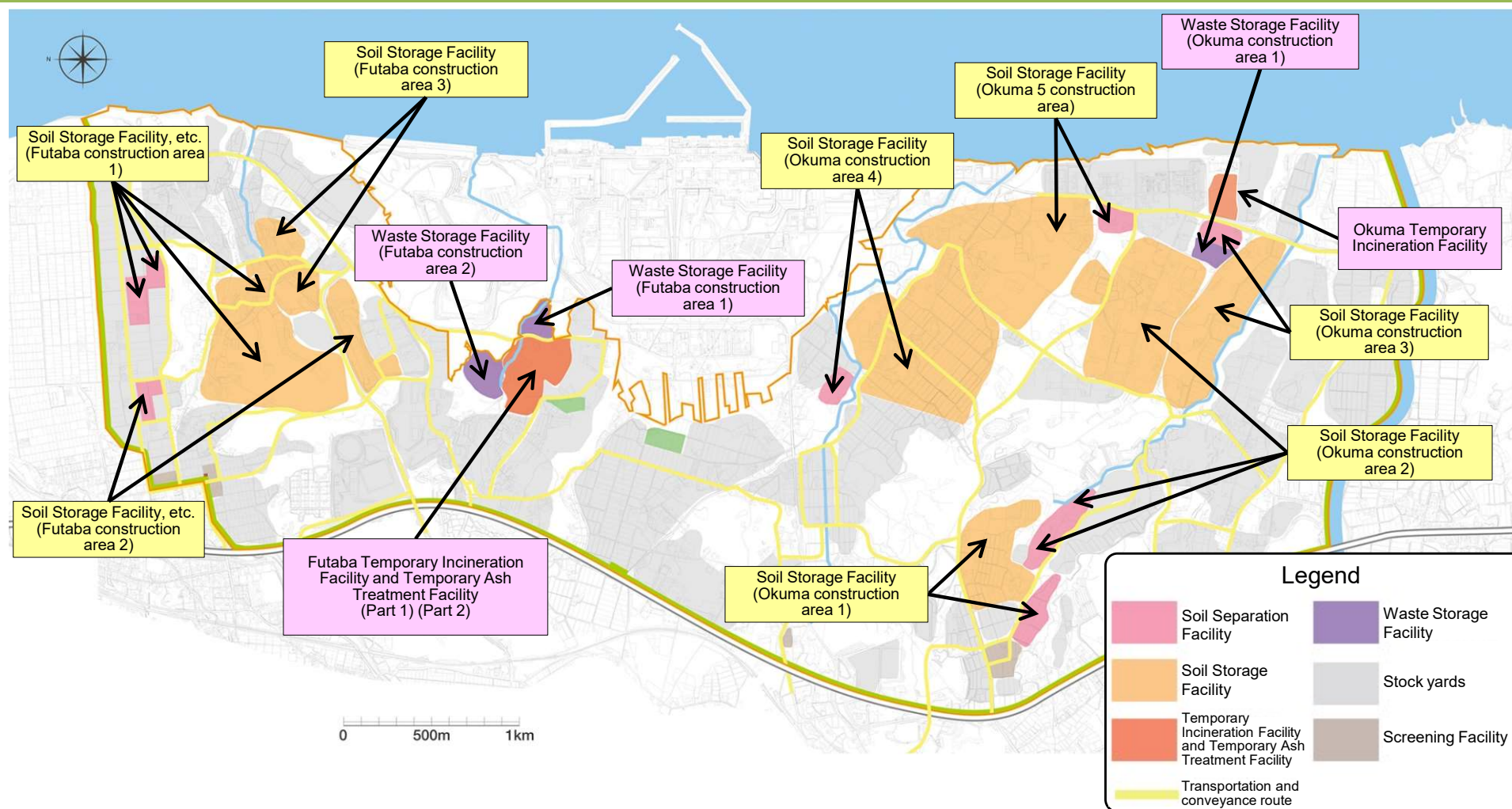


## **(2) The Interim Storage Facility**



# Overview of the Interim Storage Facility

- The Interim Storage Facility was built to manage and store removed soil, waste and incinerated ash etc. (>100,000 Bq/kg) generated by decontamination in Fukushima Prefecture, safely and in an integrated manner, until final disposal outside Fukushima Prefecture within 30 years from the start of transportation to the Interim Storage Facility.
- Okuma Town and Futaba Town accepted the construction of the facility, by making very difficult decisions. MOE will continue to work on the Interim Storage Facility project with a “Safety First” policy.
- The Interim Storage Facility area occupies about 1,600 ha (about the same area as Shibuya City).

