Chapter 1 General Remarks (Before the Establishment of the Reconstruction Agency)

Section 1 Overview of the Disaster

1. Status of damage

The 2011 off the Pacific coast of Tohoku Earthquake ("The Tohoku earthquake")[1] was the largest earthquake ever recorded in Japan, with a magnitude of 9.0, making it the fourth largest earthquake in the world since 1900. Given the vast scale of the disaster, affecting all of eastern Japan, coupled with the unprecedented complexity of the multiple disasters involving a large earthquake, tsunami, and a nuclear power plant accident, the government determined that a unified name was necessary for recovery and reconstruction initiatives. Thus, the disaster caused by the off the Pacific coast of Tohoku Earthquake and the resulting nuclear power plant accident, which occurred on March 11, 2011, was officially designated as the Great East Japan Earthquake[2].

(1) Overview of the earthquake and tsunami disaster

1) Summary of the earthquake and tsunami

The epicenter area of the Tohoku earthquake extended from offshore Iwate Prefecture to offshore Ibaraki Prefecture, with a fault line approximately 450 km in length and 200 km in width thought to have ruptured over a span of about three minutes[3]. As a result, shaking was felt across a vast area, and a massive tsunami occurred, causing widespread damage. The strongest shaking, of seismic intensity 7, was observed in Kurihara in northern Miyagi Prefecture. Tremors of seismic intensity 6-upper were recorded in Miyagi, Fukushima, Ibaraki, and Tochigi Prefectures, with shaking observed from Hokkaido to Kyushu at levels ranging from 6-lower to 1 on the seismic intensity scale. Recorded tsunami heights included 9.3 meters or more in Soma, Fukushima Prefecture, 8.5 meters or more in Miyako, Iwate Prefecture, 8.0 meters or more in Ofunato, Iwate Prefecture, and 8.6 meters or more in Ayukawa, Ishinomaki, Miyagi Prefecture. Additionally, according to surveys by the Tohoku Earthquake Tsunami Joint Survey Group, the maximum run-up height of the tsunami reached over 40 meters. Furthermore, the Geospatial Information Authority of Japan reported that the total inundation area, based on aerial and satellite images, was 561 km^2 across 62 municipalities in six prefectures (Aomori, Iwate, Miyagi, Fukushima, Ibaraki, and Chiba)—about nine times the area within Tokyo's Yamanote Line loop (63 km^2).

○ Overview of the Tohoku earthquake
- Date and time of occurrence
  March 11, 2011 (Friday) at 14:46
- Epicenter and magnitude
  Off the coast of Sanriku (latitude 38.1°N, longitude 142.9°E, approximately 130 km southeast of the Oshika Peninsula)

[1] Named by the Japan Meteorological Agency on March 11, 2011.
[2] Cabinet approval on the designation of the disaster as the "Great East Japan Earthquake" on April 1, 2011 (regarding the disaster caused by the Earthquake off the Pacific coast of Tohoku).
[3] This area was thought likely to include six regions identified in the long-term assessment at the time by the Earthquake Research Committee of the Headquarters for Earthquake Research Promotion: central offshore Sanriku, offshore Miyagi Prefecture, the southern offshore Sanriku region along the trench, offshore Fukushima Prefecture, offshore Ibaraki Prefecture, and the area along the trench of the Boso region off the northern shore of Sanriku. The Earthquake Research Committee had assessed the scale and probability of earthquakes occurring individually in these six areas, as well as for an earthquake involving a combination of offshore Miyagi Prefecture and the southern offshore Sanriku region near the trench. However, an earthquake involving all six areas simultaneously had not been anticipated.

Depth: 24 km / Moment magnitude: Mw 9.0

- Seismic intensity in various areas (intensity 6-lower and above)

Seismic intensity 7	: Northern Miyagi Prefecture
Intensity 6-upper	: Southern and central Miyagi Prefecture, Nakadori and Hamadori in Fukushima Prefecture, northern and southern Ibaraki Prefecture, northern and southern Tochigi Prefecture
Seismic intensity 6-lower	: Coastal southern Iwate Prefecture, inland northern and southern Iwate Prefecture, Aizu in Fukushima Prefecture, southern Gunma Prefecture, southern Saitama Prefecture, and northwestern Chiba Prefecture

- Tsunami

At 14:49 on March 11, a major tsunami warning was issued.

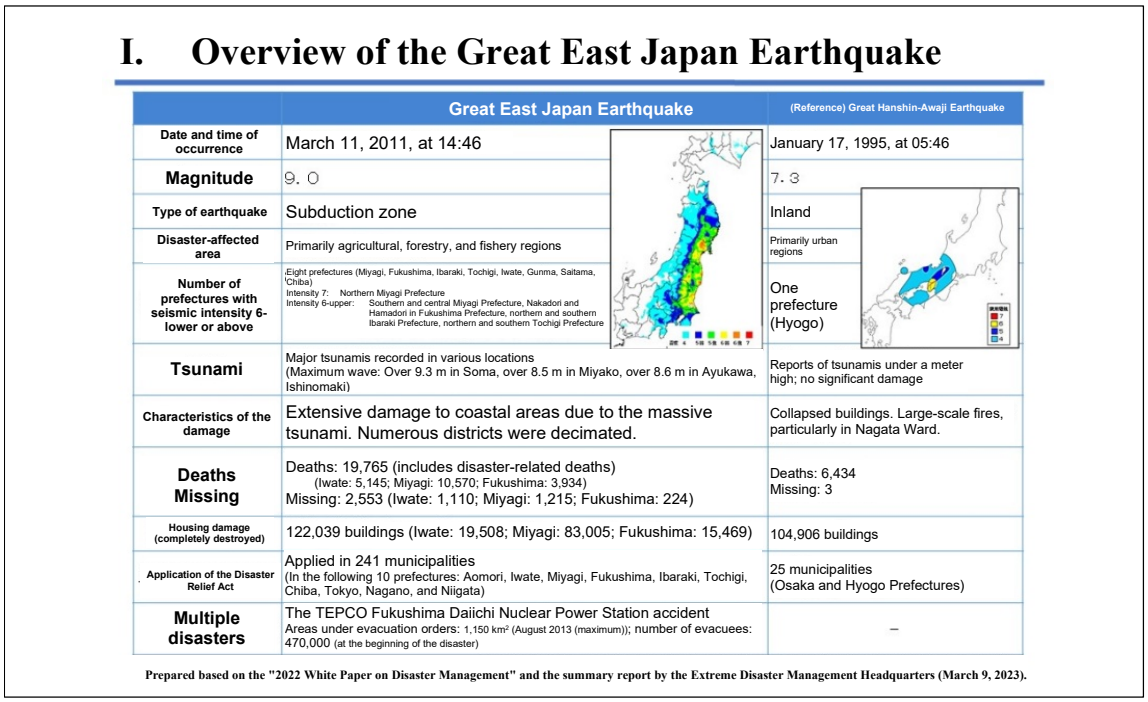
Tsunami observations (at tide gauges)

Shoya, Erimo	Maximum wave	15:44	3.5m
Miyako	Maximum wave	15:26	Over 8.5 meters
Ofunato	Maximum wave	15:18	Over 8.0 meters
Kamaishi	Maximum wave	15:21	Over 420 cm
Ayukawa, Ishinomaki	Maximum wave	15:26	Over 8.6 meters
Soma	Maximum wave	15:51	Over 9.3 meters
Oarai	Maximum wave	16:52	4.0m

Aftershocks occurred over a wide area, mainly within a region approximately 500 km in length and 200 km in width extending from offshore Iwate Prefecture to offshore Ibaraki Prefecture, corresponding to the main earthquake's epicenter area. Additionally, aftershocks were recorded across a broad range, including on the east side of the trench axis near the epicenter, as well as inland shallow areas in Fukushima and Ibaraki Prefectures. There were six aftershocks of seismic intensity 6-lower or above by the end of 2020. Moreover, several other strong earthquakes occurred outside the aftershock region of the Tohoku earthquake, including an earthquake in northern Nagano Prefecture on March 12, 2011, and one in eastern Shizuoka Prefecture on March 15, 2011, both of which recorded a maximum seismic intensity of 6-upper. It should be noted that the summary of damages presented in the following section 2) includes damages caused by these aftershocks and other related events.

2) Overview of damage

Figure 1-1-1 Overview of the Great East Japan Earthquake



I. Overview of the Great East Japan Earthquake

	Great East Japan Earthquake	(Reference) Great Hanshin-Awaji Earthquake
Date and time of occurrence	March 11, 2011, at 14:46	January 17, 1995, at 05:46
Magnitude	9.0	7.3
Type of earthquake	Subduction zone	Inland
Disaster-affected area	Primarily agricultural, forestry, and fishery regions	Primarily urban regions
Number of prefectures with seismic intensity 6-lower or above	Eight prefectures (Miyagi, Fukushima, Ibaraki, Tochigi, Iwate, Gunma, Saitama, Chiba) Intensity 7: Northern Miyagi Prefecture Intensity 6-upper: Southern and central Miyagi Prefecture, Nakadori and Hamadori in Fukushima Prefecture, northern and southern Ibaraki Prefecture, northern and southern Tochigi Prefecture	One prefecture (Hyogo)
Tsunami	Major tsunamis recorded in various locations (Maximum wave: Over 9.3 m in Soma, over 8.5 m in Miyako, over 8.6 m in Ayukawa, Ishinomaki)	Reports of tsunamis under a meter high; no significant damage
Characteristics of the damage	Extensive damage to coastal areas due to the massive tsunami. Numerous districts were decimated.	Collapsed buildings. Large-scale fires, particularly in Nagata Ward.
Deaths Missing	Deaths: 19,765 (includes disaster-related deaths) (Iwate: 5,145; Miyagi: 10,570; Fukushima: 3,934) Missing: 2,553 (Iwate: 1,110; Miyagi: 1,215; Fukushima: 224)	Deaths: 6,434 Missing: 3
Housing damage (completely destroyed)	122,039 buildings (Iwate: 19,508; Miyagi: 83,005; Fukushima: 15,469)	104,906 buildings
Application of the Disaster Relief Act	Applied in 241 municipalities (In the following 10 prefectures: Aomori, Iwate, Miyagi, Fukushima, Ibaraki, Tochigi, Chiba, Tokyo, Nagano, and Niigata)	25 municipalities (Osaka and Hyogo Prefectures)
Multiple disasters	The TEPCO Fukushima Daiichi Nuclear Power Station accident Areas under evacuation orders: 1,150 km² (August 2013 (maximum)); number of evacuees: 470,000 (at the beginning of the disaster)	–

Prepared based on the "2022 White Paper on Disaster Management" and the summary report by the Extreme Disaster Management Headquarters (March 9, 2023).

Source: Reconstruction Agency materials

a. Human casualties

The Great East Japan Earthquake caused an extremely severe loss of life, with 19,765 confirmed deaths and 2,553 people reported missing across 13 prefectures as of March 9, 2023 (Fire and Disaster Management Agency, Report No. 162, including disaster-related deaths). This makes it the third most devastating disaster since the Meiji era, following the 1923 Great Kanto earthquake (approximately 105,000 dead or missing) and the 1896 Sanriku earthquake (approximately 22,000 dead or missing). Of the total, Iwate Prefecture recorded 5,145 deaths and 1,110 missing; Miyagi Prefecture 10,570 deaths and 1,215 missing; and Fukushima Prefecture 3,935 deaths and 224 missing, with these three prefectures accounting for the majority of casualties. Additionally, 3,789 deaths were attributed to disaster-related causes (according to the Reconstruction Agency on March 31, 2022). For comparison, the Great Hanshin-Awaji Earthquake in 1995 resulted in 6,434 deaths and three missing persons (final report, May 19, 2006, Fire and Disaster Management Agency), highlighting the scale of impact of the Great East Japan Earthquake.

b. Damage to housing

The earthquake caused significant damage to residential buildings, with 122,039 houses completely destroyed across nine prefectures and 283,698 partially destroyed across 13 prefectures (March 9, 2023, Fire and Disaster Management Agency). Of these, Iwate Prefecture experienced 19,508 completely destroyed and 6,571 partially destroyed houses, Miyagi Prefecture 83,005 completely destroyed and 155,130 partially destroyed houses, and Fukushima Prefecture 15,469 completely destroyed and 83,323 partially destroyed houses, with these three prefectures that experienced the worst casualties similarly accounting for the majority of residential damage. In comparison, the Great Hanshin-Awaji Earthquake resulted in 104,906 completely destroyed and 144,274 partially destroyed houses.

Figure 1-1-2 Casualties and housing damage caused by the Great East Japan Earthquake

3. Human casualties and housing damage

Reconstruction Agency
Reconstruction, revitalization and beyond

	Human casualties			Housing damage							
				Residential damage					Non-residential damage		
	Deaths	Missing	Injured	Completely destroyed	Significant damage	Partial damage	Flooding above floor level	Flooding below floor level	Public buildings	Other	Fire
Hokkaido	1		3		4	7	329	545	17	452	4
Aomori	3	1	110	308	701	1,005				1,402	11
Iwate	5,145	1,110	213	19,508	6,571	19,066		6	529	4,178	33
Miyagi	10,568	1,215	4,148	83,005	155,130	224,202		7,796	9,948	16,848	137
Akita			11			5					1
Yamagata	3		45		14	1,249			8	124	2
Fukushima	3,931	224	183	15,435	82,783	141,054	1,061	351	1,010	36,882	38
Ibaraki	66	1	714	2,638	25,056	190,471	33	610	1,763	21,668	31
Tochigi	4		133	261	2,118	74,173			718	9,706	
Gunma	1		42		7	17,679					2
Saitama	1		104	24	199	16,511			95		12
Chiba	22	2	268	807	10,313	57,449	61	455	12	827	18
Tokyo	8		119	20	223	6,570			419	786	35
Kanagawa	6		137		41	459				13	
Niigata			3			17			4	5	
Yamanashi			2			4			1	1	
Nagano			1								
Shizuoka			3			13		5			
Mie			1				2				
Osaka			1						3		
Tokushima							2	9			
Kochi			1				2	8			
Total	**19,759**	**2,553**	**6,242**	**122,006**	**283,160**	**749,934**	**1,490**	**9,785**	**14,527**	**92,892**	**330**

(Reference)	Deaths	Missing	Injured	Completely destroyed	Significant damage	Partial damage	Complete fire destruction	Significant fire damage	Partial fire damage	Non-residential damage
Great Hanshin-Awaji Earthquake	*6,434*	*3*	*43,792*	*104,906*	*144,274*	*390,506*	*7,036*	*96*	*333*	*42,496*

Source: Extreme Disaster Management Headquarters, as of March 8, 2022 (14:00) (Fire and Disaster Management Agency, as of March 1, 2022) and damage from the Great Hanshin-Awaji Earthquake (Hyogo Prefecture website: confirmed by the Fire and Disaster Management Agency on May 19, 2006). * Deaths include those classified as disaster-related fatalities.
* The damage figures include those caused by aftershocks of the 2011 Tohoku earthquake (excluding damages from the earthquakes that struck off the coast of Fukushima Prefecture on February 13, 2021, and off the coast of Miyagi Prefecture on March 20, 2021, as separately compiled by the Fire and Disaster Management Agency). The damage figures also include those caused by earthquakes occurring outside the aftershock zone after March 11, 2011, where it was impossible to distinguish the causes of the damage.

Source: Expert Meeting on Reflection on the Past Decade of Reconstruction Policy for the Great East Japan Earthquake (1st meeting, October 24, 2022) Reference Material 1

c. Disruption to transportation

The Great East Japan Earthquake caused damage to 4,198 road locations. On the National Routes under direct management of the central government, damages included 22 sections of National Route 45 that were closed and five bridges that lost their superstructures. Additionally, 20 expressways, including the Tohoku Expressway and Joban Expressway, were closed.

For railways, JR East's Tohoku Shinkansen sustained damage at approximately 1,200 locations, leading to the suspension of all services. In addition, on local lines, the tsunami caused severe damage to seven rail lines, including the Hachinohe Line, Yamada Line, Ofunato Line, Kesennuma Line, Ishinomaki Line, Senseki Line, and Joban Line, with 23 stations washed away. Other railways, including the Sendai Subway Nanboku Line, Sendai Airport Line, and the Sanriku Railway North and South Rias Lines, also suffered damage, leading to full or partial service suspensions for both passenger and freight rail services.

Regarding ports, all ports along the Pacific coast from Hachinohe in Aomori Prefecture to Ibaraki Prefecture ceased functioning due to the earthquake and subsequent tsunami.

