Cabinet Office
Japan

White Paper

Disaster Management in Japan 2017

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Introduction

The White Paper on Disaster Management in Japan 2017 has a special feature entitled “Revising Disaster Management Policies in Light of the Kumamoto Earthquake.” This special feature describes the push-mode support which was mobilized to provide supplies in the aftermath of the April 2016 Kumamoto Earthquake, partnerships between NPOs and local government, and other important responses by the government. It also discusses measures to be developed in the future, including information-sharing mechanisms and the formulation of local government aid acceptance plans.

Part I, on the “Current Disaster Management Measures in Japan,” looks at the recent progress of measures and policy initiatives with a particular focus on those implemented in FY2016, including the following measures and initiatives:

- The March 2017 revision of the Act on the Promotion of Measures for Tsunamis to include provisions on the promotion of international cooperation in the area of measures for tsunami, in light of the designation of November 5 — Tsunami Preparedness Day — as World Tsunami Awareness Day.

- The May 2016 revision of the Basic Plan for Disaster Risk Reduction based on the report by the Working Group on Study on Evacuation and Emergency Response Measures for Flood Disasters following the Torrential Rain of September 2015 in the Kanto and Tohoku Regions.

- The December 2016 revision of the Guide to Developing Concrete and Practical Evacuation Plans for Volcanic Eruption based on the lessons of the Mt. Ontake Eruption Disaster.

- The revision of the Guidelines for Producing a Handbook on Decision and Dissemination for Evacuation Recommendations (name changed to the Guidelines for Evacuation Recommendations) based on the lessons of the floods caused by the 2016 Typhoon 10.

- The recommendations by the Study Group on Promoting Volunteer Activities Contributing Generally to Disaster Risk Reduction (March 2017).

Special Feature

“Revising Disaster Management Policies in Light of the Kumamoto Earthquake”

Special Feature "Revising Disaster Management Policies in Light of the Kumamoto Earthquake"

The 2016 Kumamoto Earthquakes (hereinafter the "Kumamoto Earthquake"), which occurred on April 14 and 16, 2016 and had a maximum seismic intensity of 7, caused immense damage. There were 228 fatalities (as of April 13, 2017, according to a Fire and Disaster Management Agency survey) and a total of approximately 200,000 houses were completely destroyed, half-destroyed or partially destroyed. In response, the government strove to restore transport links to the affected area without delay, completing recovery of infrastructure such as expressways, the Shinkansen bullet train line, and Kumamoto Airport within about a month. In addition, the government undertook recovery of rivers ahead of the rainy season to prevent secondary damage and has steadily undertaken slope stabilization in the area where the Aso-ohashi Bridge stood, which suffered a major slope failure. It carried out recovery of prefectural and municipal roads that had become impassable due to subsidence or sediment collapse, enabling transport routes for relief supplies to be secured promptly. As well as recovering the route to the north of National Route 57 and Aso-ohashi Bridge on National Route 325, which is being managed by the national government on behalf of Kumamoto Prefecture, the government has applied the Act on Reconstruction from Large-Scale Disasters for the first time, in respect of local roads requiring advanced technology, such as the prefectural road between Kumamoto and Takamori, and the municipal road between Tochinoki and Tateno. Thus, the government is using its authority to serve on behalf of local governments to ensure that roads can be recovered promptly.

Support for affected people by the disaster took the form of initiatives based on the lessons learned from past disasters, including the provision of supplies via the push-mode support, which was used for the first time, and collaboration with expert volunteers and nonprofit organizations (NPOs) in the management of evacuation centers. On the other hand, quite a few issues were highlighted that will need to be addressed in the future. These include the fact that earthquake damage rendered the prefectural office buildings and some designated evacuation centers unusable, non-successful response to the immense number of evacuees flooding into the evacuation centers, and inability to ensure the smooth delivery of relief supplies to evacuees. Nevertheless, dealing with the various challenges involved in supporting affected people yielded many valuable experiences and lessons that will inform future measures for disasters.