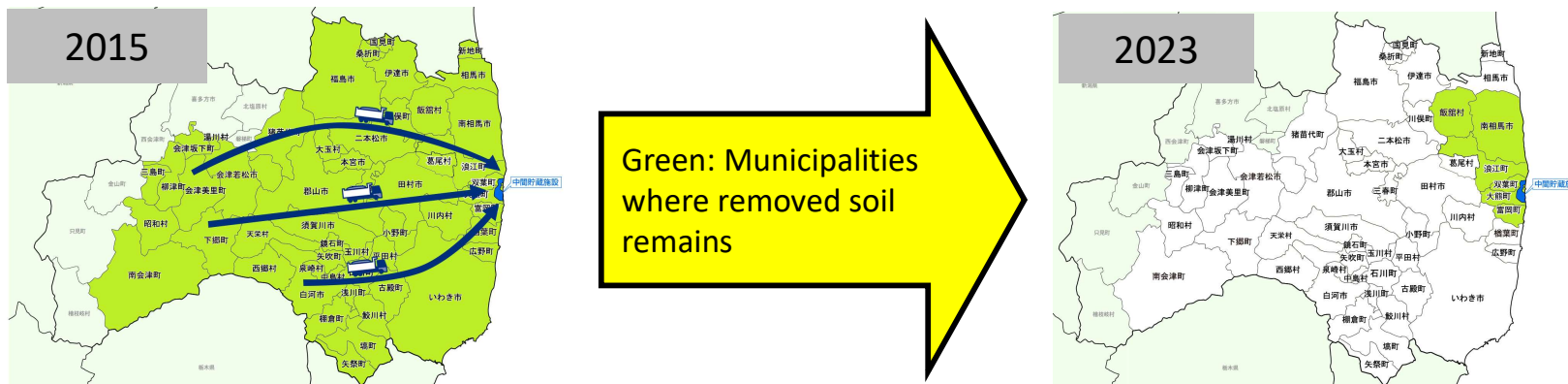




## **(3) Recycling and Final Disposal**

# Final Disposal of Removed Soil outside Fukushima Prefecture

- Interim Storage Facility (ISF) covers a wide range of area of approximately 1,600ha in Okuma Town and Futaba Town. (almost **as large as Shibuya City**)
- There were **a lot of residents living** there before the earthquake.
- Landowners were forced to evacuate due to the nuclear accident and **made a difficult decision to give up their ancestral land and houses** for the ISF project.
- This decision contributed to the **construction of the ISF, and the reconstruction of Fukushima made great progress as a whole**. (There were approximately 1,370 Temporary Storage Sites for removed soil and waste throughout the prefecture → Currently there are approximately **200 sites**)

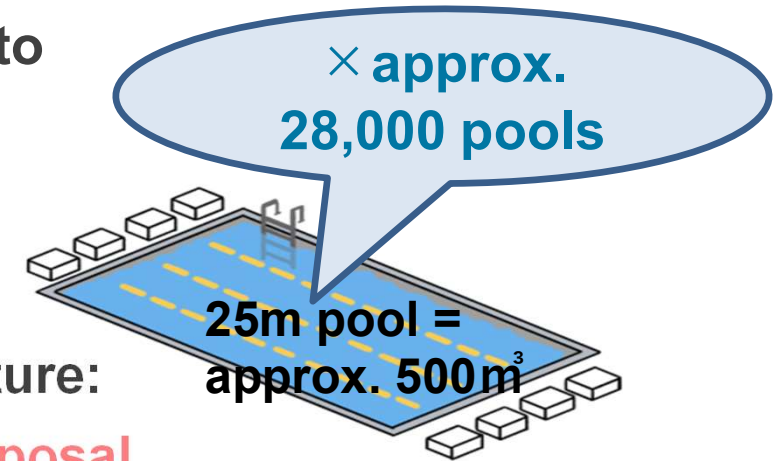


- Furthermore, **Fukushima Prefecture has faced the most serious environmental pollution in Japan due to the accident of the nuclear power plant**, imposing a significant burden on its residents.
- Given that **citizens of Fukushima Prefecture are already under a heavy burden**, local communities in Fukushima Prefecture accepted the construction of the ISF, based on the premise of **'final disposal outside Fukushima Prefecture within 30 years'**. This is **a responsibility of the national government**, stipulated in the law and is an important promise that must be fulfilled.

# The Necessity of Recycling of Removed Soil

Amount of removed soil and waste transported to the ISF:

**Equivalent to the volume of approximately 28,000 25m-swimming pools**



Toward final disposal outside Fukushima prefecture:

In order to reduce the amount of soil for final disposal, it is necessary to recycle the soil, which is originally a valuable resource, by ensuring safety as a major premise.

Soil of **low** radioactivity concentration

**Recycling**

maintenance management (public works, etc.)



## Distribution of radioactivity concentration in removed soil

8,000Bq/kg or less  
**Approx. 75%**

More than 8,000Bq/kg  
**Approx. 25%**

After reducing the volume, etc.

**Final disposal outside Fukushima prefecture**

- Regarding the removed soil and waste generated in Fukushima Prefecture, the national government is legally required to **take necessary measures to complete final disposal outside the prefecture within 30 years from the start of transportation to the Interim Storage Facility (by March 2045)**. In order to reduce the final disposal volume, the national government is making efforts to reduce the volume and recycle the removed soil and waste.
- In promoting volume reduction and recycling, specific efforts are being made in accordance with the **“Technology Development Strategy for Volume Reduction & Recycling of the Removed Soil and Waste under Interim Storage”** and the “Process Chart,” which were formulated in 2016 and reviewed in 2019.
- In particular, with regard to recycling, MOE is implementing demonstration projects based on the Basic Concept for Safe Use of Removed Soil Processed into Recycled Materials compiled in 2016 as a guideline, as well as working to foster understanding throughout the nation.
- **With FY2024 as the strategic target**, we will proceed with the development of basic technology and **present several feasible options for the required area and structure of the final disposal site**. Then, **after FY2025, we will proceed with studies and adjustments related to the final disposal site**.
- In preparation for full-scale recycling and final disposal in FY2025 onward, discussions started at the Working Group to discuss **communication and coexistence with local communities**.

# IAEA-MOE Japan Experts Meeting on Volume Reduction and Recycling of Removed Soil Arising from Decontamination Activities



## Background

- This meeting is held by the International Atomic Energy Agency (IAEA) upon the request of the Ministry of the Environment (MOE), Japan. The meeting is intended to exchange views concerning the measures taken by MOE for recycling and necessary disposal of removed soil in the future.
- Provision of international assessment and advice from technical and social perspectives is expected.

## Overview of the 2<sup>nd</sup> meeting

### ● Date / place

Schedule: Monday, 23 Oct. - Friday, 27 Oct. 2023

Main venue: IAEA Headquarters, Vienna, Austria (Hybrid meeting)

### ● Main agenda

1. Approach for safety and standards for the recycling and final disposal of removed soil
2. Approach for communication with stakeholders
3. Information dissemination to the international communities

### ● Members of IAEA officials and international experts

10 persons of IAEA officials and international experts

Note: The results of the 2<sup>nd</sup> meeting was published on January 12<sup>th</sup> by the IAEA as a summary report.