Regarding airports, of the four affected airports—Sendai, Hanamaki, Fukushima, and Ibaraki—Hanamaki, Ibaraki, and Fukushima Airports resumed operations on the same day despite sustaining damage. However, Sendai Airport was closed and rendered inoperative due to sediment and debris deposited by the tsunami.

This extensive damage to the transportation infrastructure in the affected areas left many residents isolated, creating significant challenges in securing transport routes for essential supplies.

d. Condition of lifeline utilities

In eastern Japan, approximately 8.91 million households experienced power outages across the areas serviced by Tohoku Electric Power, Tokyo Electric Power, and Hokkaido Electric Power.

About 480,000 households lost access to city gas, while LP gas supply was halted for approximately 1.66 million households across the three prefectures of Iwate, Miyagi, and Fukushima.

For water supply, approximately 2.2 million households experienced water outages at one point. Wastewater systems in 13 prefectures saw damage to 120 treatment facilities. Industrial water supply systems in 13 prefectures suffered damage to 44 operations, leading to service suspensions.

In telecommunications, around one million landlines went offline, and about 15,000 mobile phone base stations ceased operations.

For reference, the Great Hanshin-Awaji Earthquake saw around 2.6 million households lose power, approximately 845,000 households without gas supply, around 1.27 million households without water, and roughly 480,000 disrupted landlines (both exchange and subscriber lines).

Additionally, in the eight prefectures that observed a seismic intensity of 6-lower or above during Great East Japan Earthquake, 237 out of 352 municipal government buildings were damaged. This impacted emergency disaster response, destroying various data held by municipalities, and hindering administrative services.

The suspension of lifeline utilities and administrative functions in the affected areas led to extended evacuation for survivors, delaying efforts for them to begin rebuilding their lives as early as possible.

e. Impacts in the Tokyo metropolitan area and other regions

In the Tokyo metropolitan area, where a seismic intensity of 5-upper was observed, the shutdown of public transportation left a massive number of people unable to return home, resulting in crowded sidewalks filled with people attempting to walk home, as well as many individuals remaining stranded. As of 04:00 on March 12, around 94,000 individuals sought shelter in Tokyo's public facilities, metropolitan schools, and temporary accommodations provided by local municipalities.

Additionally, liquefaction occurred extensively in areas across Ibaraki, Chiba, Tokyo, Saitama, and Kanagawa Prefectures, particularly on reclaimed land developed since the Meiji era, leading to issues such as manhole protrusion, tilting or sinking of houses and utility poles, and lifeline utility disruptions. According to a survey conducted by the Ministry of Land, Infrastructure, Transport and Tourism (as of September 27, 2011), about 27,000 cases of liquefaction-related residential damage occurred across nine prefectures from Tohoku to Kanto.

Additionally, the resonance between the natural frequencies of buildings and the slow, repetitive motion of long-period ground motion caused significant shaking and damage in high-rise buildings in Tokyo and other areas. Furthermore, planned power outages were implemented within the Tokyo Electric Power Company's service area following the earthquake. Thus, the quake had a substantial impact not only on the Tohoku region but also on the Tokyo metropolitan area and beyond. The earthquake also had a substantial impact on Japan's economy. For example, the Nikkei Stock Average, which was trading around 10,300 yen on the day of the earthquake, dropped to 8,600 yen level by the close on March 15.

f. Damage estimation

The estimated damages from the Great East Japan Earthquake include a stock loss estimate by the Cabinet Office (economic and fiscal analysis), which placed the damage between approximately 16 trillion yen and 25 trillion yen, and a stock damage estimate by the Cabinet Office (disaster management), calculated at approximately 16.9 trillion yen. Both estimates far exceed the damage estimate of approximately 9.6 trillion yen for the Great Hanshin-Awaji Earthquake by the National Land Agency.

Figure 1-1-3 Comparison of damage estimates for the Great East Japan Earthquake and the Great Hanshin-Awaji Earthquake

		Great East Japan Earthquake			(Reference) Great Hanshin-Awaji Earthquake
Estimating entity		Cabinet Office (disaster management)	Cabinet Office (economic and fiscal analysis)		National Land Agency
			Case 1	Case 2	
Buildings Buildings, etc. (residences, residential land, stores, offices, factories, machinery, etc.)		About 10.4 trillion yen	About 11 trillion yen Estimation of the rate of building damage • Tsunami disaster-affected areas: About twice the amount of Hanshin • Areas unaffected by tsunamis: About the same as Hanshin	About 20.4 trillion yen Estimation of the rate of building damage • Tsunami disaster-affected areas: Especially larger than Case 1 • Areas unaffected by tsunamis: About the same as Hanshin	About 6.3 trillion yen
Lifeline facilities (Water, gas, electricity, communications, and broadcasting facilities)		About 1.3 trillion yen	About 1 trillion yen	About 1 trillion yen	About 600 billion yen
Social infrastructure facilities (Rivers, roads, ports, sewers, airports, etc.)		About 2.2 trillion yen	About 2 trillion yen	About 2 trillion yen	About 2.2 trillion yen
Other	Agriculture, forestry, and fisheries	About 1.9 trillion yen	About 2 trillion yen	About 2 trillion yen	About 500 billion yen
	Other	About 1.1 trillion yen			
Total		About 16.9 trillion yen	About 16 trillion yen	About 25 trillion yen	About 9.6 trillion yen

Note: The stock categories are based on those used in estimates by the Cabinet Office (disaster management), and may vary slightly depending on the estimation.

Source: Expert Meeting on Reflection on the Past Decade of Reconstruction Policy for the Great East Japan Earthquake (1st meeting, October 24, 2022) Reference Material 1

- Cabinet Office (economic and fiscal analysis) estimate

This estimate was published in the materials for the March 23, 2011 Special Meeting on Earthquake Response of the Ministerial Council on the Monthly Economic Report, titled "Macroeconomic Impact Analysis of the Tohoku earthquake."

The estimated damage to stock (social infrastructure, housing, and private business facilities) in affected areas was calculated at approximately 16 to 25 trillion yen, based on a macro-level estimate. This figure was derived by applying a damage rate—developed from data on the Great Hanshin-Awaji Earthquake—to the estimated stock in each affected prefecture.

Specifically, if the tsunami-affected areas experienced a damage rate around twice that of the Great Hanshin-Awaji Earthquake (Case 1), damage to the stock, totaling roughly 175 trillion yen across affected areas, was estimated at 16 trillion yen. If tsunami damage to buildings was assumed to be especially severe (Case 2), the damage estimate rose to approximately 25 trillion yen.

- Cabinet Office (disaster management) estimate

This estimate, titled "Damage Estimate for the Great East Japan Earthquake," was announced to the press on June 24, 2011.

To serve as a reference for future discussions on recovery and reconstruction in affected areas, the estimated damage to stock—based on information provided by each prefecture and related ministries regarding the value of losses to buildings, lifeline facilities, and social infrastructure—was set at approximately 16.9 trillion yen.

Specifically, this estimate includes approximately 10.4 trillion yen for buildings (housing and land, stores, offices, factories, machinery, etc.); 1.3 trillion yen for lifeline facilities (water, gas, electricity, and communication/broadcasting facilities); 2.2 trillion yen for social infrastructure (rivers, roads, ports, sewage systems, airports, etc.); 1.9 trillion yen for agriculture, forestry, and fisheries (farmland and agricultural facilities, forests, fisheries facilities, etc.); and 1.1 trillion yen for other facilities (sport/education/culture, healthcare/welfare, waste management, and other public facilities); totaling approximately 16.9 trillion yen.

(2) Overview of the TEPCO Fukushima Daiichi Nuclear Power Station Accident

1) The TEPCO Fukushima Daiichi Nuclear Power Station Accident

The Great East Japan Earthquake, which occurred at 14:46 on March 11, resulted in the automatic shutdown of Units 1 through 3 of 6 reactors at the Tokyo Electric Power Company (TEPCO) Fukushima Daiichi Nuclear Power Station (hereinafter "TEPCO Fukushima Daiichi NPS"). Units 4 through 6 had already been shut down for periodic inspection.

At 15:42 on the same day, TEPCO determined that an Article 10 event had occurred under the Act on Special Measures Concerning Nuclear Emergency Preparedness (Act No. 156 of 1999, hereinafter the "Nuclear Emergency Preparedness Act"), involving the loss of all AC power at Units 1 through 3, and subsequently notified the Nuclear and Industrial Safety Agency (NISA) and other related agencies.

Furthermore, at 16:36, TEPCO confirmed an incident involving the inability to inject water via the emergency core cooling system at Units 1 and 2, an event under Article 15 of the Nuclear Emergency Preparedness Act, notifying NISA and other relevant authorities at 16:45. In the case of Unit 3, early in the morning of March 13, TEPCO reported to NISA and other relevant authorities that an event under Article 15 of the Nuclear Emergency Preparedness Act (loss of reactor cooling function) had occurred. The spent fuel pools at Units 1 through 4 also faced cooling challenges.

In the following days, explosions suspected to be hydrogen explosions occurred: Unit 1 on the afternoon of March 12, Unit 3 on the morning of March 14, and Unit 4 on the morning of March 15. Additionally, on the morning of March 15, a loud impact sound suspected to be due to a hydrogen explosion was observed at Unit 2, while a fire was detected at Unit 4 that same morning. The situation escalated beyond damage to the plant itself, leading to radioactive material release outside the plant and contaminated water accumulation and leakage.

Amid these developments, to contain the situation, the government, under Article 64, Paragraph 3 of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors, ordered TEPCO via the Minister of Economy, Trade and Industry to implement measures such as the suppression of pressure within the reactor containment vessels and the injection of seawater. Additionally, water-spraying operations were carried out by the Self-Defense Forces, the Metropolitan Police Department riot squads, and emergency fire response teams. TEPCO also took actions including water injection and spraying to cool the reactors and spent fuel pools, pressure suppression within the reactor containment vessels, nitrogen injection in Unit 1 to prevent hydrogen explosions, and measures to prevent the release of contaminated water.

Due to this incident, on March 12, NISA initially assigned the event a provisional rating of Level 3 (serious incident) on the International Nuclear and Radiological Event Scale (INES), and later that same day raised it to Level 4 (accident with local consequences). On March 18, it was escalated to Level 5 (accident with wider consequences), and on April 12, to Level 7 (major accident). Notifications of these ratings were sent to the International Atomic Energy Agency (IAEA).

2) Accident at the TEPCO Fukushima Daini Nuclear Power Station

Following the Tohoku earthquake, all four reactors at the TEPCO Fukushima Daini Nuclear Power Station (hereafter "Fukushima Daini Plant") that were operational—Units 1 to 4—automatically shut down. On the same day at 17:35, TEPCO determined that a situation under Article 10 of the Nuclear Emergency Preparedness Act had occurred in Unit 1 due to reactor coolant leakage. At 18:33, they determined that another Article 10 event, indicating a loss of the reactor heat removal function, had

occurred in Units 1, 2, and 4, and notified NISA and other relevant agencies. Early on the morning of March 12, TEPCO reported to NISA and other agencies that an Article 15 event of the Nuclear Emergency Preparedness Act (loss of pressure suppression function) had occurred in Units 1, 2, and 4. Subsequently, TEPCO's recovery work restored the heat removal function, and all reactors achieved cold shutdown, stabilizing the situation.

Regarding this incident, on March 12, NISA assigned it a provisional INES rating of Level 3 (serious incident) and notified the IAEA.

2. Initial response and emergency measures

(1) Response to the earthquake and tsunami disasters

This section is primarily based on the "Overview of Measures Taken on Disaster Management" (2011 White Paper on Disaster Management) submitted to the 177th session of the National Diet, with additions and amendments to focus on the initial and emergency response measures taken at the beginning of the disaster on March 11, 2011. (For information on subsequent recovery efforts, please refer to Chapter 2 onward.)

1) Initial response

a. Establishment of the Extreme Disaster Management Headquarters

Immediately following the disaster, at 14:50 on March 11, the government established an emergency response office at the Prime Minister's Office and convened an emergency response team. At the same time, the Prime Minister issued instructions to ① ascertain the status of the damage; ② ensure the safety of residents and promptly implement evacuation measures; ③ secure lifeline utilities and restore transportation networks; and ④ provide accurate information to residents with all available resources.

At 15:14, in order to strongly promote emergency measures in response to the Tohoku earthquake disaster, the Extreme Disaster Management Headquarters, headed by the Prime Minister, was established by a Cabinet decision based on the Basic Act on Disaster Management (Act No. 223 of 1961) for the first time since the law' enactment ("establishment of the 2011 Tohoku Earthquake Extreme Disaster Management Headquarters").

At 15:37, the first meeting of the Extreme Disaster Management Headquarters was held, and the basic policy for emergency disaster measures was determined.

Figure 1-1-4 Basic policy for emergency disaster measures

表１－２－１ 災害応急対策に関する基本方針

本日14時46分頃に発生した地震は，東北を中心に北海道から関東地方にかけての広い範囲を中心に，地震動，津波等により，激甚な被害が発生している模様である。さらに，今後の余震により，被害が拡大する可能性も考えられる。

このため政府として，以下の基本方針に基づき，地方自治体と緊密に連携し，被災者の救援・救助をはじめとする災害応急活動に総力をあげて取り組むとともに，国民生活及び経済活動が早期に回復するよう全力を尽くす。

1．災害応急活動が円滑に行えるよう，関係省庁は情報の収集を迅速に行い，被害状況の把握に全力を尽くす。

2．人命の救助を第一に，以下の措置により被災者の救援・救助活動，消火活動等の災害応急活動に全力を尽くす。

(1) 全国から被災地に，自衛隊の災害派遣部隊，警察広域緊急援助隊，緊急消防援助隊，海上保安庁の部隊及び災害派遣医療チーム（DMAT）を最大限派遣する。

(2) 応急対応に必要な人員，物資等の緊急輸送路を確保するため，高速道路や幹線道路等の通行路の確保に全力を挙げる。

(3) 救援・救助活動等の応急対策を適切に進めるため，必要に応じて航空情報（ノータム）の発出等により，関係機関，関係団体の協力の下，被災地上空及びその周辺空域における航空安全の確保を図る。

3．被災地住民の生活の復旧等のため，電気，ガス，水道，通信等のライフラインや鉄道等の交通機関の復旧に全力を挙げる。

4．応急対応に必要な医療物資，食糧，飲料水及び生活必需品，並びに緊急輸送路・ライフライン等の復旧のための人員，物資を確保するため，全国からの官民一体となった広域応援体制を確保する。

5．被災地の住民をはじめ，国民や地方自治体，関係機関が適切に判断し行動できるよう，的確に情報を提供する。

（緊急災害対策本部資料）

Source: 2011 White Paper on Disaster Management

On the day of the disaster, two additional Extreme Disaster Management Headquarters meetings were held. In the Tokyo metropolitan area, all rail services were suspended immediately after the earthquake, causing a large number of people unable to return home to gather at stations. Following the third Extreme Disaster Management Headquarters meeting held at 19:23, the Chief Cabinet Secretary instructed all ministries and agencies to make every effort to assist those unable to return home by maximizing the use of public facilities around stations. In response, facilities belonging to the national government located in the Tokyo metropolitan area, including the Showa Kinen Park, were opened as temporary shelters for those stranded.

The procurement and transportation of supplies for disaster victims which were conducted by local governments, wide-area medical transfers, and acceptance of international aid, were coordinated by task forces (with up to 70 members) established within the Extreme Disaster Management Headquarters.

In areas affected by the tsunami, there were numerous isolated individuals and local governments that had lost their functional offices. Thus, at the sixth meeting of the Extreme Disaster Management Headquarters on March 12, the Prime Minister instructed that in order to advance human rescue efforts, they were to ① strengthen the wide-area support system, actively deploying Self-Defense Forces units to rescue isolated individuals, and ② enhance support for municipalities where local government functions have been lost.