Accordingly, the government's Kumamoto Earthquake Initial Response Review Team has compiled a report on the findings from its review, covering praiseworthy aspects of the initial response and areas for reflection and improvement, to ensure that lessons are learned from the actions taken in response to the Kumamoto Earthquake. Based on this report, in December 2016, the Working Group for Studying Emergency Response and Livelihood Support Measures in Light of the Kumamoto Earthquake compiled a report that gave specific consideration to the whole range of approaches to emergency response and livelihood support measures.
(See *Emergency Response and Livelihood Support Measures* in Light of the Kumamoto Earthquake http://www.bousai.go.jp/updates/h280414jishin/h28kumamoto/okyuseikatu_wg.html)

Based on these reports, this special feature provides an overview of specific examples and data showing how the government aims to revise its disaster management policies ahead of future major disasters, focusing in particular on central government responses in such areas as support for local governments, evacuation center management and the transport of supplies.

Chapter 1　Overview of the Kumamoto Earthquake

1-1 Overview of the Kumamoto Earthquake and Damage

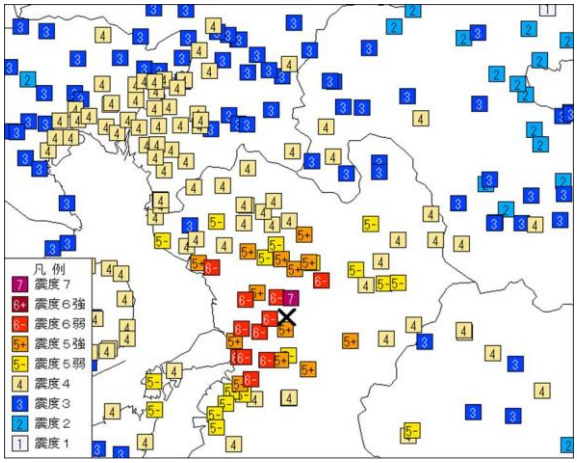
(1) Overview of the Kumamoto Earthquake

At 21:26 on April 14, 2016, a magnitude 6.5 earthquake struck the Kumamoto region of Kumamoto Prefecture, with a seismic intensity of 7 observed in Mashiki Town, Kumamoto Prefecture. This was followed by a magnitude 7.3 earthquake at 01:25 on April 16, with a seismic intensity of 7 observed in Mashiki Town and Nishihara Village (Fig. 1-1-1). These two violent tremors occurred within a short time of each other and triggered intense seismic activity from the Kumamoto district to the Aso district, along with central Oita Prefecture. As a result, there was immense damage in both Kumamoto and Oita prefectures, primarily in Mashiki Town and Nishihara Village.

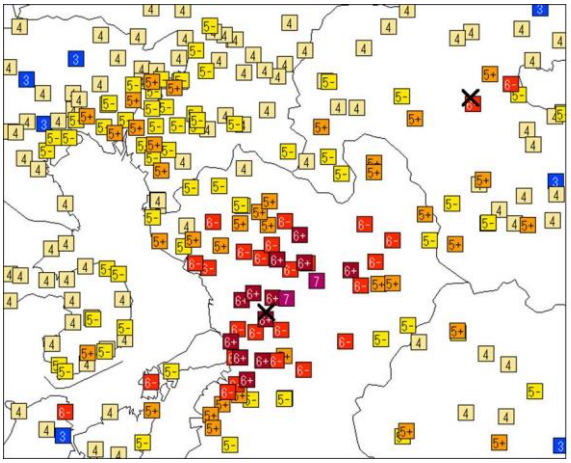
This marked the first time that two tremors with a seismic intensity of 7 had been observed in the same region since the seismic intensity rating of 7 was added to the Japan Meteorological Agency's seismic intensity scale in 1949, and the seventh time (including both of the Kumamoto quakes) that an earthquake with a seismic intensity of 6-lower or more has occurred. At least 4,000 earthquakes with a seismic intensity of 1 or more occurred over the six months or so from the first earthquake on April 14 (Fig. 1-1-2).