## Way forward

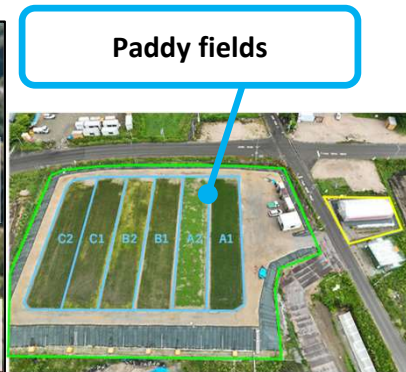
- The final report will be produced by the IAEA after the 3<sup>rd</sup> meeting, which will be submitted to the MOE and published



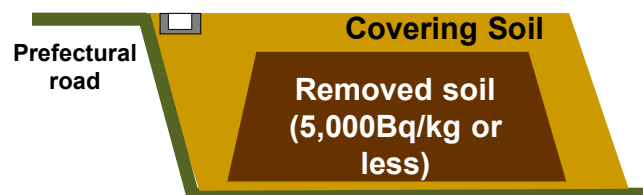
# Demonstration Projects of Recycling in Fukushima Prefecture

- In Iitate Village's Specified Reconstruction and Revitalization Base, for which approval was given in April 2018, a demonstration project is underway for recycling soil removed for decontamination (removed soil) to be used in raised earth foundations for **farmland** development, with soil covering on top of the removed soil.
- The project was launched in April 2021 to build raised earth foundations for farmland development in a large site with an approximate area of 22 ha, and paddy and other cultivation experiments have begun to be carried out in completed zones in a sequential manner.
- In addition, in order to study the possibility of recycling for road building, demonstration projects for building **raised roadbeds** were commenced within the Interim Storage Facility site in October 2022.
- From the past **demonstration projects implemented in Fukushima Prefecture, the safety of recycling removed soil has been confirmed.**
- Based on these results, plans for implementing similar demonstration projects in other prefectures are under consideration.

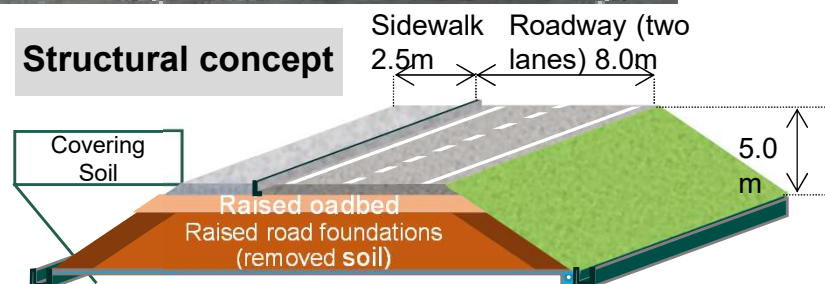
## ◇ Farmland demonstration project in Nagadoro District, Iitate Village



### Structural concept



## ◇ Raised roadbed demonstration project in the Interim Storage Facility premise



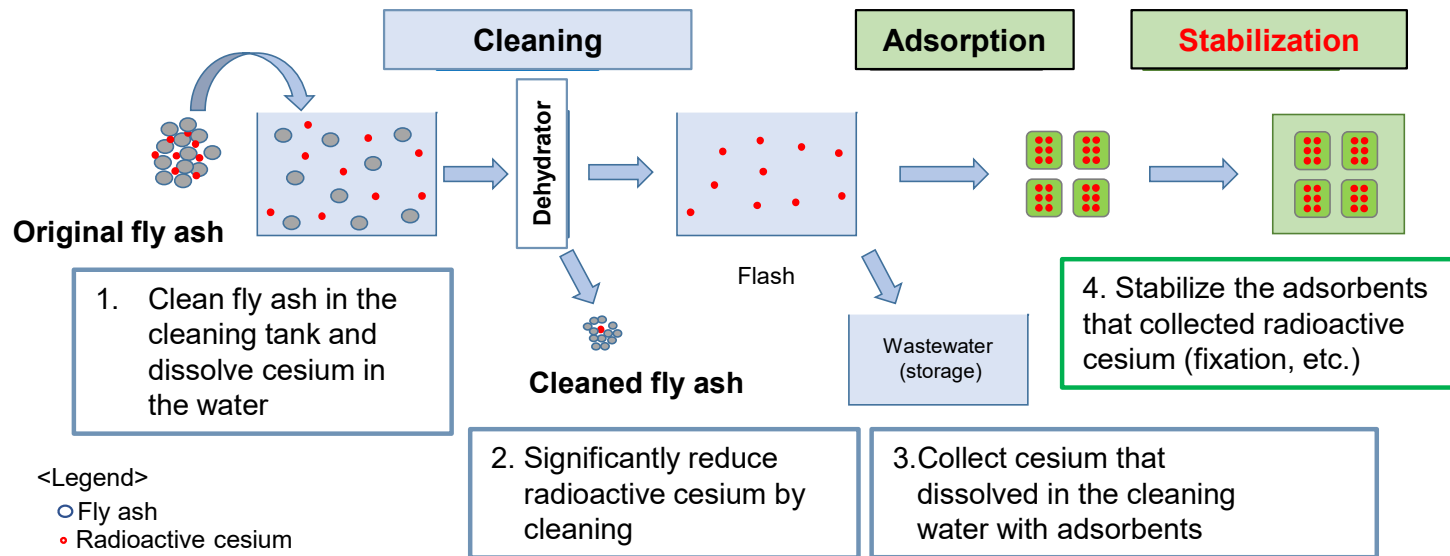


# Fly Ash Cleaning and Stabilization

## Overview of the technology demonstration test

- MOE has implemented technology demonstration test for volume reduction and stabilization at the Fly Ash Cleaning Technology Demonstration Facility (Futaba Town) to build the basis for realizing final disposal outside Fukushima Prefecture of “fly ash with concentrated radioactive cesium” generated in the Temporary Ash Treatment Facilities.
- Taking advantage of the characteristics that radioactive cesium in fly ash is easily soluble in water, feasibility of a series of techniques will be confirmed for washing fly ash with water (cleaning process), collecting dissolved radioactive cesium with adsorbents (adsorption process), and stabilizing the collected radioactive cesium in a stabilized form (stabilization process).