By March 17, one week after the disaster, the Extreme Disaster Management Headquarters had convened 12 times to promote comprehensive coordination of emergency measures, with urgent actions taken on the points including:

- On March 11, the Disaster Relief Act (Act No. 118 of 1947) was applied to ten prefectures: Aomori (two municipalities), Iwate (all 34 municipalities), Miyagi (all 35 municipalities), Fukushima (all 59 municipalities), Ibaraki (37 municipalities), Tochigi (15 municipalities), Chiba (eight municipalities), and Tokyo (47 wards and municipalities), as well as one village in Nagano Prefecture and three municipalities in Niigata Prefecture on March 12.
- On March 12, a Cabinet decision titled "Cabinet Order on the Designation of Severe Disasters Caused by the 2011 off the Pacific coast of Tohoku Earthquake and Measures Applicable to Such Disasters" (Cabinet Order No. 18 of 2011) was made.
- From March 12 onward, the Act on Support for Reconstructing Livelihoods of Disaster Victims (Act No. 66 of 1998) was applied sequentially in each affected prefecture.
- On March 13, another Cabinet decision was made, titled "Cabinet Order on the Designation of the Specified Disaster Caused by The 2011 off the Pacific coast of Tohoku Earthquake and Measures Applicable to Such Disaster" (Cabinet Order No. 19 of 2011), officially designating the disaster as a specified disaster.
- On March 14, a Cabinet decision was made regarding the use of contingency funds for the procurement and transportation of supplies to affected areas due to the Tohoku earthquake. .

At the 12th meeting of the Extreme Disaster Management Headquarters on March 17, given the urgent need to support the livelihoods of disaster victims, it was decided to establish the Special Headquarters for Measures to Assist the Lives of Disaster Victims under the Extreme Disaster Management Headquarters.

Furthermore, at the 17th meeting on May 20, the Extreme Disaster Management Headquarters approved the "Immediate Policy for Normalizing Life in Disaster-Affected Areas of the Great East Japan Earthquake," which outlined measures for the government to undertake over the next three months in preparation for the transition to the full-scale recovery phase.

Below is a summary of the Extreme Disaster Management Headquarters meetings and their proceedings held in 2011.

Figure 1-1-5 List of Extreme Disaster Management Headquarters meetings held in 2011 for the 2011 Tohoku earthquake

Meeting number	Date and time	Main agenda items	Agreements and remarks
1st meeting	March 11 15:37–15:56	• Reports from ministries: Earthquake information Response status, etc. • Basic policy for emergency disaster measures	"Basic policy for emergency disaster measures" approved
2nd meeting	March 11 Shortly after 16:00–16:22	• Reports from ministries: Earthquake information Response status, etc. • Basic policy for emergency disaster measures	
3rd meeting	March 11 19:23–19:38	• Reports from ministries: Earthquake information Response status, etc.	Shared the policy to proceed with the establishment of local disaster management headquarters

4th meeting	March 12 08:30–09:15	• Reports from ministries: Earthquake information Response status, etc.	Reported the establishment of local disaster management headquarters
5th meeting	March 12 11:36–12:08	• Reports from ministries: Earthquake information Response status, etc.	
6th meeting	March 12 21:40–22:05	• Reports from ministries: Earthquake information Response status, etc.	Shared the policy of the Cabinet decision that day for the designation of this disaster as a severe disaster
7th meeting	March 13 09:32–10:04	• Reports from ministries: Earthquake information Response status, etc.	
8th meeting	March 13 21:01–21:35	• Reports from ministries: Earthquake information Response status, etc.	Reported the agreement on planned power outages Shared the policy of the Cabinet decision that day for the designation of this disaster as a specified disaster
9th meeting	March 14	• Reports from ministries: Response status, etc.	
10th meeting	March 15	• Reports from ministries: Response status, etc.	Reported a Cabinet decision at a round-robin meeting on March 14 to use a contingency fund of 30.2 billion yen
11th meeting	March 16	• Reports from ministries: Response status, etc.	Shared the policy on the revision of ordinances that day concerning revenue shortfalls and related bonds
12th meeting	March 17	• Reports from ministries: Response status, etc.	
13th meeting	March 21	• Reports from ministries: Support system and status of disaster-affected areas Status and measures for nuclear power plants	Reported reinforcement measures (Special Headquarters for Measures to Assist the Lives of Disaster Victims, Electricity Demand and Supply Emergency Response Headquarters, Disaster Volunteer Cooperation Team, etc.)
14th meeting	March 31	• Reports from ministries: Report on the status of support for disaster victims Status and measures for nuclear power plants, and support for disaster victims Response to economic damage	
15th meeting	April 11	• Reports from ministries: Report on the status of support for disaster victims Status and measures for nuclear power plants, and support for disaster victims	

16th meeting	May 6	• Reports from ministries and related organizations: Restructuring of government bodies related to the disaster Current state of and issues ① Status of support for disaster victims ② Nuclear power station accident response and support for nuclear disaster victims	Sharing the organizational restructuring effective May 9 (including changing the "Special Headquarters for Measures to Assist the Lives of Disaster Victims" to the "Disaster Victims Livelihood Support Team")
17th meeting	May 20	• Drafted the Immediate Action Policy for Restoring Normalcy in Affected Areas of the Great East Japan Earthquake	Approved the Immediate Action Policy for Restoring Normalcy in Affected Areas of the Great East Japan Earthquake
18th meeting	August 26	• Current status of restoration and efforts to address major issues • Draft of the Basic Policy Regarding Emergency Implementation of Decontamination • Forum to be held for discussions with Fukushima Prefecture	Joint meeting with the Great East Japan Earthquake Reconstruction Headquarters (6th meeting) and the Nuclear Emergency Response Headquarters (19th meeting)
19th meeting	September 11	• Status of recovery and response to major issues • Progress on the support for nuclear disaster victims • Additional Report of the Government of Japan to the International Atomic Energy Agency: About the Accident at the Fukushima Nuclear Power Station of Tokyo Electric Power Company - (Second Report)	Joint meeting with the Great East Japan Earthquake Reconstruction Headquarters (7th meeting) and the Nuclear Emergency Response Headquarters (20th meeting)

b. Establishment of the Local Response Headquarters

At 18:42 on March 11, a survey team of about 30 members, led by the State Minister of the Cabinet Office, was dispatched to the affected areas to gain a detailed understanding of the local damage (members were dispatched from: Cabinet Secretariat; Cabinet Office; National Police Agency; Ministry of Internal Affairs and Communications; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Health, Labour and Welfare; Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of the Environment; and Ministry of Defense). Subsequently, in line with the Cabinet decision made on March 11, the Emergency Disaster Local Response Headquarters (headed by the State Minister of the Cabinet Office) was established in Miyagi Prefecture at 06:00 on March 12.

Additionally, on the same day, government survey teams were dispatched to Iwate and Fukushima Prefectures, where local liaison and response offices were also set up.

The purpose of the Local Response Headquarters is to facilitate communication and coordination with the affected local governments regarding disaster measures implemented jointly by the national government. The headquarters also aimed to handle disaster-related administrative matters dynamically and promptly on-site in the affected areas while providing the maximum possible support and cooperation from the national government for the disaster response operations being carried out by the local government disaster response headquarters.

Furthermore, local governments established disaster response headquarters and implemented disaster measures, with such headquarters set up in 23 prefectures, including Iwate, Miyagi, and Fukushima

Prefectures, as well as other prefectures in the Tohoku and Kanto regions, spanning from Hokkaido to Kyushu.

c. Rescue and relief activities, etc.

○ Rescue and relief activities

In this earthquake, widespread tsunamis occurred, resulting in many missing persons and isolated communities, particularly along the coastal areas. Prioritizing life-saving efforts, firefighting units, police, the Japan Coast Guard, and the Self-Defense Forces (SDF) collaborated to conduct large-scale rescue and relief operations.

The National Police Agency, Fire and Disaster Management Agency, and Japan Coast Guard requested or instructed support from police, fire departments, and regional coast guard headquarters outside the disaster-affected areas. The Ministry of Defense issued a large-scale disaster dispatch order to SDF units immediately after the disaster, deploying as many units and resources as possible for rapid initial response.

The National Police Agency dispatched units from police organizations nationwide, with wide-area emergency response teams and riot squads working alongside local prefectural police in the disaster-affected areas to rescue victims and search for missing persons. The total number of dispatched personnel as wide-area emergency response units etc., has reached approximately 131,600 (according to the Extreme Disaster Management Headquarters on March 9, 2023).

The Fire and Disaster Management Agency directed the deployment of emergency fire response teams, with a peak force of 1,870 teams and 6,835 personnel conducting rescue operations on March 18. This earthquake marked the first deployment of emergency fire response teams under the direction of the Commissioner of the Fire and Disaster Management Agency since the establishment of these teams. Furthermore, teams from 44 prefectures, excluding Iwate, Miyagi, and Fukushima, were dispatched, totaling 8,854 teams and 30,684 personnel over 88 days from March 11 to June 6, 2011 (according to the Extreme Disaster Management Headquarters on March 9, 2023).

The Japan Coast Guard mobilized 95,885 patrol vessels, 40,626 aircraft, and 2,554 members of special rescue teams to carry out rescue operations (according to the Extreme Disaster Management Headquarters on March 9, 2023).

To further strengthen efforts in the disaster-affected areas, the Ministry of Defense formed a joint task force comprising ground, maritime, and air SDF units on March 14 to conduct search and rescue operations for disaster victims. Additionally, for the first time outside of training, reservists and immediate response reservists were called up based on the Self-Defense Forces Act. Acting on instructions from the Prime Minister, a maximum deployment force of about 107,000 personnel was mobilized for search and rescue operations on March 26. Over 174 days from March 11 to August 31, 2011, approximately 10,580,000 personnel were deployed in total (according to the Extreme Disaster Management Headquarters on March 9, 2023).

○ Acceptance of rescue teams from overseas

Since the disaster, 163 countries and regions and 43 organizations offered assistance, with rescue teams and expert teams from 29 countries, regions, and organizations dispatched to Japan (according to the Extreme Disaster Management Headquarters on March 9, 2023).

In response to Japan's request for assistance, the U.S. military launched a large-scale operation called Operation Tomodachi, deploying more than 15,000 personnel, around 24 ships, and about 140 aircraft at peak deployment. They supplied relief supplies from vessels such as the aircraft carrier USS Ronald Reagan and the amphibious assault ship USS Essex, provided transportation assistance to international rescue teams, conducted search and rescue operations, and helped restore Sendai Airport. The U.S. also supported the TEPCO Fukushima Daiichi NPS response by providing a barge, dispatching the Marine Corps' Chemical Biological Incident Response Force (CBIRF), and offering aerial imagery from unmanned reconnaissance aircraft like the Global Hawk.

○ Occurrence of fires and firefighting activities

Fires broke out in various areas immediately following the earthquake.

In this disaster, fires were confirmed in coastal urban areas, petroleum complexes, and hazardous material facilities. In some cases, on-site firefighting efforts were hampered by debris and flooding caused by the tsunami.

In addition to prefectural wide-area support, firefighting agencies (fire officers and volunteer firefighters) and emergency fire response teams in the disaster-affected areas worked to extinguish fires, conduct rescues, and provide emergency medical assistance.

d. Emergency medical activities

After the disaster, many medical facilities in the affected areas sustained damage. Even at medical institutions that suffered only minor structural damage or avoided total or partial destruction, difficulties arose in staff commuting, patient transport, and the delivery of medical supplies.

Despite these challenging conditions, autonomous efforts were observed across disaster-affected areas immediately following the disaster, with healthcare personnel gathering at facilities to engage in emergency medical activities. Emergency medical operations from outside the disaster-affected areas included deploying Disaster Medical Assistance Teams (DMAT) and carrying out wide-area medical transport, implementing emergency medical responses on a nationwide scale.

○ Deployment of DMAT

The Ministry of Health, Labour and Welfare promptly requested DMAT dispatch to prefectures following the disaster. DMATs conducted relief operations, including hospital support and wide-area medical transport, in Iwate, Miyagi, Fukushima, and Ibaraki Prefectures. The Ministry of Education, Culture, Sports, Science and Technology also requested DMAT dispatch to all national, public, and private university hospitals on the day of the disaster. This led to the deployment of up to 193 DMATs in the disaster-affected areas. DMAT activities concluded on March 22.

○ Wide-area medical transport

To provide advanced medical care for critically injured patients during the large-scale disaster outside the disaster-affected areas and reduce the medical burden within the disaster zones, wide-area medical transport was implemented.

○ Securing medicines and medical equipment

Due to road damage from the earthquake and fuel shortages, hospitals in the disaster-affected areas faced shortages of medicines and medical equipment, and faced challenges securing such supplies. To address this, on March 12, the Ministry of Health, Labour and Welfare requested relevant organizations to take comprehensive measures to prevent supply disruptions of medicines and medical equipment to healthcare facilities and to ensure the unobstructed flow of these supplies. The ministry also notified organizations about the application procedures for emergency vehicle access permits to facilitate the smooth transportation of medicines and medical equipment to disaster-affected areas. With the cooperation of relevant organizations, medicines and medical equipment were successfully transported to the disaster-affected areas.

e. Procurement and transportation of essential supplies

In the disaster-affected areas, a large number of survivors were left in need, and shortages of essential supplies like water and food arose on the day of the disaster. Consequently, it became necessary to deliver large quantities of essential supplies to these areas. Starting on the day of the disaster, the

Extreme Disaster Management Headquarters assembled officials from relevant ministries and agencies responsible for procurement and transportation to coordinate the supply of necessary goods. Additionally, relevant organizations and companies were asked to cooperate through their supervising ministries. Previously, necessary supplies in disaster-affected areas were procured directly by local governments. However, due to the unprecedented scale and widespread impact of the Great East Japan Earthquake and the significant decrease in the functionality of local governments, the national government (through the Extreme Disaster Management Headquarters) took an unprecedented approach by directly handling the procurement and transportation of supplies. To cover the expenses required for this, a Cabinet decision was made on March 14 to use approximately 30.2 billion yen from the 2010 contingency fund to support the supply of goods.

The Extreme Disaster Management Headquarters (renamed the Special Headquarters for Measures to Assist the Lives of Disaster Victims on March 20) coordinated support efficiently in response to requests from affected areas. Based on successive requests from each affected prefecture, which compiled the supply needs of the disaster-affected municipalities, necessary goods were procured with the cooperation of relevant ministries, agencies, organizations, and companies and then transported to collection points designated by each prefecture. Supplies transported to these collection points were subsequently delivered to evacuation shelters and other locations by local governments, the Self-Defense Forces, and other organizations.

Requests for supplies from the headquarters initially included water, food, and blankets, but the demand for fuel increased soon after. About a week after the disaster, in addition to these supplies, the focus shifted to daily necessities like diapers and toilet paper, followed by items to improve living conditions in evacuation shelters, such as partitions, shampoo, and cooking equipment. In this manner, the headquarters procured and transported necessary supplies to the disaster-affected areas based on the evolving needs.

For petroleum products, supply disruptions were compounded by the suspension of operations at some refineries, damage to roads in the disaster-affected areas, and other transportation challenges. This created a severe shortage of fuel for critical operations in hospitals, communications facilities, and local fire departments—facilities essential to rescue operations and sustaining lives. To address these challenges, emergency measures were implemented to secure supply and diversify transportation options, including requests for smooth supply cooperation from relevant industries, reducing the private petroleum storage obligation by three days, controlling exports and demand, coordinating between petroleum companies, deploying large numbers of tanker trucks, using rail transport, and establishing service station hubs.

f. Securing emergency transport routes

The police designated sections of the Tohoku Expressway, Joban Expressway, and Ban-Etsu Expressway as emergency transport routes the day after the disaster, in accordance with the Basic Act on Disaster Management. This designation was intended to ensure passage for vehicles necessary for life-saving operations and emergency supply deliveries.

From March 16 to 22, the restricted sections were gradually reduced in line with highway repairs, and even in the remaining restricted sections, large vehicles were exempted from traffic restrictions to minimize the impact on residents' daily lives. On March 24, all major highway restrictions were lifted.

Additionally, emergency traffic vehicle verification stickers were issued to vehicles involved in emergency disaster relief efforts, such as rescue, relief, medical support, and urgent supply transport, allowing them to use the designated emergency routes.

2) Response to infrastructure and lifeline utility damages

After the disaster, numerous essential municipal functions, necessary for the rapid and precise execution of various emergency response activities, were heavily impacted, along with extensive disruptions to vital transportation networks essential for emergency and recovery operations.

Infrastructure facilities such as ports were damaged, and lifeline utilities including electricity, gas, and water experienced widespread outages. Additionally, liquefaction occurred across a wide area from the Tohoku to Kanto regions, further damaging lifeline infrastructure.

In response, the national government, local governments, and utility companies all engaged in recovery operations. The national government focused on restoring directly managed projects and dispatched the Emergency Disaster Response Team (TEC-FORCE) from the Ministry of Land, Infrastructure, Transport and Tourism. This team, totaling 18,115 personnel deployed to disaster-affected areas (as of March 9, 2023, per the Extreme Disaster Management Headquarters), worked to rapidly assess damage, establish communication systems for municipalities with disrupted networks, secure emergency transport routes, remove floodwaters, and support the smooth conduct of rescue, relief, and supply transport activities, thereby facilitating the swift recovery of impacted municipalities.

a. Transportation infrastructure

The earthquake tremors, liquefaction over a wide area, and tsunami damage along coastal regions resulted in substantial harm to transportation infrastructure.

