Recovery from the Great East Japan Earthquake and Tsunami

-Recommendations from Iwate-

Iwate Prefecture

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About this Collection of Recommendations

■Purpose of Creation

Ever since the Great East Japan Earthquake and Tsunami, Iwate Prefecture has been working on recovery and reconstruction on an unprecedented scale and an unprecedented level of organization, with the help of a great deal of support from home and abroad. In March 2020, nine years after the earthquake, a collection of recommendations, "Recovery from the Great East Japan Earthquake and Tsunami: Recommendations from Iwate," was compiled based on the prefecture's past reconstruction efforts and lessons learned in order to prepare for future disasters and to contribute to improving the disaster preparedness of Japan as a whole by sharing the contents of the proposal to the public.

Using selected items from the collection such as unique initiatives or lessons learned, we have prepared an English version of the recommendations, with some data updated, for foreign government officials and others to reference in formulating their disaster response plans.

■Roles of the National, Prefectural and Municipal Governments

The Basic Act on Disaster Management (Act No. 223 of 1961) defines the basic principles of disaster control and the responsibilities of the national, prefectural, and municipal governments based on these fundamental principles as follows.

○Basic Philosophy of Disaster Countermeasures (excerpt)

Considering the natural characteristics of Japan, it is always assumed that a disaster may occur, taking into account changes in Japan's population, industries, and other social and economic conditions, and efforts are made to minimize damage and achieve a prompt recovery if a disaster occurs.

In the event of a disaster, efforts must be made promptly to restore facilities, aid victims, and achieve recovery.

○Responsibilities of the National Government (Summary)

Based on the basic principles and in light of the mission of protecting the national land and lives, bodies and properties of citizens from disasters, the State has the responsibility to take all possible measures concerning disaster management by mobilizing all its organizations and functions.

To perform the responsibilities prescribed in the preceding paragraph, the State must formulate a plan on which disaster management, emergency disaster control measures, and disaster recovery efforts are to be based, implement the plan on the basis of laws and regulations, pursue the implementation of affairs or operations concerning disaster management handled by local governments, designated public corporations, and designated local public corporations, undertake the overall coordination of the implementation, and ensure that the burden of expenses related to a disaster is appropriate.

○Responsibilities of Prefectures (Summary)

Based on the basic principles and in the interest of protecting the area of a prefecture, and the lives, bodies, and properties of its residents from disaster, the prefecture has the responsibility to formulate a disaster management plan concerning an area of the relevant prefecture with the cooperation of related organs and other local governments, implement the

plan on the basis of laws and regulations, and at the same time, assist in the implementation of affairs or operations concerning disaster management handled by municipalities and designated local public corporations within the area, and undertake the overall coordination of the implementation.

○Responsibilities of Municipalities (Summary)

Based on the basic principles and in the interest of protecting the area of a municipality, and the lives, bodies, and properties of its residents from disaster, as a local government at the base level, the municipality has the responsibility to formulate a disaster management plan concerning the area of the relevant municipality with the cooperation of related organs and other local governments, and implement the plan on the basis of laws and regulations.

In order to fulfill responsibilities under the preceding paragraph, the mayor of the municipality must endeavor to sufficiently employ all capabilities of the municipality, by keeping the organization of fire-fighting organs, flood prevention units, etc., in good condition, by enhancing organizations related to disaster management, voluntary disaster management organizations, and other public groups within the area of the municipality, and by promoting voluntary disaster management activities among the residents.

■Main Audience of the Recommendations

This report is intended to serve as a guide for prefectural government officials and others involved in disaster preparedness and countermeasures, to help them prepare for future disasters and take appropriate action when responding to disasters and during recovery/reconstruction efforts. The report also provides recommendations based on our experiences regarding the systems and financial resources under the jurisdiction of the national government, which are important in the recovery and reconstruction efforts. We hope that this report will serve as reference for future disaster response in regions other than Iwate Prefecture.

■Report Structure

At the Third United Nations World Conference on Disaster Risk Reduction held in Sendai in March 2015, Iwate Prefecture compiled examples of disaster reduction and recovery efforts and the resulting recommendations, sharing them domestically and internationally as the "Proposal from Iwate Prefecture about Disaster Risk Reduction and Reconstruction".

This report also incorporates these examples and recommendations.

○ Chapter 1: Outline of Iwate Prefecture introduces Iwate Prefecture's area, population, number of households, economic growth rate and industries.

○ Chapter 2: Overview of Damage Caused by the Great East Japan Earthquake and Tsunami summarizes the scale of the earthquake and tsunami disaster, as well as the general state of damage in the prefecture.

○ Chapter 3: Correspondence with the Sendai Framework for Disaster Risk Reduction 2015-2030 summarizes the four priority actions to be implemented by all stakeholders as defined in the Sendai Framework for Disaster Risk Reduction 2015-2030 and the correlation with this collection of recommendations.

○ Chapter 4: Prefectural Initiatives summarizes excerpts from Recovery from the Great East

Japan Earthquake and Tsunami: Recommendations from Iwate, explaining the initiatives implemented by the prefecture as well as lessons learned and recommendations made from these initiatives.

- Section 1: Initial Response and Emergency Measures and Section 2: Restoration and Recovery Efforts include a selection of disaster response efforts immediately after the disaster and subsequent restoration and recovery efforts in chronological order.
- Section 3: Countermeasures for Radiation Effects lists the measures the prefecture has taken since the accident at the TEPCO Fukushima Nuclear Power Plant.
  This section also includes Establishment of a System for Responding to Nuclear Power Plant Accidents among other measures the prefecture has taken since the accident.
- Section 4: Initiatives Beyond the Existing Framework summarizes a selection of the unique initiatives that the prefectural government has been implementing in response to the actual conditions in the affected areas, while making proposals to the national government in order to accurately respond to various issues as it promotes recovery and reconstruction from the Great East Japan Earthquake and Tsunami.

■At the Time of Writing

"Recovery from the Great East Japan Earthquake and Tsunami: Proposals from Iwate" was edited in the 2019 fiscal year and published in March 2020.

The English version of the book was edited in the 2023 fiscal year and published in March 2025.

Chapter 1: Outline of Iwate Prefecture

■Area and Geography

Iwate Prefecture is located in the northeastern part of Honshu and is a long oval shape, measuring approximately 122 km horizontally and 189 km vertically. At 15,279 km2, it is the second largest prefecture in Japan after Hokkaido, accounting for 4% of Japan's total area of 377,955 km2.

Most of the inland area of Iwate Prefecture is mountainous, with the Ou Mountains on the western border with Akita Prefecture, and the Kitakami Mountains in the eastern part running parallel to these mountains. The Kitakami River flows to the south between these two mountain ranges, through the plains that spread to the river valley.

The coastal area north of Miyako City is a typical uplifted coast with sea cliffs and coastal terraces. On the other hand, the area south of Miyako City is a contrasting landscape, with a typical Japanese rias coastline formed by submerged water at the foot of the Kitakami Mountains. The offshore area of the Sanriku coast is one of the world's largest fishing grounds, blessed with excellent fishing ports and harbors.

■Population

Population: 1,144,407 (as of October 1, 2024)

The population dropped below the 1.4 million mark in 2004, which had been maintained since 1978, and has since declined, falling below 1.3 million in 2013 and 1.2 million in 2021.

Number of households: 535,326(as of October 1, 2024)

The number of households is increasing, but the number of persons per household, calculated by dividing the population by the number of households, is decreasing.

■Economy

Gross Prefectural Product (Nominal) 4.7474 trillion yen (National Share 0.89%) (Real) 4.6565 trillion yen

Economic growth rate (Nominal) -2.2% (Real) -3.0% (both in the 2020 fiscal year)

The construction, logistics/postal, and accommodation/food services industries have shrunk, resulting in a 2.2% decrease in nominal terms and a 3.0% decrease in real terms, which is a continuation of the decrease seen in the 2019 fiscal year.

Prefectural per capita income: 2,666,000 yen (rate compared to national income per capita (=100): 89.2)

Note: Prefectural per capita income is calculated by dividing the total income of residents and businesses in the prefecture by the total population of the prefecture.

Breakdown of (nominal) gross prefectural product by industry: primary industries (agriculture, forestry, and fishing) 3.1%, secondary industries (mining, manufacturing, and construction) 27.2%, and tertiary industries 69.2%.

Breakdown of employment by industry: primary industry 9.8%, secondary industry 26.1%, tertiary industry 64.1% (in the 2020 fiscal year)

■Agriculture

In 2021, agricultural production was 265.1 billion yen, placing Iwate 2nd in the Tohoku region and 10th in Japan. Iwate plays an important role as a food supply base for Japan, as it is blessed with agricultural resources such as vast farmland and rich weather conditions, and a variety of farming techniques are being developed by utilizing the special characteristics of each region.

■Forestry

In 2021, forestry production was approximately 19.3 billion yen, which is 4% of domestic production and places 6th in the nation.

The forested area in the 2020 fiscal year is approximately 1.18 million hectares, accounting for 77% of prefectural land, with a good balance of conifers and broad-leaved trees.

■Fishing

In 2021, fishing production was about 29.6 billion yen, placing Iwate 3rd in the Tohoku region and 14th in Japan. Blessed with the calm waters of the Rias Coast and reefs suitable for the growth of marine products, the prefecture is a leader in "foster fishery" with abalone ranking 1st, wakame 2nd, and salmon 3rd in Japan.

To support the fishing industry, the prefecture is working to improve the infrastructure of coastal fishing grounds, fishing ports, and fishing villages, to develop distribution and processing systems, and to seed release salmon and abalone.

■Manufacturing

Manufacturing shipments in Iwate Prefecture were 2,494.3 billion yen in 2020 with about 23.3% of those from the automotive industry and about 16.5% from the semiconductor industry, due in part to the development of manufacturing infrastructure by those industries as well as the expansion of local industries. The prefecture's economy is driven by the highly internationally competitive manufacturing industry.

■Tourism

The total number of tourists exceeded 18.33 million (in 2022).

The prefecture, which is the second largest in area after Hokkaido, is blessed with a wide variety of tourist attractions, with its rich nature, deep history and culture, colorful local festivals and traditional performing arts, and cuisine. The aim is to expand tourism by actively

making use of the region's characteristics.

In cooperation with coastal municipalities and businesses in the tourism industry, we will open all reconstruction roads, pass on the lessons and realities of the Great East Japan Earthquake and Tsunami, make progress in new community development, and develop tourism by utilizing local resources.

Overview of the Disaster-Stricken Coast of Iwate Prefecture

■Overview

The coast of Iwate Prefecture is located in easternmost Honshu and consists of five cities, four towns, and three villages, from Hirono Town in the north to Rikuzentakata City in the south. The total area of the region is approximately 4,946 km2. The region is surrounded by a rich natural environment, including the scenic Rikuchu Coast, natural harbors, and world-class fishing grounds.

In addition to the fishing industry, which takes advantage of its geographical location, the region has global market share in the precision machinery, steel, and cement manufacturing industries, along with its extensive transportation network that is used to transport industrial products produced in the inland regions of the prefecture to shipping ports.

However, the coastal region has a weak economic base compared to the inland areas of the prefecture and the rest of Japan. As it is thought that "without the development of the coastal areas, the prefecture will not develop," the prefectural government has been focusing on the development of this region as a top priority task.

■Natural Characteristics

The coastline, which stretches 708 km in total, is composed of beautiful and varied sea-eroded landscapes that cannot be found elsewhere in Japan. Most of the area has been designated as Sanriku Fukko National Park.

■Population and Economy

In 2010, prior to the Great East Japan Earthquake and Tsunami, the population of the coastal region was approximately 274,000, accounting for about 20% of the population of Iwate Prefecture. As for age demographics, Iwate Prefecture has a higher percentage of elderly people than the rest of Japan, with population aging progressing especially in the coastal areas.

In addition, the net production value of the coastal areas in 2008 was 568.9 billion yen, accounting for about 20% of the prefecture's total. Prefectural per capita income and job offer rates were below the prefectural average.

Chapter 2: Overview of Damage Caused by the Great East Japan Earthquake and Tsunami

The Great East Japan Earthquake and Tsunami, which measured 9.0 on the Richter scale with a maximum seismic intensity of 7 and a maximum tsunami run-up height of at least 40.1 meters, caused unprecedented damage. In Iwate Prefecture alone, over 6,200 people were killed or still missing (in 2010, Iwate's population was 1,330,147), over 26,000 houses were completely or partially destroyed, and industrial damage exceeded 820 billion yen.

Earthquake Overview

●Date of occurrence: 14:46:18, March 11, 2011

●On March 11, 2011, the Japan Meteorological Agency (JMA) named the earthquake the "2011 off the Pacific coast of Tohoku Earthquake." On April 1, 2011, the government named the disaster the "Great East Japan Earthquake." In Iwate Prefecture, the earthquake is referred to as the "Great East Japan Earthquake and Tsunami".

●Epicenter: 130 km east-southeast of Oshika Peninsula, off the Sanriku coast (38.1° N / 142.9° E)

●Depth of epicenter: approx. 24 km

●Epicenter area: 450-500 km long and 200 km wide (off the Iwate - Ibaraki coasts)

●Moment magnitude scale: 9.0

■Summary of the Earthquake

At 14:46 on March 11, 2011, a 9.0 earthquake on the moment magnitude scale (M) occurred, with its epicenter off the coast of Sanriku. A maximum seismic intensity of 7 on the JMA Seismic Intensity Scale was observed in Kurihara City, Miyagi Prefecture, and an seismic intensity of upper 6 was observed in Miyagi, Fukushima, Ibaraki and Tochigi Prefectures.

In Iwate Prefecture, Ofunato City, Hanamaki City, Ichinoseki City, Kamaishi City, Oshu City, Yahaba Town, Fujisawa Town (now merged into Ichinoseki City), and Takizawa Village (now Takizawa City) observed an seismic intensity of lower 6, with strong tremors also observed throughout other areas of the prefecture.

Rikuzentakata City [Before the Earthquake]

Rikuzentakata City [After the Earthquake]

■Summary of the Earthquake

Name	The 2011 off the Pacific coast of Tohoku Earthquake
Time	March 11, 2011 2:46 p.m.
Epicenter	Off the Sanriku Coast (38° 06.2' N, 142° 51.6' E, 24 km depth)
Magnitude	9.0 (moment magnitude scale)
Maximum Seismic Intensity in the Prefecture	Lower 6 (Ichinoseki City, Yahaba Town, Kamaishi City, Ofunato City, Takizawa City, Fujisawa Town, Hanamaki City, Oshu City)
Height of Tsunami	Miyako: 8.5m (minimum) Ofunato: 8.0m (minimum) Kamaishi: 4.2m (minimum) Kuji Port: 8.6m (estimated)

(Data courtesy of the JMA)

■Earthquake Mechanism

This massive earthquake is thought to have been an "interplate earthquake", in which the Pacific Plate slid below the North American Plate where eastern Japan is located on. The tip of the North American Plate, which was also dragged down by the Pacific Plate, was unable to withstand the force and recoiled, causing a large earthquake and tsunami.

The epicenter of the earthquake was off the coast of Iwate and Ibaraki Prefectures, covering an extremely wide area of about 450-500 km vertically and 200 km horizontally, and is thought to have been the result of six epicenter blocks (Central Sanriku-oki, Miyagi-oki, near the Southern Sanriku-oki Trench, near the Sanriku-oki to Boso-oki Trench, Fukushima-oki, and Ibaraki-oki) interlocking to create a fault rupture. The six epicenter blocks had been observed and recognized as a potential subduction zone up until the disaster. The rupture of the fault began around 130 km east-southeast of the Oshika Peninsula in Miyagi Prefecture (near the southern Sanriku-oki Trench), causing a chain reaction which spread north to central Sanriku-oki and south off the shore of Ibaraki Prefecture.

■Post Earthquake Crustal Deformation

The Geospatial Information Authority of Japan (GSI) set up 1,240 GPS-based control stations at 20 km intervals, which are used as reference points for surveying, and monitors crustal deformation nationwide, publishing data on the amount of change in horizontal and vertical crustal deformation caused by the main shock of earthquakes.

The earthquake caused severe shaking in the Tohoku region, leading to unprecedented tsunami damage. As a result of the earthquake, the Oshika control station (Ishinomaki City, Miyagi Prefecture) moved approximately 5.3 meters to the east-southeast and sank 1.2 meters, with crustal deformation observed in a wide area from Hokkaido to the Kinki region.

In the prefecture, large movements were observed in coastal areas, with the Ofunato control station moving 4.19 m horizontally and -77 cm vertically, and the Kamaishi control station moving 3.32 m horizontally and -53 cm vertically. Large movements were also observed in the inland areas, with the Iwate Daito control station moving 3.30 m horizontally and -32 cm vertically.

■Liquefaction

The earthquake caused ground deformation over a wide area from Tohoku to Kanto, resulting in liquefaction, tilted buildings, land subsidence, and other damage. This was due to strong seismic motions over a wide area, with tremors that continued over a long period of time. Liquefaction was observed over an extremely wide area, even in the Kanto region far from the epicenter. In particular, damage was identified in the Tokyo Bay area, landfilled areas down the Tone River, as well as old river channels and ponds, having a major impact on building foundations, roads, and lifeline services which rely on underground connectivity.

■Aftershocks

After the main shock on March 11, 2011, aftershocks were frequent in the epicenter area.

According to statistics from the JMA, there were 115 earthquakes of seismic intensity 4 or higher from March 11 to March 31, 2011, 52 in April, and 16 in May. Since then, the frequency

has gradually decreased, but earthquakes of seismic intensity 4 or higher were recorded 262 times during a period of about one and a half years until August 31st 2012. Of these, a maximum seismic intensity of 6 or higher was recorded twice, a maximum seismic intensity of 6 or lower twice, a maximum seismic intensity of 5 or higher 12 times, a maximum seismic intensity of 5 or lower 40 times, and a maximum seismic intensity of 4 measured 206 times.

Tsunami Overview

●Maximum inundation height: 18.3 m (survey location: Ryouishi Bay, Kamaishi City, Iwate Prefecture)

●Maximum run-up height: 40.1 m (survey location: southern entrance of Ryori Bay, Sanriku-cho, Ofunato City, Iwate Prefecture)

●Distance upstream: 48.88 km (survey location: Kitakami River / Oizumi, Tome City, Miyagi Prefecture)

●Flooded area: 561 ㎢

■Scale of Tsunami

The tsunami that followed the earthquake struck the Pacific coast region from Aomori to Chiba prefectures, devastating many coastal cities, towns, and villages.

Thirty to fifty minutes after the earthquake, one of the largest tsunamis ever recorded washed over the Pacific coast of eastern Japan. The GSI announced that, based on land-based GPS observations and sea floor crustal movement observation data from the Japan Coast Guard, there was horizontal fault movement (fault slip) of over 50 meters in the area near the Japan Trench (close to the epicenter), which is estimated to have caused the sea floor to rise by over 12 meters in the area. This crustal movement is believed to have caused the huge tsunami.

Tsunami heights (from sea level) observed at tsunami observation facilities in various areas were at least 8.5m in Miyako City, at least 8.0m in Ofunato City, at least 8.6m in Ayukawa, Ishinomaki City, Miyagi Prefecture, and at least 9.3m in Soma City, Fukushima Prefecture.
※There was a period of time when data was unavailable because the observation facility was damaged by the tsunami. It is possible that subsequent waves may have been higher.

The tsunami was not only felt along the Sanriku coast near the epicenter, but throughout the Japanese archipelago, exceeding 3 meters in parts of Hokkaido, and 1 to 1.5 meters was recorded in the Tokyo Bay area.

Tsunami heights (inundation height) at points on land near the coast are measured from traces of flooding left on buildings. Most of the Sanriku coast from northern Iwate Prefecture to the Oshika Peninsula in Miyagi Prefecture reached 10 to 15 meters, and the Sendai Bay coast reached around 8 to 9 meters at its highest. The run-up height, which is the height a tsunami reaches on land, was 40.1 meters at Ryori Bay, Ofunato City and the highest in Japan's recorded history, measured by the 2011 Tohoku Earthquake Tsunami Joint Survey Group. In addition, tsunami propagation into rivers was observed in many locations, overtopping levees and causing extensive damage. A survey by the Tohoku Regional Development Bureau, a branch of the Ministry of Land, Infrastructure, Transport and Tourism confirmed that the tsunami had traveled 49km inland up the Kitakami River from the river entrance.