Fig. 1-1-1 Seismic Intensity Distribution

Earthquake at 21:26 on April 14



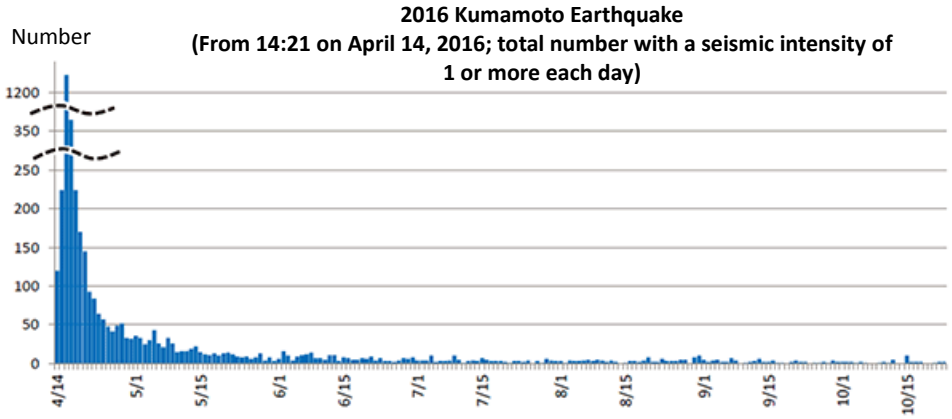
Earthquake at 01:25 on April 16



This seismic intensity includes the tremor from the M5.7 (reference value) earthquake that occurred in central Oita Prefecture immediately after this quake.

Source: Japan Meteorological Agency

Fig. 1-1-2 Number of Earthquakes with a Seismic Intensity of 1 or More Observed by Date



Source: Japan Meteorological Agency

(2) Damage

The Kumamoto Earthquake caused immense damage. Collapsing houses, landslides resulted in 228 fatalities, while a further 2,753 people sustained severe or minor injuries (Fig. 1-1-3). In addition, approximately 200,000 houses were completely, half and partially destroyed (Fig. 1-1-4).

The number of evacuation centers operated peaked at 855, while the number of evacuees reached approximately 184,000 at its highest (Fig. 1-1-5).

Fig. 1-1-3 Human Casualties

Fatalities: 228	People with severe/minor injuries: 2,753
(i) Fatalities confirmed by means of police autopsy: 50 (ii) Fatalities due to exacerbation of injuries caused by the disaster or the physical burden of living as an evacuee: 170 (Of which, fatalities recognized by municipalities as having been caused by the disaster, pursuant to the Act on Provision of Disaster Condolence Grant: 167) (iii) Fatalities caused by the torrential rain between June 19 and 25 that were recognized as being related to the Kumamoto Earthquake: 5 (iv) Fatalities recognized as having been caused by the disaster, pursuant to the Act on Provision of Disaster Condolence Grant: 3 ((i)-(iii): Kumamoto Prefecture; (iv): Oita Prefecture)	Severe injuries / Minor injuries Kumamoto Prefecture: 1,130 / 1,552 (Other prefectures): 19 / 52 Total: 1,149 / 21,604 *Figures for other prefectures represent the total across Fukuoka, Saga, Oita, and Miyazaki prefectures