○ Roads

Highways such as the Tohoku Expressway and national highways were closed due to damage. Especially notable was the destruction of the coastal sections of National Route 45.

Restoration efforts prioritized securing access to the Tohoku region by first establishing the north-south corridor through the Tohoku Expressway and Route 4 as an emergency transport route on March 12, the day following the disaster. Additionally, to provide access from this inland north-south axis to the Pacific coast, east-west highways were cleared in a “comb teeth” pattern, with 11 routes opened by March 12 and all 15 routes fully operational by March 15 (the “comb teeth” strategy). On March 18, seven days after the earthquake, Route 45 was mostly cleared for access.

For the Tohoku Expressway, a crucial logistics artery, general traffic resumed completely by March 24, 13 days after the disaster, and on April 1, 21 days after the disaster, the Joban Expressway was also fully reopened for general traffic, except within the restricted zone around the TEPCO Fukushima Daiichi NPS.

On April 10, approximately one month after the disaster, emergency repairs and detours on Routes 45 and 6 were mostly completed, excluding restricted areas near the Fukushima Daiichi NPS.

By May 8, Route 6 within the Fukushima Daiichi NPS restricted zone, along with detours, was also ready for limited access in time for scheduled temporary entries.

○ Railways

Immediately after the earthquake, numerous JR East and private rail lines suspended service.

The Tohoku Shinkansen, a major artery in the region, resumed phased operations, with full service restored by April 29.

In the Tokyo metropolitan area, many lines resumed service from the night of March 11 through the following morning.

○ Ports

All Pacific coast ports, from Hachinohe in Aomori Prefecture to Ibaraki Prefecture, ceased operations due to the earthquake and subsequent tsunami. Starting March 14, after the tsunami warnings were lifted, debris removal began in major ports, including channels and berthing areas. Starting with Kamaishi Port and Ibaraki Port (Hitachinaka District) on March 15, some berths in various ports became available by March 24, allowing for the transport of emergency supplies, fuel, and other necessary goods.

○ Airports

Four airports—Sendai, Hanamaki, Fukushima, and Ibaraki—sustained damage. Among them, Fukushima Airport's control tower windows were broken, while damage such as fall of the ceiling occurred at the terminal buildings of Hanamaki and Ibaraki airports. Nevertheless, all airports continued operations from the day of the earthquake, accommodating disaster-response flights and temporary services. Regular commercial flights resumed on March 11 at Fukushima Airport, on March 14 at Ibaraki Airport, and on March 17 at Hanamaki Airport.

Sendai Airport, which was affected by the tsunami, temporarily reopened a 1,500-meter runway for rescue flights on March 16, facilitating large deliveries of relief supplies. Emergency repairs continued, and commercial flights resumed on April 13.

b. Lifeline utilities

○ Electricity

Approximately 8.91 million households experienced power outages, but restoration was completed by June 18, 2011, except in areas where houses had been washed away.

○ Gas

For city gas, outages affected around 480,000 households, but approximately 420,000 households, excluding areas where houses were washed away, had service restored by May 3, partly thanks to support from city gas providers in other regions.

Additionally, as of that date, LP gas was available for supply in areas where houses had not been washed away.

○ Water supply

Water supply facilities in 187 municipalities were damaged, resulting in water outages affecting approximately 2.2 million households at one point.

In response, affected water service providers conducted restoration work with support from water providers nationwide, and by September 30, 2011, water supply had been restored in all areas except those where houses were lost to the tsunami (35,000 households across three prefectures).

○ Sewerage systems

Among the 129 sewage treatment plants that sustained damage, Sendai's Minami-Gamo Wastewater Treatment Plant, which had extensive damage, was restored by the end of 2015, while all other damaged treatment facilities, excluding two locations without wastewater generation and three within the areas under evacuation orders, had their treatment capacity restored to normal levels by April 2016.

Among the sewage pipes that sustained damage, emergency repairs were completed by May 2011 for sections necessary to ensure wastewater flow.

○ Industrial water supply

Industrial water supply systems in 13 prefectures suffered damage to 44 operations, leading to service suspensions.

Affected providers undertook temporary restoration work, some with assistance from other providers, and water supply was resumed at 43 providers (including partial restorations) by May 31.

○ Telecommunications

For fixed-line phone services (subscription phones and ISDN), approximately 1 million lines were down at the peak of the disaster. By May 30, 2011, outages had decreased to about 12,000 lines. Base stations for mobile phones also experienced outages, with a peak of about 14,800 stations (across all four providers[4]) offline, later reduced to approximately 440 stations. Currently, all services have been restored except in difficult-to-return zones (according to the Extreme Disaster Management Headquarters on March 9, 2023).

○ Broadcasting

Initially, 120 TV relay stations went offline due to the earthquake, but all have since been restored (according to the Extreme Disaster Management Headquarters on March 9, 2023).

The Ministry of Internal Affairs and Communications granted prompt approval for temporary disaster FM radio stations in 23 municipalities requesting broadcast services (as of May 31, 2011). Additionally, 10,000 portable radios were distributed to disaster-affected areas.

○ Petroleum refining facilities, etc.

Six refineries halted operations due to the earthquake. By May 14, 2011, three had resumed operations, while the remaining three, including two that had fires in shipping equipment, piers, and storage tanks, remained offline until April 28, 2012, when all facilities were fully restored (according to the Extreme Disaster Management Headquarters on March 9, 2023).

Petroleum distribution facilities also faced disruptions, with damage to facilities like the Shiogama Oil Depot leading to the temporary closure of 1,137 gas stations under major brands in the Tohoku region, resulting in gasoline shortages. Gradual reopening of stations has since stabilized fuel supply in the region.

c. Public and institutional buildings

○ Educational facilities, etc.

Many educational and cultural facilities, including schools and social education buildings, as well as cultural assets, sustained significant damage. To prevent disruptions to educational activities, the national government enabled early commencement of restoration work before conducting onsite inspections. It also simplified procedures for disaster recovery projects to support local governments and other entities in the swift restoration of schools and social education facilities.

○ Medical facilities, etc.

With extensive damage reported, including the complete destruction of some medical institutions and social welfare facilities, medical personnel were dispatched by relevant medical organizations to maintain healthcare services in the disaster-affected areas. Temporary clinics and dental clinics were also established, and financial support was provided to facilitate the early restoration of medical facilities.

d. River and coastal facilities

[4] NTT Docomo, KDDI, SoftBank Mobile, and EMOBILE

○ Rivers

For rivers under direct government management, earthquake and tsunami damage caused levee collapses, cracks, and damage to embankments in 2,115 locations along rivers like the Kitakami and Tone. Emergency repairs were implemented, and additional precautions were taken, such as lowering thresholds for the dispatch of flood prevention teams, issuing public warnings, and organizing evacuation measures. Of these damaged sites, 53 locations across six river systems were designated for emergency restoration projects, all of which were completed by March 5, 2012.

○ Coastlines

Regarding coastal protection facilities, approximately 190 kilometers of coastal levees, out of about 300 kilometers along the coasts of Iwate, Miyagi, and Fukushima Prefectures, sustained complete or partial destruction, with a resulting 561 square kilometers of land flooded by the tsunami.

In preparation for future typhoons, urgent measures such as sandbagging up to high-tide levels were undertaken.

○ Landslides

The earthquake triggered 141 landslides across 12 prefectures, including Fukushima, resulting in 19 fatalities.

In anticipation of the typhoon and rainy seasons, emergency measures such as sandbagging were put in place. Additionally, urgent construction of structures such as erosion control dams was completed in areas affected by the earthquake. Measures were strengthened by lowering the thresholds for landslide warnings, and monitoring with debris flow sensors was enhanced.

3) Support for the livelihoods of disaster victims

a. Establishment of the Special Headquarters for Measures to Assist the Lives of Disaster Victims (Disaster Victims Livelihood Support Team)

At the 12th meeting of the Extreme Disaster Management Headquarters on March 17, it was determined that supporting the daily lives of disaster victims was an urgent priority. To further strengthen government efforts, the Special Headquarters for Measures to Assist the Lives of Disaster Victims, led by the Minister of State for Disaster Management, was established under the Extreme Disaster Management Headquarters. Its primary duties included coordinating with relevant governmental bodies, local governments, companies, and organizations to procure and deliver essential supplies, improve living conditions in evacuation shelters, stabilize housing, and ensure access to health, medical, welfare, and educational services for disaster victims.

The Special Headquarters for Measures to Assist the Lives of Disaster Victims established separate review and promotion meetings on issues such as recovery in disaster-affected areas, disaster waste management, employment support for disaster victims, job creation, and the promotion of housing availability for disaster victims, facilitating interagency cooperation.

Later, on May 9, the headquarters was renamed the Disaster Victims Livelihood Support Team.

The main initiatives of the Disaster Victims Livelihood Support Team were as follows[5]:

① Improving living conditions in evacuation shelters

- Analyzing results from evacuation shelter surveys conducted by relevant agencies and listening by Local Response Headquarters
- Requesting countermeasures from prefectures and municipalities as needed
  Instructing ministries to review problematic policies
- Promoting temporary relocation to inns and hotels

② Early resolution of evacuation shelter use

[5] "Challenges and Initiatives for Disaster Victim Support (Classification)" (July 22, 2011, Disaster Victims Livelihood Support Team)

- Monitoring the number of evacuees by prefecture and facility
- Providing housing

③ Providing necessary information
- Disseminating government information through the Prime Minister's Office website and public bulletin boards
- Distributing handbooks like the "Livelihood Support Handbook" and "Handbook on Reconstructing Livelihoods and Businesses"
- Publishing consultation information provided by various organizations for disaster victims on the team's website

④ Procuring and delivering supplies (shifted from national to prefectural responsibility on April 21)
- Procuring and delivering supplies to disaster-affected areas
- Temporarily continuing national support for items difficult to procure at the prefectural level upon request

⑤ Early restoration of infrastructure
- Monitoring damage and recovery status
- Coordinating activities of various ministries and agencies

⑥ Rebuilding livelihoods
- Organizing the "Japan as One" Work Project in phases 1 and 2
  Promoting employment for disaster victims through recovery projects and employment fund projects
- Enhancing support measures for affected SMEs and publishing a guidebook through the Small and Medium Enterprise Agency
- Providing support measures for early resumption of agriculture and fisheries through the Ministry of Agriculture, Forestry and Fisheries

⑦ Support for local governments
- Support by providing personnel
- Restoring municipal office functions
- Establishing a support desk with the Ministry of Internal Affairs and Communications and the Disaster Victims Livelihood Support Team to address consultation needs
- Conducting discussions on the administration of municipalities affected by nuclear disasters
- Developing the "National Evacuee Information System[6]" to collect information from evacuees on their new locations to provide to their original local governments
- Implementing policy changes and flexible system operations based on local government requests
- Preparing and distributing explanatory materials on special measures for prefecture and municipal staff

⑧ Policy management within the government
- Decision on the Immediate Action Policy for Restoring Normalcy in Affected Areas of the Great East Japan Earthquake
- Conducting discussions with municipalities
- Sharing information and coordinating through inter-ministerial meetings
- Providing information through the Prime Minister's Office, the team, various ministries' websites, and other media

b. Procurement and transportation of essential supplies

Under the Special Headquarters for Measures to Assist the Lives of Disaster Victims (Disaster Victims Livelihood Support Team), efforts conducted by the Extreme Disaster Management Headquarters to procure and transport supplies continued, based on successive requests from each affected prefecture,

[6] A system enabling evacuees to voluntarily provide information on their new locations to receiving municipalities, which then share it with their home prefectures or municipalities to facilitate information provision to the evacuees.

adapting to the changing needs of disaster-affected areas. After the first week following the disaster, goods began accumulating at distribution hubs, prompting the Ministry of Land, Infrastructure, Transport and Tourism to arrange for logistics experts to be dispatched to prefectural offices or municipalities in Miyagi, Iwate, Fukushima, and Ibaraki Prefectures. As a result, 13 experts were dispatched to assist in streamlining the final delivery of goods from distribution hubs to evacuation shelters. By April, as affected prefectures began to manage procurement independently, the headquarters' direct procurement was phased out by the end of the month.

Major supplies procured by the incident response teams of the Extreme Disaster Management Headquarters and the Special Headquarters for Measures to Assist the Lives of Disaster Victims (Disaster Victims Livelihood Support Team) included approximately 26.21 million food servings, 7.94 million bottles of beverages, 410,000 blankets, 16,000 kiloliters of fuel, 400,000 diapers, 240,000 boxes of general medicine, and 66,000 partitions. To transport these supplies, approximately 1,900 trucks arranged via the Japan Trucking Association, 150 flights by Self-Defense Force aircraft, five helicopters from police and private sectors, and eight ships were utilized.

In addition to supplies provided by the national government to the affected prefectures, significant amounts of supplies were also provided by local governments, companies, and organizations across Japan, transported by various transport providers and the Self-Defense Forces. As of May 30, 2011, logistics records from various logistics operators show that prefectural truck associations arranged approximately 5,500 truck deployments, JR Freight ran around 150 fuel transport trains, roughly 990 tankers and other vessels were deployed for fuel transport, ferries conducted approximately 240 trips transporting Self-Defense Force personnel and vehicles, and around 660 flights were made by aircraft.

c. Improving living conditions in evacuation shelters

○ Status of the number of evacuees

Evacuee numbers increased, especially in the hardest hit prefectures of Iwate, Miyagi, and Fukushima, reaching about 470,000 by March 14. This was roughly 1.5 times the peak number during the 1995 Great Hanshin-Awaji Earthquake, which saw about 320,000 evacuees.

○ Improving living conditions in evacuation shelters

In the immediate aftermath of the disaster, there was a severe shortage of essential supplies, including food, at evacuation shelters. However, this shortage was alleviated by April as the national government began direct procurement and distribution efforts.

Based on regular assessments of living conditions at all evacuation shelters, significant improvements were observed in areas like meals, underwear, laundry, privacy, and bathing between the first assessment in early April and the third in late April, thanks to progress in supplies and the restoration of lifeline utilities like water and electricity. Nevertheless, improvements lagged in certain coastal municipalities with many evacuation shelters. These municipalities were supported with focused assistance through collaboration with prefectural evacuation shelter coordinators.

○ Information provision for disaster victim support

To make essential information readily accessible to disaster victims, the government distributed resources such as wall newspapers, the "Livelihood Support Handbook," and the "Handbook on Reconstructing Livelihoods and Businesses" at evacuation shelters, supermarkets, and convenience stores, and communicated information via radio, local newspapers, and the Prime Minister's Office disaster response website. In addition, various ministries and agencies provided consultations, set up phone support, and distributed guidebooks. Local governments in disaster-affected areas also disseminated practical information on education, childcare, transportation, waste and sewage disposal, lifeline utilities, medical and health services, and support programs via bulletins and temporary disaster radio stations. For evacuees who had left their home municipalities, a voluntary information system was established, allowing evacuees to register information, which was then shared through the

National Evacuee Information System, enabling the original municipalities to continue providing information and support.

d. Deployment of personnel to municipalities

In disaster-affected municipalities, damage to government offices and the personal impact on municipal employees led to disruptions in administrative systems and functions. To address this, the Ministry of Internal Affairs and Communications, with the support of the Japan Association of City Mayors and the National Association of Towns and Villages, organized a nationwide system to send personnel to these municipalities. Additionally, through sister-city partnerships and the system established by the National Governors' Association, local governments actively provided personnel support to each other, resulting in the dispatch of numerous staff members.

Regarding the deployment of national government personnel, various ministries communicated directly with affected local governments to understand their needs and dispatched staff accordingly to the disaster-affected areas. Furthermore, a system was set up at the national government level to survey staffing requests for government employees from affected areas and deploy personnel from relevant ministries based on those requests.

e. Securing health, medical, welfare, and educational services

○ Health, medical, and welfare services

The Ministry of Health, Labour and Welfare and the Ministry of Education, Culture, Sports, Science and Technology requested cooperation from related organizations and universities to dispatch healthcare professionals and support personnel to assist disaster victims in need of health, medical, and welfare services. Medical staff such as doctors, dentists, nurses, pharmacists, and care workers were dispatched to the affected areas. Hospitals administered by the Ministry of Health, Labour and Welfare accepted patients from disaster-affected areas. They also coordinated the acceptance of evacuees in need of assistance outside the affected areas, and provided financial relief by reducing or waiving fees for medical and caregiving services.