■Tsunami Warnings

The JMA estimated the magnitude of the earthquake to be 7.9 on the JMA magnitude scale, and at 14:49, three minutes after the earthquake, issued a major tsunami warning for Iwate, Miyagi, and Fukushima Prefectures, and a tsunami warning or advisory for the rest of the Pacific coast. The first report stated the expected tsunami height was 6 meters for Miyagi Prefecture and 3 meters for Iwate and Fukushima Prefectures. However, a sharp rise in tide levels was observed from GPS wave observation buoys in various areas at around 15:10, and a second tsunami warning was issued at 15:14, raising the expected tsunami height to more than 10 meters in Miyagi Prefecture and 6 meters in Iwate and Fukushima Prefectures.

This earthquake caused almost all broadband seismographs in Japan to reach their measurement limits, hence why it took time to calculate the magnitude in accordance to the moment magnitude scale, which estimates the size of massive earthquakes. Due to this delay, this information could not be used for tsunami warnings issued at the time. The JMA has since drastically revised its tsunami warning announcement method, mainly to promote prompt evacuation and warnings, because the first report's information that the tsunami was expected to reach a height of 3 meters led to delays in evacuation.

■Source Areas of the Tsunami

The Meteorological Research Institute estimated the tsunami source area (the area where a direct change in the height of the sea surface is observed due to topographic changes on the sea floor) by calculating backwards from the arrival time of the tsunami at 19 tsunami observation stations located along the Pacific coast and offshore from Hokkaido to the Kanto region. The source area was estimated to be approximately 550 km long and 200 km wide, extending from offshore Iwate Prefecture to Ibaraki Prefecture. (Monthly Report on Earthquakes and Volcanoes in Japan March 2014)

This expansive tsunami source area is the cause of the massive tsunami.

Summary of Damage

■Human Casualties, Residential Damage, Industrial Damage, Damage to Public Infrastructure, Damage to Lifelines

The Great East Japan Earthquake and Tsunami caused serious damage throughout the prefecture. The tsunami was larger than the 1896 Sanriku Earthquake and Tsunami, the 1933 Sanriku Earthquake and Tsunami, and the 1960 Chile Earthquake and Tsunami, and led to many casualties and extensive material damage in coastal areas. The damage in coastal areas varied greatly from municipality to municipality and region to region, with some areas suffering catastrophic damage and losing most of their ability to function as villages and cities, while other regions sustained extensive damage to coastal cities but had cities further inland which managed to survive. In inland areas, strong tremors also caused casualties and damage to houses. The socioeconomic impact was felt throughout the whole prefecture due to extensive damages to public infrastructure and the agriculture, forestry and fisheries industries. Logistical disruptions and reputational damage caused by unfounded rumors also contributed.

Even after the March 11, 2011 earthquake, numerous earthquakes, both large and small, occurred intermittently. In particular, on April 7, 2011, a strong earthquake with a magnitude of 7.1 struck

with its epicenter off the coast of Miyagi Prefecture, and strong tremors were observed throughout the prefecture, with Ofunato City, Kamaishi City, Yahaba Town, Ichinoseki City, Hiraizumi Town, and Oshu City all measuring just under 6 on the JMA seismic intensity scale.

■Human Casualties (Iwate Prefecture)

The Great East Japan Earthquake and Tsunami caused a total of 6,253 casualties, with 5,146 dead and 1,107 missing. The number of casualties, including those injured, accounted for 0.5% of the prefectural population and 2.3% of the coastal population (as of March 31, 2024).

■Residential Damage (Iwate Prefecture)

The number of houses totally or partially destroyed reached 26,079, most of which were damaged by the tsunami. The population of the areas submerged by the tsunami was approximately 88,000, accounting for about 30% of the total population of coastal municipalities (as of March 31, 2024).

■Evacuees (Iwate Prefecture)

The number of evacuees peaked at approximately 54,000 on March 13, 2011 (two days after the earthquake). However, even after the completion of emergency temporary housing, some evacuees were still waiting for home repairs to be completed. All evacuation centers were eventually closed by October 7, 2011 (approximately seven months after the earthquake).

Construction of emergency temporary housing began in Rikuzentakata City and Kamaishi City on March 19, 2011 (eight days after the earthquake), and all 13,984 units were completed on August 11, 2011 (five months after the earthquake).

■Industrial Damage (Iwate Prefecture)

Industrial damage totaled 829.4 billion yen. Of this amount, damage to fisheries and fishing ports accounted for the largest amount at 564.9 billion yen, followed by 133.5 billion yen for commercial industries, 98.4 billion yen for agriculture and forestry, and 32.6 billion yen for tourism (accommodation) as of November 25, 2011.

In addition to the aforementioned damage, the earthquake had a serious impact on all areas of the prefecture's commerce and economy, including travel cancellations and the cancellation of various events due to a mood of self-restraint.

■Damage to Public Infrastructure (Iwate Prefecture)

Damage to public infrastructure totaled 2,752 locations and 257.3 billion yen. Of these, damage to rivers, coasts, and road infrastructure accounted for the most damage at 172.3 billion yen, of which damage to coastal infrastructure such as seawalls and flood gates was particularly severe at 128.9 billion yen. Damage to road infrastructure specifically amounted to 25.2 billion yen, with coastal roads damaged by the tsunami and inland roads damaged by intermittent aftershocks. Damage to port-related infrastructure was 44.5 billion yen, and damage to park infrastructure was 40.5 billion yen (as of July 25, 2011).

In addition to the damage to many of the tsunami disaster management facilities, the tsunami also caused land subsidence in many areas, resulting in flooding every time the tide rose.

Damage Classification			Damage
Human Casualties	Number of Deaths		5,146 people
		(Deaths directly caused by the disaster)※	4,675 people
		(Deaths indirectly caused by the disaster)	471 people
	Number of Missing Persons		1,107 people
Residential Damage	Number of Houses Destroyed		26,079 properties

※ Includes the number of fatalities due to aftershocks after April 8, 2011 following the Great East Japan Earthquake Tsunami
(As of March 31, 2024)

Industrial Damage	(Billion yen)
Agriculture and Forestry Industry	984
Fisheries Industry	5,649
Commercial Industry	1,335
Tourism Industry (Accommodation)	326
Total	8,294

(According to the Iwate Prefecture Disaster Countermeasures Headquarters as of November 25, 2011)

Public Infrastructure Damage	(Billion yen)
Rivers, Coasts and Road Infrastructure	1,723
Park Infrastructure	405
Port Infrastructure	445
Total	2,573

(According to the Iwate Prefecture Disaster Countermeasures Headquarters as of July 25, 2011)

■Damage to Lifelines (Iwate Prefecture)

The maximum damage to lifelines, as determined by the prefectural disaster headquarters, is as follows: approximately 760,000 homes were left without power (restored on May 28, 2011), 9,400 homes had no access to gas (restored on April 26, 2011), 190,000 homes were left without access to running water (restored on July 12, 2011), and 66,000 telephone lines were out of service (restored on April 17, 2011).

■Characteristics of Damage in Iwate Prefecture

According to the estimated capital stock damage by the Development Bank of Japan Inc., the damage to Iwate Prefecture as a whole was approximately 4.276 trillion yen, which, when compared to the GDP of Iwate Prefecture at that time according to the Department of National Accounts, Economic and Social Research Institute, Cabinet Office, was equivalent to one year of GDP. For context, this is a higher ratio than the damage estimated for Miyagi (0.81 years' worth of GDP) and Fukushima (0.43 years' worth of GDP) Prefectures.

Although Miyagi Prefecture experienced the greatest amount of damage among the main prefectures affected, Iwate Prefecture had the highest percentage of estimated capital stock damage at 12.6% of total estimated capital stock, and percentage in the coastal areas of Iwate Prefecture was particularly prominent at 47.3% when compared to other areas.

This is because the coastal area of Iwate Prefecture is a rias coast, characterized by steep mountains rising close to the sea and a complex topography of narrow bays. With the steeply sloping mountains reaching the coast, residential and commercial infrastructure is only able to sit on the few flat areas in this unique terrain. This is the main reason why the tsunami caused extensive damage to the area.

Due to this geographical composition, the land utilization ratio of inundated areas was higher in Iwate Prefecture compared to the other prefectures, with 34% of land utilized for buildings, compared to 21% in Miyagi Prefecture and 12% in Fukushima Prefecture.

Estimated Capital Stock Damage and Percentages (Unit: billion yen)

		Estimated Capital Stock	Estimated Capital Stock Damage					Percentage of Total Capital Stock	GDP	Damage as % of GDP
			Public Infrastructure	Residential	Manufacturing Industry	Other	Total			
Iwate Prefecture	Inland Areas	26,369	457	22	64	211	754	2.90%	4,255	1.0 years' worth
	Coastal Areas	7,449	1,943	607	191	781	3,522	47.30%		
	Total	33,818	2,400	629	255	992	4,276	12.60%		
Miyagi Prefecture	Inland Areas	31,443	856	40	148	551	1,595	5.10%	8,007	0.81 years' worth
	Coastal Areas	23,182	2,031	1,446	290	1,130	4,897	21.10%		
	Total	54,625	2,887	1,486	438	1,681	6,492	11.90%		
Fukushima Prefecture	Inland Areas	34,314	630	7	263	370	1,270	3.70%	7,228	0.43 years' worth
	Coastal Areas	15,941	1,244	145	151	319	1,859	11.70%		
	Total	50,254	1,874	152	414	689	3,129	6.20%		

※Capital stock and damage estimates made by the Development Bank of Japan Inc. (April 28, 2011).

※GDP figures are derived from "FY 2009 Prefectural Accounts" (February 29 2012, National Accounts of Japan, Economic and Social Research Institute, Cabinet Office).

Percentage of Land Utilization in Tsunami Inundation Areas

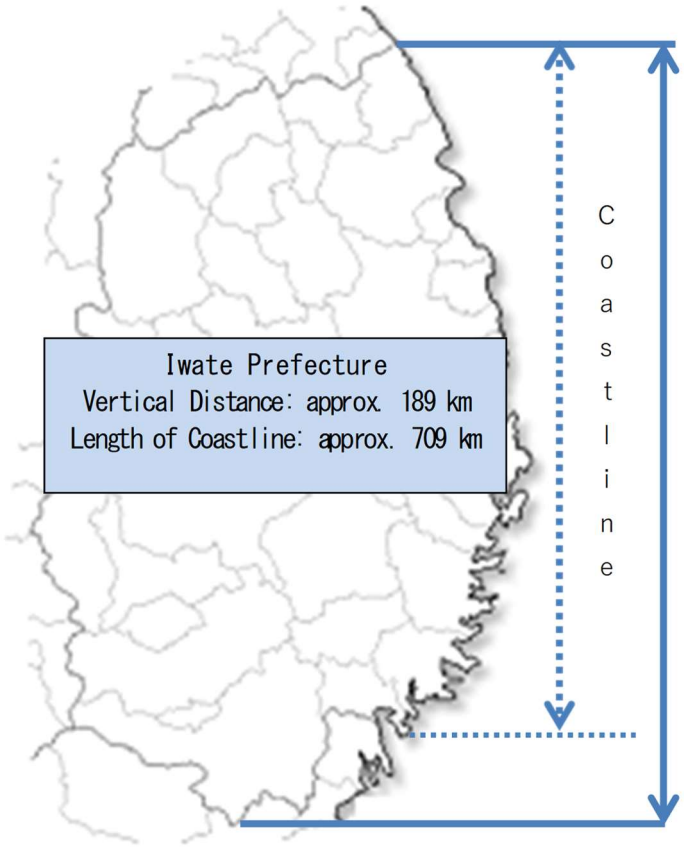
(%)

Land Utilization	Rice Fields	Other Agricultural Land	Forests	Buildings
Iwate Prefecture	17	4	9	**34**
Miyagi Prefecture	41	7	7	21
Fukushima Prefecture	53	3	4	12
Tohoku Region	37	5	7	20

Source: "Land Utilization in Tsunami Inundation Areas" (April 18, 2011, Geospatial Information Authority of Japan)

Extent of Tsunami Damage

To protect ourselves from tsunami damage, measures must be taken along the whole Iwate coastline.



Coastline Length Calculations are based on "Coastline Lengths by Prefecture" published by the Fisheries Agency.

Chapter 3: Correspondence with the “Sendai Framework for Disaster Risk Reduction 2015-2030”

In this collection of recommendations, as defined in the “Sendai Framework for Disaster Risk Reduction 2015-2030,” the four priority actions to be implemented by all stakeholders are organized as follows, along with the corresponding relationships between the prefecture’s efforts in Chapter 4, Sections 1 through 4.

Recommendation / Four Priority Actions	Chapter 4 Prefectural Initiatives Section 1. Initial Response and Emergency Measures	Section 2. Recovery and Reconstruction Initiatives	Section 3. Countermeasures for Nuclear Radiation Effects	Section 4. Initiatives Beyond the Existing Framework
1 Understanding and sharing the risks of disasters		(11) Promoting Iwate Reconstruction Education (12) Collection and Utilization of Materials Related to the Earthquake and Tsunami		(3) Construction of the Reconstruction Memorial Park and Memorial Facilities (4) Disseminating Information on Iwate’s Reconstruction Efforts
2 Strengthening disaster risk management	(1) Securing Power/Fuel Necessary for Disaster Response ①② (2) Logistical Support Activities to the Affected Areas (3) Provision of Relief Supplies (4) Support for Recovery of Administrative Functions in Affected Municipalities (5) Emergency Restoration of Public Facilities ①②③④⑤		(1) Establishment of a System to Respond to Nuclear Accidents	

3 Investing in disaster preparedness and mitigation to increase resilience		(1) Restoration and Maintenance of Coastal Protection Facilities Such As Seawalls (2)Community Development (surface development) (3)Restoration of Port Facilities (4) Restoration and Reconstruction Initiatives in the Fishing Industry (5) Restoration of Fishing Ports (6)Support for Reconstruction of Housing for Disaster Victims (7)Development of Public Housing for Disaster Victims (8) Maintaining and Promoting the Health of Disaster Victims (9)Establishment of Mental Health Care Centers (10) Establishment of Child Care Centers		
4 To be fully prepared for disasters and make improvements during reconstruction				(1)Prioritized Development of Reconstruction Roads (2) Establishment of “the Iwate Learning Hope Fund” (5)Emergency Disaster Drills to Strengthen the Power of “Self-help”, “Mutual Assistance” and “Public Support”

Chapter 4 Prefectural Initiatives

Section 1: Initial Response and Emergency Measures

(1) Securing Power/Fuel Necessary for Disaster Response ①Emergency Power Supply

【Case Study】

■Status of Emergency Power Supply

Power plants and power grids were damaged by the Great East Japan Earthquake and Tsunami, resulting in long-term and widespread power outages.

Emergency power generation facilities are effective in dealing with power outages, but at the time of the disaster only nine of the sixteen prefectural and district government buildings, including the prefectural government office, were equipped with emergency power generation facilities.

The remaining seven government buildings were not equipped with emergency power generation systems, and the power outages were the biggest obstacle to initial disaster response.

■Problems with Securing a Portable Emergency Generator

The seven government buildings that did not have emergency power generation facilities were forced to continue without power after the disaster struck, but five of the seven buildings were able to procure portable generators through rental or other means. As a result, the company was able to respond to the disaster with the minimum necessary electrical equipment, such as communications and lighting, during the period between the blackout and the restoration of power.

On the other hand, two of the seven government buildings were unable to procure portable generators, so they had to work without electricity until the power outage was resolved.

■Emergency Power Supply Malfunctions and Operational Problems

One of the nine government buildings, which had emergency power generation facilities in place, experienced a power outage immediately after the disaster because the emergency power generator failed to start automatically. The next day on March 12, 2011, repair workers arrived from Sendai and power was restored once repairs were completed.

In another government building, the emergency power generator automatically started up, but because the generator engine was a water-cooled radiator and the water supply and elevated water tank were cut off, there was a shortage of cooling water for the generator engine which led to an emergency shutdown. Until power was restored after the outage, they were forced to respond to the disaster by securing a portable generator.

Other government buildings had no problems and were able to secure a certain level of power. The prefectural government and other government buildings were able to secure fuel supplies and stockpiles, but one government building had a small fuel tank and had to refuel frequently, making it difficult to procure fuel on each occasion.

Renewed emergency power generation equipment at the Morioka District Joint Government Office Building (maintenance completed in the 2013 fiscal year)

New installation of emergency power generation equipment at the Oshu District Joint Government Building (maintenance completed in the 2012 fiscal year)

【Lessons Learned and Recommendations】

■Necessity of Securing Emergency Power Supply (Installation and Continuous Operation of Emergency Power Generation Equipment)

When installing emergency power generation equipment, it is important not only to install the equipment, but also to consider whether the equipment will operate under post-disaster conditions.

Of the nine government buildings that had emergency power generation systems in place prior to the disaster, six had deteriorating systems, and the Great East Japan Earthquake and tsunami occurred just as the planned replacement of these systems was beginning. Furthermore, the emergency power generation facilities in these government buildings were mainly used as emergency power sources for things such as firefighting equipment which are required by law to be installed, and their power generation capacity was limited. Due to this, it was decided to review the power generation capacity to the level necessary to maintain the functions of disaster prevention centers, and after the earthquake, the facilities were renewed as planned with support from the government.

Some of the government buildings that had been renovated before the earthquake did not have their power generation capacity upgraded, but since these buildings were equipped with solar power generation systems, the emergency power generation systems and solar power generation systems were used in combination to compensate for the lower capacity. For government buildings that were not equipped with emergency power generation facilities, new facilities with are being installed in a similar manner to ensure sufficient power generation capacity.

In regards to handling emergency shutdowns from lack of cooling water, when installing new equipment or updating existing equipment, air-cooled radiators were adopted to cope with emergency shutdowns due to lack of cooling water, even when the water supply is cut off.

■The Need to Prepare for Prolonged Power Outages (securing fuel)

In addition to securing emergency power generation equipment, it is also important to secure fuel in anticipation of long-term power outages.

National guidelines recommend stockpiling enough fuel for 72 hours of continuous operation to cope with prolonged power outages. Three government buildings, including the prefectural government office, are capable of operating emergency power generation facilities for 72 hours as disaster management centers, but the emergency power generation facilities in five other government buildings are designed as emergency power sources only for things such as firefighting equipment, and were not designed to operate for long periods of time. In some government buildings where fuel storage tanks were used for heating and cooling systems, there was no issue with the capacity of fuel which allowed them to be used as-is.

Additional tanks were installed as some government buildings only had fuel storage tanks exclusively for power generation equipment, which needed to be refilled frequently during the earthquake disaster.

In addition, with regard to securing fuel, the government amended the law to facilitate smooth information gathering and sharing among oil companies in the event of a disaster, and established a system that would allow them to respond to emergency requests and jointly use storage facilities without violating the law.

■Necessity of Proper Maintenance and Management

With regards to the installation of emergency power sources, it is necessary to make efforts for proper maintenance and management, including daily inspections and maintenance, systematic repairs, and renewing equipment.

In some government buildings, the power generation equipment was unable to start up due to malfunctions. Although regular inspections were conducted once a year, it is unclear whether the

malfunctions were caused by poor maintenance, degradation, or damage from the earthquake.

■Preparing Soft Measures is also Necessary

In addition to the above, it is anticipated that in the event of a disaster, it may not be possible to cope with the situation only by improving physical infrastructure. It is also important to be prepared in terms of soft measures. For example, collaborating with operators who have portable power generation facilities and establishing a system for sharing information to secure fuel.

(1) Securing Power/Fuel Necessary for Disaster Response ②Oil/Petroleum

【Case Study】

■Request for Stable Oil Supply

The Great East Japan Earthquake and Tsunami caused severe damage to fuel supply centers such as refineries and oil depots, as well as service stations, which led to electricity and gas being cut off. Under these circumstances, a stable supply of oil was requested as fuel for emergency power generation equipment in public facilities and hospitals, for heating in evacuation centers, and as fuel for emergency vehicles. Oil played a major role as a disaster-resistant, self-reliant and decentralized energy source due to its superior convenience, storage, and transportability.

Of the 27 refineries nationwide, six refineries located in the Tohoku and Kanto regions ceased operations. Social infrastructure such as ports and roads were at a standstill, which hampered the supply of petroleum products.

In the prefecture, there was a shortage of fuel for emergency vehicles soon after the disaster. In addition, when fuel was supplied to emergency vehicles on a priority basis, this caused issues such as friction between them and the general public.

■Fuel Supply through Emergency Response

A fuel storage warehouse in Kamaishi City was also damaged by the tsunami, but as there was fuel stored in the undamaged tanks, they were purchased by a petroleum distributor and put to use.

Immediately after the disaster, the company outsourced fuel delivery to a kerosene distributor in the Kansai region in order to set up a system to transport fuel.