### Overview of the demonstration test



### Demonstration Project in FY2022

- For the cleaning process, real-scale test equipment is installed, and a real-scale test is implemented.
- For adsorption and stabilization processes, three bench test systems are installed, and tests are implemented, to compare multiple processing methods.

### Plan in FY2023

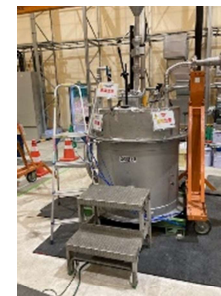
- One of the adsorption and stabilization technologies tested in demonstration tests in FY2022 was selected, and integrated tests on a real-scale for cleaning, adsorption and stabilization are implemented.



Cleaning process equipment



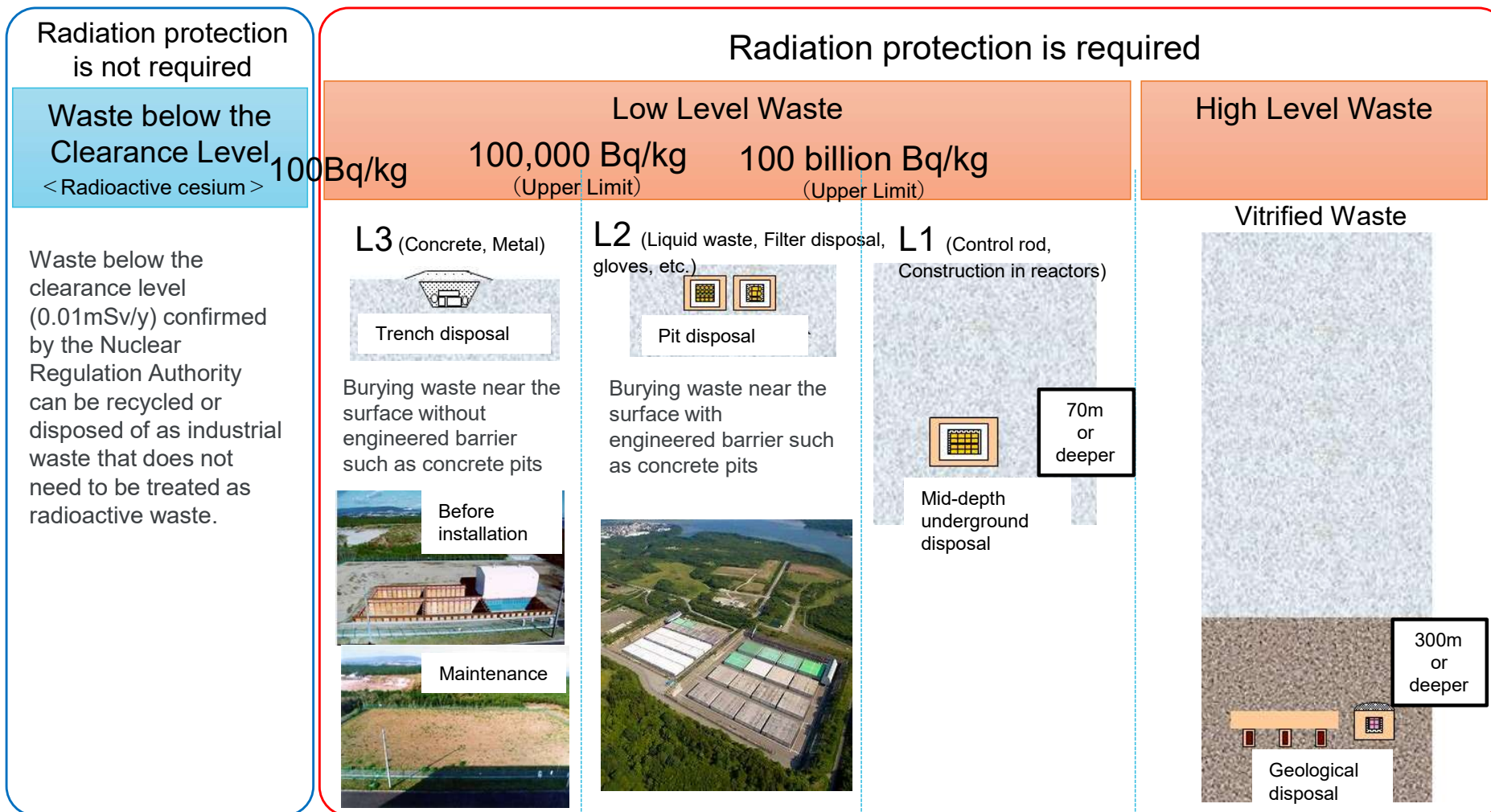
Adsorption process equipment (one of the three systems)



Stabilization process equipment (one of the three systems)

# (Reference) Disposal of Radioactive Waste

- Regarding removed soil and waste, which are subject to final disposal, radioactive cesium is the dominant nuclide (the half-life of Cs-137 is approximately 30.2 years), and currently most of it is below 8,000Bq/kg. Even if it is assumed that the radioactive concentration will increase due to volume reduction process, it is considered to be classified as the Low-Level Radioactive Waste under the IAEA Safety Standards (assumed to be tens of millions - hundreds of millions of Bq/kg at most).