To prevent secondary health issues among victims, public health nurses were deployed to visit evacuation shelters and conduct health consultations. Additionally, mental care teams provided mental health support, working with public health nurses to visit evacuation shelters, conduct home visits for victims, and support government personnel.

○ Education

The Ministry of Education, Culture, Sports, Science and Technology requested that prefectural boards of education accept displaced students in schools throughout the country, and accommodations were made accordingly. Additionally, they called for flexible measures such as the provision of free textbooks and tuition assistance for affected students. While assessing the situation in disaster-affected areas, the ministry prioritized securing the necessary teaching staff for the full restoration of school operations by implementing additional staffing measures.

Universities were also encouraged to consider academic adjustments and flexible scheduling for students impacted by the disaster. They were informed of economic support options for students, including tuition waivers and scholarships, to provide financial assistance where needed.

f. Support for livelihood restoration

○ Provision of livelihood recovery support funds for disaster victims

In cases where homes were completely destroyed or met certain other criteria, affected households received livelihood recovery support funds in accordance with the Act on Support for Reconstructing Livelihoods of Disaster Victims. Based on the extent of damage to the home, these households

received a basic support grant (up to 1 million yen) and an additional grant (up to 2 million yen) depending on the method chosen to rebuild. Payments began in late April. Additionally, the support systems for rebuilding the lives of disaster victims were adjusted to address issues related to ground liquefaction and other soil damage.

○ Provision of disaster condolence payments and other aid

For those who lost family members or suffered severe disabilities due to the disaster, disaster condolence payments or disaster disability compensation payments were provided. Additionally, special loan terms for disaster relief funds were extended to disaster victims, including a reduced interest rate of 1.5% (interest-free if a guarantor was provided) and extended repayment periods. Interest-free welfare loans (emergency small loans) were also provided to affected households.

○ Employment measures and livelihood support

① Employment measures for disaster victims

To support the employment of disaster victims, Hello Work job counseling centers strengthened employment support by setting up special consultation desks for disaster victims, providing inter-regional job placement services, conducting on-site consultations at evacuation shelters, securing job openings, and organizing joint job fairs.

Special provisions for unemployment insurance were implemented to provide unemployment benefits even to those who had not actually left their jobs but were forced to suspend work without pay due to business closures or suspensions caused by the disaster.

Businesses that were forced to scale back operations due to economic reasons stemming from this disaster and implemented temporary closures or other measures to maintain employment became eligible for employment adjustment subsidies. Additionally, special measures were introduced for business owners in regions covered by the Disaster Relief Act, excluding Tokyo.

To further facilitate employment and job creation, the “Conference on the Promotion of Employment Support and Job Creation for Disaster Victims” was established, implementing immediate comprehensive measures known as the “Japan as One” Work Project (Phase 1) and additional measures through supplementary budgets and legislation (Phase 2).

② Support for small and medium-sized enterprises (SMEs)

Since the immediate aftermath of the earthquake, the Ministry of Economy, Trade and Industry, along with other agencies, requested financial institutions to flexibly adjust conditions such as deferring repayments on existing debts. Additionally, they supported business recovery financially by providing disaster-related guarantees through credit guarantee associations and offering long-term, low-interest disaster recovery loans via the Japan Finance Corporation and the Shoko Chukin Bank. Furthermore, the supplementary budget for 2011 was utilized to implement measures such as reducing interest rates, extending the loan repayment and grace periods, increasing loan limits, and expanding interest rate subsidies.

To support the restoration of factories and other facilities, funding and personnel assistance, along with the establishment of temporary shops and factories in the disaster-affected areas, were carried out in collaboration with local governments. In addition, financial support was provided for the repair of facilities and the removal of debris in affected shopping areas.

Furthermore, informational materials summarizing support measures for SMEs were distributed widely to raise awareness of these support initiatives. A special consultation hotline, the “Navi Dial for SME Phone Consultations,” staffed by experts, was also utilized to support the resumption of business operations.

③ Support measures for agriculture and forestry

The Ministry of Agriculture, Forestry and Fisheries provided various information to the disaster-affected areas to facilitate the acceptance of disaster victims into farming, mountain, and fishing villages. Specifically, for individuals interested in utilizing abandoned farmland for agricultural business, support was provided for farming and other activities. Guidance was also offered to encourage the employment of affected farmers as workers on disaster recovery projects.

In regions where it was challenging to plant crops, support was given to agricultural workers who conducted joint recovery efforts aimed at resuming farming activities. Additionally, to support the financial recovery of agricultural businesses, disaster recovery funds were made available under

conditions of no collateral or guarantor and effectively interest-free for a limited period. Measures were also taken to increase the loan limits, extend repayment terms, and lengthen grace periods to enhance agricultural financing. For food production and distribution businesses affected by the disaster, long-term, low-interest financing systems were implemented to support their recovery, with further support measures under consideration.

In terms of restoration materials for emergency temporary housing, stable supplies of essential materials needed for full-scale recovery were ensured through support for the early reactivation and rebuilding of plywood factories and other related facilities, as well as strengthening initiatives for forestry and forest industry regeneration.

④ Support measures for the fisheries industry

Given the extensive, catastrophic damage to the fisheries sector across a wide area, support was provided for early recovery of businesses, focusing on self-led efforts by fishers that were committed to continuing operations to recover and process debris and on the fisheries cooperatives' procurement of fishing vessels, stationary nets, and other necessary fishing equipment.

Additionally, special budgetary measures were implemented to fund reinsurance payouts for fishing vessel insurance and indemnity payments by fisheries mutual aid, supplementing the financial resources for insurance payments by fishing vessel insurance associations and mutual aid payments by fisheries mutual aid associations in the affected regions.

To support the reopening of fisheries from a financial standpoint, loans from the fisheries modernization fund and Japan Finance Corporation were made effectively interest-free, with measures established to allow for collateral-free and guarantor-free loans, along with enhancements to guarantee systems.

g. Detailed measures based on the needs of disaster victims

Each ministry implemented the following measures with detailed consideration for the needs and perspectives of disaster victims:

① "Simplification of emergency goods import procedures" (Ministry of Finance administrative notification) (March 11 and 12)

Simplification of import procedures for relief goods provided free of charge to disaster victims

② "Handling cases where insurance certificates cannot be presented" (Ministry of Health, Labour and Welfare administrative notification) (March 11, March 12, and April 2)

Measures to allow disaster victims to receive medical treatment at insurance-covered medical institutions and access nursing care services even if they are unable to present their health insurance or nursing care insurance certificates

③ "Resident registration procedures" (Ministry of Internal Affairs and Communications notification) (March 13)

Acceptance of moving-in notifications from residents arriving from disaster-affected areas who are unable to submit a change of address certificate from their previous residence

④ "Extension of deadlines for national tax and customs declarations and payments" (National Tax Agency and Ministry of Finance announcement) (March 15)

For taxpayers located in Aomori, Iwate, Miyagi, Fukushima, and Ibaraki Prefectures, all deadlines for national tax returns and payments due on March 11 or later were extended to a date specified by a separate National Tax Agency announcement.

For disaster victims in these prefectures, deadlines for applications under customs laws were also extended, and fees for certificate issuance and related services were reduced.

⑤ "Special handling of foreign resident registration procedures" (Ministry of Justice notification) (March 15)

Measures allowing foreign residents who had registered in the disaster-affected areas to receive personal or residency certificates at their evacuation municipalities

⑥ "Handling of the suspension of seal registration certificate issuance" (Ministry of Justice directive) (March 18)

Special provisions for cases where seal registration cards issued by registry offices or registered seals submitted to registry offices were lost, making it impossible to obtain seal registration certificates

⑦ “Special provisions for identity verification of disaster victims” (Directives from the National Police Agency; Financial Services Agency; Ministry of Internal Affairs and Communications; Ministry of Justice; Ministry of Finance; Ministry of Health, Labour and Welfare; Ministry of Agriculture, Forestry and Fisheries; Ministry of Economy, Trade and Industry; and Ministry of Land, Infrastructure, Transport and Tourism) (March 25)

Temporary measures allowing disaster victims who lost their identity documents to open bank accounts and conduct similar procedures

4) Disaster waste management and other measures

a. Disaster waste management

Due to the earthquake and the resulting tsunami, a significant amount of disaster waste was generated. The estimated amount of debris from collapsed buildings in Iwate, Miyagi, and Fukushima Prefectures caused by the tsunami is approximately 24.9 million tons. On March 25, 2011 the Ministry of the Environment issued guidelines on entering private land for removal work and dismantling damaged buildings related to disaster waste removal. Based on the Act on Waste Management and Public Cleaning, special measures were implemented for disaster waste disposal projects conducted by municipalities, such as raising the national subsidy rate, covering the full local share with disaster relief bonds, and providing a 100% tax grant for principal and interest payments, thereby promoting early management of disaster waste.

b. Measures against flooding

Tsunamis and land subsidence caused flooding in low-lying coastal areas, obstructing search and facility recovery activities. The Ministry of Land, Infrastructure, Transport and Tourism gathered drainage pump vehicles from across the country and quickly conducted drainage operations in 16 municipalities in Iwate, Miyagi, and Fukushima Prefectures from March 12, 2011 onward. The Ministry of Agriculture, Forestry and Fisheries mobilized pumps from regional agricultural bureaus and, from March 14, forced drainage operations were conducted using emergency disaster pumps in 10 municipalities in Miyagi and Fukushima Prefectures.

In areas where safety levels decreased due to land subsidence, related ministries and agencies collaborated to implement secondary disaster prevention measures, including coastal levee construction.

c. Liquefaction countermeasures

Widespread liquefaction occurred due to this earthquake, impacting roads, river levees, sewage systems, and housing. Ports along the Pacific coast experienced extensive damage, including pier subsidence and bulging quay walls caused by liquefaction, compounded by tsunami damage, which severely impacted port facilities.

In reclaimed residential areas of Chiba Prefecture, various issues such as leaning utility poles, raised manholes, and ground subsidence around buildings were observed, leading to prolonged lifeline utility outages.

The Cabinet Office revised procedures to ensure that disaster-affected housing due to liquefaction received appropriate damage assessments reflecting actual conditions.

d. Issuing appropriate warning information

The Meteorological Agency and other organizations, taking ground loosening into account, lowered the issuance criteria for heavy rain warnings, advisories, and landslide alert information for municipalities that recorded seismic intensities of 5-upper or above in the disaster areas affected by the Great East Japan Earthquake. Additionally, the issuance criteria for warnings and advisories related to

heavy rain and floods, as well as flood forecasts, were lowered for areas with river levees and drainage facilities damaged by the earthquake and tsunami.

In Iwate, Miyagi, Fukushima, and Ibaraki Prefectures, considering the extent of land subsidence, flexible operations were conducted by issuing storm surge advisories and tide level information during high tide periods, urging caution for flooding and inundation in low-lying coastal areas.

5) Promoting stable housing for affected residents

a. Construction of emergency temporary housing

To ensure the swift construction of emergency temporary housing, multiple efforts were initiated: the Ministry of Land, Infrastructure, Transport and Tourism deployed staff to disaster-affected prefectures to assist with land acquisition, while the Ministry of Finance offered unused national land for free leasing. By May 30, 2011, a total of 23,795 units had been completed. (By March 2013, all 53,194 units of the construction-type emergency housing were finished.)

The Ministry of Health, Labour and Welfare made it possible for privately-owned rental housing to be used as emergency temporary housing for secondary shelter by local governments, which rented the units and provided them to evacuees free of charge. Although large-scale efforts of this kind—local governments renting existing private housing and providing it as emergency temporary housing (rental-type emergency housing)—had not been previously implemented, the Ministry of Health, Labour and Welfare issued a notification[7] on April 30, 2011, allowing properties contracted in the names of disaster-victims to be converted to contracts under prefectural (or delegated municipal) names, making them eligible for national funding as emergency temporary housing. Consequently, by the peak in occupancy on March 30, 2012, of the total 123,723 emergency temporary housing units, more than half—68,616 units—were supplied through rental-type emergency housing (private leases).

b. Secondary evacuation to public housing

The Ministry of Land, Infrastructure, Transport and Tourism established a public housing information center for disaster victims on March 22, connecting evacuees to local government offices handling applications for free public housing. Additionally, the Ministry of Finance compiled a list of immediately available national public servant housing for use as temporary accommodations and provided this information to all prefectures. These housing units were offered to evacuees free of charge through prefectural offices, similar to public housing.

c. Temporary evacuation to hotels and inns

Local governments provided designated inns and hotels free of charge to the evacuees as temporary shelters until they could find housing that could be used continuously. The Japan Tourism Agency, in coordination with the Ministry of Health, Labour and Welfare and other related agencies, supported the acceptance of disaster victims across prefectural boundaries in hotels and inns under the Disaster Relief Act.

6) Support for disaster-affected areas

[7] Notification from the Director-General of the Social Welfare and War Victims' Relief Bureau, Ministry of Health, Labour and Welfare, dated April 30, 2011: "Regarding the Leasing of Private Rental Housing as Emergency Temporary Housing for the Great East Japan Earthquake"

a. Relief supplies from overseas

The government received offers of support from 163 countries and regions, as well as 43 international organizations. Among them, 64 countries, regions, and international organizations provided relief supplies, including food, water, medical supplies, and nuclear-related materials and devices, which were subsequently distributed to the disaster-affected areas (according to the Extreme Disaster Management Headquarters on March 9, 2023). Notably, the Japan-based U.S. military conducted activities such as transporting and distributing relief supplies under "Operation Tomodachi."

b. Donations

○ Donations from within Japan

Donation collection organizations such as the Japanese Red Cross Society and the Central Community Chest of Japan received contributions that surpassed those collected for the Great Hanshin-Awaji Earthquake. Donations to the Japanese Red Cross Society, among others, totaled approximately 384.5 billion yen by the end of 2020.

○ Overseas donations

By December 28, 2012, a total of over 17.5 billion yen had been donated from 95 countries, regions, and international organizations (excluding support from private organizations and individuals) (according to the Extreme Disaster Management Headquarters on March 9, 2023).

c. Volunteers

Following the Great Hanshin-Awaji Earthquake, numerous volunteers quickly arrived in disaster-affected areas to assist with relief activities, including supporting evacuees, clearing mud from homes, aiding in restoring the vitality of affected areas and individuals, assisting in rebuilding lives and helping communities revitalize. These disaster-related volunteer activities have spanned from the emergency response phase through recovery and reconstruction efforts, encompassing a wide range of support initiatives.

In this disaster, too, social welfare councils and other organizations set up disaster volunteer centers in disaster-affected areas, facilitating volunteer registration, matching volunteers to the changing needs of disaster victims, and supporting tasks such as operating evacuation shelters and providing food assistance.

Initially, fuel shortages and limited accommodation made it difficult to accommodate large numbers of volunteers in the disaster-affected areas. Therefore, volunteer efforts were primarily led by local residents. As recovery progressed, only self-contained volunteers—those who could arrange their own transportation, meals, and accommodation—were accepted. This allowed volunteers from outside the local area to contribute, particularly in coastal towns with significant needs.

From outside the disaster-affected areas, a system was implemented to effectively participate in volunteer activities while reducing the burden on the affected areas. Based on the needs of each area, the required number of volunteers and the nature of their activities were organized, and volunteers were recruited accordingly. This effort included the operation of volunteer buses, which were chartered to transport volunteers to and from the disaster-affected areas.

In some cases, local governments collaborated with volunteers. For example, in Miyagi Prefecture, a regular four-party support conference for disaster victims was held, involving the prefecture, prefectural disaster volunteer centers, the Self-Defense Forces, and the government's Local Response Headquarters to ensure coordinated support between the government and the private sector.

Additionally, surrounding municipalities provided logistical support, as in Tono, Iwate Prefecture, where they offered accommodation for volunteers, transport to disaster sites, and organized relief supply collection and distribution.

(2) Institutional responses to the Great East Japan Earthquake

This section is primarily based on the "Overview of Measures Taken on Disaster Management" (2011 White Paper on Disaster Management) submitted to the 177th session of the National Diet, with additions and amendments to focus on the initial and emergency response measures taken at the beginning of the disaster on March 11, 2011. (For information on subsequent reconstruction efforts, please refer to Chapter 2 onward.)