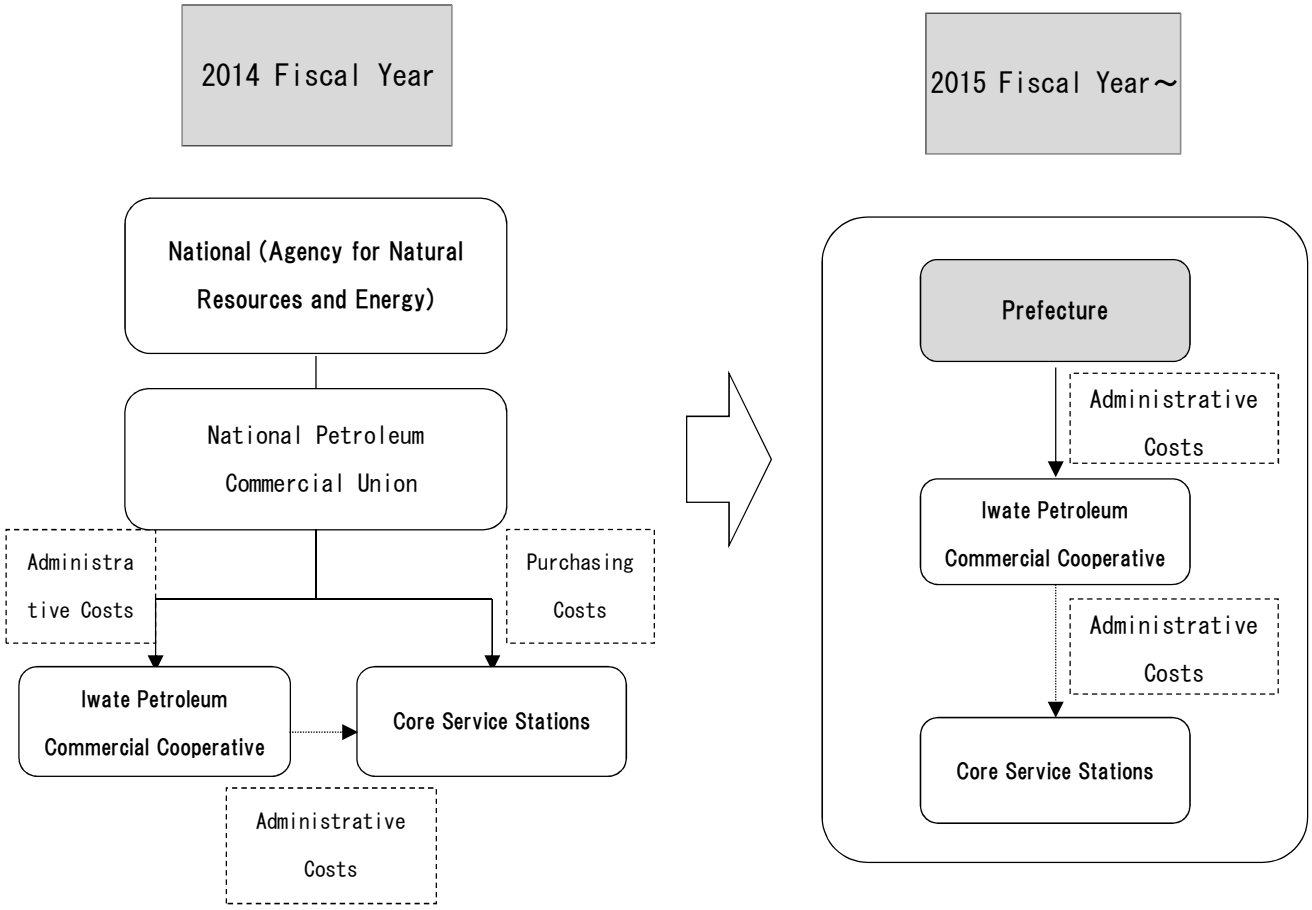
The company that was commissioned to deliver the fuel transported eight tank trucks from the Hokuriku region to Iwate Prefecture, loaded fuel from the fuel storage warehouse in Kamaishi City, and delivered the fuel in response to requests from the affected cities, towns, and villages.

■Infrastructure and Institutional Development Necessary for Stable Supply

Since the 2011 fiscal year, the government has been working to improve service stations that can operate even during power outages and has established a program to promote fuel stockpiling to ensure that emergency vehicles are able to receive a reliable supply of fuel in the event of a disaster.

Within the prefecture, fuel stockpiling at core service stations has continued in excess of the prescribed amount since the 2014 fiscal year.

In addition, there has been a focus in implementing infrastructure and institutional improvements in terms of both supply and demand, including the establishment of a system able to respond to requests for fuel supply in emergencies.



【Lessons Learned and Recommendations】

■Need to Promote Structural and Non-structural Measures for Stable Oil Supply

Various efforts have been made to maintain and strengthen the supply chain in order to ensure a stable supply of oil even in the event of a disaster. However, it is necessary to further promote structural and non-structural measures for stable oil supply in preparation for wide-area and large-scale disasters such as an earthquake directly under the Tokyo metropolitan area or a massive Nankai Trough earthquake.

■Need for Measures to Collect and Disseminate Information on Service Station Operations

It is anticipated that situations such as the supply of fuel being delayed due to damage to roads and other fuel transportation routes, forcing service stations to restrict sales or suspend operations, as well as confusion stemming from busy traffic at service stations that can supply fuel even during a power outage may happen. In preparation for such situations, it is necessary to consider how to collect accurate and prompt information on the operation status of service stations during a disaster, and how to disseminate information appropriately.

■Consumers Also Need to be Prepared at All Times

It is important for fuel suppliers to prepare for large-scale power outages, and it is also important to promote measures that balance both suppliers and consumers such as promoting further stockpiling of fuel at all times, including for private vehicles.

(2) Logistical Support Activities to the Affected Areas

【Case Study】

■Establishment of Collection Centers for Supply Distribution

The Great East Japan Earthquake and Tsunami caused extensive damage to coastal municipalities, making it difficult to procure supplies within each municipality. Collection centers for relief supplies were established in the inland areas as the roads long the coast were damaged, splitting the coastal municipalities into northern and southern regions. Initially, the prefecture decided to use the prefectural fire academy and other facilities located in the central part of the prefecture as collection centers, since they had not been decided upon in advance.

However, as the facilities were too small, on March 15, 2011 the primary collection center for relief supplies was changed to a multipurpose event facility in Takizawa City, adjacent to Morioka City, and a system was established to transport relief supplies from the primary collection center to secondary collection centers in coastal municipalities.

■Municipal Logistical Support Activities

Logistical support activities were also conducted in areas such as Tono City and Sumita Town, which are within an hour's drive of adjacent coastal municipalities.

[Logistical Support Activities from Tono City]

During the disaster, Tono City served as a logistics base for the Self-Defense Forces from March 12, 2011 to July 25, 2011, as well as a base for emergency firefighting teams and police forces operating in the affected cities, towns, and villages.

As large quantities of relief supplies were sent to Tono City from all over Japan, Tono City also became a base for collecting and transporting relief supplies from other prefectures, separate to the prefectural relief supplies collection center located elsewhere.

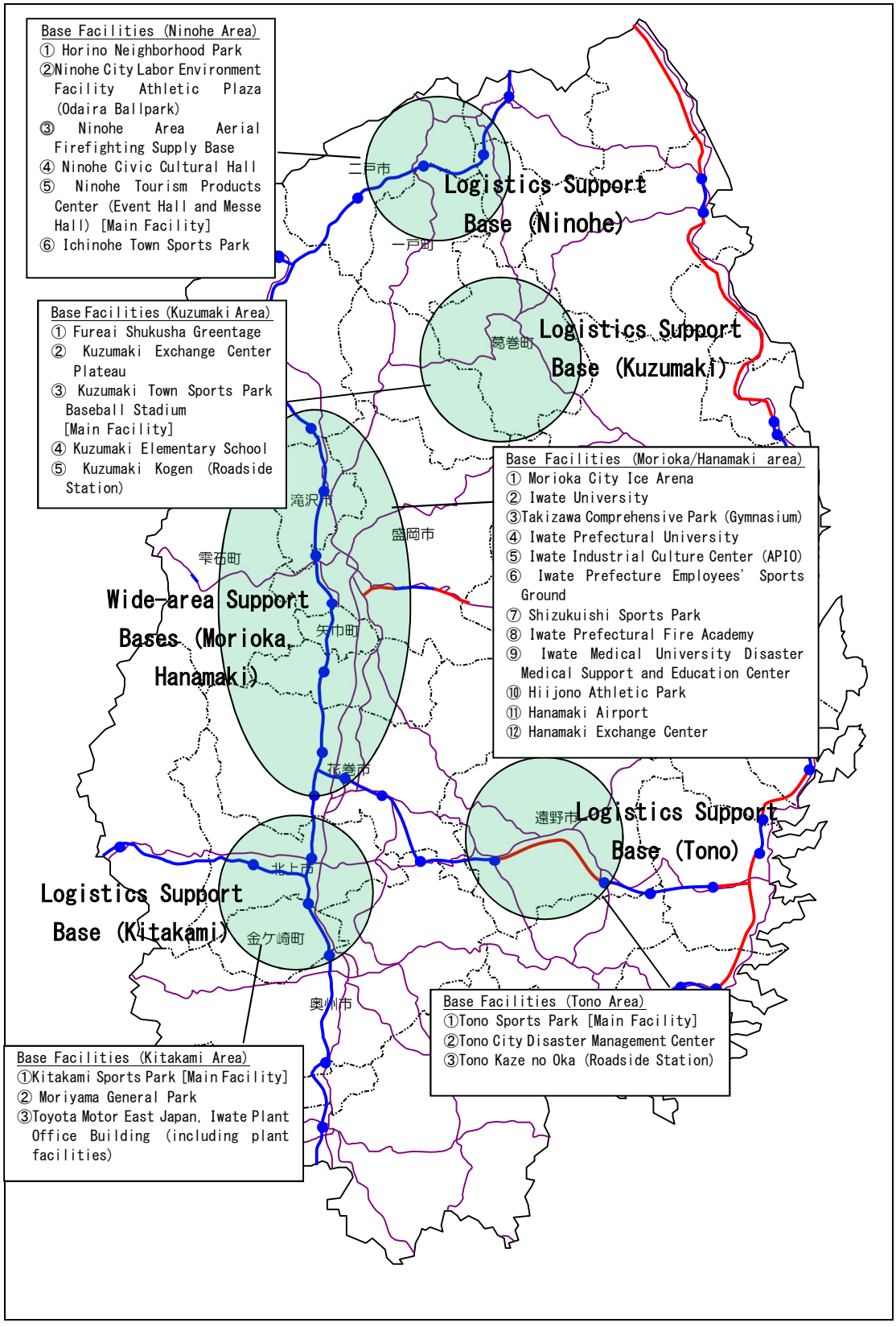
Even before the earthquake, Tono City had been preparing to function as a support base for coastal municipalities in the event of a disaster by building a sports park that can be used as a temporary heliport and for logistical support. The city had also been conducting prefectural emergency disaster drills and participating in disaster response drills organized by the Self Defense Forces to prepare for tsunami disasters in coastal areas.

In particular, during the earthquake response drills organized by the Self Defence Forces, the city conducted training to receive approximately 900 Ground Self-Defense Force (GSDF) training troops, as well as food preparation drills for logistics training to verify the logistics support and disaster prevention agency coordination systems.

[Logistical Support Activities from Sumita Town]

From March 12, 2011, Sumita Town provided relief supplies, conducted search operations by the fire brigade, and provided meals by groups such as the Women's Firefighting Cooperation Volunteers to Rikuzentakata City and Ofunato City. In addition, the town received support teams from the police and other organizations at its facilities.

■Location of Wide-area Disaster Management Centers in the Prefecture



【Lessons Learned and Recommendations】

■Need for a Base to Support Affected Areas in less affected areas

When a large-scale disaster strikes, there will be a shortage of human and material resources, roads will be cut off, and communications will be disrupted in the affected area. Therefore, it is necessary to establish operation bases that enable the movement of people, logistics, and the transmission of information, as well as a system of coordination between the disaster response

headquarters and bases.

A review of the prefecture's response to the Great East Japan Earthquake and Tsunami revealed the following issues: the prefecture did not set up a prefectural supply collection center, and the support system for stockpiling and supplies was inadequate.

Logistical support activities by Tono City and other cities located halfway between the central region of the prefecture and the coastal municipalities did play an important role. At the beginning of the disaster however, supplies to the coastal disaster areas did not go smoothly because of insufficient coordination between the prefecture and Tono City. Due to this, on March 21, 2011, the prefecture dispatched a liaison officer to Tono City to strengthen their coordination system.

The prefecture studied the establishment of a disaster management system capable of responding to a large-scale disaster over a wide area, and formulated a plan for the deployment of wide-area disaster management centers in the 2013 fiscal year.

A wide-area disaster management base is a facility with various functions in the event of a large-scale disaster, such as a base camp for support forces, receiving and distributing relief supplies, and providing logistical support to the affected area. The prefectural government's plan outlines the functions and locations required for wide-area disaster management centers in the prefecture.

In addition to the type and quantity of supplies to be procured, it is also important to take into consideration the needs of those affected.

At the time of the disaster, there were shortages of water, food, blankets, and other supplies, as well as the inability to provide meals to those with allergies or other various conditions. In light of these issues, the prefectural government established guidelines in 2013 based on the prefectural government's Regional Disaster Management Plan that set guidelines for stockpiling food and other necessary supplies. Based on these guidelines, the prefecture shares the stockpiling of necessary supplies with municipalities, conducts periodic inspections and updates, and encourages households and business establishments to stockpile supplies.

In stockpiling supplies, the prefecture encourages municipalities to procure supplies with special consideration for those in need, such as the elderly, the disabled, patients with intractable diseases, those with food allergies, foreigners, infants, and pregnant and nursing mothers.

■Distribution of Wide-area Disaster Management Bases is Also Effective

Looking at the Great East Japan Earthquake and Tsunami, we believe that for local governments with a large area similar to that of our prefecture, it would be effective to distribute wide-area disaster management bases in order to provide logistical support to affected municipalities over a large area.

We also believe that the cost of establishing wide-area disaster management centers can be reduced by utilizing existing facilities such as gymnasiums and sports parks.

The prefecture decided to establish two types of wide-area disaster management bases: wide-area support bases and logistical support bases.

Wide-area support bases are disaster management bases that have the ability to respond to large-scale disasters that occur throughout the prefecture, and are especially equipped to

support the on-site activities of support forces.

Logistical support bases serve as frontline bases in order to provide support for nearby disaster-stricken areas and are especially equipped with facilities as a base camp for support units coordinating on-site activities, as well as the ability to support those on-site activities such as by resupplying.

In order to effectively deal with wide-area disasters such as earthquakes, tsunamis, and volcanic eruptions, as well as the regional characteristics of this prefecture with its large land area, the prefectural government decided to station wide-area support bases in the Morioka and Hanamaki areas, and logistical support bases in the Ninohe, Kuzumaki, Tono, and Kitakami areas.

(3) Provision of Relief Supplies

【Case Study】

■Determining Collection Points for Receiving Relief Supplies and Establishment of a Supply Transportation System

Coastal municipalities were devastated by the tsunami disaster, and the large number of evacuees made it difficult to procure and provide supplies for them. Although communications were disrupted, the prefectural government decided that it was necessary to provide supplies from inland to the affected coastal municipalities after estimating the damage to them from the onset of the disaster. They began transporting supplies with the help of the Self-Defense Force as well as local trucking companies to the affected areas starting March 12. However, due to the large volume of relief supplies received, which exceeded expectations, the initial facilities for receiving relief supplies quickly went into overflow.

The "Iwate Prefecture Regional Disaster Management Plan" did not clearly determine a collection center for relief supplies. Private facilities that had been receiving relief supplies since March 11, the day of the disaster, had to resume regular business operations by March 13, the beginning of the following week, making it difficult for them to receive relief supplies for an extended period of time. Therefore, it was necessary to decide on a center for receiving relief supplies as soon as possible.

After consulting with a group of trucking companies in the prefecture, a multi-purpose event facility owned by the prefecture was designated as the primary collection point for relief supplies, and all relief supplies received after March 14 were to be collected at this multi-purpose event facility.

This multi-purpose facility was constructed as a large-scale event hall, and large trucks could directly enter the facility. It was also suitable as a collection center because it was equipped with forklifts, pallets, and other equipment.

Since this multi-purpose facility was managed and operated under a designated manager system, it took time to coordinate with the designated management company regarding the period and method of use before it could be used as a center for receiving relief supplies.

■Issues in the Transportation of Relief Supplies to Collection Centers

A series of tasks such as organizing, packing, and loading supplies were performed by prefectural employees. Because the prefectural staff, who had no previous experience in this area, performed unfamiliar tasks, there were complaints from the affected coastal municipalities that the supplies received were not in prime condition.

Requests for relief supplies from the affected coastal cities, towns, and villages also changed as time went on. Even after the needs for blankets and drinking water were met, donations of blankets and drinking water continued to come in from all over Japan, making it difficult to secure storage space for these supplies.

Since it was difficult for the prefecture to handle all responses related to relief supplies on its own, they entrusted the basic operation of relief supplies to an organization of truck operators in the prefecture. By setting up a temporary prefectural office in a multipurpose event facility, a system was established to enable the receipt, loading, and unloading of relief supplies on a 24-hour basis. Up until August 11, 2011, when the prefectural disaster response

headquarters was dissolved, 1,721 deliveries were made from the multi-purpose facility and warehouses to coastal municipalities.

In order to streamline packing and loading operations, before trucks transporting goods to the affected areas entered the multi-purpose facility, prefectural officials used walkie-talkies to inform the facility of the trucks' destinations, bed sizes, and other information. The prefectural staff in charge of the project had to wait outside for long hours, both day and night, for the trucks to arrive. Some had to wait in phone booths to stay warm while temperatures were below freezing. Depending on the time of the disaster, it may be necessary for staff to take measures to prevent heat stroke in the summer and keep warm in the winter.

■Review of the "Iwate Prefecture Regional Disaster Management Plan" in Preparation for the Next Large-scale Disaster

After the earthquake, the "Iwate Prefecture Regional Disaster Management Plan" was reviewed and this multi-purpose event facility was officially chosen as the prefecture's supplies collection center and designated as a wide-area support center with functions to receive and distribute relief supplies.

Loading relief supplies at APIO [Source: Iwate Earthquake Tsunami Archive / Provider: Iwate Prefecture].

【Lessons Learned and Recommendations】

■Designating Supply Collection Centers and Establishing an Efficient Transport System for Relief Supplies in Advance

During the disaster, it took time for the prefecture to decide on the locations of the supply collection centers. From this, it is necessary to designate in advance supply collection centers that are capable of receiving and distributing relief supplies according to the situation. Since it is difficult for the prefecture to receive, manage, and transport relief supplies on its own, it is also necessary to establish a system to efficiently and reliably transport relief supplies in the event of a disaster leveraging the superior knowledge and skills of affiliated organizations.

A series of logistics systems for relief supplies, including receiving, loading, and unloading, based at a multi-purpose event facility and carried out in cooperation between the prefecture and a group of trucking companies in the prefecture, later became known as the "Iwate Method" and was a model case for logistics in disaster relief in Japan.

(4) Support for Recovery of Administrative Functions in Affected Municipalities

【Case Study】

■Assistance for Municipalities with Declining Administrative Functions became Necessary

In coastal municipalities, the tsunami damaged government buildings and caused administrative data to be lost, and many employees were victims of the disaster, severely impairing administrative functions and forcing the suspension of services to residents.

In Rikuzentakata City and Otsuchi Town, the tsunami hit the upper floors of the main government buildings. In Rikuzentakata City, 68 employees were killed, and in Otsuchi Town, 33 employees including the mayor were killed. As government buildings were damaged, administrative data was swept away, and other administrative functions were severely damaged, quick recovery became a priority task.

■Assessing the Status of Administrative Functions and Dispatching Prefectural Officials

Rikuzentakata City and Otsuchi Town, whose government buildings were damaged, were particularly in need of immediate support as well as assessment of the situation. Therefore, prefectural government officials, together with officials dispatched from the national government, visited Otsuchi Town on March 18, 2011, and Rikuzentakata City on March 20, 2011, to interview officials of both areas about the damage and their immediate needs.

Based on the results of the interviews, the prefectural government dispatched a total of 256 prefectural employees to the two areas for a total of 256 days as emergency support. The dispatched staff provided practical support, including decision-making support, liaison and coordination with the national government, prefectural government, and related organizations, as well as legal and internal administrative work. In order to secure the manpower necessary to implement full-scale restoration and reconstruction projects, they provided necessary operational support as the situation changed from post disaster support to restoration, such as compiling needs related to requests for support staff from other municipalities.