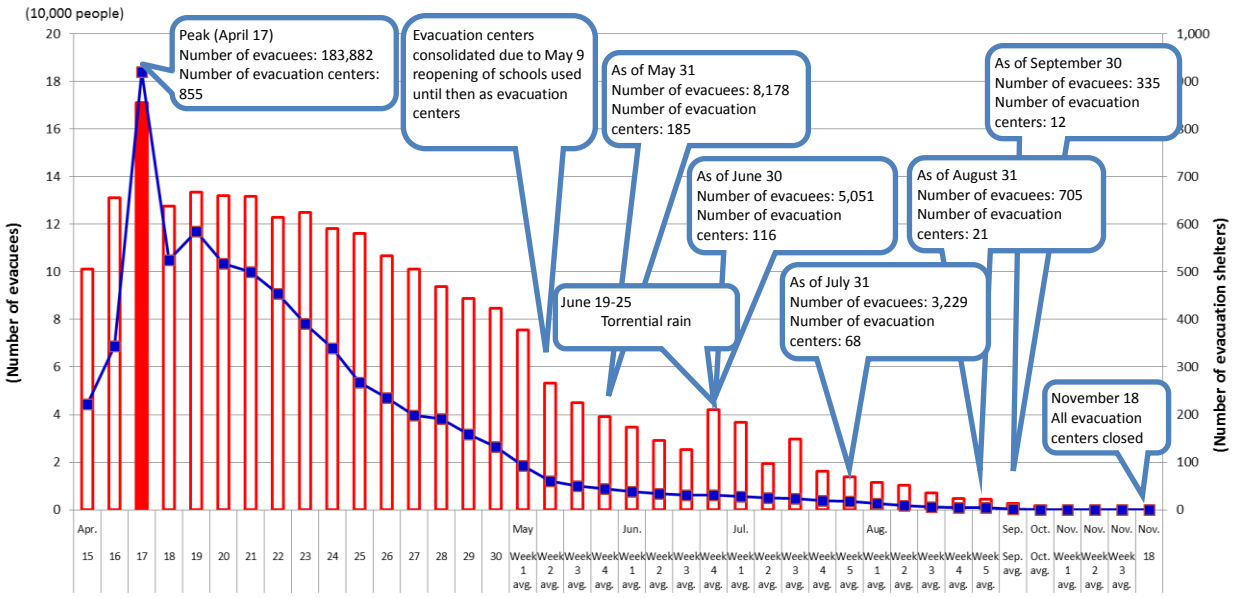
Source: Data from the Fire and Disaster Management Agency (as of April 13, 2017)

Fig. 1-1-4 Extent of Damage to Houses

Prefecture	Houses damaged (buildings)			Non-residential buildings damaged (buildings)		Fires (number)
	Completely Destroyed	Half Destroyed	Partially Destroyed	Public buildings	Other	
Kumamoto	8,688.	33,809	147,563	439	10,943	15
Oita	9	222	8,062	0	62	0
Other	0	6	277	0	2	0
Total	8,697	34,037	155,902	439	11,007	15

Source: Data from the Fire and Disaster Management Agency (as of April 13, 2017)

Fig. 1-1-5 Changes in the Number of Evacuees and Evacuation Centers in Kumamoto Prefecture Due to the Kumamoto Earthquake



Source: Produced by the Cabinet Office from various materials, including the *Report on the Review of Responses to the Kumamoto Earthquake Over a Period of Approximately Three Months* (March 2017, Kumamoto Prefecture)

In addition, lifeline utilities such as electricity, gas, and water supply were damaged, with approximately 480,000 houses suffering power cuts at the worst point. Airports, roads, railways, and other transport infrastructure also suffered a huge amount of damage, causing significant disruption to the daily lives of local citizens and the business activities of small and medium-sized enterprises and operators in the agriculture, forestry, and fishery industries and the tourism sector.

Fig. 1-1-6 Extent of Damage to Lifelines

	Maximum Number of Homes Affected	Status of Restoration	
Electric power	477,000 homes (14:00, April 16, 2016)	Restored April 20, 2016	Ministry of Economy, Trade and Industry data
Gas	105,000 homes (09:00, April 16, 2016)	Restored April 30, 2016	Ministry of Economy, Trade and Industry data
Water supply	445,857 homes (Cumulative total for the number of homes whose water was cut off at the worst point in each local government)	Restored July 28, 2016	Ministry of Health, Labour and Welfare data

Slope failure in the area where the Aso-ohashi Bridge stood

1-2 Response by the National Government

(1) Major Disaster Management Headquarters, etc.

After the Kumamoto Earthquake, the government established a Major Disaster Management Headquarters headed by then Minister of State for Disaster Management Taro Kono at 22:10 on April 14, 2016 (44 minutes after the earthquake struck), pursuant to the provisions of the Basic Act on Disaster Management. This headquarters put together a policy to serve as the basis for the swift and appropriate implementation of emergency measures for disaster. It then carried out tasks including the overall coordination of emergency measures in a diverse array of areas, such as rescue, first aid, and medical care, as well as gathering and distributing information, and liaising with Kumamoto Prefecture and affected municipalities.