1) Designation as a severe disaster

The Tohoku earthquake and the accompanying massive tsunami caused catastrophic damage across eastern Japan, particularly in the Tohoku region. Given that the damage clearly exceeded the criteria for designation as a severe disaster, the "Cabinet Order on the Designation of Severe Disasters Caused by the 2011 off the Pacific coast of Tohoku Earthquake and Measures Applicable to Such Disasters" was approved in a Cabinet decision on March 12, 2011, the day after the disaster, without waiting to aggregate damage reports from the disaster-affected areas. This designation (covering the entire nation) was promulgated and enforced on March 13.

Under the ordinance, the following measures were applied:

① Special financial assistance for public works disaster recovery projects

② Special measures for subsidies related to disaster recovery projects for agricultural land and facilities

③ Subsidies for disaster recovery projects for aquaculture facilities for aquatic plants and animals

④ Special provisions for disaster-related guarantees under the Small and Medium-sized Enterprise Credit Insurance Act

Additionally, 18 measures, including subsidies for private school facility restoration, special provisions for subsidies for the construction of public housing for disaster victims, inclusion of principal and interest repayment costs of small disaster bonds in the standard fiscal needs, and special provisions for unemployment insurance benefits based on the Employment Insurance Act, were implemented.

Subsequently, on April 15, based on the Act on Temporary Measures concerning Financing Farmers, Forestrymen and Fishermen Suffering from Natural Disaster (Act No. 136 of 1955), the Ministry of Agriculture, Forestry and Fisheries introduced enhanced loan limits and extended repayment periods for affected farmers and fishers under the severe disaster system. A Cabinet decision approved a revision to the ordinance ("Partial Revision of Cabinet Order on the Designation of Severe Disasters Caused by the 2011 off the Pacific coast of Tohoku Earthquake and Measures Applicable to Such Disasters," Cabinet Order No. 102 of 2011), which was promulgated and enforced the same day.

Furthermore, the initial ordinance from March 12 was revised to rename the disaster as the Great East Japan Earthquake, among other revisions. These amendments were incorporated into the "Partial Revision of Cabinet Order on the Designation of Severe Disasters Caused by the 2011 off the Pacific coast of Tohoku Earthquake and Measures Applicable to Such Disasters" (Cabinet Order No. 124 of 2011) in a Cabinet decision on May 2, and was promulgated and enforced the same day.

2) Designation as a specified disaster

The disaster was designated as a specified disaster under the "Cabinet Order on the Designation of the Specified Disaster Caused by The 2011 off the Pacific coast of Tohoku Earthquake and Measures Applicable to Such Disaster" (promulgated on March 13). Measures were implemented to preserve and protect the rights and interests of disaster victims by extending expiry dates for administrative rights and interests, among other actions. Subsequent revisions to the ordinance renamed the disaster as the Great East Japan Earthquake and added further measures (promulgated on June 1, 2011).

① Extension of expiry dates for administrative rights and interests (e.g., extension of driver's license validity period)

Considering that victims of the specified disaster might be unable to complete the procedures necessary to renew licenses or permits with expiration dates, such as driver's licenses, the validity periods of these administrative rights and interests may be extended for a certain period (until August 31, 2011).

② Exemption from liability for non-performance of administrative obligations within deadlines

If legal obligations with deadlines could not be fulfilled by the original due date due to the specified disaster but were completed within a specified period (by June 30, 2011), the individuals or entities involved would not be held administratively or criminally liable.

③ Postponement of the initiation of corporate bankruptcy proceedings

For corporations that fell into insolvency due to the specified disaster, decisions to initiate bankruptcy proceedings could not be made for a specified period (until March 10, 2013), except in cases of insolvency due to inability to pay.

④ Special measures regarding civil conciliation fees under the Civil Mediation Act (added by partial amendment)

Individuals who resided in the disaster-affected areas and sought civil conciliation under the Civil Mediation Act for disputes arising from this disaster were exempted from conciliation filing fees (until February 28, 2014).

⑤ Special measures for the duration of emergency temporary housing under the Building Standards Act (added by partial amendment)

For emergency temporary housing constructed under the Building Standards Act, which permits a maximum duration of two years and three months, extensions for additional one-year periods could be granted with permission from the designated administrative agency

3) Flexible application of the Disaster Relief Act

In light of the extensive damage caused by this disaster, measures have been taken to implement flexible applications of the Disaster Relief Act to enable active support for disaster victims, not only in the disaster-affected areas but also in prefectures outside these areas.

The main flexible application measures are as follows:

① It was made possible to use public lodging facilities or lease private inns, hotels, and similar establishments to serve as evacuation shelters. As a reference, unit costs from past disasters were provided[8].

② Depending on local circumstances, the use of private rental housing or vacant homes was deemed acceptable, and unit costs from past disasters were provided as a reference[9].

③ It was clarified that, if public housing or similar facilities are used to establish evacuation shelters or emergency temporary housing for evacuees from municipalities where the Disaster Relief Act has been applied, the associated costs will be eligible for national government funding[10].

④ In cases of widespread evacuation, it was indicated that evacuations across prefectural borders from areas where the Disaster Relief Act has been applied would also be eligible for national government funding, encouraging proactive support[11].

⑤ To ensure that disaster victims at evacuation shelters have access to bathing opportunities, it was clarified that the costs of using nearby bathing facilities would be covered as part of disaster relief expenses eligible for national government funding[12].

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8 Social Welfare Circular No. 0319-1, March 19, 2011, "Flexible Application of the Disaster Relief Act in Relation to the 2011 Tohoku Earthquake"

9 Social Welfare Circular No. 0319-1, March 19, 2011, "Flexible Application of the Disaster Relief Act in Relation to the 2011 Tohoku Earthquake"

10 Social Welfare Circular No. 0325-1, March 25, 2011, "Flexible Application of the Disaster Relief Act in Relation to the 2011 Tohoku Earthquake (No. 3)"

11 Social Welfare Circular No. 0319-1, March 19, 2011, "Flexible Application of the Disaster Relief Act in Relation to the 2011 Tohoku Earthquake"

12 Social Welfare Circular No. 0427-1, April 27, 2011, "Flexible Application of the Disaster Relief Act in Relation to the Great East Japan Earthquake (No. 6)"

⑥ Specific points of consideration were outlined to facilitate early occupancy of emergency temporary housing[13].
⑦ It was clarified that if securing land for emergency temporary housing proves difficult, land rental costs will also be eligible for national government funding under the Disaster Relief Act[14].
⑧ It was indicated that the costs for land preparation and restoration for emergency temporary housing construction sites would be covered under the Disaster Relief Act, provided they fall within a necessary and reasonable scope[15].
⑨ To alleviate the financial burden on the three disaster-affected prefectures, the Ministry of Health, Labour and Welfare decided to handle the administrative procedures for claims on their behalf[16].

Such flexible applications of the Disaster Relief Act have continued to be implemented as special standards for disasters occurring after the Great East Japan Earthquake. However, affected local governments have expressed concerns that making these approvals on a case-by-case basis for each disaster takes considerable time for coordination. They have suggested that the general rules themselves should be revised[17]. In relation to this matter, some of the special standards implemented during the Great East Japan Earthquake, such as national funding for certain facilities in emergency temporary housing, have subsequently been generalized into standard practice.

4) Improvements in the administration of financial support for the livelihood recovery of disaster victims

Support payments for the livelihood recovery of disaster victims, provided to households whose residential homes were completely destroyed or whose living conditions suffered severe damage due to the disaster, were subject to measures aimed at streamlining the payment procedures. Furthermore, procedures were revised to ensure that housing damage due to liquefaction received appropriate damage assessments reflecting actual conditions.

a. Streamlining procedures for financial support for the livelihood recovery of disaster victims

In order to expedite the issuing of damage certificates, which are used to make decisions regarding the application of various disaster victim support programs, including financial support for the livelihood recovery of disaster victims, the necessary housing damage assessment process was simplified. The simplified methods for assessing damage communicated to affected local governments included:

① Identifying houses washed away by the tsunami as “completely destroyed” using aerial or satellite imagery
② Declaring all houses within areas identified as tsunami-flooded zones, where surveys showed that flooding had generally reached up to the ceiling of the first floor, as “completely destroyed”
③ Utilizing simple methods, such as visual inspections combined with sketches or diagrams, to assess damage

To further expedite the provision of financial support for the livelihood recovery of disaster victims, it was communicated to affected local governments that:

① If a photograph clearly showed the collapse of a house, applications could be submitted with the photograph alone, without requiring a damage certificate
② For cases where an entire area was devastated by the tsunami and households were classified as requiring long-term evacuation, support payments could be made even without a damage certificate

[13] Social Welfare Circular No. 0506-1, May 6, 2011, “Flexible Application of the Disaster Relief Act in Relation to the Great East Japan Earthquake (No. 7)”
[14] Social Welfare Circular No. 0415-1, April 15, 2011, “Emergency Temporary Housing in Relation to the Great East Japan Earthquake”
[15] Social Welfare Circular No. 0506-1, May 6, 2011, “Flexible Application of the Disaster Relief Act in Relation to the Great East Japan Earthquake (No. 7)”
[16] Administrative Notification, April 29, 2011, “Regarding the Handling of Claims for Prefectures Affected by the Great East Japan Earthquake Under Article 35 of the Disaster Relief Act”
[17] Expert Meeting on Reflection on the Past Decade of Reconstruction Policy for the Great East Japan Earthquake (3rd meeting, February 27, 2023), including contributions from the mayor of Minamisanriku and others

Additionally, to strengthen the administrative capacity for processing financial support payments, the government requested an increase in the number of corporate personnel involved in the payment process and actively sought cooperation from prefectural governments to support disaster-affected municipalities.

b. Measures to address liquefaction damage

The earthquake caused widespread housing damage due to liquefaction in areas such as Chiba and Ibaraki Prefectures. Based on concerns that the existing survey and assessment methods for housing damage did not reflect the realities of liquefaction-related damage of this earthquake, the assessment criteria were revised after gathering on-site observations and consulting with academic experts. Specifically, criteria were added for assessments based on tilting of structures integrated with their foundations and floors, as well as subsidence of residential foundations and related components.

5) Tax measures

In recognition of the unprecedented damage caused by the Great East Japan Earthquake, and considering the circumstances of affected taxpayers, special tax relief measures were implemented to alleviate burdens that would have been imposed if the existing tax system had been applied as is. These measures were established under the Act on Temporary Special Provisions of Acts Related to National Tax, in Relation to Victims, etc. of the Great East Japan Earthquake (Act No. 29 of 2011, promulgated on April 27) and the Act Partially Amending the Local Tax Act (Act No. 30 of 2011, promulgated on April 27).

a. National taxes

For income tax, special provisions were made, such as allowing losses from damaged business assets due to the earthquake to be included as necessary expenses in the calculation of income for the 2010 tax year. Additionally, special provisions were applied to corporate taxes, property taxes, and consumption taxes.

b. Local taxes

For individual residential taxes, special provisions included allowing deductions for losses on housing, household items, and private vehicles as miscellaneous losses in the 2011 resident tax. Special provisions were also applied to local corporate taxes, fixed asset taxes, city planning taxes, real estate acquisition taxes, automobile acquisition taxes, and automobile and light vehicle taxes.

6) 2011 first supplementary budget

To support early recovery efforts following the Great East Japan Earthquake, an initial supplementary budget of 4.0153 trillion yen for 2011 was approved on May 2 to cover costs anticipated within the fiscal year. Furthermore, a second supplementary budget of 1.8106 trillion yen, which allocated funding for nuclear damage compensation and support for disaster victims, was approved on July 25, 2011.

7) Special financial assistance under the Act on Special Fiscal Aid and Subsidies for Recovery from the Great East Japan Earthquake

To address the Great East Japan Earthquake disaster, the “Act on Special Fiscal Aid and Subsidies for Recovery from the Great East Japan Earthquake” (Act No. 40 of 2011, promulgated on May 2) was enacted. This legislation aimed to provide financial assistance to local governments for prompt emergency recovery, reduce social insurance premiums for disaster victims, and offer financial support to small and medium-sized enterprises, among other special aid measures.

a. Financial assistance to local governments

Financial assistance was provided to local governments significantly impacted by the earthquake or tsunami (designated as "specified disaster-affected local governments"), covering activities such as the restoration of public works facilities and social welfare facilities, as well as disaster waste disposal.

The specified disaster-affected local governments subject to these measures included, as stipulated in Article 2 of the Act, the following prefectures: Aomori, Iwate, Miyagi, Fukushima, Ibaraki, Tochigi, Chiba, Niigata, and Nagano. Additionally, 148 municipalities were designated based on criteria outlined in the "Cabinet Order Specifying Municipalities under Paragraphs 2 and 3 of Article 2 of the Act on Special Fiscal Aid and Subsidies for Recovery from the Great East Japan Earthquake" (Cabinet Order No. 127 of 2011). These criteria included experiencing seismic intensity of 6-lower or above, a substantial number of homes completely destroyed, or confirmed flood damage from large-scale tsunamis.

b. Special assistance measures for disaster victims

During the disaster, special measures were implemented to assist disaster victims in municipalities where the Disaster Relief Act was applied, as well as in equivalent areas (designated as "specified disaster areas"). These measures included reductions in social insurance premiums and financial support for farmers, fishermen, and small and medium-sized enterprises.

The specified disaster areas subject to these measures were designated under the "Cabinet Order Specifying Municipalities under Paragraphs 2 and 3 of Article 2 of the Act on Special Fiscal Aid and Subsidies for Recovery from the Great East Japan Earthquake." These areas corresponded to regions covered by the Disaster Relief Act (excluding those related to stranded commuters) and equivalent areas eligible for the Act on Support for Reconstructing Livelihoods of Disaster Victims (excluding those with zero households completely destroyed). A total of 214 municipalities were designated.

8) Special measures related to construction

In light of the damage caused by the Great East Japan Earthquake, special measures were implemented, including the delegation of disaster recovery projects on public works facilities to the national government and special construction restrictions in urban areas.

a. Delegation of public works disaster recovery projects to the national government

The "Act on the Delegation of Public Works Disaster Recovery Projects Affected by the Great East Japan Earthquake to the National Government" (Act No. 33 of 2011, promulgated on April 29) was enacted. This law established a system allowing the national or prefectural government to carry out public works disaster recovery projects on behalf of affected local governments, provided there was a request from the local government and it was deemed necessary after considering the local circumstances and implementation framework. The delegated projects included the restoration of fishing harbors, erosion control, ports, and roads.

b. Special provisions for construction restrictions

To prevent construction that could hinder the orderly recovery of urban areas in disaster-affected regions, the "Act on Special Provisions Concerning Building Restrictions in Urban Areas Severely Damaged by the Great East Japan Earthquake" (Act No. 34 of 2011, promulgated on April 29) was enacted. Under this law, the designated administrative authority overseeing urban areas severely affected by the earthquake could impose restrictions or bans on construction in designated zones for up to six months (extendable to eight months) from the date of the disaster.

c. Special provisions under the Land Improvement Act (salt removal projects)

To address the impact of the Great East Japan Earthquake and promote the early resumption of farming activities, a special law was enacted to allow for salt removal projects and alleviate financial burdens on prefectures for disaster recovery-related land improvement projects, called the “Act on Special Provisions of the Land Improvement Act in Response to the Great East Japan Earthquake” (Act No. 43 of 2011, promulgated on May 2). The following measures were introduced:

① Special provisions for salt removal

Projects aimed at removing salt damage caused by seawater intrusion into agricultural land due to the tsunami following the Tohoku earthquake could be conducted as disaster recovery land improvement projects.

② Special provisions for land improvement projects by national or prefectural governments

In recovery efforts following tsunami-related disasters, the national or prefectural government could undertake land improvement projects, such as modifying land improvement facilities or conducting land readjustment, without requiring applications if deemed necessary.

③ Special provisions for national subsidies and contributions

(3) Response to the nuclear disaster

This section is primarily based on the "Overview of Measures Taken on Disaster Management" (2011 White Paper on Disaster Management) submitted to the 177th session of the National Diet, with additions and amendments to focus on the initial and emergency response measures taken at the beginning of the disaster on March 11, 2011. (For information on subsequent recovery efforts, please refer to Chapter 2 onward, especially Chapter 7.)