【Number of People Dispatched】

Otsuchi Town: 2 (3/20 to 4/30 for a total of 96 days of work)

Rikuzentakata City: 3 (3/22-5/11 for a total of 129 days of work), 1 supervisor from 5/1 to 5/31

Otsuchi Town: Temporary government building set up in the schoolyard of Otsuchi Elementary School (in use since May 2011).

■Assistance in Restoring Administrative Functions

In order to restore administrative functions, Rikuzentakata City and Otsuchi Town needed to establish government buildings to serve as bases for securing resident service counters and office space and installing equipment necessary for operations. The Otsuchi Town and Rikuzentakata City municipal governments moved to temporary government buildings on April 25, 2011 and May 16, 2011 respectively, to serve as bases for administrative functions.

In both places, as the servers for the systems that managed residents' information were inundated by the tsunami, the prefectural government shared their information database that held four types of information (name, address, gender, and date of birth) of residents, which were then used. Later, the hard disks of the servers that managed residents' information were recovered from the damaged government building, and the data was restored with the help of a specialized company.

■Acceptance of Support Staff through Short-term Dispatch

As of December 31, 2011, a total of 30,107 support personnel from 30 prefectures and 9,205 from 34 cities, wards, towns, and villages were dispatched to the affected coastal municipalities and the prefecture on a short-term basis to operate evacuation centers, sort supplies, construct emergency temporary housing, and provide health services. (This is limited to activities known by the prefecture.)

The affected coastal municipalities were faced with the challenge of securing staff to propel their enormous administrative operations, including the operation of evacuation centers immediately after the disaster, support for disaster victims, and the implementation of projects for recovery and reconstruction. Immediately after the disaster, there were requests from municipalities throughout Japan to dispatch personnel, but the prefectural government did not have a clear contact point or policy for receiving and responding to such requests. Therefore, in addition to the department in charge of the National Governors' Association, the departments

in charge of personnel affairs, civil engineering, health and welfare, and other specialized fields coordinated with the relevant prefectural agencies.

【Lessons Learned and Recommendations】

■Proactive Support is Needed from the Prefecture

When municipalities are unable to report damages, make decisions, or request support from other municipalities or prefectures due to damage to government buildings, the prefecture must take the initiative in providing support.

Under the pre-disaster system, municipalities were responsible for emergency measures in the event of a disaster, and if the municipalities were unable to handle the situation, they would request support from the prefecture. However, there was no support system in place in the event that the municipalities themselves were unable to function.

■Facilitating Coordination for Receiving Support Staff

In the event of a large-scale disaster, it is necessary to establish rules for responding to requests from other local governments for the dispatch of support personnel in a wide range of fields. In the coordination process for receiving support staff, there were issues such as lack of coordination among relevant departments and lack of a consistent chain of command. The affected municipalities were also busy with disaster response and other activities, making it difficult for them to take meticulous action to coordinate the acceptance of support staff.

■Preparations to Receive Support Staff are Necessary

For support staff dispatched from other local governments, it is necessary to confirm a system of cooperation with related organizations in order to provide as much support as possible, including the provision of information about the disaster area and accommodations. When receiving support staff immediately after the disaster, there was a lack of local information, and it was difficult to make preparations before receiving the staff, including determining the scale of work necessary and the number of staff required, and securing means of transportation and places to stay.

■Ensuring the Continuation of Government Operations by Utilizing ICT

If the government building itself is damaged by a disaster, administrative data and other data that form the basis of administrative services may be lost. Although resident information could be recovered from hard disks at the time of the Great East Japan Earthquake and Tsunami, it is necessary to ensure that important information is backed up in a safe location that cannot be affected by flooding. It is also necessary to review the BCP (Business Continuity Plan) to determine where and how to continue government operations depending on the extent of damage to government buildings and employees, and to anticipate disasters such as the recent heavy rains.

(5) Emergency Restoration of Public Facilities

①Opening Roads and Navigation Channels

【Case Study】

■Road Clearance

Securing a network of passable roads was essential for saving lives and transporting supplies to the affected areas, and road reopening had to be a top priority.

Due to the damage caused by the earthquake and tsunami, 68 points within the 50 national and prefectural roads administered by the prefecture were closed to traffic. National Route 45, a road running north-south along the coast of the prefecture, as well as other roads in coastal areas, were cut off by debris and flooding. The tsunami also swept away parts of National Route 45, including the Kesen Ohashi Bridge in Rikuzentakata City.

The prefectural government, in cooperation with government agencies, worked to secure the Tohoku Expressway and National Route 4, which run north-south through the Tohoku region, and then proceeded with road clearance in line with Operation "Teeth of a Comb" to secure the East-West routes to the Sanriku coast.

Road clearing proceeded with caution while taking into consideration the possibility that there might be survivors among the debris, and in the event that a body was found, the police were contacted for instructions.

In addition, information on the open road routes was provided daily on the prefectural government's website.

Road clearing, emergency work on damaged roads and bridges, and debris disposal were handled by local contractors and construction companies with support from inland areas, based on an agreement between the prefectural government and a group of construction companies in the prefecture.

■Sea Route Clearing

After the disaster struck, as rubble from destroyed buildings and vehicles drifted into the port or sank to the sea floor, sea clearing operations were urgently needed in order for large vessels to enter the port to assist disaster victims.

In order to secure an approach from the sea, the national government and its branches utilized their mobility to conduct the clearance work.

The prefecture manages six ports, four major ports and two regional ports. All six ports were damaged by the tsunami and widespread land subsidence caused by the earthquake. In two of the ports, the breakwaters at the mouth of the bay were almost completely collapsed, and in the other ports, quays and seawalls suffered extensive damage, including washouts and subsidence.

In the southern coastal areas, damage to port facilities was particularly severe, with significant subsidence of the facilities and roads becoming severely uneven, with some roads completely destroyed. In addition, due to searches for victims that had gone missing, it took quite some time for the ports to become usable again. The four major ports were able to resume regular service in the middle of April 2011.

Immediately after the disaster, there were offers from many sources to transport emergency relief supplies by sea, but it was difficult to coordinate the receipt of such supplies because of the lack of information on the state of debris on the seabed and damage to the quays. Once

the relief efforts were underway, many emergency relief supplies were received.

【Road and Sea Route Clearing】

Road Clearing Work in Kamaishi City (March 13th, 2011)

Sea Clearing Work at Ofunato Port

【Lessons Learned and Recommendations】

■Establishment of a Wide-Area Support System

Although local construction companies are responsible for road clearance during disasters, in the event of a large-scale disaster, local construction companies will also be affected and hence it is necessary to establish a more extensive support system in advance.

■The Importance of Team Coordinated Road Opening

Since road opening needs to be done in conjunction with the search for survivors and the possibility of finding bodies, it is necessary for the SDF, fire department, police, and construction companies to form teams to conduct the road opening efforts.

■The Importance of the Role of the National Government

The opening of sea routes proceeded smoothly, as the national government and associated agencies provided support for the opening efforts, including surveying damage to port facilities. As a result, transport of relief supplies such as food and fuel was carried out at an early stage.

(5) Emergency Restoration of Public Facilities

②Emergency Work on Roads, Coasts, and Ports

【Case Study】

■Emergency Road Restoration

Due to widespread ground subsidence caused by the earthquake, some areas of the national and prefectural roads in the coastal areas were flooded at high tide. As an emergency measure, the roads were raised with fill, but until the work was completed, attention to detail was required such as closing the roads only during the flooding period while checking tide levels.

【Emergency Restoration of Roads (raising flooded areas)】

Ofunato Hirota Rikuzentakata Line (Rikuzentakata City)

Kirikiri Kamaishi Line (Otsuchi Town)

■Emergency Restoration of Coastal Areas

From the following three perspectives, the prefecture selected areas for emergency restoration work from among the coasts damaged by levee outflows or other issues stemming from the disaster.

(1) Remote inland areas with habitable settlements or where houses remain
(2) Flooded areas where public facilities and lifelines essential for restoration and reconstruction are located
(3) Areas where flooding caused by storm surges will hinder relief efforts such as search activities, debris disposal, and acceptance of relief supplies

In these selected areas, emergency restoration work started in May 2011. The first task was to build a seawall that can withstand high tide, with the aim of finishing by early July 2011 as risk of flooding would be higher during that period. Following the completion, reinforcement of the infrastructure took place by utilizing local materials up until the typhoon season in early September 2011. Taking into consideration the time required for full-scale restoration, the height of the seawall made during emergency restorations was built based on the probabilities of the greatest heights of a tsunami within 5 years. Based on the situation in the area, materials such as large-scale sandbags and rubble were used, and emergency restoration work was completed by the expected time.

【Conditions at the Coast during Emergency Restoration】

Takata District Beach, Rikuzentakata City (February 2012)

Unosumai District (Katagishi Coast), Kamaishi City (July 2011)

■Emergency Restoration of Ports and Harbors

Although cranes and other cargo handling machinery were severely damaged by the tsunami at each port, as port functions were restored regular service from general vessels resumed.

As the main quays of the ports became available for use, the prefecture implemented a one-year exemption of port facility fees in an effort to encourage vessels to call at ports and revitalize logistics in order to support the recovery and facilitation of business activities and secure employment in the areas affected by the disaster.

【Conditions of Ports and Harbors during Emergency Restoration】

【Lessons Learned and Recommendations】

■Emergency Road Restoration

In the event of a major earthquake, bridges and other structures may have abnormalities that cannot be detected visually, so it is necessary to conduct specific safety inspections. For these

safety inspections, it is important to establish the routes to be inspected and an inspection system in advance, as well as a system for implementing emergency work after the inspection.

Floods leading to blocked roads caused by a combination of wide-area ground subsidence and high tide is a situation not accounted for under normal road management systems. In the immediate aftermath of the disaster, many vehicles used the roads for search and rescue operations, debris disposal, and other restoration activities, so roads were opened to traffic according to the tide level.

■Emergency Restoration of Coastal Areas

In the emergency restoration of coastal protection facilities, the entire extent of the damage was able to be determined without requiring a detailed investigation, and early establishment of criteria for selecting areas requiring emergency restoration was considered to have contributed to the early completion of restoration efforts.

In the Takata area of Rikuzentakata City, the entire length of the seawall was destroyed by the tsunami, and the emergency restoration work took longer than other areas because of the large scale (approximately 1.9 km) and difficulties in activities such as securing materials for rubble stone work. The work was completed at the end of the 2011 fiscal year.

In emergency restoration work, it is advisable to pay sufficient attention to determine construction methods and materials based on the purpose of the work.

■Emergency Restoration of Ports and Harbors

Many of the affected companies that utilized the ports before the earthquake were able to do so the same as they did prior due to the reduction or exemption of port facility fees. The prefecture's efforts set a precedent for other prefectures to take similar measures.

(5) Emergency Restoration of Public Facilities

③Emergency Construction of Fishing Ports

【Case Study】

■Implementing Emergency Measures for Early Resumption of Fishing Operations

The Great East Japan Earthquake and Tsunami caused catastrophic damage to 108 of the 111 fishing ports in the prefecture, including the collapse and sinking of breakwaters, revetments, and quays, as well as the floating and accumulation of vast amounts of debris on navigation channels, anchorage areas, and sites for fishing port facilities. In order to resume fishing operations as soon as possible, restoration of fishing port facilities, which are the foundation of the fishing industry, was an urgent task.

Fishery-related facilities also suffered catastrophic damage, including damage to seedling production facilities and the loss of fishing boats and aquaculture facilities. In order to resume fishing operations as soon as possible, it was imperative to assess the full extent of damage to fishing port facilities and to take emergency measures to prevent further damage.

■At the Onset of a Disaster, Priority is Given to Supporting Affected Municipalities

During the disaster, it was impossible to survey the damage to fishing port facilities because the scope and scale of the damage were too large, and the roads leading to the ports were cut off by the enormous amount of debris and sedimentation caused by the tsunami. In addition, during the first month after the disaster, the highest priority was to quickly respond to the enormous amount of work involving the lives of disaster victims with only a limited number of personnel, so local prefectural government officials provided support for things that local municipal employees alone could not handle, such as operating evacuation centers and sorting and delivering relief supplies. As a result, a large number of personnel were needed and it was not possible to begin surveying damage to fishing port facilities.

■Full-Scale Damage Assessment is Conducted after the Establishment of a Support System for Back-Up Staff

Damage assessment was conducted from fishing ports where debris had been removed and roads reopened to traffic, but full-scale assessment could not be conducted until May 2011 when support staff dispatched from prefectures across Japan were available to assist.

■Emergency Work Started As Soon As Possible with Cooperation from Organizations as Agreed Prior

A full-scale damage survey was conducted starting May 2011. In order to resume fishing operations as soon as possible, emergency work was carried out, including debris removal to secure shipping routes, temporary raising of wharves for unloading marine products in response to land subsidence, and temporary restoration of breakwaters for the safe mooring of fishing boats. As a result, in September 2011 fishing boats were able to use all 108 fishing ports in the prefecture and were able to unload regardless of tide level.

【Damage to Fishing Ports in the Prefecture】

Floating Debris in the Anchorage Area (Hirota Fishing Port)

Damage to the Quay (Otsuchi Fishing Port)

【Lessons Learned and Recommendations】

■Physical Support is Indispensable in Large-Scale Disasters

In the event of a regular scale disaster such as a typhoon or cyclone, it is imperative to quickly assess the extent and scale of the damage and take necessary emergency measures in order to resume fishing operations as soon as possible.

However, in the case of a large-scale disaster such as the Great East Japan Earthquake and Tsunami, where the damage was extensive and catastrophic and there was a large number of victims, physical support is indispensable.

■Establishing a System to Deal with Damage Assessment for Secondary Disasters

In the event of a large-scale disaster, it is necessary to create a system that allows a small number of people to quickly survey damage from a safe location For example, enabling damage assessment through aerial photography using drones.

At the onset of the disaster, the number of personnel available to survey damage was small because of the need to provide physical support to the affected municipalities. In addition, after the disaster, the surrounding area including local facilities had a high risk of secondary disasters such as cave-ins and collapses. Furthermore, it was necessary to secure multiple survey personnel who could respond to emergency situations, such as the frequent issuance of tsunami warnings and advisories due to aftershocks. As a result, it took time to secure the necessary personnel, resulting in a delay in damage assessment.

■Developing a Logistical Support System

When a large-scale disaster occurs, it is anticipated that local municipalities and other local personnel alone will not be able to handle emergency measures.

Therefore, it is necessary for the national government to establish a system in advance that enables providing logistical support to local governments for disaster operations that are difficult for the affected local governments to handle.

During the Great East Japan Earthquake and Tsunami, the national government provided support for the transportation of emergency supplies by utilizing government-owned vessels. At port facilities under the jurisdiction of the national government, a support system led by the national government was implemented to survey damage on behalf of the prefecture, remove debris from the sea, and procure cranes to unload goods onto the wharves.

(5) Emergency Restoration of Public Facilities

④Support for Restoration of Water Supply Facilities

【Case Study】

■Emergency Measures for Damaged Water Supply Facilities

The Great East Japan Earthquake and Tsunami cut off water supply to approximately 190,000 homes in 29 municipalities in the prefecture. Since the restoration of electricity is essential for the operation of water supply facilities, the prefectural government requested that electric power companies prioritize supplying power to areas where water supply facilities are located. The municipalities took emergency measures such as switching water distribution systems and installing temporary pipes in the affected areas, and gradually expanded their water supply areas based on the available power supply area, eventually reaching full recovery on July 12, 2011. It took approximately four months from the onset of the disaster.

In addition to emergency measures such as the installation of temporary pipes, many water supply facilities (distribution reservoirs, pipes, etc.) were damaged by the tsunami in coastal municipalities, resulting in damage totaling approximately 24.5 billion yen.

■Restoration of Damaged Water Supply Facilities

The affected municipalities have been restoring their water supply facilities with subsidies from the national government, and the prefectural government has been supporting the restoration of water supply facilities through guidance and supervision, including on-site surveys and performance reports.

As of the end of the 2022 fiscal year, restoration projects are still underway in two affected cities.

■Summary of Damage to Water Supply Facilities

Type of Assessment	Target Locations Cost of Damage (Restoration Expenses)
Regular (Restoration of Original Status)	Ichinoseki City, Tono City, Hirono Town, Noda Village, Kuji City, Iwaizumi Town, Miyako City, Tanohata Village, Otsuchi Town, Ofunato City, Yamada Town, Kamaishi City, Oshu City, Rikuzentakata City
	Total 2,720 million yen
Special (Method of Restoration Determined by Consultation)	Noda Village, Miyako City, Yamada Town, Otsuchi Town, Kamaishi City, Ofunato City, Rikuzentakata City
	Total: 21,810 million yen

■Difference between Regular and Special Restoration Activities for Water Supply Facilities

	Water Supply Facility Restoration Activities	
	Conventional Disaster	Great East Japan Earthquake and Tsunami
Outline	・Granting subsidies of disaster restoration expenses for facilities for drinking water and simple waterworks	・Granting subsidies for disaster restoration expenses of water supply facilities related to the Great East Japan Earthquake and Tsunami
Subsidy Rate	・1/2 (2/3 or 8/10 in the case of severe disasters) ・Water supply equipment and water leakage investigations are exempted	・The subsidy rate will be between 80/100 to 90/100 (the expenses minus the subsidy amount will be transferred from general accounting, and the transfer will be covered by a special subsidy tax for disaster reconstruction) ・Water supply equipment 1/2 ・Leakage equipment 1/2
Method of Restoration	・Restoration of original status	・Restoration of original status ・Special exceptions (planned through consultation)

【Damaged Water Facilities】

Auxiliary Pipe Damage (Ofunato City)

Central Control Room Damage (Rikuzentakata City)

【Lessons Learned and Recommendations】

■Sufficient Coordination is Important Among Infrastructure Providers Immediately After the Disaster

Restoration work by various infrastructure providers including electricity, gas, and sewer systems was carried out at the same time, which complicated the work site. In addition, many accidents occurred such as damage to water pipes caused by the removal of disaster waste. Therefore, it is important to ensure sufficient coordination among infrastructure providers, including the sharing of information on the status of structures and work schedules for restoration.

■Restoration Construction is Closely Linked to Community Development Projects

Water distribution pipes and other water supply facilities are constructed at the end of urban development projects in conjunction with the progress of underground structures such as sewers and power lines, and are therefore greatly affected by the progress of other related projects. There are many cases where sudden design changes are required due to changes in construction plans for other structures such as seawalls and roads. Therefore, close coordination with related urban development projects such as roads, seawalls, land readjustment, and property relocation is required.

(5) Emergency Restoration of Public Facilities

⑤Support for Emergency Sewer Construction

【Case Study】

■Damage Assessment

In coastal municipalities, seven treatment plants and ten pumping stations were damaged by the tsunami. Mechanical and electrical equipment stopped functioning due to flooding, and the facilities were littered with mud, driftwood, vehicles, and other debris.

In regards to pipelines, water pipeline bridges and bridge attachments were damaged or leaked, and the insides of the pipelines were blocked by earth and sand due to leaking manhole covers and sewage catch basins. As a result, it was anticipated that it would take a considerable amount of time before sewage waste could be discharged to the treatment plant for disposal.

In the immediate aftermath of the disaster, residences and offices were also washed away by the tsunami, effectively causing sewage to not be discharged in the affected areas. In preparation for the increase in sewage waste that would accompany the restoration of electricity and water supply, local governments urged people to use temporary toilets and to keep miscellaneous wastewater from flowing as much as possible.

■Support for Damage Investigation

For a long time, it was difficult to remain in contact Rikuzentakata City and Otsuchi Town due to severe damage. Therefore, after March 13, 2011, the prefecture directly went and surveyed the affected areas to assess the situation.

■Emergency Restoration

At the onset of the disaster, simple sedimentation treatment was carried out using culverts and pump stations from which sewage flowed. The prefecture purchased approximately 6 tons of solid chlorine to be used for disinfection as part of the sedimentation treatment and distributed it to the municipalities that needed it. The prefectural government also decided to hold preliminary meetings with the national government regarding emergency restoration work on behalf of the affected municipalities.

■Basin Sewer System

Although no major damage was observed in the basin sewers located in the inland areas of the prefecture, water treatment operations had to be carried out using emergency generators due to power outages. In addition, securing fuel became a major issue immediately after the disaster. In order to secure fuel, the prefecture was able to borrow about 40kL of fuel oil meant for heating from schools in the prefecture during the spring vacation.