Operational status at the power demonstration reactor (Tokai Village) for disposal of L3 waste

<Approx. 1,670 tons buried>

Operational status at Rokkasho Low-Level Radioactive Waste Disposal Center

<As of the end of December 2023, 350,939 drums (approx. 70,000 m<sup>3</sup>) buried>

Source: Agency for Natural Resources and Energy (HP) "Radioactive Waste" "Clearance System for Recycling the Waste from Nuclear Power Generation"  
 Japan Atomic Energy Agency (HP) "Demonstration Test"  
 Japan Nuclear Fuel Limited (HP) "Disposal Concept" "Operational Status at Low-Level Radioactive Waste Disposal Center" (As of the end of December 2023), partially modified by MOE



# Efforts to Foster Understanding toward Final Disposal and Recycling

- The level of awareness of the policy for final disposal outside Fukushima Prefecture is **approximately 50% within Fukushima Prefecture** and **20% outside Fukushima Prefecture**.
- It is **essential to foster understanding among all citizens** regarding recycling and final disposal of removed soil. MOE is running various programs such as **building understanding for the next generation** (lectures at universities, on-site work shops etc.), **site tours**, **installation of potted plants and planters using removed soil**.

## Initiatives for the next generation



Lectures at universities



On-site workshop

## Removed soil used for potted plants in public places



▼ In March 2023, planting and installing flowers in a planter with removed soil (about 5,100Bq/kg).



Godochosha No.5 (Chiyoda-ku, Tokyo)

➢ As of the end of January, 2024, potted plants are put in 23 places outside Fukushima Prefecture.

## Site tour



Site tours have been offered in the soil storage area of the Interim Storage Facility and the demonstration project area in Iitate Village's Nagadoro District.

(The number of people for the tours in the demonstration project area in Nagadoro District, Iitate Village)

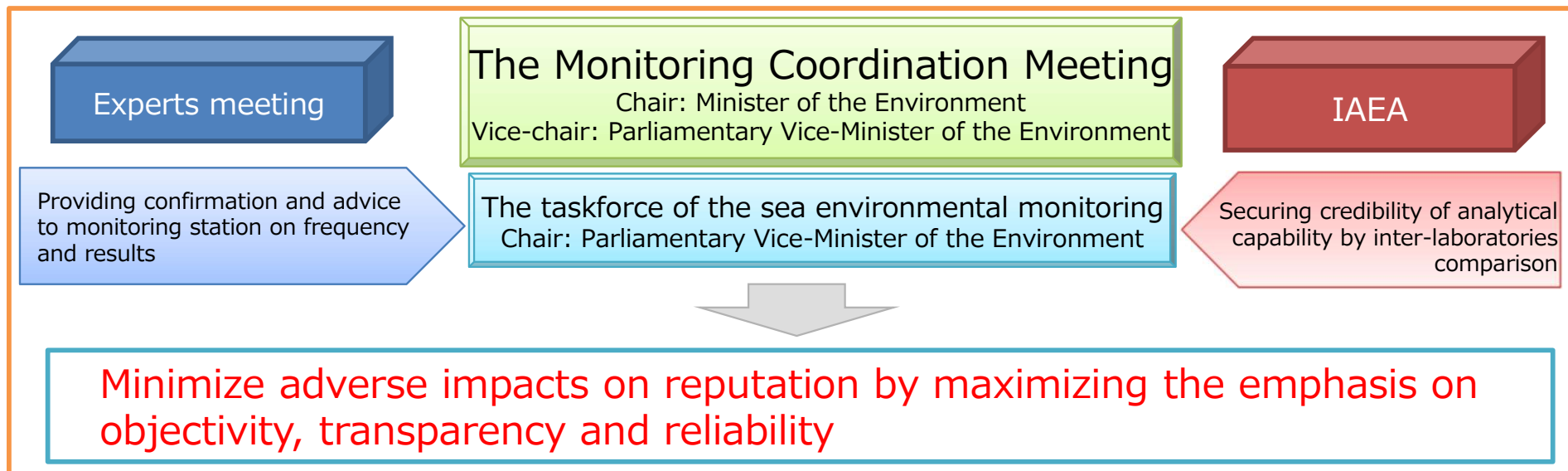
- Group tour: 1,222 in total
- Tours for general public: 153 in total (Results as of the end of January, 2024)

## **(4) Sea Area Monitoring Regarding Discharge of ALPS-Treated Water into the Sea**

# Sea Area Monitoring regarding ALPS treated water

**MOE conducts the sea area monitoring regarding ALPS treated water for tritium before the discharge. After the discharge, the monitoring has been reinforced and strengthened.**

- The sea area monitoring will be conducted by collaborating with relevant ministries (MOE, NRA, FAJ, and Fukushima pref. etc.) under the Monitoring Coordination Meeting (Chair : Minister of the Environment).
- Confirmation and advice on the sea area monitoring activities have been provided by the expert committee.
- Securing credibility of analytical capability by inter-laboratories comparison project in cooperation with IAEA.



- After the discharge on 24<sup>th</sup> Aug. in 2023, **the monitoring has been reinforced and strengthened.** The rapid analysis and precise analysis have been conducted frequently.
- So far, **the concentration of tritium are much less than various standards.** This shows **there are no adverse impact on human health and the environment.** The results are released on website and SNS.

cf. Regulatory standards of tritium for safety : 60,000 Bq/L

WHO standards for drinking water : 10,000 Bq/L

The discharge suspension level for TEPCO : 700 Bq/L within 3km of NPS, 30 Bq/L within 10km square

# Overview of sea area monitoring regarding ALPS treated water

[Rapid Analysis]		During the discharge (About 17 days)	The discharge stopped
3 points near the discharge outlet	Tritium	<u>Twice in one discharge</u>	<u>Monthly</u>
	Gamma-ray nuclides	<u>Twice in one discharge</u>	<u>Monthly</u>
Other coastal 20 points	Tritium	<u>Once in one discharge</u>	—