1) Establishment of the Nuclear Emergency Response Headquarters

At 15:42 on March 11, TEPCO determined that all AC power sources had been lost for Units 1 through 3 of the Fukushima Daiichi NPS. Based on this assessment of an emergency situation under Article 10 of the Nuclear Emergency Preparedness Act, TEPCO notified relevant agencies, including the Nuclear and Industrial Safety Agency. At 16:36, an emergency response office was set up at the Prime Minister's Office, and consultations were held with an expanded emergency response team, which had already been convened to address the Great East Japan Earthquake. At 16:45, TEPCO further reported to the Nuclear and Industrial Safety Agency that an Article 15 emergency under the Nuclear Emergency Preparedness Act had occurred at the Fukushima Daiichi NPS. Based on this, the Minister of Economy, Trade and Industry recognized that an Article 15 emergency under the Nuclear Emergency Preparedness Act had occurred and immediately reported it to the Prime Minister. At 19:03, the Prime Minister issued a nuclear emergency declaration and established the "2011 Fukushima Daiichi Nuclear Power Station Accident Nuclear Emergency Response Headquarters" and its Local Response Headquarters—the first such measures since the enactment of the Nuclear Emergency Preparedness Act. The director-general of the Nuclear Emergency Response Headquarters also invoked Article 20, Paragraph 4 of the Nuclear Emergency Preparedness Act to request the dispatch of Self-Defense Force units to the Minister of Defense. The following morning, on March 12, a separate Article 15 emergency under Nuclear Emergency Preparedness Act was declared for the Fukushima Daini Nuclear Power Station, leading to the issuance of a nuclear emergency declaration. (Consequently, the Nuclear Emergency Response Headquarters was renamed the "2011 Fukushima Daiichi and Daini Nuclear Power Station Accident Nuclear Emergency Response Headquarters." A similar name change was also applied to the Local Response Headquarters.)

On March 15, the government established the "Integrated Headquarters for Response to the Incident at the Fukushima Nuclear Power Stations," headed by the Prime Minister, to enable unified action between the government and TEPCO to address the nuclear power station accidents. (This headquarters was later reorganized on May 9 under the Nuclear Emergency Response Headquarters as the "Government-TEPCO Integrated Response Office." On March 18, a local coordination office was established to strengthen collaboration among the Self-Defense Forces, police, fire departments, and other agencies.

Given the urgent need to address the lives of those affected by the nuclear disaster, the "Nuclear Sufferers Life Support Team" was established under the Nuclear Emergency Response Headquarters on March 29, with the Minister of Economy, Trade and Industry serving as the team leader. This team implemented comprehensive and rapid measures to address issues such as securing evacuation sites and accommodation for those affected.

2) Evacuation of affected residents and designation of zones

In response to the accidents at the TEPCO Fukushima Daiichi NPS, various measures were implemented to ensure the safety of surrounding residents, under the direction of the director-general of the Nuclear Emergency Response Headquarters. These included the designation of evacuation zones and restrictions on agricultural product shipments. Decisions regarding evacuation zones were made with utmost consideration for the health and safety of residents, taking into account radiation monitoring results, the status of the nuclear stations, and opinions from the Nuclear Safety Commission.

a. Evacuation instructions

○ Establishment of evacuation zones and shelter-in-place zones

To ensure the health and safety of residents in areas surrounding the Fukushima Daiichi and Daini Nuclear Power Stations, the head of the Nuclear Emergency Response Headquarters, based on the

situation at the nuclear power station, instructed under Nuclear Emergency Preparedness Act the governor of Fukushima Prefecture and relevant municipal leaders to implement evacuation and shelter-in-place measures for residents. (Instructions for shelter-in-place were lifted on April 22.)

Regarding the Fukushima Daini NPS, as the risks of a severe accident significantly decreased compared to the situation on March 12 when the nuclear emergency declaration was issued, the evacuation zone radius was reduced from 10 km to 8 km on April 21.

○ Designation of the no-entry zone

On April 21, the director-general of the Nuclear Emergency Response Headquarters instructed the governor of Fukushima Prefecture and municipal leaders to designate a 20 km radius around the Fukushima Daiichi NPS as a no-entry zone under the Nuclear Emergency Preparedness Act to ensure resident safety. Based on this designation, from midnight on April 22, entry into this area was prohibited without municipal mayoral permission, except for personnel conducting emergency response activities such as firefighters, police officers, Japan Coast Guard personnel, and members of the Self-Defense Forces.

○ Designation of the planned evacuation zone

On April 22, areas where cumulative radiation exposure was expected to reach 20 millisieverts within one year of the Fukushima Daiichi NPS accident were designated as the planned evacuation zone by the director-general of the Nuclear Emergency Response Headquarters. Residents in this zone were instructed to evacuate outside of the zone within approximately one month, considering potential health impacts.

○ Designation of the emergency evacuation preparation zone

Also on April 22, the director-general of the Nuclear Emergency Response Headquarters lifted shelter-in-place instructions for areas within 20 to 30 km of the Fukushima Daiichi NPS. However, considering the ongoing unstable conditions of the accident, areas where emergency evacuation or shelter-in-place might still be required were designated as the emergency evacuation preparation zone, and residents were asked to prepare for such actions.

b. Restrictions on shipments

Regarding agricultural products, based on inspection results conducted by prefectural authorities, the director-general of the Nuclear Emergency Response Headquarters instructed relevant prefectural governors to impose shipment restrictions in certain areas under the Nuclear Emergency Preparedness Act starting March 21. On April 4, director-general of the Nuclear Emergency Response Headquarters published the “Concepts of Inspection Planning and the Establishment and Cancellation of Items and Areas to which Restriction of Distribution and/or Consumption of Foods concerned Applies,” which allowed for shipment restrictions and their lifting to be implemented on a block-by-block basis within a prefecture. For agricultural products with radiation levels below the standard limits, shipment restrictions were lifted sequentially.

For rice planting, the director-general of the Nuclear Emergency Response Headquarters instructed the governor of Fukushima Prefecture on April 22 to impose planting restrictions within the no-entry zone, planned evacuation zone, and emergency evacuation preparation zone under the Nuclear Emergency Preparedness Act.

Additionally, regarding livestock within the no-entry zone, on May 12, the director-general of the Nuclear Emergency Response Headquarters instructed the governor of Fukushima Prefecture to euthanize the animals in a humane manner, with the consent of their owners, under the Nuclear Emergency Preparedness Act.

3) Emergency safety measures

In response to the Fukushima Daiichi NPS accident, the Minister of Economy, Trade and Industry issued instructions on March 30 for emergency safety measures to all electric utility companies. These instructions required emergency safety measures to ensure that, even in the event of a tsunami similar to the one that caused the accident, which could result in the loss of all AC power, core damage and spent fuel damage would be prevented so that a state of cold shutdown can be maintained without releasing significant radioactive materials. The measures included the development of emergency procedures and training as well as securing power supply vehicles, deploying fire engines, and providing fire hoses. For medium and long-term safety measures, the instructions called for securing spare parts for seawater pumps as well as preparing plans for installing air-cooled, high-capacity emergency generators, and protective measures against tsunamis. Subsequently, the Nuclear and Industrial Safety Agency reviewed the implementation status of these emergency safety measures as reported by the electric utility companies. Following thorough on-site inspections, it was announced on May 6 that the companies' implementation of the measures was deemed appropriate.

Moreover, following the April 7 aftershock off the coast of Miyagi Prefecture, which caused the emergency diesel generator of Tohoku Electric Power's Higashidori Nuclear Power Station Unit 1 to become inoperable, the Nuclear and Industrial Safety Agency instructed on April 9 that at least two emergency diesel generators per reactor must remain operable, even when the reactor is in cold shutdown.

Further, the April 7 aftershock caused widespread power outages, leading to the temporary loss of external power at some nuclear facilities. In response, on April 15, the Nuclear and Industrial Safety Agency instructed electric utility companies to ensure the reliability of external power supply connections by securing multiple (all) external transmission lines for each reactor and strengthening on-site power facilities.

On May 1, the Minister of Economy, Trade and Industry also directed reprocessing operators to implement emergency safety measures.

Regarding Chubu Electric Power's Hamaoka Nuclear Power Station, on May 6, considering its unique circumstances—an 84% probability of being struck by a seismic intensity 6-upper earthquake within 30 years due to the anticipated Tokai earthquake and the imminent risk of a large tsunami—the Prime Minister requested through the Minister of Economy, Trade and Industry that Chubu Electric Power shut down all reactors at the plant until medium to long-term measures, such as the construction of a seawall, were completed to provide greater public reassurance. Chubu Electric Power complied with the request and shut down the operating reactors at the plant by May 14.

4) Efforts toward resolving the nuclear power station accidents

On April 17, TEPCO announced the "Roadmap towards Restoration from the Accident at Fukushima Daiichi Nuclear Power Station," defining "radiation dose is in steady decline" as "Step 1" and "release of radioactive materials is under control and radiation dose is being significantly held down" as "Step 2." The target timeline for achieving these goals was approximately three months for Step 1 and roughly three to six months following Step 1 for Step 2. Subsequently, on May 17, TEPCO released a progress report and a review of this roadmap.

In response, on the same day, the government released its "Roadmap for Immediate Actions for the Verification of and Restoration from the Accident at Fukushima Dai-ichi Nuclear Power Station," outlining future measures. These included cooling the reactors and spent fuel pools, suppressing the release of radioactive materials into the air and soil, ensuring safety of the work environment, and engaging in international cooperation through the IAEA. The government, leveraging technical and human support from other countries and the international community, worked to accelerate the timeline for returning to normal after the accident as much as possible while ensuring the safety of affected residents in accordance with this roadmap.

5) Initiatives to support affected residents in designated zones

The Nuclear Emergency Response Headquarters, in addition to addressing the safety of affected individuals and efforts to return to normal following the accident as described above, formulated the "Immediate Actions for the Assistance of Nuclear Sufferers" on May 17. This set of policies summarized immediate challenges and measures related to supporting residents and municipalities affected by the accident. The following initiatives were implemented in designated zones around the nuclear accident to ensure smooth evacuations and support for the affected residents' lives.

a. Initiatives for evacuation zones

○ Evacuation status

The population within the designated evacuation zones (within a 20 km radius of Fukushima Daiichi NPS and an 8 km radius of Fukushima Daini NPS), as instructed by the director-general of the Nuclear Emergency Response Headquarters, was approximately 78,000 people.

Evacuations of residents in the designated zones were carried out in collaboration with Fukushima Prefecture and relevant municipalities. However, as of late May 2011, about 6,300 people were still living in approximately 110 primary evacuation shelters within Fukushima Prefecture. About 36,000 had evacuated outside the prefecture. Meanwhile, to prevent prolonged shelter stays and improve living conditions, land was secured for emergency temporary housing, and housing units were constructed. Public housing and privately leased rental housing were also utilized to establish secondary evacuation sites.

Additionally, residents of facilities for persons with disabilities within the evacuation zones were moved to facilities in other prefectures that could provide continuous care, as requested by Fukushima Prefecture. Furthermore, for residents of nursing care facilities within the evacuation zones, information regarding the availability of facilities in other prefectures capable of accepting them was provided to Fukushima Prefecture. A support system for accommodating vulnerable individuals was established, and their evacuation to facilities outside the prefecture was successfully completed.

○ Implementation of temporary home entry

Many residents forcibly evacuated due to the accident were unable to retrieve essential belongings from their homes in the evacuation zones. Consequently, there were numerous requests to allow temporary entry into their homes. Therefore, in conjunction with the establishment of the no-entry zone, the Nuclear Emergency Response Headquarters established general guidelines to allow temporary entry in the following cases: ① when denying entry could be expected to be injurious to the public interest, and ② when a resident of the no-entry zone wishes to enter temporarily for reasons related to immediate living requirements.

In accordance with this policy, the control system for temporary entry was studied in coordination with the Local Response Headquarters, related municipalities (Tamura, Minamisoma, Naraha, Tomioka, Kawauchi, Okuma, Futaba, Namie, and Katsurao), Fukushima Prefecture, and other related organizations, while paying sufficient attention to ensuring safety. As a result, temporary entry for residents was allowed starting May 10, 2011.

b. Initiatives for the planned evacuation zone

The areas surrounding the Fukushima Daiichi NPS beyond the 20 km radius, where cumulative radiation exposure was projected to reach 20 millisieverts within a year, were designated as the planned evacuation zone on April 22, where residents were requested to evacuate outside the area within approximately one month. The affected population in this zone (including the entirety of Iitate, Katsurao and Namie (areas outside the 20 km radius of NPS), and parts of Kawamata and Minamisoma) was approximately 10,000 people. To facilitate the smooth implementation of the planned evacuation, the government established local government response offices in Iitate and Kawamata on April 22, staffed

with nine personnel, including senior officials from relevant ministries. These offices worked closely with local municipalities and Fukushima Prefecture to address evacuation measures and provide livelihood support.

To secure evacuation destinations, additional evacuation sites were deemed necessary, particularly in Iitate and Kawamata. Measures included utilizing emergency temporary housing, public housing, employment promotion housing, and private rental housing to ensure smooth evacuation.

Furthermore, from the perspective of maintaining employment—essential to the foundation of municipalities—residents' health and safety were prioritized, and businesses within the zone were allowed to continue operations under the responsibility of the respective municipalities, provided certain conditions were met.

c. Measures related to the emergency evacuation preparation zone

For areas within the 20–30 km radius of the Fukushima Daiichi NPS, excluding the planned evacuation zone, the emergency evacuation preparation zone was established. Residents in this zone were required to be prepared for emergency evacuation or shelter indoors if necessary. This area included Hirono (entire area), Naraha (area outside the 20 km radius of NPS), Kawauchi (area outside the 20 km radius of NPS), parts of Tamura, and parts of Minamisoma, with a population of approximately 58,500 people. Since residents and businesses were generally allowed to continue living and operating within the emergency evacuation preparation zone, the Nuclear Emergency Response Headquarters focused on ensuring the livelihood infrastructure within the emergency evacuation preparation zone. Postal services within this zone, including mail delivery and post office operations, resumed on April 25, except for post offices with collapsed buildings. Medical facilities were also developed using the Regional Medical Care Revitalization Fund.

d. Maintaining public safety within the designated zones

To ensure the safety and security of residents, police efforts included roadside checkpoints around the no-entry zone and increased patrols within the other designated zones. In collaboration with related local governments and other entities, measures were undertaken to strengthen public safety in all designated zones.

6) Ensuring the safety and security of affected residents

The Nuclear Emergency Response Headquarters implemented the following measures to ensure the safe and secure living conditions of residents affected by the disaster.

a. Maintaining local communities

When prefectural and municipal governments facilitated the relocation of evacuees from initial evacuation shelters to secondary accommodations or temporary housing, they provided necessary support to ensure the preservation of local community ties.

b. Addressing health concerns

To alleviate residents' health concerns regarding radiation exposure, comprehensive screening and decontamination were necessary. These efforts, in collaboration with Fukushima Prefecture, were carried out for over 190,000 people by May 29. To ensure proper health management, measures included the establishment of a health consultation hotline, health consultations by experts during visits, and the provision of mental health support.

c. Support for education

Efforts were made to ensure educational opportunities for children in evacuation locations and to

address soil concerns at educational facilities in Fukushima Prefecture. Based on environmental monitoring results, actions were taken, including a survey conducted by Fukushima Prefecture targeting approximately 1,600 educational facilities (excluding those in the 20 km no-entry zone) for radiation levels. As a follow-up, 52 schools with relatively high radiation measurements underwent additional investigations (April 14). In response to these findings, the Nuclear Emergency Response Headquarters, referencing recommendations from the International Commission on Radiological Protection (ICRP), developed interim guidelines on the use of school buildings and grounds in Fukushima Prefecture (April 19). The Ministry of Education, Culture, Sports, Science and Technology also conducted field studies to identify methods for reducing radiation levels (May 8). Effective approaches, such as concentrated underground storage and the vertical mixing method, were confirmed (May 11). Furthermore, adhering to the interim guidelines aimed at minimizing students' radiation exposure, a framework was established to create a safer educational environment. This included the release of a policy titled "Immediate Measures toward Reducing the Radiation Doses that Pupils and Others Receive at Schools, etc. in Fukushima Prefecture" (May 27).

d. Enhancing environmental monitoring

To comprehensively understand the overall status of the accident and support evaluations for establishing the planned evacuation zone, the Plan to Enhance Environmental Radiation Monitoring Activities was formulated on April 22 to ensure systematic collaboration among related organizations.

Based on this plan, a dose measurement map and an estimated cumulative dose map reflecting data as of April 24 were released on April 26, with plans for continuous updates. Additionally, a soil concentration map was also planned for development.