■ Damage to Sewage Treatment Plants in the Prefecture

Municipality	Treatment Plant	Type of Damage	Status of Restoration
Miyako City	Taro Septic Center	Submergence of power receiving equipment, dust collectors, private generators, etc.	Near-regular treatment since June 20
Ofunato City	Ofunato Septic Center	Submergence of private generators, switchboxes, etc.	Biological sewage treatment in single succession since January 2012
Kuji City	Kuji Septic Center	Flooding of private generators, switchboxes, etc.	Near-regular treatment since March 14.
Noda Village	Noda Septic Center	Flooding of mechanical and electrical equipment in the administration building	Regular treatment since October 2012
Rikuzentakata City	Rikuzentakata Septic Center	Near complete destruction of mechanical and electrical equipment	Temporary MBR treatment plant installed
Kamaishi City	Odaira Sewage Treatment Plant	Complete destruction of electrical facilities (flooded on 1st floor of main administration building)	Biological sewage treatment since March 2013
Otsuchi Town	Otsuchi Septic Center	Near complete destruction of mechanical and electrical equipment	Regular treatment since July 2012

Ofunato Septic Center

Rikuzentakata Septic Center

【Lessons Learned and Recommendations】

■Being Prepared to Continue Operations Even in the Event of a Disaster

Sewerage and other facilities are essential lifelines, and it is important to ensure that they are operational 24 hours a day, 365 days a year. Since the earthquake, study sessions have been held with municipalities in the prefecture to formulate BCPs (Business Continuity Plans), and by the 2016 fiscal year, all municipalities had completed formulating their BCPs.

■Training for Long-Term Power Outages is Necessary

Since securing fuel for emergency power generation facilities due to prolonged power outages became an issue, a manual was created in February 2013 to clarify how to operate the facilities during prolonged power outages. Based on the manual, drills on information communication during disasters are being conducted.

■Facility Ledgers Need to be Utilizable Even After a Disaster Occurs

Since some facilities lost their ledgers and other documents due to the tsunami, it is necessary to consider how to manage the ledgers, such as backing up ledger data.

Section 2: Restoration and Reconstruction Initiatives

(1) Restoration and Maintenance of Coastal Protection Facilities Such As Seawalls

【Case Study】

■Establishment of the "Iwate Tsunami Disaster Prevention Committee of Technology Experts" and Deciding Restoration and Maintenance Policy

While the municipalities were formulating their urban development plans for reconstruction, it was necessary to quickly formulate policies for restoration and maintenance of coastal protection facilities, which form the basis of community development.

In April 2011, the prefectural government established a committee of experts consisting of specialists in tsunami disaster management, community development, and earthquakes, and proceeded with the planning of such policies. The committee established a basic policy for tsunami countermeasures on the principle that evacuation is key, and aims for community development that is able to handle multiple disasters, through discussions on understanding and examining disaster situations, the effectiveness of current facilities, and how disasters occur.

The development of tsunami countermeasures, such as seawalls, were discussed ahead of time without waiting for the results of the national government's study, and from September to October 2011 the height of coastal levees for each series of beaches and bays was determined and announced.

The heights of the coastal levees were based on the heights of tsunamis that occur with a frequency of once every tens of years to every hundred plus tens of years. The structure of the levees was designed to be resistant even to tsunamis of a magnitude exceeding estimations, and the restoration and maintenance of the levees was continued. Furthermore, the committee also discussed the possibility of constructing seawalls at a height appropriate for each region that is lower than what was planned, in accordance with land use and regional characteristics.

As of the end of March 2024, 141 (99.3%) of the 142 coastal protection facilities planned for restoration and maintenance by the prefecture have been completed.

■Operator Casualties and Sluice and Flood Gates Automatic Closing System

In the Great East Japan Earthquake and Tsunami, many operators who were engaged in the closing of sluice and flood gates were killed. In order to prevent the tragic loss of life, in August 2011 the prefectural government decided to establish a system that would not require operators to go on-site. In order to ensure the safety of operators, the basic plan for reconstruction specified that operations accommodate for remote control and that communications and power sources be multiplexed.

In order to control operations remotely, the number of facilities requiring operations was first reduced, and for the facilities that remained, a sluice/flood gate automatic closing system was developed to remotely automate operations.

This pioneering system, which simultaneously closes more than 200 sluices and flood gates at the time of a tsunami without on-site human operation upon receipt of a tsunami warning from the nationwide instantaneous warning system (J-ALERT), is unprecedented in Japan.

The system has been partially operational since July 2017, and is being developed to operate at 214 sluice and flood gates.

When a tsunami warning was issued on January 16, 2022 due to an undersea volcanic eruption

near the Tongan Islands, the automatic closure system was activated for the first time since its operation began, closing all 165 facilities in operation at the time.

Ofunato Port Coastal Shimizu Area Seawall completed in the 2022 fiscal year (Ofunato City)

【Lessons Learned and Recommendations】

■How the Technical Committee Proceeds

The prefectural government set up a committee at an early stage and conducted extensive discussions with the aim of quickly determining the development goals for the seawalls. In deciding on those goals in each individual district, several tsunami simulations were presented for each planned height of seawall and community development plan, and municipalities also attended the committee meetings and expressed their opinions within discussions in their individual districts. Some of the municipalities even had their mayors participate in the discussions. There were about 100 observers at each of these committee meetings, including the national, prefectural, and municipal governments.

■Careful Coordination with Municipalities

In addition to the committee meetings, the prefectural government held more than 100 concrete discussions with each municipality, coordinating the discussions with the community development plans underway in each area. As a result of the discussions with the municipalities in addition to the committee meetings, some areas decided to implement more flexible measures based on local circumstances, such as restoring the seawalls at a lower height than the prefectural government had planned.

■Passing Down the "Defense in Depth" Ideology

Tsunami countermeasure facilities aim to protect human lives and property, various industrial and economic activities, and the national land from frequently occurring tsunamis. At the same time, for the largest class of tsunamis, countermeasure facilities aim to minimize danger to human lives through "defense in depth" that combines not only tsunami countermeasure facilities but also soft measures such as evacuation.

From the resolve gained post-disaster, it is necessary to ensure that the concept of "defense in depth" is passed on to the next generation through tsunami disaster preparedness education and disaster preparedness/evacuation drills, so that the people of the prefecture will never again be subjected to such grief.

(2) Community Development (surface development)

【Case Study】

■Formulating Reconstruction and Community Development Plans in Affected Municipalities

The damage caused by the Great East Japan Earthquake and Tsunami was enormous, and municipalities affected by the disaster were overwhelmed by the need to dispose of debris, operate evacuation centers, and provide support to victims of the disaster, making it extremely difficult to formulate plans for reconstruction. While several reconstruction projects such as land readjustment were considered in the planning process, very few staff members in the affected municipalities were familiar with the project schemes, and some projects were being undertaken for the first time. The affected municipalities had no choice but to formulate urban development plans for the affected areas without introducing such prospects.

■Support For The Development of Reconstruction Plans for Affected Municipalities By The National Government

Taking into account the situation, the national government supported the affected municipalities in formulating their reconstruction plans by having consultants commissioned to survey and analyze the situation and formulate their community reconstruction development plans. After the reconstruction plans were formulated, studies were conducted on the commercialization of projects such as land readjustment.

■Prefectural Support for Community Development and Reconstruction

The municipalities affected by the disaster faced issues such as a constant shortage of manpower and a lack of understanding of project schemes. Due to this, in order to support the affected municipalities in their reconstruction and community planning, the prefectural government held various meetings with those in charge, such as the Town Planning Promotion Council, to share information on issues and countermeasures in accordance with their current progress.

In addition, the presence of support staff was essential for both the prefecture and the municipalities.

■Progress in Community Reconstruction Planning

As a result of these efforts, all 158 planned community development (surface development) projects were completed by the end of March 2021, and construction was completed on all 7,472 planned lots by the end of December 2020.

■Support Through Utilization of Former Disaster Sites

Disaster sites were hard to utilize in reconstruction projects as they were scattered due to municipalities only having the ability to purchase residential and adjacent farmland, as well as having to accommodate for landowners who did not wish to sell their land. This led to struggles with consolidating the affected land.

The utilization of the land, including the aforementioned disaster sites and adjacent privately owned land, was a major issue in promoting new community development as well as from the perspective of maintenance and management costs.

■Prefectural Support for Municipalities

The prefectural government supported the formulation of plans for land utilization by providing municipalities with information on examples of land utilization, while interviewing each individual district to grasp their current situation.

As of the end of May 2023, approximately 60% of the 321.9 hectares of the former disaster-stricken land eligible for purchase have been designated for use as industrial land and regional multipurpose open spaces. On the other hand, consolidating the land with privately-owned land was time consuming, and matters such as specific application needs have yet to be identified.

Taro District, Miyako City, which was developed as part of the group relocation for disaster mitigation project

【Lessons Learned and Recommendations】

■The Necessity of Pre-Disaster Initiatives

Based on the reconstruction efforts of the affected municipalities, it is necessary to promote pre-disaster initiatives for reconstruction, including learning beforehand the projects to be introduced as responses to disasters.

The affected municipalities involved in the community development (surface development) project had the following points to reflect on.

(1) Immediately after the disaster, there was no time to study the reconstruction and community development plan as they were busy dealing with various other issues.

(2) There were no staff members who were familiar with projects such as land readjustment to study the plans.

(3) Without a clear understanding of the schemes, requirements for adoption, and merits and demerits of each project, each affected area had to go through its own planning process, which caused anxiety among the affected people because of the lack of detailed explanations.

■The Benefit of Meetings Between Those In Charge to Resolve Issues Faced by the Affected Municipalities

As reconstruction from the Great East Japan Earthquake and Tsunami progressed, the issues faced by the municipalities changed accordingly. For this reason, meetings were held for those in charge to grasp and resolve the issues faced by the municipalities, which was beneficial to reconstruction initiatives needing rapid progress.

■The Importance of Preliminary Analyses on Utilizing Former Disaster Sites Planned for Relocation

When relocating to higher ground as part of a reconstruction project, it is important to provide residential land and manage vacant lots, as well as provide local residents early with an idea on the course of action for community development, while also considering a plan in advance for utilizing the former disaster site.

■The Need for Deciding the Criteria for How to Use Former Disaster Sites

In addition to establishing a basic policy for the affected sites, municipalities need to efficiently foster consolidating former disaster sites by classifying and prioritizing them based on the current status of each district, such as districts that require private businesses to utilize the sites or districts where the municipalities will only maintain and manage the sites in their current state.

■Measures to Promote Utilizing Municipal Purchased Former Disaster Sites

Due to the restriction that government grants are not allowed to be used for disaster-stricken sites with no probability of being utilized, further utilization of the disaster-stricken sites has been unable to progress. We will continue to appeal strongly to the government for more flexible subsidy measures to facilitate the consolidation and site preparation of disaster-stricken areas.

(3) Restoration of Port Facilities

【Case Study】

■Restoration of Port Facilities

Full-scale restoration work on port facilities began in the 2012 fiscal year and was completed in March 2014 for Kuji and Yagi Ports, September 2015 for Omoto Port, March 2016 for Kamaishi Port, March 2017 for Ofunato Port, and March 2018 for Miyako Port.

In some cases, the restoration process was significantly delayed due to changes in the construction method based on the results of geological surveys done after the work order was placed. The port administrator, construction contractor, and port users communicated closely with each other to ensure that the work was completed in a way that met the needs of users as much as possible and minimized the impact on economic activities using the port.

At the time of the Great East Japan Earthquake and Tsunami, large-scale land reclamation projects for the construction of new public and industrial wharves were in the final stages in some areas of the port. Post-disaster, the vast vacant land were used for various purposes. Firstly, as a temporary storage site for damaged vehicles, then as a secondary sorting site for earthquake-related waste, and finally as a temporary storage yard for excavated sand and soil from the city's reconstruction projects until they could be diverted to other embankment work, contributing greatly to the promotion of reconstruction efforts.

【Port Restoration Status】

Name	Business Entity	Restoration Completion Date
Kuji Port	National	March 2014
	Prefectural	March 2014
Miyako Port	National	March 2018(approximate)
	Prefectural	March 2018
Kamaishi Port	National	March 2018
	Prefectural	March 2016
Ofunato Port	National	March 2017
	Prefectural	March 2017
Yagi Port	Prefectural	March 2014
Omoto Port	Prefectural	September 2015

■Promoting the Use of Ports and Harbors

In parallel with the restoration work of port facilities, a strategy to promote the use of the ports was formulated in March 2013, setting forth the direction and measures to be taken to implement the formation of a logistics hub for the ports. With the plan of quickly restoring port functions that were severely damaged by the disaster and attracting new container routes, efforts were made to restore the volume of cargo handled at the ports which had been greatly reduced by the Great East Japan Earthquake and Tsunami. As a result, in 2013 the total cargo volume handled at ports in the prefecture were restored to pre-disaster levels.

Subsequently, in April 2016, as a successor to the Port Utilization Promotion Strategy, a Port Utilization Promotion Plan was formulated to take into account changes in the logistics

environment, including the restoration of port facilities and the development of roads for reconstruction. In formulating the plan, the main direction was to consider measures to advance the soft aspects of the port such as skilled personnel and information. However, port stakeholders engaged in lively discussions about not only restoring the port, but also making physical improvements such as quays as well as cargo demand by attracting companies to the areas behind the port.

As a result of those efforts, the total volume of cargo handled at ports in the prefecture exceeded 6 million tons in 2017 for the first time in 12 years.

In addition, the early completion of restoration work combined with the construction of the Sanriku Expressway and other facilities enhanced the port's functions as a logistics hub, as evidenced by the September 2017 opening of a gantry crane at Kamaishi Port and the June 2018 opening of the prefecture's first ferry route between Miyako Port and Muroran Port in Hokkaido.

The ferry service was suspended on March 31, 2020, but the prefecture will work together with Miyako City and other affiliated parties to resume port calls.

Container loading and unloading by gantry crane (November 17, 2017) Kamaishi Port

First ferry route in Iwate Prefecture opened (June 22, 2018) Miyako Port - Muroran Port

【Lessons Learned and Recommendations】

■Mechanisms to Coordinate Port Usage Needs Are A Necessity In Case of An Emergency

In regards to restoration work for port facilities, it is essential to ensure logistics are not halted from the perspective of early restoration and rebuilding of business activities and the local economy It is important to proceed with the work systematically while closely coordinating the use of quays and yards with port users, including port transport companies, by presenting a construction schedule for each quay to users.

In addition, it is important to promote the use of ports and harbors, taking into consideration not only the restoration status of port facilities, but also the restoration and maintenance status of related infrastructure such as reconstruction roads.

In addition, because of the large area of land for ports and harbors, various needs arise during emergencies, and port administrators often have no choice but to regulate the use of the land and take other such actions themselves. Due to this, it is necessary to have a system where those in positions to coordinate the entire recovery and reconstruction process can make decisions and adjustments as to what services should be prioritized.

(4) Restoration and Reconstruction Initiatives in the Fishing Industry

【Case Study】

■Initiatives for Resuming Fishing Operations As Soon As Possible

In the immediate aftermath of the disaster, fishing grounds and beaches were covered with debris washed ashore by the tsunami, making it extremely difficult to resume fishing. Many fishermen faced a situation where they had no daily income and no future prospects.

The prefectural government requested that the national government provide support for the affected fishermen until they could earn an income from fishing, as well as full financial support for the restoration of aquaculture and other fishing facilities, leading the national government to establish a support program. These support projects and emergency job creation projects provided employment opportunities and immediate livelihood support for the affected fishermen, helping them not to give up on resuming fishing operations and to rebuild their lives.

■Support for Restoration and Maintenance of Hatcheries

In order to achieve early restoration and reconstruction of the devastated production infrastructure, the prefecture supported the collective improvement of fishing vessels and aquaculture facilities, mainly by fishery cooperatives, and the restoration and improvement of shared facilities such as collection points. In particular, the restoration of the salmon propagation business, the core of the fishing industry in this prefecture, was an urgent task as 21 of the 28 hatcheries that contributed to the release of over 400 million fry were damaged.

In the process of restoring the hatcheries, a major challenge for the affected fishery cooperatives was to reduce their own expenses. The prefectural government requested the national government to provide support with a higher subsidy rate than the existing government-subsidized program, and the government established an emergency support program. As a result of the emergency restoration work under this project, 18 of the prefecture's 28 hatcheries, including those that avoided the disaster, were able to produce fry in the 2011 fiscal year, and approximately 290 million fry were released in the spring of 2012. By the 2015 fiscal year, the damaged hatcheries were consolidated, and the system was restored to a level capable of producing more than 400 million fry again.

■Establishing a Distribution and Processing System Centered on Local Fish Markets

The local fish markets and seafood processing plants were damaged by the tsunami, leading to the complete loss of fishing for marine products. The local fish markets are key for the distribution of marine products, and the recovery of the local economy whose core industry is fisheries will be delayed if the markets are not restored. With this in mind, the prefectural government urgently took to restoring the fish markets as soon as possible. They received support from the private sector in order to purchase equipment required for reconstruction as well as make repairs for emergency facilities. Together with those in the fishing industry, the creation of a distribution and processing system that made up the core of the fishing markets progressed in unison, enabling the markets to return to business one by one. By 2012, all 12 of the previously damaged fish markets were able to operate in a state of emergency. Subsequently, full-scale restoration of distribution and processing facilities, including fish markets, proceeded under government programs, and by the end of March 2019, freezing and refrigeration capacity had generally recovered to pre-disaster levels.

■Emergency Restoration Through the Emergency Project for Supporting Post-Disaster Restoration of Salmon and Trout Production Areas (government subsidy rate: within 2/3).

Miyako City Tsugaruishi Hatchery immediately after the disaster

Tsugaruishi Hatchery, Miyako City after emergency restoration

【Lessons Learned and Recommendations】

■The Importance of Promptly Implementing Measures to Maintain the Motivation and Prospects of Fishers

In order to preserve the fisher's prospects and motivation to continue fishing, it was important to provide them with emergency employment opportunities and welfare support until the damaged production infrastructure was restored and fishery production resumed, as well as to set a course of action for the recovery and reconstruction of the fishing industry through various projects, and to implement these projects in a prompt and meticulous manner.

■The Importance of Early Restoration of The Foundation of the Fishing Industry: Hatchling Production Facilities

Salmon and abalone are important fishery resources that support the fishing industry in the prefecture, and continuous hatchling releases are necessary to ensure stable catches. Since it took several years to rebuild the damaged facilities, the number of hatchlings released decreased over time, delaying the recovery of fishery resources. It is imperative that hatchling production facilities are restored to minimize the decline in fishery resources and to speed up their recovery.

■Collaboration with Private Organizations for the Early Restoration of Fish Markets in the Area is a Necessity

Since the initial emergency response with support from private organizations was effective for early restoration, it is important to collaborate not only within the government but also with the private sector for a flexible response.

Immediately after the disaster, there was an urgent need to restore facilities, especially those necessary for managing the freshness of products. However, the national and prefectural restoration projects required time for institutional framework and budgeting.

■Administrative Support for Restoration Projects for Nearby Disaster Survivors

For restoration initiatives, it is necessary to create a system that is easily grasped by disaster survivors, while also ensuring that the implementation is done with support from the prefecture and municipalities that are familiar with administrative work.

In addition, it is necessary to provide close support to disaster survivors, such as by consolidating points of contact.

The implementation of the restoration projects entailed an enormous amount of administrative work, which placed a particularly heavy burden on the fishery cooperatives that acted as the main implementers.

In addition, many restoration projects were established by the national government, prefectures, municipalities, and private organizations, making it confusing for disaster survivors to decide which project to select or apply for.

(5) Restoration of Fishing Ports

【Case Study】

■Simplifying Disaster Assessments Enables Early Restoration

In order to begin full-scale restoration of the fishing port facilities as soon as possible, it was necessary to complete the assessment of all locations by the end of December 2011, the deadline for applying for disaster assessments conducted by the government. However, with more than 1,000 damaged areas, the conventional disaster assessment procedure was insufficient in terms of manpower and time to handle the enormous volume of work, making it extremely important to speed up the disaster assessment process.

In response to these issues, the government announced a policy that disaster assessment work could be simplified as a special exception. Full- scale disaster assessment was implemented in the prefecture from June 2011, three months after the Great East Japan Earthquake and Tsunami. By the end of December 2011, all disaster assessments for 1,254 sites totaling 139 billion yen had been completed.

■Restoration of Fishing Ports

Full-scale work on the restoration of fishing ports began in January 2012, and by the end of July 2014, work had begun on all 108 fishing ports, with all restoration work completed by the end of August 2019.

【Lessons Learned and Recommendations】

■The Need to Strengthen Fishing Port Facilities in Preparation for Earthquakes and Tsunamis

In the Great East Japan Earthquake and Tsunami, all emergency supplies were unloaded from port facilities and delivered by land to the areas in need. In some cases however, roads in some fishing village areas were cut off and relief supplies could not be delivered for several days. In response, the prefectural government is working to strengthen the structures of some of the fishing ports it manages, including breakwaters and wharves, to withstand earthquakes and tsunamis. In addition, it is also necessary to work on the development of a system, such as the creation of guidelines that clarify the roles of relevant organizations in advance, in order to transport emergency supplies and personnel as well as resume the production and distribution of marine products as soon as possible in the event of a large-scale natural disaster.