[Precise Analysis]	
Tritium	Quarterly in all 29 points In addition, monthly in 3 points near the discharge outlet by FY2023
Seven major radionuclides	Quarterly in 3 points near the discharge outlet
Other nuclides (61 nuclides)	Yearly in 3 points near the discharge outlet

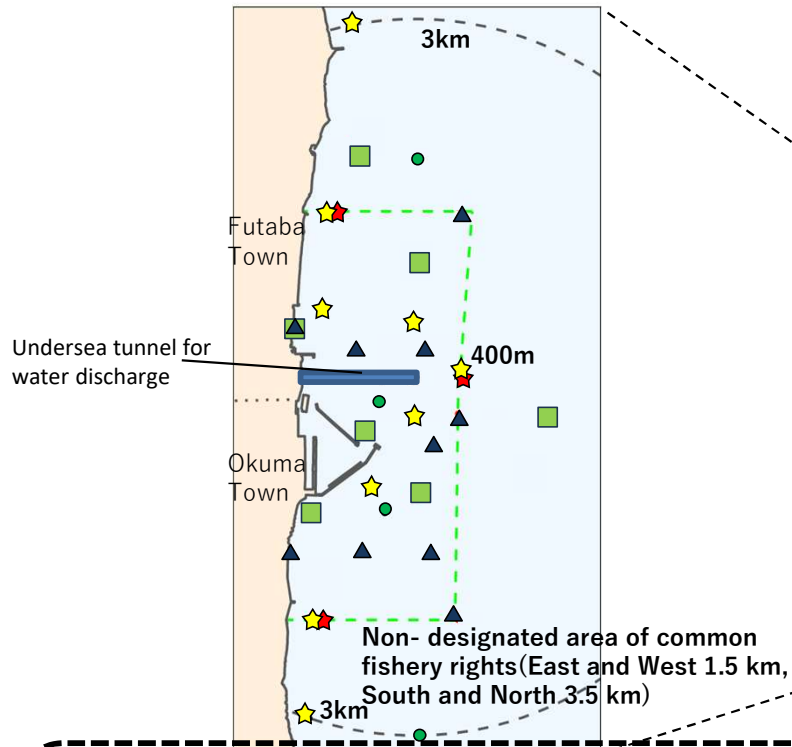
One year after the start of the discharge (the end of Aug. in 2024), the monitoring plan would be considered based on the progress of the one-year discharge.



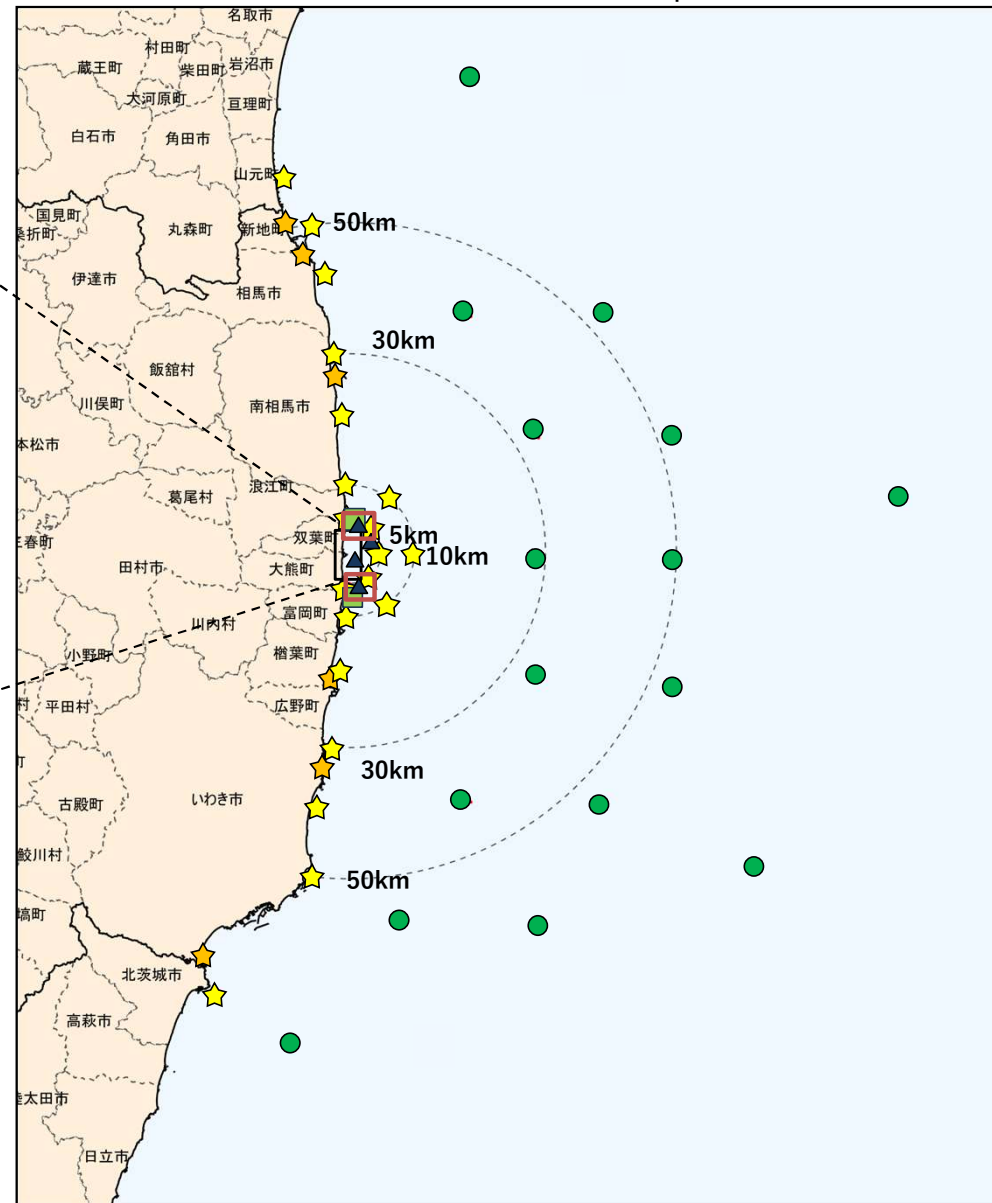


# cf. The map of sea area monitoring

【Enlarged map (3 km radius)】



【Broader area map】



< Legend >

【MOE】

- ★ : Sampling points for tritium in seawater
- ★ (red) : Sampling points for 7 major radionuclides, other related radionuclides
- ★ (yellow) : Sampling points for tritium at beaches

Rapid analysis is conducted at 11 points selected from ★  
(The 11 points are selected and analyzed in rotation.)