Efforts were undertaken to conduct environmental monitoring on agricultural land, educational facilities, and other locations, while monitoring for radioactive materials in food and tap water was also carried out, with necessary measures implemented as required.

e. Handling disaster waste and sewage treatment by-products

Regarding disaster waste management in Fukushima Prefecture and the detection of radioactive materials in sewage sludge at local treatment facilities, guidance from the Nuclear Safety Commission was taken into account. Provisional policies on handling disaster waste and sewage treatment by-products were established on May 2 and May 12, respectively.

f. Expanding public communication for the nuclear disaster and affected residents

To disseminate accurate and timely information about the accident, daily press briefings were held. Additionally, efforts were made to ensure that evacuees received clear and essential information through local radio broadcast programs and the display of newsletters at evacuation shelters.

7) Ensuring employment and supporting agriculture and industry

In light of the unique damage caused by the nuclear disaster, including reputational harm, the government, under the Nuclear Emergency Response Headquarters, implemented the following measures for securing employment, supporting agricultural and industrial activities, and countering reputational harm through the appropriate provision of information to foreign governments.

- Promoting employment measures under the "Japan as One" Work Project
- Implementing special measures for employment adjustment subsidies and unemployment benefits
- Providing support for new employment opportunities for disaster victims, including students from affected areas
- Countering reputational harm and promoting exports of agricultural, forestry, and fishery products, as well as food items

- Supporting private-sector financing for agricultural, forestry, and fishery businesses affected by shipment restrictions
- Establishing the “Emergency Credit Guarantee for Recovery from the Great East Japan Earthquake” and the “Great East Japan Earthquake Reconstruction Special Loans” for small and medium-sized enterprises
- Supporting the recovery of factories and shops through collective reconstruction and improvement projects by small and medium-sized enterprises, including the establishment of temporary factories and stores
- Creating a long-term, interest-free loan system, primarily collateral-free, for small and medium-sized enterprises forced to relocate from areas such as the no-entry zone
- Addressing reputational harm by providing appropriate information to foreign governments, enhancing the domestic inspection system, and supporting inspections, as well as promoting exports of industrial products and other goods

(4) Strengthening disaster countermeasures based on the Great East Japan Earthquake

The Great East Japan Earthquake provided numerous lessons, embedding new approaches to disaster management across a wide array of areas. These included basic thinking around disaster assumptions and disaster mitigation; establishing support systems for disaster-affected municipalities overwhelmed by the loss of administrative functions or increased workloads; ensuring lifeline infrastructure, logistics, and supply of goods; improving the setup and management of evacuation shelters; supporting secondary and wide-area evacuations; providing emergency temporary housing; considering persons requiring special assistance; securing healthcare and mental health services; fostering community resilience; handling international aid; and improving evacuation from tsunamis and disaster volunteer activities[18]. Going forward, countermeasures must focus on disaster mitigation and protecting human lives, and the government is strengthening disaster preparedness as outlined below.

1) Establishment of the "Committee for Technical Investigation on Countermeasures for Earthquakes and Tsunamis Based on the Lessons Learned from the '2011 off the Pacific coast of Tohoku Earthquake'"

On April 27, 2011, the Central Disaster Prevention Council established the Committee for Technical Investigation on Countermeasures for Earthquakes and Tsunamis Based on the Lessons Learned from the "2011 off the Pacific coast of Tohoku Earthquake" to analyze the occurrence and the scale of impact of the Tohoku earthquake and tsunami, as well as to consider future countermeasures. After 12 sessions, the committee released its report, "Report of the Committee for Technical Investigation on Countermeasures for Earthquakes and Tsunami Based on the Lessons Learned from the '2011 off the Pacific coast of Tohoku Earthquake,'" on September 28, 2011.

Concurrently, starting August 12, 2011, the Review Committee on Emergency Disaster Response during the Great East Japan Earthquake was convened. Comprised of experts, its goal was to evaluate the national government's emergency disaster response measures during the earthquake and propose further improvements. After seven meetings, a preliminary summary was issued on November 28, 2011[19], and subsequent discussions were passed on to the Committee for Policy Planning on Disaster Management.

2) Establishment of the Committee for Policy Planning on Disaster Management and the Disaster Management Implementation Committee

Building on the findings of the Committee for Technical Investigation on Countermeasures for Earthquakes and Tsunamis Based on the Lessons Learned from the "2011 off the Pacific coast of Tohoku Earthquake," the government reviewed its response to the Great East Japan Earthquake, summarized lessons learned, and sought to widen and strengthen disaster countermeasures. This effort aimed to address potential large-scale disasters like a Tokyo near-field earthquake, Nankai trough megathrust earthquake, volcanic eruptions, and frequent torrential rains. As part of this effort, the Committee for Policy Planning on Disaster Management was established on October 11, 2011, under the Central Disaster Prevention Council, consisting of relevant cabinet ministers and academic experts. The committee met 13 times, issuing an interim report on March 7, 2012, and a final report was approved and made public on July 31, 2012.

Following this, the Committee for Policy Planning on Disaster Management was dissolved on March 26, 2013, and replaced with a new expert committee, the Disaster Management Implementation Committee. This committee was not limited to following up on the final report of its predecessor, Committee for Policy Planning on Disaster Management. It was set up with the purpose of actively supporting various ministries in the implementation of disaster-related measures suggested in the final report and promoting cross-ministerial discussions on disaster countermeasures to drive practical outcomes.

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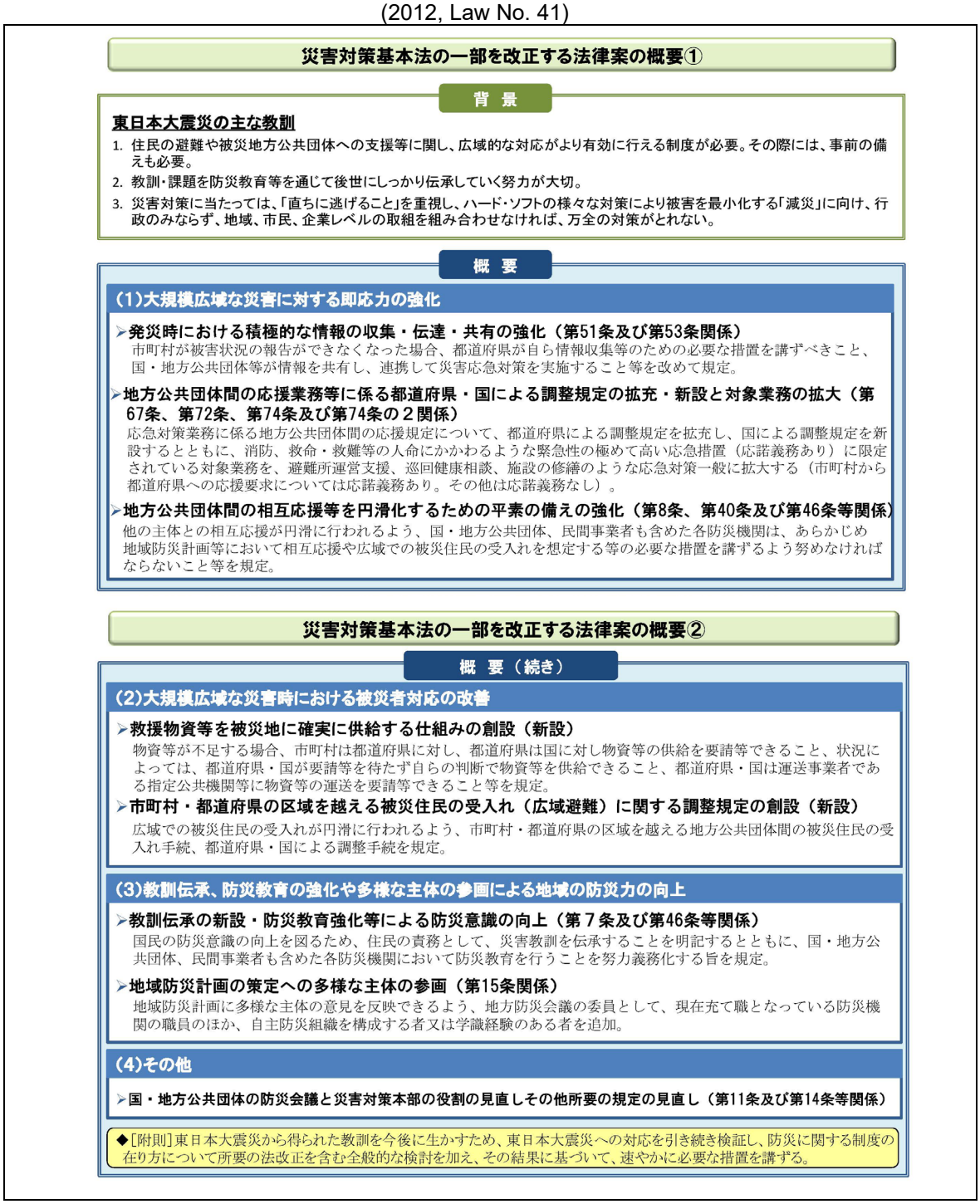
[18] Lessons learned across these areas are summarized in Chapter 1, "Lessons Learned from the Great East Japan Earthquake," of Section 2, Part 1 "Advancing Measures Based on the Great East Japan Earthquake," in the 2012 White Paper on Disaster Management by the Cabinet Office (disaster management).

[19] This preliminary summary was reported at the second meeting of the Committee for Policy Planning on Disaster Management.

3) Review of disaster management legislation

Based on deliberations by the Committee for Policy Planning on Disaster Management, measures were implemented to address legislative issues highlighted by the Great East Japan Earthquake. These measures focused on: ① strengthening rapid response capabilities for large-scale and wide-area disasters, ② improving responses to affected individuals during such disasters, and ③ enhancing the transmission of lessons learned, disaster education, and improving regional disaster resilience through the participation of diverse stakeholders. These measures were enacted under the Act for Partial Amendment of the Basic Act on Disaster Management (promulgated and enforced on June 27, 2012). The summary of the law is shown in the figure below.

Figure 1-1-6 Summary of the Act for Partial Amendment of the Basic Act on Disaster Management (2012, Law No. 41)



Source: Cabinet Office materials

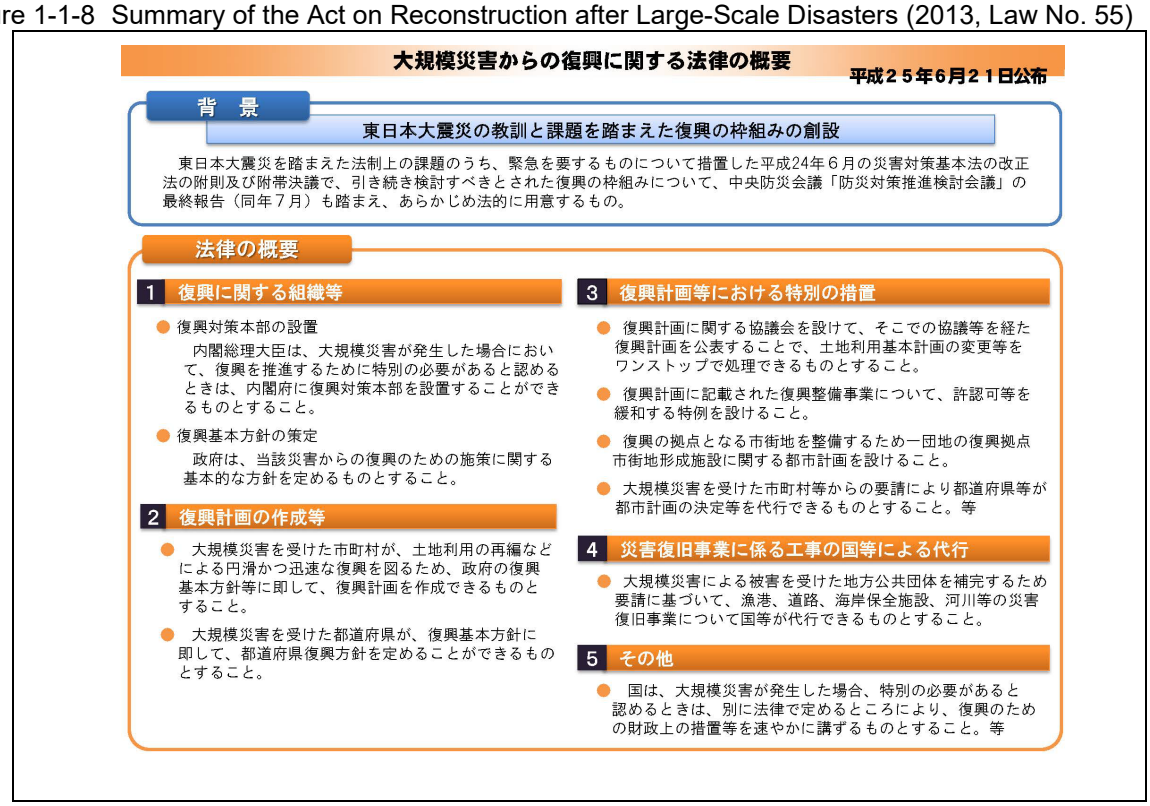
Subsequent deliberations led to further legislative measures to: ① strengthen rapid response capabilities for large-scale and wide-area disasters, ② ensure smooth and safe evacuation of residents, ③ improve measures to protect disaster victims, and ④ strengthen proactive disaster preparedness. These measures were enacted under the Act for Partial Amendment of the Basic Act on Disaster Management (promulgated on June 21, 2013, partially enforced). The summary of the law is shown in the figure below.

Figure 1-1-7 Summary of the Act for Partial Amendment of the Basic Act on Disaster Management (2013, Law No. 54)

Source: Cabinet Office materials

Additionally, measures were introduced under the Act on Reconstruction after Large-Scale Disasters (promulgated on June 21, 2013, partially enforced). These measures focused on: ① organizations related to reconstruction, ② formulation of reconstruction plans, ③ special measures within reconstruction plans, and ④ delegation of restoration works to the national government. The summary of the law is shown in the figure below.

Figure 1-1-8 Summary of the Act on Reconstruction after Large-Scale Disasters (2013, Law No. 55)



Source: Cabinet Office materials

4) Review of damage estimates for predicted large-scale earthquakes and disaster countermeasures

Based on discussions by the Committee for Policy Planning on Disaster Management, damage estimates for predicted large-scale earthquakes and a review of disaster countermeasures were conducted. This review avoided optimistic scenarios and instead adopted a disaster mitigation approach to minimize damage through both physical infrastructure and people-oriented measures. Regarding tsunamis in particular, a shift from relying solely on structural defenses, such as seawalls, to a multi-layered approach emphasizing evacuation as the core strategy was widely recognized in the aftermath of the Great East Japan Earthquake, as highlighted in the report “Towards Reconstruction—Hope beyond the Disaster” (June 25, 2011, Reconstruction Design Council in Response to the Great East Japan Earthquake).

- Nankai Trough megathrust earthquake
  On March 7, 2012, the Nankai Trough Megathrust Earthquake Countermeasures Study Working Group was established. A first report on damage estimates was published on August 29, 2012, and a second report followed on March 18, 2013. Over the course of 16 meetings, the group issued its final report on countermeasures on May 28, 2013.
- Tokyo near-field earthquake
  On March 7, 2012, the Working Group for Earthquake Disaster Mitigation in the Tokyo Metropolitan Area was established. Following 19 meetings, the group issued its final report on damage estimates and countermeasures on December 19, 2013.
- Trench-type Megaquakes in the Vicinity of the Japan and Chishima Trenches
  On April 21, 2020, the Working Group to Study Measures against Large Earthquakes along the Japan Trench and the Kuril Islands Trench was established. The group considered scenarios involving the strongest class of earthquakes, including shaking and tsunamis, while also addressing challenges specific to snowy and cold regions, such as the additional time required for evacuations. Damage estimates were released on December 21, 2021. Following 10 meetings, on March 22,

2022, the group issued its final report, which outlined concrete disaster countermeasures. It stated that implementing these measures appropriately could reduce fatalities by up to approximately 80%. Furthermore, the Act for Partial Amendment of the Act on Special Measures concerning Advancement of Countermeasures against Earthquake Disaster in Relation to Subduction Zone Earthquake Around Japan Trench and Chishima Trench was revised (passed on May 13, 2022, and enforced on June 17). This amendment introduced measures such as increasing the national subsidy rates for developing evacuation sites and routes, including tsunami evacuation towers. Moving forward, it is essential that comprehensive measures combining the development of evacuation routes and sites with enhanced evacuation drills are further promoted by relevant ministries, agencies, and local governments, based on the framework of this law and the disaster countermeasures proposed by the working group. Additionally, it is necessary to further advance collaboration between administrative bodies and private entities, such as designating private facilities as evacuation sites.