■The Importance of Appropriate Enforcement of Disaster Assessment Policies

In light of the Great East Japan Earthquake and Tsunami and other large-scale disasters that have occurred frequently in recent years, the government has established a policy to streamline and simplify disaster assessment in advance. In order to make use of this experience, it is necessary for the prefectural government to establish a system and structure that will enable it to respond more quickly to large-scale disasters.

■The Importance of Establishing Rules for Evacuation of Fishing Boats

During the Great East Japan Earthquake and Tsunami, fishermen evacuated their fishing boats offshore from fishing ports or fishing grounds to prevent their boats from being washed away or damaged, but according to prefectural investigations, several people were killed when they were engulfed by the tsunami. Learning from this, in May 2019 the prefecture formulated a Manual for Establishing Rules for Fishing Boat Evacuation. For the future, it is necessary to provide

support for the creation of rules proactively conducted by fishermen for fishing boat evacuation in order to prevent casualties among fishermen as they move offshore when a tsunami strikes.

(6) Support for Reconstruction of Housing for Disaster Survivors

【Case Study】

■Conducting Housing Consultations is Required

Since an increase in the number of housing-related inquiries from disaster survivors was foreseen, a budget was secured on March 16, 2011 immediately after the disaster in order to operate the "Housing Hotline" (five toll-free lines), which opened on April 1, 2011 and operated by support staff and other personnel.

■Consultation Services for Support Systems and Moving into Temporary Housing

Since then, the "Housing Hotline" received a total of 2,006 consultations until the end of its operation on August 5, 2011. The hotline provided consultation on support systems for rebuilding homes and moving into emergency temporary housing and prefectural housing. In addition, a separate "Inspection and Consultation Desk" was set up for technical consultations such as for home repairs, to enable a wide range of consultation services to be provided.

■Dispatch Consultations for Home Repairs

The "Inspection and Consultation Service for Damaged Houses" was commissioned by the prefectural government to the Iwate Association of Architects and Building Engineers, and began accepting consultations in late March 2011. Architectural technicians were dispatched to sites free of charge at the expense of the prefecture to provide consultation on how to inspect and repair damaged houses, and from March 2011 to June 2011, 2,395 consultations were conducted.

■Holding Consultation Meetings and Housing Festivals

After the temporary housing had mostly been filled with tenants, "Housing Reconstruction Consultation Meetings" were held to inform people about the next stage of support for rebuilding on their own, and to provide individual consultation. The consultation sessions were held at places such as the municipal office buildings and meeting areas near temporary housing, and were coordinated by prefectural and municipal officials. During the seven-year period from the 2012 fiscal year to the 2018 fiscal year, a total of 523 consultation sessions were held, and 4,286 groups participated.

In addition, with the cooperation of private businesses, a "Housing Exhibition and Consultation Sessions and Reconstruction Housing Festival" was held about three times a year.

■Providing Personalized Support for Housing Reconstruction

The national government's "Support Program for Reconstructing Livelihoods of Disaster Survivors " provides assistance to households that have suffered severe damage to their infrastructure including the total destruction of their homes. Iwate Prefecture however has established its own "Support Program for Reconstructing Housing for Disaster Survivors " as an additional subsidy to this program, which is jointly supported by the prefecture and municipalities.

■Housing Hotline Response Results

	Housing Matters						Matters Besides Housing	Total
	Provisions of Housing				House Repairs/ Rebuilding	Other		
	Temporary Housing	Prefectural Housing	Private Housing	Other/ General				
Survivors	170	257	443	155	246	161	110	1,542
Proxy Agents	40	41	90	51	52	37	24	335
Other	21	21	133	34	21	112	51	393
Total	231	319	666	240	319	310	185	2,270

※The total number of consultations does not equal 2,006 as consultations covering two or more items are counted separately.

■Results of the "Inspection/Consultation" Desk for Affected Houses

Month	Number of Consultations
March 2011	60
April 2011	1,680
May 2011	534
June 2011	121
Total	2,395

■Results of Housing Reconstruction Consultation Meetings

Fiscal Year	Number of Times Held	Number of Supported Groups
2012	18	369
2013	39	503
2014	88	688
2015	91	849
2016	84	567
2017	106	845
2018	97	465
Total	523	4,286

【Lessons Learned and Recommendations】

■Preparations in Advance are a Necessity - Schemes and Response Systems

Estimating the size of the budget was difficult as it was difficult to ascertain the scale of the disaster during its initial stages. However, it is necessary to anticipate project schemes and prepare in advance so that in the event of an emergency, procedures for securing resources can be carried out promptly.

■Operational Issues - Publicizing and Organizing Services

In the immediate aftermath of a disaster when means of communication are limited, publicizing the hotlines and consultation services themselves is an issue. How best to communicate to survivors who need consultation services the most must be devised depending on factors such as the scale of the disaster.

In addition, in order to respond appropriately to a wide variety of issues, Q&A should be

prepared in advance, and information should be shared closely among staff members, with other departments within the prefectural government, subcontracting organizations and municipalities.

In regards to technical consultation, cases were mostly during the initial stages, causing it to take time to organize consultation forms.

Therefore, it would be effective to establish the format for consultation forms and paperwork procedures in advance.

(7) Development of Public Housing for Disaster Survivors

【Case Study】

■National Response to the Development of Public Housing for Disasters

Disaster public housing is public housing provided by the law in the event of a disaster above a specified scale, to be rented to survivors who have lost their residences due to the disaster. Compared to general public housing, this type of housing is eligible for special exceptions such as an increase in the government subsidy rate, which is 2/3 in the case of general disasters and 3/4 in the case of severe disasters, whereas the normal subsidy rate is 1/2. In the case of the Great East Japan Earthquake and Tsunami, the subsidy rate was increased to 7/8.

■Prefectural Housing Reconstruction Policy and Progress in Development

In October 2011, the number of disaster public housing units to be provided was set at approximately 4,000 to 5,000 units, and in September 2012, the target was set at approximately 6,000 units. In addition, it was decided that the prefectural government would develop large apartment complexes over a wide area while municipalities would develop small detached houses in each region, and that the prefectural government would develop some of the units on behalf of the municipalities and then transfer ownership to them. After coordinating repeatedly with the municipalities, the total number of disaster public housing units planned for the prefecture and municipalities, coastal and inland, was 5,833 units, all of which had been completed as of December 2020.

■Maintenance Facilitation Measures

Overlapping implementation schedules and other restoration and reconstruction projects caused a substantial increase in construction expenses and shortages of workers, leading the government to approve of adding housing costs to the development expenses.

In addition, a new method of commissioning construction work was suggested by an investigation conducted directly by the government, and was adopted in some areas.

Terano (Phase 1) Disaster public housing (wooden, detached) in Otsuchi Town, completed in September 2015.

Tochigasawa Disaster public housing in Rikuzentakata City completed in June 2016 (301 units, 9 floors, the largest in the prefecture)

Minami Aoyama Apartments (for inland evacuees, 99 units, some 4 stories) in Morioka, completed in December 2020.

【Lessons Learned and Recommendations】

■Determining the Site and Number of Housing Units Promptly is Important

As with emergency temporary housing, it is difficult to estimate the number of disaster public housing units to be built, but efforts were made to accurately determine the number of units by repeatedly surveying disaster survivors as much as possible. However, unlike emergency temporary housing, securing land for disaster public housing (including housing sites for non-assisted reconstruction) may take time depending on the progress of municipal community development plans such as land readjustment and land raising, and what disaster survivors intend to do may change as time passes. Therefore, it is important to quickly and adequately coordinate the location and number of housing units to be developed.

In the prefecture, priority has been given to the construction of housing units in the coastal areas affected by the tsunami. However, based on a survey of the wishes of inland evacuees and after consulting and coordinating with coastal municipalities, it was decided that 310 units (5.3% of the total number of 5,833 units) in the inland areas would be built.

■The Task of Increasing Housing Stock and Providing Support to Tenants

The construction of disaster public housing will add a large number of public housing units (approximately 6,000) to the existing stock of approximately 18,000 units of prefectural and municipal public housing, and proper maintenance and management of the entire public housing stock will be necessary. Allowing tenants other than disaster survivors to move into disaster public housing, transferring to the private sector, community support for tenants, and rent subsidies are major issues to be addressed, with requests made to the national government.

(8) Maintaining and Promoting the Health of Disaster Survivors

【Case Study】

■Support As Evacuation Centers Became Long Term Residences

As people lived in evacuation centers for prolonged periods of time, support for health care management due to seasonal and environmental changes also changed significantly.

Cold and influenza prevention measures were needed for the cold weather immediately after the disaster, and heat stroke and food poisoning prevention measures were needed for the heat wave in mid-summer. In addition, as there were concerns about issues such as disuse syndrome regardless of age, efforts were made to provide support tailored to the evacuation environment with the cooperation of people such as public health dispatch nurses, by encouraging simple exercise through radio exercises or health classes in evacuation centers.

In addition, a system was established to ensure that those with illnesses, insomnia, or other symptoms were connected to medical teams or mental health care teams.

■Cooperating with Affiliated Organizations and Health Support in Response to Changes in the Evacuation Environment

With the construction of emergency temporary housing, the evacuation environment for disaster survivors will undergo major changes.

In line with this, it is necessary to understand the health conditions of the survivors and provide health guidance from a different perspective from that of living in evacuation centers. However, with support dispatched from government bodies nationwide coming to an end, health centers and municipalities in the prefecture were short of human resources.

With the assistance of affiliated organizations, nurses (including public health nurses) were gathered to conduct home visits to emergency temporary housing and home evacuees to ascertain the health status of individual disaster survivors as their life situation changed and to provide health guidance tailored to their living environment. In addition, periodic meetings were held with welfare support counselors and affiliated organizations to share information and discuss as well as implement support methods tailored to individual needs.

Public health nurses and nutritionists also made periodic visits to temporary housing areas to provide services such as health counseling, classes, and nutritional guidance. With the cooperation of affiliated organizations, dentists and dental hygienists were dispatched to the affected areas to provide dental checkups, consultation activities, tooth brushing guidance, and other services to maintain the health of those affected.

During this period, researchers reported that there were concerns about an increase in strokes due to elevated blood pressure among the elderly living in temporary housing. A handbook was created to help them manage their blood pressure appropriately and leaflets were distributed to all households in the affected municipalities to help do so. Health centers in the affected areas also took the initiative in spreading awareness for the need for proper blood pressure control by those affected themselves.

■Dietary Support

In some evacuation centers, evacuees were able to cooperate and collaborate to maintain a relatively good dietary environment until the evacuation centers eventually closed. However, in other evacuation centers where it was difficult to organize opportunities for evacuees to

interact with each other and bread and instant noodles were constantly distributed, complaints of issues such as mouth ulcers, anemia, and constipation increased.
Support such as dietary consultations, nutritional instruction and nutritional food provisions was provided to improve nutrition according to the situation of each evacuation center.

After the transition to emergency temporary housing, visits by nutritionists and public health nurses revealed that the survivors (especially women who were mainly responsible for cooking in their homes before the earthquake) were losing motivation to cook due to the accumulation of fatigue caused by the prolonged stay in shelters and the long period of absence from daily tasks such as cooking. To address these issues, the project supported self-management of nutrition and dietary habits by holding simple cooking classes and distributing simple recipes at places such as community halls.

■Continuing Health Support for People Moving From Emergency Temporary Housing to Disaster Public Housing

The consolidation of emergency temporary housing and relocation to disaster public housing have also been major turning points for disaster survivors.

Many evacuees have found it difficult to build new relationships from being forced to start their lives over from the community they had built up to that point, leading to new problems arising such as seclusion and alcohol dependence. Due to this, efforts are being made to maintain and promote the health of disaster survivors by continuing health support and dental health care activities in the community halls of public housing for disaster survivors, and by monitoring activities in cooperation with municipalities and affiliated organizations.

【Health Counseling and Dental Checkups】

Public health nurses and others made regular rounds at emergency temporary housing and public housing for disaster survivors, conducting checks such as for blood pressure, daily health consultations, and health education. (Photo: left)
With the cooperation of the Prefectural Dental Association and the Prefectural Dental Hygienists' Association, dentists and dental hygienists were dispatched to the affected areas to conduct dental health activities such as dental checkups, dental consultations, and tooth brushing guidance. (Photo: right)

【Lessons Learned and Recommendations】

■Establishment of a System for Medium and Long-term Support

The impact on the health of evacuees is immeasurable due to the rapid changes in their environment over several years, from evacuation shelters to emergency temporary housing, and then to rebuilding their lives on their own or moving to disaster public housing.

During the Great East Japan Earthquake and Tsunami, issues were handled at each of these milestones and junctures as they evolved, and it is necessary to define measures to respond to disasters based on the results of these efforts. It is also necessary to develop a system for securing human resources with a medium to long-term perspective through cooperation with affilated organizations, such as securing public health nurses and nutritionists at public health centers and municipalities in the prefecture in order to respond to these issues.

■The Need for Ongoing Health and Food Support

Subsidies and other programs to secure manpower tend to be scaled back as people rebuild on their own or move into disaster public housing. However, while some disaster survivors may no longer need support from an early stage, there are many cases where problems only become apparent later. In particular, with prolonged evacuation living conditions as in the case of a large-scale disaster such as the Great East Japan Earthquake and Tsunami, problems tend to manifest themselves later due to aging from the prolonged period of time.

It is important to provide health support while assessing the situation of disaster survivors at each juncture, and it is necessary to ensure that systems are in place to enable this kind of response to continue over the long term.

(9) Establishment of Mental Health Care Centers

【Case Study】

■Establishment of Iwate Mental Health Care Center

In order to take over the activities of the mental health care teams dispatched from all over Japan and to ensure a system for continuous implementation of mental health care measures for disaster victims, Iwate Medical University was commissioned to provide mental health care services for disaster victims in February 2012 and established the Iwate Mental Health Care Center at the university. In March 2012, Regional Mental Health Care Centers were established in four coastal medical regions: Kuji, Miyako, Kamaishi, and Ofunato.

The Mental Health Care Centers are responsible for taking over the activities of the Mental Health Care Teams and complementing the functions of the mental health administration and services in the affected areas.

They are also responsible for providing comprehensive support for mental health in the affected areas, including individual support for community mental health activities such as mental health counseling, specialist care, connections to affiliated institutions, and preventive psychological support, as well as mental health promotion activities such as health education and human resource training, mental health measures for workers, and local suicide prevention measures. In addition, in order to realize community-based support in the medium to long-term, they are engaged in activities to enhance and strengthen local support systems through means such as collaborating with supporters.

■Activities of the Iwate Mental Health Care Center

The Iwate Mental Health Care Center and the regional centers are staffed by public health nurses and registered nurses, mental health workers, and other specialists. "Earthquake Mental Health Consultation Rooms" are set up regularly at seven coastal areas by psychiatrists and specialists.

The consultation rooms are managed by psychiatrists in order for people to be able to receive consultations by specialists in nearby places. However, there are few psychiatrists in the prefecture, especially in coastal areas, making it difficult to secure those required for management. Due to this, psychiatrists are dispatched from affiliated institutions and organizations through cooperation with Iwate Medical University.

In addition to providing individual consultations regarding mental health in the affected areas, the consultation rooms also conduct case reviews, professional guidance, supervision, and advice with professionals such as local public health nurses. They also conduct outreach programs in cooperation with municipalities as needed.

Other than providing individualized services at the consultation rooms, they also support community health activities such as door-to-door visits, health checkup programs, and community mental health promotion including health education, and develop local human resources such as suicide prevention gatekeeper training programs.

【Lessons Learned and Recommendations】

■Creating a Network in Cooperation with Affiliated Organizations

The network that had been established in the pre-disaster period by Iwate Medical University, the prefecture, municipalities, and other related parties was put to good use once the disaster

occurred.

Even before the disaster, Iwate Medical University had been working together with local health centers, municipal public health nurses, and other affiliated organizations on suicide prevention, mental health promotion projects, and mental health care during disasters, especially in the Kuji area. They have also been expanding activities in coordination with the municipalities and prefectural government departments in charge. From this, the know-how, networks, and other such developments through these activities was able to be utilized in mental health care measures for disaster victims.

Since building a network of concerned parties on a regular basis is a powerful tool in times of emergency, it is necessary to continue strengthening in-person relationships and to continue to spread awareness about mental health care.

■Ongoing Efforts over the Medium to Long Term

As time passes, the problems faced by disaster victims are becoming more complex and diverse. On top of the direct stress caused from the immediate aftermath of the disaster, changes in their living environment and other factors accompanying the progress of reconstruction have become an emotional burden.

Even in the 2022 fiscal year, more than 10 years after the Great East Japan Earthquake and Tsunami, the number of consultation and support cases by the Mental Health Care Center exceeded 7,000 per year. Supervision of workers such as municipal public health nurses by doctors and specialists has remained at around 3,000 per year. Therefore, there is still a great need for mental health care support in the affected areas.

Given this situation, it is necessary to continue to provide mental health care for disaster victims over the medium to long term. Specifically, psychiatrists and other specialists should continue to provide close support to disaster victims, and the quality of support should be improved by securing specialist staff as well as improving their skills.

(10) Establishment of Child Care Centers

【Case Study】

■The Establishment of Children's Mental Health Care Centers in Three Coastal Areas

Among the children who experienced the disaster, there were some who complained of symptoms such as child regression, bed-wetting, feeling unwell, crying at night, inability to sleep, and sudden crying spells. Many parents and caregivers were concerned about how to care for such children.

In response, the prefectural government established Children's Mental Health Care Centers in Miyako City, Ofunato City, and Kamaishi City in June 2011 to provide mental health care with the cooperation of doctors from within as well as outside the prefecture.

In addition, mental health care training sessions were held for guardians and childcare workers with the cooperation of affiliated organizations at child consultation centers and prefectural agencies, and child psychologists from the child consultation centers visited nurseries and after-school children's clubs to provide consultation to childcare workers and other childcare supporters.

■The Establishment of a Prefecture-wide Main Facility: Iwate Child Care Center

In March 2012, the prefectural government established a project team of experts in the prefecture to study the state of mental health care for children.

Even before the disaster, the prefecture had few pediatric and psychiatric doctors and medical institutions, and had to rely on support from outside the prefecture. In May 2013, the Iwate Child Care Center was established at the Iwate Medical University with assistance from the State of Kuwait and the Japanese Red Cross Society to provide a stable, long-term base for support. The center's operations are centered on mental health care for children affected by the disaster, making weekly rounds to the Miyako, Kamaishi, and Kesen areas, and has expanded to holding case conferences by various professions and conducting training sessions for supporters.

【Establishment of the Children's Mental Health Care Center】

Name	Miyako Children's Mental Health Care Center	Kamaishi Children's Mental Health Care Center	Kesen Children's Mental Health Care Center
Coordinating Organization	Miyako Child Consultation Center	Miyako Child Consultation Center	(Primary) Child Family Support Center Taiyo (Secondary) Ichinoseki Child Consultation Center
Location	Miyako Child Consultation Center	Kamaishi Public Health Center	Child Family Support Center Taiyo
Area of Jurisdiction	Miyako, Yamada	Kamaishi, Otsuchi	Ofunato, Rikuzentakata, Sumita
Established	June 2011	August 2011	July 2011
Frequency of Consultations	Once a week	Once every other week	Once a week
Consultation Staff	One child psychiatrist	One child psychiatrist	One child psychiatrist (+ clinical psychologists, nurses, etc.)
Source of Dispatch	Ministry of Justice	The Japanese Association of Child and Adolescent Psychiatry	Tokyo

【Lessons Learned and Recommendations】

■The Need for Multifaceted Support for Children

The recovery of a child's mental health requires multifaceted perspectives that considers not only their physical and mental condition, but also the environment and the growth and development of the child. In addition to medical care, it is also important to have various forms of support involved with children, such as welfare and education.

On top of the direct effects of the disaster and the loss of loved ones, various factors such as instability in family relationships and living environments in the aftermath of the disaster can have a compounding effect on a child's mental health.

Since its establishment, the Iwate Child Care Center has held clinical conferences and training sessions for supporters in various fields, and has been promoting the improvement of expertise of child supporters in the prefecture as well as the creation of a system for natural cooperation. It is necessary to continue these efforts and utilize the knowledge gained through post-disaster support to further enhance the expertise of organizations by understanding each other's specialties and roles.