In addition, monitoring of fish (on the boundary of common fishery rights area) and seaweed (at Ukedo and Tomioka fishing ports) are also conducted.

【NRA】

- : Sampling points for tritium in seawater

【FAJ】

- : Sampling points for tritium rapid analysis in fishery products

【Fukushima Pref】

- : Sampling points for tritium in seawater

【TEPCO】

- ▲ : Main sampling points for tritium in seawater

## **2. Radiation Risk Communication**



# Risk Communication and Dissemination of Information

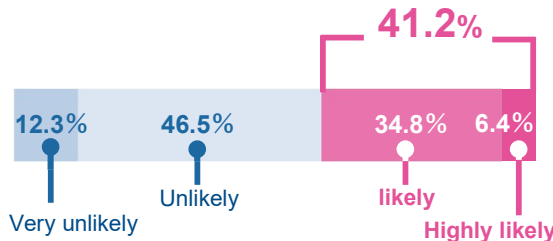
## GuGuRu Project



The GuGuRu Project was launched in July 2021 to help people develop sound judgment and avoid being misled by rumors; the project is promoting efforts to disseminate accurate information on the health effects of radiation throughout the country in an easy-to-understand manner. The GuGuRu Project aims to dispel anxieties and misunderstandings resulting from the lack of updated information regarding the health effects of radiation related to the Fukushima Daiichi Nuclear Power Plant accident, as well as to eliminate rumors, discrimination, and prejudice arising from them.

The goal is to reduce the percentage of people who believe that “it is highly likely that current radiation exposure will effect the health of future generations in Fukushima Prefecture” **from 40%** (in FY2020) **to 20% by FY2025**.

How likely is current radiation exposure to have health effects on the next generation of Fukushima residents?



Source: FY2020 Ministry of the Environment Survey on the Radiation Health Effects (March 2021)

### Radiation College

Seminars are organized at universities and workplaces across Japan, and art contests were also held as an opportunities for presenting what they have learned.



Guidance Seminar



Presentation by students



Drama taken from lines idea of participants.



GuGuRu Project Website



GuGuRu Project YouTube Channel

## Radiation Risk Communication Consultant Support Center

MOE has established the “Radiation Risk Communication Consultant Support Center” in Iwaki City, Fukushima Pref. to provide a variety of support to consultants, municipal employees involved in risk communication activities, and residents mainly targeting 12 municipalities, where evacuation was ordered at the time of the accident.



## Portal Site for Radiation Health Effects

MOE publishes Portal Site for Radiation Health Effects (English and Japanese are available), where-specific topics are compiled: “Food,” “Visiting,” “Living,” “Effects on Fetuses and Hereditary Effects,” “Radiation Around Us.”