In addition, to ensure that the government worked as an integrated team in the area of support for the daily lives of affected people, the Team to Support the Daily Lives of Disaster Victims was established on April 17. Composed of vice-ministerial level officials from each ministry and agency, the team shared information and identified problems by reporting on the day-to-day status of each ministry and agency's deliberations concerning issues and the results of their actions in response.

(2) On-site Major Disaster Management Headquarters

Following the magnitude 6.5 earthquake that struck the Kumamoto region, the government immediately deployed a Cabinet Office advance information-gathering team to Kumamoto Prefectural Office at 23:25 on April 14, 2016. At 10:40 the following day, an On-site Major Disaster Management Headquarters (hereinafter "on-site disaster management headquarters") headed by State Minister of the Cabinet Office Fumiaki Matsumoto was established at Kumamoto Prefectural Office. Each day, the on-site disaster management headquarters held joint meetings with the Disaster Response Headquarters headed by the Governor of Kumamoto Prefecture, which Kumamoto Prefecture had set up on April 14. The two bodies thus sought to ensure close collaboration. Kumamoto Prefecture disbanded its Disaster Response Headquarters on August 30, due to the fact that the search for missing persons had ended and the number of evacuees had declined. In light of this, the national government disbanded its on-site disaster management headquarters on September 16.

First meeting of the Major Disaster Management Headquarters
(Attended by Prime Minister Abe)

The on-site disaster management headquarters in action

Chapter 2　Response to the Kumamoto Earthquake

2-1 Support for Local Governments

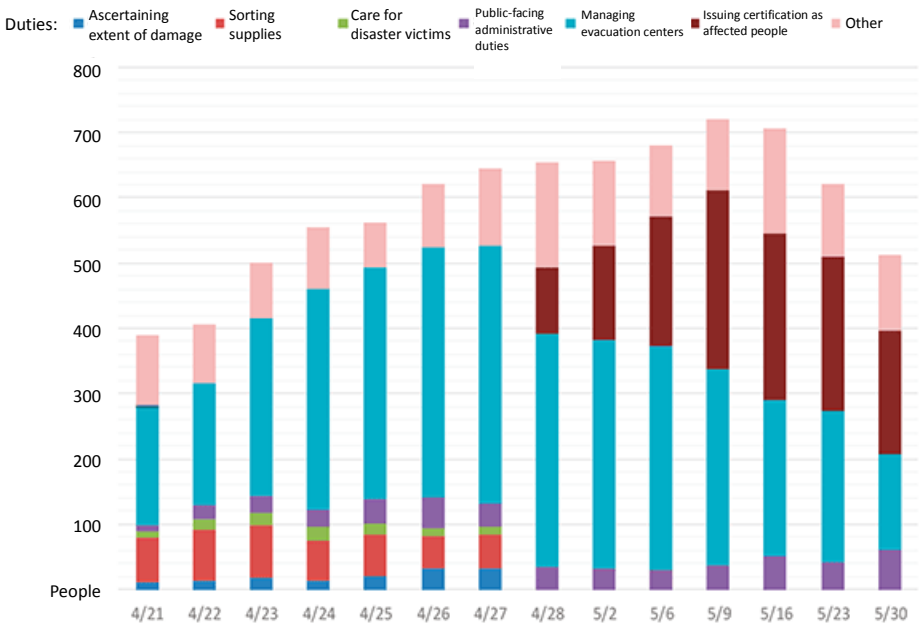
(1) Overview of Support

The national government and local governments from across Japan deployed official to assist affected local governments in dealing with the aftermath. The national government deployed a Team to Support the Daily Lives of Disaster Victims, consisting of 68 information and communications official (hereinafter "Information Liaison Officers") from various ministries and agencies, along with a total of 8,388 support official. As well as ascertaining the extent of the damage in affected municipalities, the Information Liaison Officers' role involved liaison and coordination between the national government and affected municipalities. Specifically, they sought to gain an understanding of each municipality's requests and issues, and, in particular, to ascertain needs at evacuation centers, providing regular reports on their findings to the on-site disaster management headquarters and explaining government policies, where necessary.