■Developing a Network to Nurture Children Throughout the Community

It is necessary to refer to the efforts made during the establishment of the Iwate Child Care Center to not only stop at developing disaster measures, but also have the creation of networks and the development of initiatives to support children in the community derived from them as well. The post-disaster mental health care for children in Iwate Prefecture is the result of the connections among supporters from before the disaster and the desire to do something for the children in Iwate. Securing professionals is an urgent issue, but it is also necessary to

have organizations and networks that support and work together with these professionals, rather than simply leaving them to work on their own because of their expertise.

Iwate Child Care Center (located in the Iwate Medical University Multimedia Education and Research Building)

(11) Promoting Iwate Reconstruction Education

【Case Study】

■Promoting Iwate Reconstruction Education

In order to overcome the Great East Japan Earthquake and Tsunami and create a future for the prefecture, the mission of education in Iwate is to nurture children who will be responsible for the reconstruction and development of Iwate 10 to 20 years from now.

The goal of Iwate Reconstruction Education is to apply the lessons learned in the process of overcoming the unprecedented disaster of the earthquake and tsunami to school education and to develop people who will love their hometown and support its reconstruction and development.

In cooperation with municipal boards of education, affiliated institutions, and other organizations, all public elementary and junior high schools, compulsory education schools, high schools, and special education schools in the prefecture are required to adhere to this goal through all educational activities based on the Iwate Reconstruction Education Program, and have nurtured the three educational values of “Live”, “Involve”, and “Prepare” learned from the disaster.

Since the 2018 fiscal year, Student Practical Presentation Meeting for Iwate Reconstruction Education have been held regularly to pass on the experiences and lessons of the disaster to students both within and outside of the prefecture, and to promote mutual exchange among students and schools to foster pride and attachment to their hometowns, all in order to further promote the Iwate Reconstruction Education Program. Students from elementary, junior high, high, and special education schools in the prefecture gathered to present their unique practices.

○The three educational values learned from the disaster

Live: The value of life, mental wellbeing, lifestyle, mental and physical health

Involve: The importance of bonds, community building, social participation, and connecting with nature

Prepare: The understanding of natural disasters, and disaster preparedness and safety

■Changes in the Iwate Reconstruction Education Program

(1) Creation of the Iwate Reconstruction Education Program

In February 2012, the Iwate Reconstruction Education Program was created, consisting of theory, application, and planning, to be used as a reference for planning curriculums and teaching about the reconstruction according to the actual conditions and issues at each school and region.

(2) Creation of the Iwate Reconstruction Education Program [Revised Version]

In February 2013, 21 sub-values pertaining to the significance, purpose and detail of Iwate Reconstruction Education were defined. Integration of the program in school management and how to organize educational activities were discussed, leading to the creation of a revised version.

(3) Creation of the Iwate Reconstruction Education Program [Third Edition]

In March 2019, the third edition of the Iwate Reconstruction Education Program was created based on past achievements and challenges according to changes in social conditions, revised government curriculum guidelines, the fact that children who have not experienced the disaster were now entering elementary school, changes in the awareness of teachers and instructors who have not experienced the disaster, and the improved efforts at each school.

【Lessons Learned and Recommendations】

In light of the fading of memories from the Great East Japan Earthquake and Tsunami and the various changes in social conditions after the disaster, all schools have made an effort in integrating Iwate Reconstruction Education in their school management plans. The philosophy of reconstruction education has become widespread with the initiative having taken root.

Although the environment surrounding education has changed drastically, children trying to progress strongly toward their own dreams, hopes, and futures are also the hope and future of Iwate, and are the treasures of the prefecture.

It is necessary to continue to promote Iwate Reconstruction Education systematically throughout school education activities, going through cross-curricular management that takes into account local conditions in cooperation with municipal boards of education, affiliated institutions, and other organizations.

■The Necessity of Conducting Educational Activities That Utilize Lessons Learned from the Disaster

1. Linking educational activities with the three educational values derived from lessons learned from the disaster

   Initiatives must be developed for Iwate Reconstruction Education that link the 21 sub-values with educational activities.

2. Making it a personal matter as well as a proactive initiative

   Utilize supplementary readers, the Iwate Earthquake Tsunami Archive - Hope, local history establishments, stone monuments, etc. to pass on lessons learned to students, teachers, and staff who have not experienced the disaster.

3. Cooperate with schools, families, communities, municipal boards of education, affiliated institutions and other organizations

   Incorporate initiatives to foster pride and attachment to hometowns based on the children's mental and physical conditions, school and community circumstances, environments, and other needs.

(12) Collection and Utilization of Materials Related to the Earthquake and Tsunami

【Case Study】

■Collecting Facts and Related Materials on the Great East Japan Earthquake and Tsunami

Due to the unprecedented large scale of the disaster, the prefecture faced many difficulties at the beginning such as disruption of communication and loss of municipal administrative functions. However, with support from within and outside, the prefecture has made steady progress in recovery efforts including disposal of disaster waste, construction of disaster public housing, and maintenance of damaged fishing boats and aquaculture facilities.

With the determination to pass on the reality of the disaster as well as recovery and reconstruction efforts to future generations and ensure that no one will ever again lose their life in a disaster, the prefecture has decided to collect and utilize related materials as a leading project.

At the same time however, as the affected municipalities were placing their highest priority on restoration and reconstruction initiatives, there were concerns about the lack of manpower working on the collection of materials related to the earthquake and tsunami, as well as the loss of related materials over time.

■The Perspectives of Experts and Collaborating with Municipalities

In order to discuss specific measures and guidelines for the collection, preservation, organization, and utilization of materials related to the earthquake and tsunami, an expert panel was established to make recommendations for the creation of an archive system.

Since the response to this disaster was characterized not only by government efforts, but also private sector efforts such as rescue activities and disaster relief volunteers, the experts' meeting held discussions on collecting data from sources other than the government. In addition, since the number of views of archive systems generally tends to decrease as time passes after their release to the public, in order for the archive system to continue be utilized in the future, it was decided to construct a system focusing on disaster preparedness, education, and expansion of the non-resident population.

After confirming the intentions of the coastal municipalities, it was decided that those municipalities that have already completed their archive systems or have already started the creation of one will be linked to the system to be made by the prefecture. For those municipalities that have not yet started to build a system due to lack of manpower or other reasons, the prefecture will work together with the municipalities to provide data to the prefecture's system.

■The Creation of the Iwate Earthquake Tsunami Archive - Hope

In building the archive system, the importance of conveying the lessons and reality of the disaster through the collected materials was emphasized, as opposed to simply accumulating the materials. When the creation of the archive system began, several archive systems had already been completed in other prefectures, allowing their specifications to be analyzed to make the system easier for users to utilize.

The Iwate Earthquake Tsunami Archive - Hope became available to the public on March 29, 2017, and was categorized chronologically according to six themes: "Preparedness", "The Power of Unity", "From Support to Bonds", "For Those in Need of Care", "An Unprecedented Response", and "Iwate Sanriku, Our Hometown". The site is designed to be easy to use, with a section for elementary

and junior high school students, a specially selected photo exhibition, and other selected content including an introduction to the "Tsunami Tendenko". In addition, local newspaper articles of the time are also available for browsing.

Most of the materials are available for download, with permission to use them already given from the organizations that provided the materials. Under the terms of the license, the photographic data is blurred as required, and personal rights (such as portrait rights) are taken into consideration.

Currently, approximately 240,000 items collected from public and private sectors (including approximately 100,000 items provided by NPOs, universities, social welfare councils, and other private organizations) related to the earthquake and tsunami are available for search and viewing on the dedicated website as of March 31, 2025.

■Promoting the Use of Resources Related to the Earthquake and Tsunami

In order to pass on the lessons and reality of the Great East Japan Earthquake and Tsunami to the next generation, the Prefectural Board of Education assisted with conducting on-site classes at elementary and junior high schools using materials related to the earthquake and tsunami, and created a video of the classes with commentary. In addition, the archive system is being linked to supplementary reading materials for Iwate Reconstruction Education, a prefecture-wide initiative.

Furthermore, a dedicated terminal for the archive system has been installed inside the Iwate Tsunami Memorial Museum, and the collected materials are also used in the theater and exhibits as a tool to convey the situation at the time to visitors.

(https://iwate-archive.pref.iwate.jp)

【Lessons Learned and Recommendations】

■Establishing Criteria for Collecting Materials in Advance

As some materials related to the disaster such as postings at evacuation centers, lists of names made at the time of a disaster, and damaged furniture were not intended to be preserved, materials that are scattered and lost are not uncommon.

By making collection standards and responsibilities apparent in advance, it will become possible to convey the threat of disasters and the response at those times, as well as preserve valuable materials that can serve as lessons for future generations without losing them.

■The Importance of Cooperating with the Private Sector

Since disaster response operations are diverse and records of operations handled by non-governmental organizations are lacking, it is necessary to work together to record and preserve the day's events by cooperating with the private sector.

■Reducing the Burden on Municipalities

In collecting earthquake and tsunami related materials at the time of a large-scale disaster and establishing an archiving system, it is important to reduce the human and financial burden on municipalities by having the system created by the prefectures, since the manpower of the affected municipalities will be limited.

■Maintenance Costs

Preservation of historical materials is important, but it is also necessary to consider the burden of maintenance costs on local governments when it comes to managing the system over the long term. Devising ways to ensure that the system is constantly in use is required, but considering how to operate the system effectively and efficiently over time such as by carefully selecting materials to be preserved, aggregating functions, or managing disaster-related archives by consolidating them is also necessary.

Section 3: Countermeasures for Nuclear Radiation Effects

(1) Establishment of a System to Respond to Nuclear Accidents

【Case Study】

■Immediately after the Accident (Establishment of the Nuclear Radiation Response Headquarters)

Amid concerns about the potential impact of the Accident at TEPCO's Fukushima Daiichi Nuclear Power Station caused by the Great East Japan Earthquake and Tsunami on Iwate Prefecture, the prefecture collected samples of pasture grass throughout the prefecture on May 11, 2011, and conducted an investigation on the effects of radioactive materials. Radioactive cesium exceeding the provisional permissible level for feed set by the national government was detected in the grass samples. As a result, the prefecture requested some of the municipalities to refrain from using grass in products for dairy and beef cattle and to refrain from using pasture for grazing.

On June 22, the prefecture established the Nuclear Radiation Response Headquarters and set up a system to manage radiation effects in cooperation with relevant departments in the prefectural government.

On July 20, radioactive cesium exceeding the provisional regulation value was detected in beef in the prefecture, where cattle were fed with rice straw found to be containing radioactive cesium.

In response to this situation, on July 29, the prefecture upgraded the Nuclear Radiation Response Headquarters to the Nuclear Radiation Countermeasure Headquarters, now headed by the governor and involving the whole prefectural government to strengthen the response system. On the same day, the headquarters formulated the "Basic Policy on Countermeasures Regarding Nuclear Radiation Effects," which places particular emphasis on protecting the health of children, who are considered to be particularly vulnerable to the effects of radiation, and ensuring the safety and security of food.

■Development of Response Policies

The Nuclear Radiation Countermeasure Headquarters formulated the "Policy for Measuring Radiation Related to the TEPCO Fukushima Nuclear Plant Accident" on August 31, "Policy for Reducing Radiation" on September 21, and "Policy on Food Safety of Prefectural Food Products" on October 4 as guidelines for future measures to ensure the health and safety of prefectural residents and to prevent reputational damage from baseless speculation. In accordance with these three policies, the prefecture, in cooperation with municipalities and related organizations, meticulously measured radiation levels and the concentration of radioactive matter in prefectural foodstuffs throughout the prefecture. Based on the measurement results, the prefecture has taken necessary measures to reduce radiation levels and requested voluntary restraint in the shipment and use of agricultural, forestry, and marine products, promptly announcing the results and measures taken.

In promoting efficient and effective measures against the effects of nuclear radiation, it is also necessary to cooperate with related organizations and groups in the prefecture, such as municipalities. Hence, the Municipal Nuclear Radiation Countermeasure Meeting has been held since the 2011 fiscal year in order to promote information sharing among prefectures, municipalities, associations, federations and unions, and to implement measures in cooperation with them.

■Municipal Response

In order to ensure the safety of residents and alleviate concerns on radioactive matter, municipalities have also set up task forces and specialized organizations to take action against nuclear radiation, and have held meetings with relevant government departments and agencies, taking measures on a government-wide basis.

【Lessons Learned and Recommendations】

■Establishment of a System for Cooperation and Collaboration with Relevant Parties etc.

Prior to the TEPCO Fukushima Nuclear Plant Accident, the Iwate Prefecture Regional Disaster Management Plan pertained to natural disasters such as heavy rain, earthquakes, tsunamis, and volcanoes. However, due to the long-term and widespread impact of the accident on the lives of local residents, it was deemed necessary to establish in advance what to do in the event of a nuclear disaster. The Iwate Prefecture Disaster Management Council held a meeting on March 28, 2013, and added the Nuclear Emergency Preparedness Chapter to the Disaster Management Plan.

In order to promptly and definitively implement the measures stipulated in the Nuclear Emergency Preparedness Chapter, it is also necessary to establish a direct communication system with nuclear power companies in the event of a nuclear disaster. As such, on March 28, an "Agreement on Information Sharing to Ensure the Safety of Residents of the Prefecture Regarding Nuclear Power Plants" was signed between the prefectural government and Tohoku Electric Power Co., Inc. In addition, on September 20, the prefecture made a written request to Japan Nuclear Fuel Limited (JNFL) to promptly provide information in the event of a nuclear disaster, and received their approval on September 30. With the signing of these agreements and many others, nuclear energy operators are now obliged to provide information directly to the prefecture in the event of a nuclear disaster.

It is necessary for the national government to take the initiative and take prompt action to establish a system of close coordination and cooperation between local governments, the national government, and nuclear energy operators in order to be effective in nuclear disaster countermeasures.

Section 4: Initiatives Beyond the Existing Framework

(1) Prioritized Development of Reconstruction Roads

【Case Study】

■Functioned as “Road to Life” During the Earthquake and Tsunami Disaster

Many sections of National Route 45, which goes through the coastal areas of Iwate Prefecture, were blocked due to debris and other damage as a result of the tsunami. However, as the Kamaishi-Yamada Road section, which opened to traffic six days before the earthquake, was architected to be higher than the rest of Route 45 to avoid the tsunami inundation zone, it was not as badly damaged by the disaster. The Kamaishi-Yamada Road was used to evacuate students and residents of Unosumai Elementary School and Kamaishi Higashi Junior High School, and later played a major role in relief efforts by the Self-Defense Forces and fire departments, as well as in transporting relief supplies, making it truly a “Road to Life”

■Development Progressing at an Unprecedented Rate

The prefecture designated the existing arterial high-standard highway network, consisting of roads along the Sanriku coastal area and roads connecting the coastal area with the inland areas as "Reconstruction Roads" and made repeated requests to the government for official recognition.

A request was made to the national government to recognize the importance of starting reconstruction from the reconstruction roads, emphasizing the need to ensure construction of vital areas and complete opening of the reconstruction roads at the Reconstruction Design Council in Response to the Great East Japan Earthquake Meeting on April 30, 2011.

The prefectural government continued to hold practical discussions with the national government, and in the third supplementary budget for the 2011 fiscal year (approved on November 21, 2011), the development of the full reconstruction road (359 km in Iwate Prefecture) was recognized as a formal project.

The reconstruction road project has since progressed at an unprecedented rate, with the Tohoku Expressway Kamaishi Akita Line opening in March 2019 and the Sanriku Expressway connecting Miyako City to Kesennuma City in Miyagi Prefecture opening in June 2019. The whole route was completed and opened to traffic on December 18, 2021.

【Situation in Affected Areas】

Debris-covered Route 45

The Kamaishi-Yamada Road opened on March 5, 2011

The Sanriku Expressway: Sendai – Hachinohe fully opened (December 2021)
Courtesy of Sanriku National Highway Office

【Lessons Learned and Recommendations】

■The Ripple Effects of the Opening of the Whole Line

With the opening of the reconstruction roads, travel time between Sendai and Hachinohe was reduced by approximately 3 hours and 10 minutes compared to the travel time required prior to the disaster. In addition, the roads now avoid all tsunami inundation zones, enabling safe and secure passage even in times of disaster.

Further benefits include the expansion of new and existing businesses in the area, and the improved utilization of harbors and ports. For example, the expansion of new commercial development in inland areas and the significant increase in the volume of containerized cargo handled at ports in the prefecture have been directly linked to the anticipated full opening of the Tohoku Expressway Kamaishi Akita Line. As such, significant ripple effects have been observed as a result of the full opening of reconstruction roads.

This ripple effect is a result of companies expanding into areas in response to the anticipated opening of the whole road. In order to expand the ripple effect, it is important to publicize the opening of the road and information about its benefits throughout the country.

(2) Establishment of the “Iwate Learning Hope Fund”

【Case Study】

■The Reality of the Children Affected by the Disaster and Support Measures

In early April 2011, when the full extent of the damage caused by the Great East Japan Earthquake and Tsunami was still unknown, a national newspaper reported that the prefecture and the Ministry of Education, Culture, Sports, Science and Technology were considering a plan to build a full boarding integrated public elementary and junior high school in the prefecture for students who lost their families in the Great East Japan Earthquake and Tsunami. This was prompted by a statement made by the Vice Minister of Education, Culture, Sports, Science and Technology at a press conference on March 28, 2011, during his visit to Iwate Prefecture, following discussions between the Vice Minister and the Governor of Iwate Prefecture on the topic. This news report brought about numerous warm offers of support for Iwate Prefecture, both from within Japan and from abroad.

As investigations in the affected areas progressed, it became clear that many of the children who had lost their parents had already been taken in by relatives, and the majority of children had only lost one parent as opposed to losing both parents. Therefore, it became necessary to consider other forms of special support on top of building a full boarding elementary and junior high schools.

■Creating A System to Ensure Donations are Used According to Donor Wishes

While financial management of the disaster was being led by the prefectural government’s finance division, the idea to establish a fund to receive donations grew stronger as the number of inquiries from all over the world increased and it became clear that there was a need for long term support for children affected by the disaster. The idea of establishing the fund was to ensure that donors’ wishes would be fulfilled by pooling donations into a fund that directly financed projects that supported children affected by the disaster.

At the Governor’s regular press conference on April 25, 2011, the Governor announced the establishment of this fund as the "Iwate Learning Hope Fund (tentative name)" and said, "The children who will carry the future of the affected areas are the hope not only for the affected areas but also for Iwate, Tohoku, and Japan as a whole. It is essential to support the lifestyle and learning of these children so that they can grow in peace and security in their hometowns for the future of Iwate.”

■Acceptance of Donations and Preparation of Cross-Departmental Support

Prior to the official establishment of the fund, a press release was issued announcing the acceptance of donations on May 11, 2011. "If we receive a large amount of support, we will be able to support the many children who have suffered, especially those who have lost their parents. We hope that you will understand the purpose of this project, and we would like you to spread the word about it.”

The number of donations received increased every day, thanks in part to the media coverage of the campaign. Calls for donations were from a wide range of people, including corporations and individuals throughout the prefecture, country, and even from overseas. The donations also varied in nature, including those from children who collected donations through fundraising activities, those who sent the proceeds from overseas events along with messages of support and

those who sent donations along with relief supplies from distant locations, with them all expressing their support one after another for the children who suffered from the disaster.

■Passing the Fund Ordinance and Budgeting Scholarship Programs

On June 8, 2011, about three months after the disaster, a proposal for an "Iwate Learning Hope Fund Ordinance" was presented at a special prefectural assembly meeting. Although the details of how the fund would be used had not yet been finalized and the proposal was unprecedented in its purpose to solicit donations, the prefectural assembly members were very encouraging and hopeful, and the proposed ordinance was passed with unanimous approval.

On August 9, 2011, at a special meeting of the prefectural assembly, a budget proposal for projects aimed at providing benefits to preschool children and scholarship programs to be financed by the fund, and was passed with unanimous approval. After publicizing the projects through schools and other organizations, applications were accepted from October 2011 and scholarship payments began in December 2011.