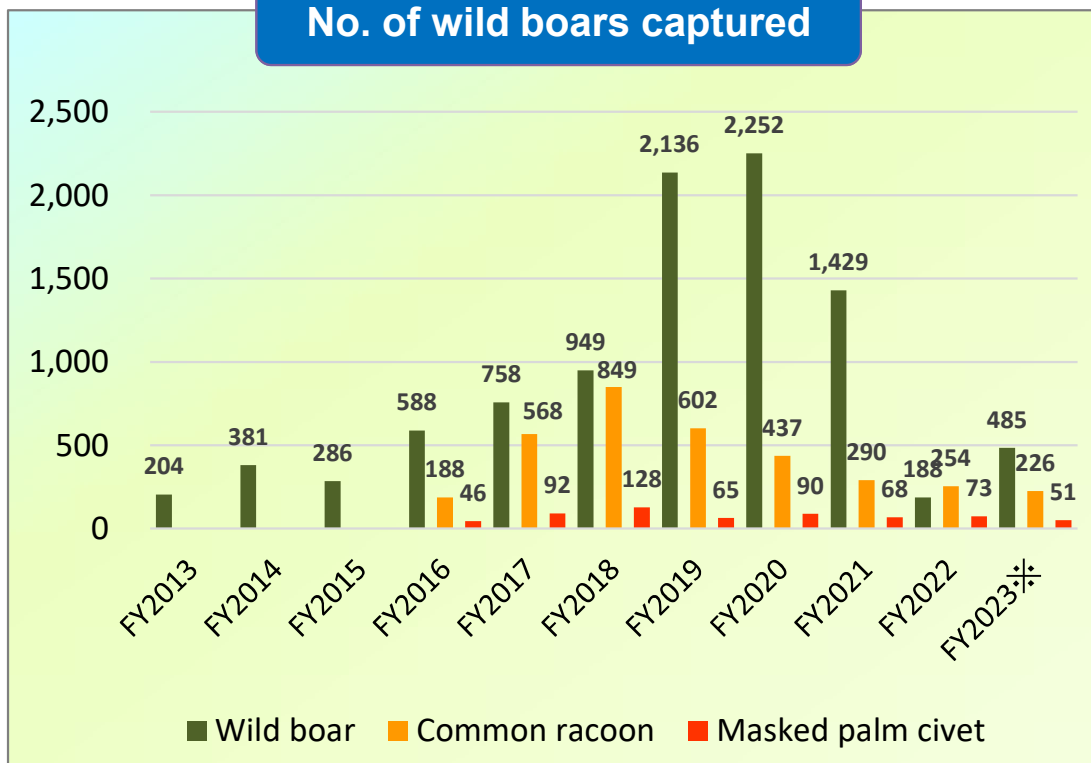


## **3. Initiatives to Prevent Damage by Wild Mammals**

## Measures Against Wild Boars in Restricted Area, etc.

- Wild mammals in Restricted area are hampering residents' preparations for return. Therefore, **MOE has been implementing a project to capture wild boars and other animals in Restricted area since FY2013** to ensure peace of mind for those who will return to their homes and support them in rebuilding their lives and the local economy.
- The number of wild boars captured in FY2023 is 485 as of December 2023, an increase compared to the previous year when the number of captured was low due to the influence of swine fever. **The frequency of wild boars appearing in footage taken by automatic cameras in Restricted area has also been decreasing since FY2019, so the number of wild boars is thought to be decreasing.** The number of raccoons and masked palm civets captured is also on a decreasing trend.

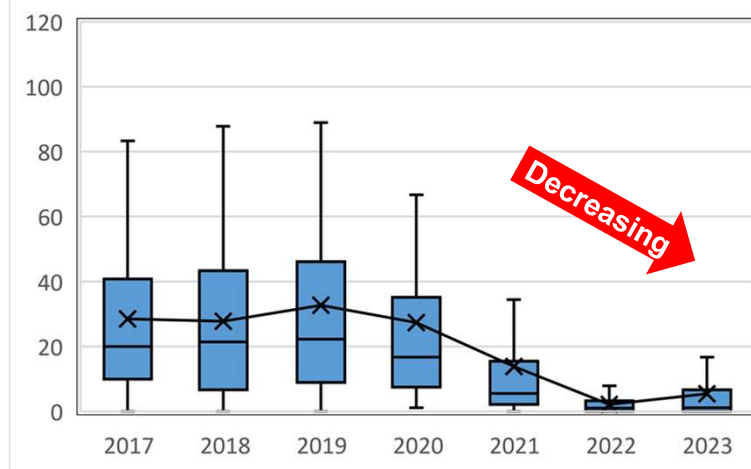
No. of wild boars captured



※as of December 2023

Frequency of detection of wild boars (caught on camera)

In order to grasp wild mammal numbers, automatic cameras are installed in a 2 km mesh configuration within the surveyable area of the Restricted area, and changes over time are monitored. Surveys are conducted three times a year (each lasting about one month).



Frequency of wild boars caught on film =  
Number of boars caught/days of camera operation x 100

x represents the average value.

## 4. Future-Oriented Projects



- Fukushima Prefecture has entered the second Reconstruction and Revitalization Period and is moving toward full-fledged reconstruction and revitalization. Taking this opportunity, MOE complied the initiatives that it needs to do, as “Fukushima: The Next Decade.”
- More than 10 years passed since the Great East Japan Earthquake, and in preparation for the next stage of full-fledged reconstruction and revitalization of Fukushima, MOE and Fukushima Prefecture cooperate on new future-oriented environmental measures under the three themes: decarbonization, combating misinformation about the affected areas, and preserving the collective memory of the disaster, under the Collaboration and Cooperation Agreement and the Fukushima Green Reconstruction Project.

### Example of Initiatives in FY2023

#### Rebranding to the Environmentally Advanced Area

##### ■ “FUKUSHIMA NEXT” future generation tour

In June, students from all over Japan planned six course tours to visit Fukushima with the aim of reviewing the current status of reconstruction and issues which Fukushima is facing and of disseminating information from the perspective of the next generation. On Sep. 1-3, 2023, the tours were held, and on the last day, all participants (about 180 people) gathered together for a roundtable discussion on the theme of “What we want to know and communicate now about Fukushima”.



Roundtable discussion on Sep. 3rd, 2023

##### ■ The 2<sup>nd</sup> FUKUSHIMA NEXT

Future-oriented initiatives were awarded, which are taking measures to create and re-discover local existing strengths from an environmental perspective.



The award ceremony of the 2<sup>nd</sup> FUKUSHIMA NEXT

##### ■ information dissemination at the COP28 to the UNFCCC

A booth exhibition was held at the 28th Conference of the Parties (COP28) to the United Nations Framework Convention on Climate Change (UNFCCC) with the aim of communicating to the world efforts on the reconstruction and environmental restoration after the earthquake and the resulting accident of Fukushima Daiichi NPS, as well as of dispelling rumors about Fukushima.



#### Passing on the Memory of Fukushima and Environmental Restoration

##### ■ Challenge award

Students are invited to call for ideas and thoughts for future Fukushima, and their own initiatives conducted for Fukushima.



Challenge award ceremony

#### Creation of Advanced “Decarbonization x Reconstruction” Town Planning

##### ■ Feasibility Studies (FS)

- FS related to reconstruction town planning through SHOWCASE projects utilizing hydrogen energy

Target area : Namie Town

Overview : Surveys and studies were conducted on the feasibility of the SHOWCASE including various ways using hydrogen, and an optimized energy management when introducing a renewable energy other than hydrogen is introduced. (Assuming a local facility where people can experience a variety of use cases related to hydrogen × lifestyles).

##### ■ Subsidy Program for Introduction of Self-Sustained and Distributed Energy Systems

- Planning for installation of renewable energy equipment at a supermarket (Koriyama City)
- Installation of solar power generation equipment at a special nursing home (Iwaki City)
- Installation of solar power generation equipment at a certified child center (Date City)
- Installation of solar power generation equipment, pellet stove for corporate management (Tamura City)
- Installation of solar power generation equipment at a sport facility (Naraha Town)