In addition, local governments across Japan deployed official to Kumamoto Prefecture and Kumamoto City to assist affected local governments under a variety of schemes, including national and regional block agreements concluded by members of the National Governors' Association, assistance organized by the Japan Association of City Mayors, and assistance based on agreements between individual municipalities (Figs. 2-1-1 and 2-1-2).

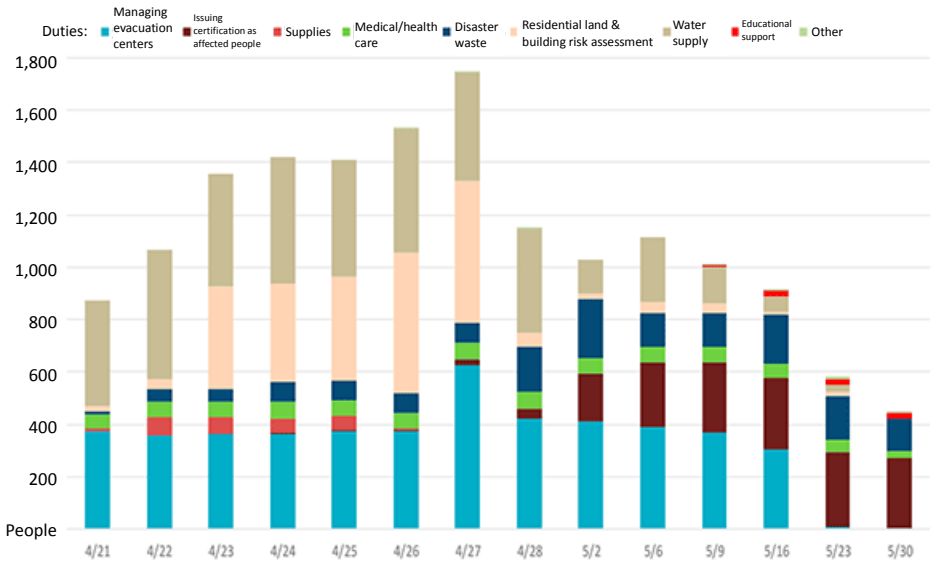
National government official engaged in support activities at Mashiki municipal office

Fig. 2-1-1 Deployment of Official to Kumamoto Prefecture Based on Agreements with the Kyushu–Yamaguchi Nine Prefectures Framework, the Union of Kansai Governments, the National Governors' Association, and Shizuoka Prefecture, etc. (April 21 – May 30, 2016)



Source: From materials distributed at the Fourth Meeting of the Working Group for Studying Emergency Response and Livelihood Support Measures in Light of the Kumamoto Earthquake

Fig. 2-1-2 Deployment of Official to Kumamoto City Based on Agreements with Major Cities and the Mayors Association of Designated Cities, etc. (April 21 – May 30, 2016)



Source: From materials distributed at the Fourth Meeting of the Working Group for Studying Emergency Response and Livelihood Support Measures in Light of the Kumamoto Earthquake

(2) Agreements between Local Governments and Agreements between Local Governments and Private Sector Companies

To ensure the smooth procurement and supply of goods in the event of a disaster, it is important that local governments not only stockpile items, but also conclude support agreements with other local governments and private sector companies before disaster strikes.

In Kumamoto Prefecture, most local governments had concluded goods procurement and supply agreements

before the earthquake, with 40 of the 46 local governments, etc. (including Kumamoto Prefectural Office) within the prefecture (approximately 90%) having concluded support agreements (Fig. 2-1-3). Of these 40 local governments, 33 (approximately 80%) had concluded agreements with local governments outside the prefecture (Fig. 2-1-4).

Should a major disaster occur, neighboring local governments are also likely to be affected, so it is necessary to conclude agreements with local governments in more distant areas as well.

Agreements must be concluded not only with other local governments, but also with private sector companies. In Kumamoto Prefecture, 29 of the 40 local governments (approximately 70%) had concluded agreements with both local governments and private sector companies (Fig. 2-1-5).