【Scholarship Recipients and Benefit Amounts】

Eligibility for Benefits		Benefit Payment Amount		
		Revised 2018	Revised 2013	Established in 2011
Preschool Children		(Ended in FY2017)	20,000 yen per month	10,000 yen per month
Elementary School Students		30,000 yen per month	20,000 yen per month	10,000 yen per month
Junior High School Students		40,000 yen per month	20,000 yen per month	10,000 yen per month
High School Students		50,000 yen per month	40,000 yen per month	30,000 yen per month
University Students, etc. (living at home)		60,000 yen per month	60,000 yen per month	50,000 yen per month
University Students, etc. (moved for school)		100,000 yen per month	60,000 yen per month	50,000 yen per month
Graduate Students (living at home)		60,000 yen per month	—	—
Graduate Students (moved for school)		100,000 yen per month	—	—
Lump Sum Payments	Starting Elementary School	60,000 yen	60,000 yen	—
	Elementary School Graduation	150,000 yen	90,000 yen	50,000 yen
	Junior High School Graduation	250,000 yen	135,000 yen	100,000 yen
	High School Graduation (living at home)	300,000 yen	300,000 yen	300,000 yen
	High School Graduation (moved for school)	600,000 yen	300,000 yen	300,000 yen

【Fund Utilization Break-down (as of October 31, 2023)】

Name	Amount
Projects Aimed at Preschool Children	Approx. 58.71 million yen
Scholarship Benefits	Approx. 2.64923 billion yen
Textbook Purchases and Other Benefits	Approx. 700.57 million yen
Support for Athletic Club Activities	Approx. 245.72 million yen
Support for Cultural Activities	Approx. 31.48 million yen
Other	Approx. 1.64862 billion yen
Total Amount Utilized	Approx. 5.33433 billion yen

【Lessons Learned and Recommendations】

Long-term support is required until the children affected by the disaster graduate from schools of their choice and become independent members of society. Therefore, it is necessary to continue to look into ways to provide detailed support to affected children by implementing new projects that utilize the fund in response to changes in the environment and the needs of the affected areas.

The initial amount of the fund was 500 million yen (100 million yen from the prefectural government and 400 million yen from donations), but thanks to numerous donations from Japan and abroad, the fund received more than 10.6 billion yen in donations as of the end of October 2023.

With this tremendous amount of aid, support measures have been gradually expanding, taking into account the reality of the many children who have been affected by the disaster, in addition to providing scholarships for children who have lost a parent or both parents.

In expanding the use of the fund, regular coordination meetings have been held since the 2017 fiscal year to discuss the use of the fund and ensure that the projects meet the needs of the affected areas, while taking into account the wishes of donors. As a result, the fund's utilization has expanded to include increases to scholarship amounts and scholarship funding to graduate students. At the same time, the booklet, "Report on the Use of the Iwate Learning Hope Fund," was published and distributed to express gratitude and inform donors of the use of their donations as well as the situation of children in Iwate and call for further support to prevent the memory of the tsunami disaster from fading.

(3) Construction of the Reconstruction Memorial Park and Memorial Facilities

【Case Study】

■The Request to Recognize a National Memorial Park as a Place of Mourning, Remembrance and Sharing Lessons and Realities

Given the wide area and enormous damage caused by the Great East Japan Earthquake and Tsunami, the prefecture considered it essential to establish a national park as a place for mourning, remembrance, and sharing the lessons and realities of the disaster, and made a request to the national government in July 2011 to "develop a disaster memorial park as a national park" with the national government spearheading the initiative.

The Iwate Prefecture Great East Japan Earthquake Tsunami Reconstruction Plan, formulated in August 2011, included the "development of a memorial park" for the purpose of memorializing and mourning the victims of the Great East Japan Earthquake Tsunami, passing on the experiences and lessons of the disaster to future generations, and fostering and passing on a culture of disaster prevention.

The prefectural government decided to strengthen their request for the creation of a national park, and held opinion exchange sessions with 12 affected coastal municipalities on the idea of developing parks and green spaces in commemoration of reconstruction efforts in preparation to select a candidate site in the prefecture.

In October 2011, the Takata Matsubara area of Rikuzentakata City was selected as a candidate site based on a comprehensive assessment of the severity of the damage, symbolic nature of the recovery, and high expectations for early recovery as the previous site was an urban park. Subsequently, in December 2011, the prefecture again requested the national government to establish a national memorial park.

■Establishment of a System to Lobby the Government from Grassroots

In conjunction with the prefectural government initiative, Rikuzentakata City included the development of a disaster memorial park in the Takata Matsubara area in its earthquake reconstruction plan formulated in December 2011.

Recognizing that the construction of a national park would require advocating to the national government from the local community, the "Bring the National Disaster Memorial Park to Rikuzentakata City Group" was established in April 2012, and a petition with approximately 34,000 signatures from locals and external supporters alike was sent to the national government in June 2012.

In July 2012, the prefecture and city jointly established the "Takata Matsubara Area Earthquake Disaster Reconstruction Memorial Park Committee," consisting of experts and local representatives, and compiled a proposal for a disaster reconstruction memorial park.

■Finalizing the Development Policy for the Reconstruction Memorial Park

After subsequent considerations by the national government, the Cabinet decided in October 2014 that instead of constructing a national park, the national government would construct a national memorial and remembrance facility within a memorial park managed and operated by the prefectural government. With Rikuzentakata City given the responsibility to develop a sports park zone with disaster reconstruction in mind, this marked the beginning of what would now be known as the Takatamatsubara Memorial Park for TSUNAMI Disaster.

In developing the park, a fundamental concept and plan was formulated based on the recommendations of a committee of experts, and a number of workshops were held to obtain valuable community opinions from residents who were familiar with the history, background, and history of the area. Those opinions were reflected in the fundamental aspects of the plan, such as the "positioning of the place of prayer" and "ensuring the safety of visitors to the park" in the national memorial facility.

On December 26, 2021, the Takatamatsubara Memorial Park for TSUNAMI Disaster (approximately 130 hectares), jointly developed and constructed by the national government, Iwate Prefecture, and Rikuzentakata City, was fully opened.

■A Facility to Pass Down the Lessons and Realities of the Disaster and to Show Appreciation for Support

In order to learn from the history of earthquakes and tsunamis that have struck the Sanriku region many times in the past, to pass on memories and experiences, and to prevent the tragedy from repeating itself in the future, the "Great East Japan Earthquake and Tsunami Memorial Community Development Project Team" was established within the prefectural government in May 2014 to understand how the earthquake and tsunami should be remembered and discuss the foundations of a facility dedicated to pass on the lessons and realities of the disaster.

The team decided to locate the facility within the Takatamatsubara Memorial Park for TSUNAMI Disaster so that it would function as a gateway to the Sanriku coastal region, utilizing local resources such as Geoparks and tourist attractions in promoting diverse exchanges. The national government, Iwate Prefecture, and Rikuzentakata City would also collaborate to build a facility that would serve as a base for disaster education to create and instill a culture of disaster preparedness in line with the restoration of the damaged Takada Matsubara Roadside Station.

In August 2015, the Great East Japan Earthquake and Tsunami Memorial Facility Planning Committee was established, and in June 2016, Great East Japan Earthquake and Tsunami Memorial Facility Exhibit Plan was created, based on the opinions of experts and comments from the public. In January 2018, a mission statement was released to convey the memorial museum's founding philosophy to visitors.

Exhibits in the museum would be based on the theme of "Protecting Lives and Living with the Ocean and the Earth," and the narrative of the museum was developed by committee members (experts), staff (researchers) and production companies, selecting photographs, video and physical evidence of the disaster to display. The details of every word and phrase of the explanations were discussed and reviewed over and over again as the exhibit was created.

When planning the management and operation of the museum, the admission fee was discussed by the facility planning committee and the prefectural assembly. In the end, the decision was made to make the admission free of charge.

■Opening of the Takatamatsubara Memorial Park for TSUNAMI Disaster

On September 22, 2019, the main facilities of the Takatamatsubara Memorial Park for TSUNAMI Disaster: Part of the National Memorial and Remembrance Facility, the Iwate TSUNAMI Memorial Museum and the Takata Matsubara Roadside Station opened. The park was fully opened to the public on December 26, 2021. Each facility is visited daily by many people from not only within the prefecture but also those from outside of the prefecture. The number of visitors to the Iwate

TSUNAMI Memorial Museum was 1,169,938 as of the end of February 2025.

Takatamatsubara Memorial Park for TSUNAMI Disaster and Iwate TSUNAMI Memorial Museum

Inside the Iwate TSUNAMI Memorial Museum, which opened in September 2019 (Guide explaining the exhibit to visitors).

【Lessons Learned and Recommendations】

■Ensuring that Lessons and Realities are Passed On to the Next Generation

The Sanriku coastal area has repeatedly experienced tsunami disasters. With tsunamis expected to strike in the future, it is important to ensure that the lessons and realities of past earthquake and tsunami disasters, including the Great East Japan Earthquake and Tsunami, are passed on to the next generation in order to protect lives from future disasters.

To this end, the "Reconstruction Memorial Park" constructed by the national and local governments must play a long-lasting role as a symbol of reconstruction, to mourn and remember the souls of the victims, and to clearly demonstrate the strong will toward reconstruction for

the revival of Japan to the world.

■ Effective Sharing and Dissemination of Information through Cooperation with Related Organizations

It is necessary to actively collaborate with related research institutes, NPOs, experts, and external organizations such as municipalities outside the prefecture in order to share disaster preparedness education and conduct various exchange programs at the facilities.

Furthermore, each municipality has its own facility for handing down the lessons of the earthquake and tsunami. By connecting these facilities through cooperation with each other, the effectiveness of handing down and disseminating information will increase.

The tsunami memorial facilities established by the prefecture are strongly required to serve as a "gateway" to share the lessons and realities of the whole Sanriku coastline that was affected by the disaster by inviting people to various places along the Sanriku coast, thereby contributing to the revitalization of each area.

■The Need for More Vast Efforts to Pass on the Lessons of the Disaster

On August 1, 2019, the "3.11 Densho Road Promotion Organization" was established, creating a system in which the public and private sectors in Tohoku can work together to pass on the experiences and memories of the earthquake as valuable lessons and disseminate information. In the future, it is expected that the individual efforts of the earthquake and tsunami memorial facilities in each region will be connected and transformed into a wide-area effort.

(4) Disseminating Information on Iwate's Reconstruction Efforts

【Case Study】

■Preventing the Memory of the Disaster from Fading and Continuing to Support and Participate in Reconstruction or Recovery Efforts

As time has passed since the Great East Japan Earthquake and Tsunami, there have been concerns about the fading of memories of the disaster, as evidenced by the decrease in related media coverage. Recovery from a major disaster requires long-term efforts, and it is important to promote them in a coordinated manner with the understanding of not only the disaster victims, but also of the residents of the prefecture and the nation as a whole. In parallel with the recovery efforts, it was deemed necessary to promote efforts to stimulate continued participation and support for the reconstruction effort and to prevent the memory of the disaster from fading away.

■Promoting Participation in the Reconstruction Effort through the "Iwate Reconstruction Mirai Juku" Program by Conveying Current Reconstruction Status

The major driving forces behind the reconstruction from the Great East Japan Earthquake and Tsunami are the "strength of all the locals" of the prefecture and the "power of connections" throughout Japan and around the world. In promoting the reconstruction efforts to date, the prefecture has received a wide range of support domestically and internationally, including from within the prefecture itself. A variety of initiatives have been developed with the participation of a diverse range of entities. In order to further develop these strengths and to firmly promote reconstruction in the future, it is necessary for individuals and groups from a range of diverse entities responsible for the reconstruction to teach the reconstruction process and learn from each other, and to make the most of this knowledge in promoting the efforts through mutual exchange and collaboration.

To this end, the "Iwate Reconstruction Mirai Juku Working Group" was established in March 2015 based on the idea that "creating the future = creating people". This initiative of the Iwate Miraizukuri Organization has been held a total of 27 times from the 2015 fiscal year to the 2023 fiscal year to promote participation in the reconstruction efforts.

In September 2022, the "Summit of Great East Japan Earthquake And Tsunami Storytellers and Guides" was held to coincide with the third anniversary of the Iwate TSUNAMI Memorial Museum, inviting guides and storytellers from Miyagi, Fukushima, and Hyogo Prefectures to Iwate Prefecture (held in conjunction with the Iwate Reconstruction Mirai Juku). The summit provided an opportunity for groups from Miyagi, Fukushima, and Hyogo Prefectures to learn about each other's activities and exchange opinions, including those of groups in the prefecture that pass on the lessons and realities of the disaster.

■Painting a Picture of the Reconstruction or Recovery via the "Iwate-Sanriku Reconstruction Forum"

In order to disseminate information on the current status of the affected areas and reconstruction efforts, the "Iwate Sanriku Reconstruction Forum" has been held a total of 33 times from the 2011 fiscal year to the 2023 fiscal year within and outside Iwate Prefecture to promote understanding, ongoing support, and participation in reconstruction efforts. Information programs on reconstruction efforts for outside the prefecture were held three times from the 2021 fiscal year to the 2023 fiscal year, and "Preventing the Memory of the Great East Japan

Earthquake and Tsunami from Fading" events were held in Tokyo and online four times from the 2020 fiscal year to the 2023 fiscal year.

〔The Purpose of Each Forum〕

(1) Prefectural Forums

The forums aim to strongly convey the message that diverse entities are earnestly working together towards reconstruction and providing a venue for people with connections to Iwate to gather to strengthen the human network for reconstruction.

(2) Media Programs to Disseminate Information on Reconstruction to People Outside of the Prefecture

By expressing gratitude for the support from all over Japan and reporting on the current status of recovery efforts in the affected areas, media programs are used to promote understanding of the prefecture's recovery, prevent memories of the recovery from fading, and promote continued support and participation in the recovery process.

(3) Events that Prevent the Memory of the Great East Japan Earthquake and Tsunami from Fading

Holding these events in conjunction with Aomori, Miyagi, and Fukushima Prefectures and the Tokyo Metropolitan Government, the aim is to disseminate information on the status of reconstruction and initiatives in the affected areas, and call for the prevention of fading of information and ongoing support in the Tokyo metropolitan area.

Summit of Great East Japan Earthquake And Tsunami Storytellers and Guides (2nd Iwate Reconstruction Mirai Juku held in the 2022 fiscal year)

〔Various Methods of Dissemination〕

(1) Posters, Video Productions, and Internet Programs

Since the 2011 fiscal year, Iwate Prefecture has been disseminating information through posters and videos. In the 2022 fiscal year, the "Miyako Umineko Maru," a new sightseeing boat in Miyako City, and the "Otsuchi High School Reconstruction Study Group," which has been conducting fixed-point observations of the region since the disaster, was featured to convey Iwate's reconstruction efforts.

In order to prevent the memory of the disaster from fading away and convey the desire for more people to take an interest in the prefecture, the "Iwate Hope Channel," an internet program

hosted by Governor Tasso was broadcasted 77 times from its start in November 2013 to the end of March 2023.

【“From Iwate-Sanriku, Thank You!” 2022 Fiscal Year Reconstruction Poster】

Miyako Umineko Maru Poster

Kamaishi DMC Poster

Otsuchi High School Reconstruction Study Group Poster

Kyassen Ofunato Poster

(2) Holding Reconstruction Reporting Sessions Overseas

In the three years between the 2013 fiscal year to the 2015 fiscal year, reconstruction reporting sessions were held in three major regions (the U.S., Europe, and Taiwan) that provided a tremendous amount of support. By expressing our gratitude for the reconstruction support and reporting the status of reconstruction efforts, we further deepened the ties between Iwate and the rest of the world that have been fostered through the reconstruction support to date, and developed public relations that would lead to continued support for reconstruction efforts.

(3) The 2019 Sanriku Disaster Risk Reduction & Reconstruction Project

The 2019 Sanriku Disaster Risk Reduction & Reconstruction Project was held from June to August 2019, eight years after the Great East Japan Earthquake and Tsunami and the year the Sanriku Railway Rias Line, a symbol of reconstruction, opened.

[Main Objective]

- To prevent the memory of the Great East Japan Earthquake and Tsunami from fading away by presenting a picture of the region’s powerful reconstruction efforts from the disaster.
- To show our appreciation for the support towards the reconstruction from home and abroad.
- To convey the memories and lessons learned from the Great East Japan Earthquake and Tsunami, and contribute to the improvement of disaster preparedness in Japan and abroad.
- To promote the creation of a new Sanriku by promoting interaction and communication of the diverse beauty of the Sanriku region to people all over the world.

2019 Sanriku Disaster Risk Reduction & Reconstruction Project (June 2019)

【Lessons Learned and Recommendations】

■Aiming for Even Better Reconstruction Through the Bonds Developed During the Recovery Process

Although there is concern that memories will fade as time passes, disaster-stricken prefectures are expected to communicate lessons learned and the state of reconstruction based on the realities of the disaster to future generations in order to contribute to improving disaster preparedness both in Japan and abroad.

Collaboration with all entities, local and international, including a wide range of organizations, businesses, NPOs, and institutions of higher education, is effective for better reconstruction. It is important to develop the connections and ties cultivated through the reconstruction efforts into something that is tangible and sustainable.

(5) Emergency Disaster Drills to Strengthen the Power of "Self-help", "Mutual Assistance" and "Public Support"

【Case Study】

■Prefectural Emergency Disaster Drills

Prefectural emergency disaster drills started off in 1964 in coordination with coastal municipalities to establish mutual cooperation among disaster management organizations and raise awareness in local communities, with drills in coordination with individual municipalities held in the following year. Drills have been held every year alternating between inland and coastal regions with a focus on the main characteristics of the region, such as earthquake, flood, and fire drills in the inland areas, and earthquake, tsunami, and fire drills in the coastal areas. Prefectural Emergency Disaster Drills for earthquake and tsunami disasters had been conducted 20 times in coastal areas until the Great East Japan Earthquake and Tsunami.

The contents of the drills include disaster simulation drills, drills for setting up local coordination centers, drills for transporting and receiving injured people, and drills for receiving assistance based on mutual firefighting support agreements in order to establish mutual cooperation among disaster prevention related organizations. In order to raise awareness in local communities, the drills consist of emergency meal kitchen training, first aid drills and early stage firefighting drills with the participation of local residents and voluntary disaster management organizations.

In the drill held in Tono City on September 2, 2007, in addition to fundamental disaster drills designed to deal with damage to vital lifelines and public facilities, fires in buildings and forests, and coastal tsunami damage due to earthquakes, a relay relief base was also set up to provide coastal support, where drills for medical aid and transport of relief supplies were also held.

■Participation in the "Michinoku Alert 2008"

In 2008, the prefecture participated in the "Michinoku Alert 2008," an earthquake response drill hosted by the Ground Self-Defense Force, and conducted drills in cooperation with many disaster prevention-related organizations to further deepen connections with the many disaster related organizations in the region.

■Review of Prefectural Emergency Disaster Drills Based on Lessons and Realities of the Great East Japan Earthquake and Tsunami

During the Great East Japan Earthquake and Tsunami, although some of the results of past drills were put to good use as local residents helped each other and many disaster management agencies worked together to respond to the unprecedentedly large disaster, in addition to the many fatalities and missing people, many firefighters and police officers who were involved in closing floodgates and guiding evacuations were also killed.

Taking all these lessons into consideration, the content of the prefectural emergency evacuation drills was reviewed. Instead of gathering relevant organizations to a central location to train skills according to one scenario, the drills would now have a bigger focus on practical "experience-type" training by simulating a natural disaster, aimed at both local residents and related disaster management organizations. In the 2012 fiscal year drills, there was a particularly big focus on the evacuation drill to ensure the safety of firefighters and other

support personnel.

Also, during the Great East Japan Earthquake and Tsunami, the challenges of wide-area regional cooperation was put under the spotlight. In response, in the 2013 fiscal year the prefecture began running prefectural emergency evacuation drills in conjunction with several municipalities in the same region, conducting evacuation drills that transcended municipal borders and patrol drills with fire brigades working in tandem with one another.

【2018 Prefectural Emergency Disaster Drill】

Training exercise①
(Disaster information given by phone or card was collected, analyzed, and assessed by the Iwate Disaster Control Headquarters Support Office, and disaster response policies were discussed.)

Training exercise②
(The drill, held at the prefectural government office, was attended by the Self-Defense Forces, fire brigade, police department, and other related agencies, and included training on cooperation with related agencies in disaster response.)

【Lessons Learned and Recommendations】

■Raising the Awareness of Local Residents is Important to Strengthen "Self-help" and "Mutual Assistance"

Since public organizations alone cannot respond to large-scale disasters such as tsunamis, it is important to conduct drills to raise the awareness of local residents to "self-help" in protecting themselves and "mutual assistance" in keeping the community safe, rather than relying on public organizations.

■ Collaboration Between Prefecture, Municipalities, and Disaster Management Agencies is Important to Strengthen “Public Support”

In order to strengthen "public support" which is defined as support given by administrative agencies, the prefectural government, municipalities, and disaster prevention-related organizations must work together to develop an effective disaster management and mitigation system.

In order to strengthen mutual regional cooperation in the event of a large-scale disaster, it is important to participate in joint drills with several coastal municipalities, wide-area evacuation drills which increase cooperation between inland municipalities and coastal municipalities, and drills organized by national disaster prevention agencies for large disasters that cross prefectural borders.