Thus, most of Kumamoto Prefecture's local governments had concluded goods procurement and supply agreements and this was one reason for their ability to secure assistance from so many local governments promptly in the aftermath of the Kumamoto Earthquake. On the other hand, many local governments and private sector companies were affected by the disaster, so it was difficult to adequately fulfill the commitments made in these agreements in some cases. This challenge is not specific to Kumamoto Prefecture, but rather is one common to local governments nationwide. Accordingly, local governments need to conclude multiple agreements to diversify their disaster risk, so that they are prepared for a major disaster of the kind expected to occur in due course, such as Nankai Trough Earthquake.

Fig. 2-1-3 Goods Procurement and Supply Support Agreements Concluded by Local Governments within Kumamoto Prefecture

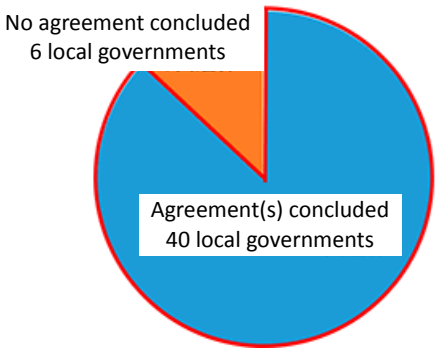


Fig. 2-1-4 Agreements Concluded with Local Governments Outside Kumamoto Prefecture

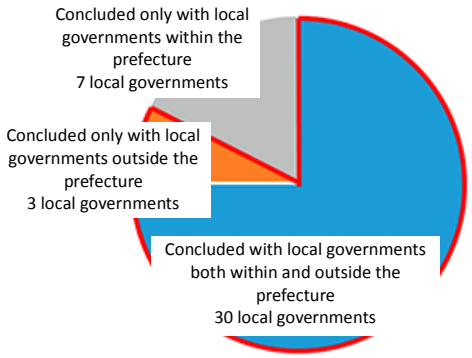
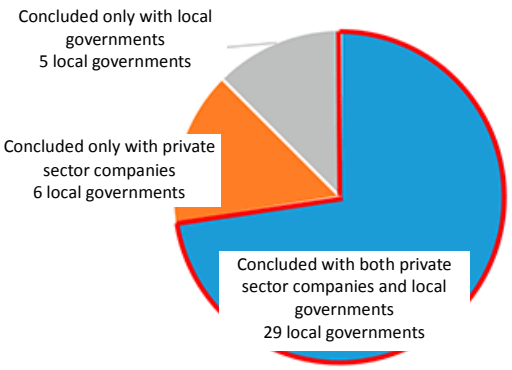


Fig. 2-1-5 Agreements Concluded with Private Sector Companies



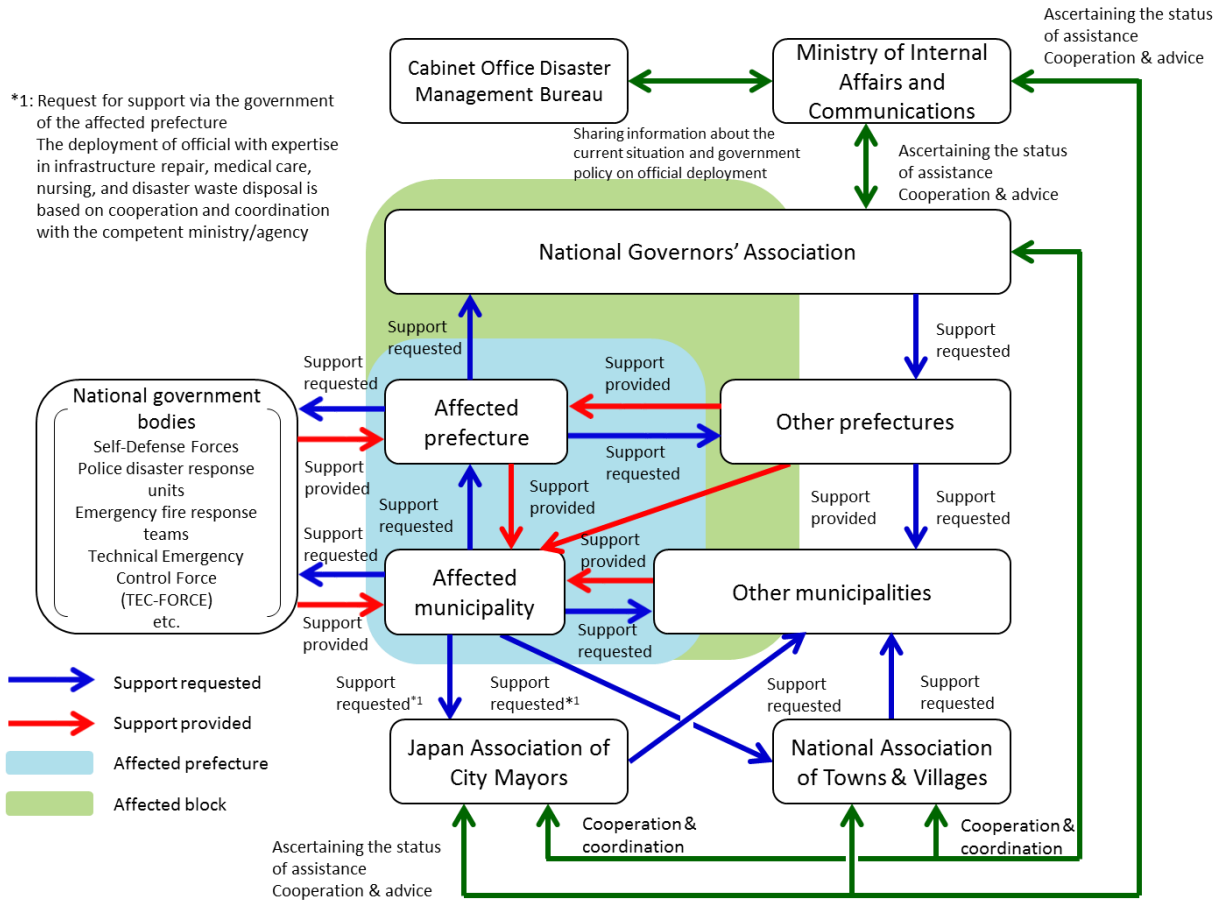
Source: From materials distributed at the Fifth Meeting of the Working Group for Studying Emergency Response and Livelihood Support Measures in Light of the Kumamoto Earthquake

(3) Development of Support Mechanisms

Mechanisms for personnel deployment and securing various other forms of support from an array of national and local government bodies had been put in place before the earthquake occurred and were utilized in Kumamoto (Figs. 2-1-6 and 2-1-7).

However, the support systems were not necessarily adequate, so further strengthening of functions enabling physical support and emergency response assistance to be provided to affected local governments is required. A key challenge in facilitating the provision of support in the event of disaster is ensuring that tasks such as the creation of mechanisms for coordination among the various assisting organizations, the standardization of disaster response work, and the matching of organizations/personnel with duties are carried out in an integrated manner. Following deliberations by the Study Group on Securing Municipal Administrative Functions in a Major Disaster between January and March 2017, the national government (Ministry of Internal Affairs and Communications) decided to establish a new scheme based on a simple checklist that would enable the status of three key elements in affected municipalities to be ascertained without delay: senior management; manpower; and government buildings and other aspects of the physical environment. In March 2017, the Seminar on the Deployment of Support Official to Assist Affected Residents in Rebuilding their Lives after a Major Disaster began to consider the development of effective manpower deployment mechanisms and support for the management of affected local governments.

Fig. 2-1-6 Illustration of the Deployment of Support Official to Major Municipalities Following a Major Disaster



Source: From materials distributed at the Fourth Meeting of the Working Group for Studying Emergency Response and Livelihood Support Measures in Light of the Kumamoto Earthquake

Fig. 2-1-7 Major Local Government Support Initiatives by each Ministry and Agency

Ministry of Internal Affairs and Communications	・Mobile power generators ・Loan of mobile communications equipment for use in disaster management ・Free public wireless LAN at evacuation centers	Ministry of Defense	・Disaster relief deployment of Self-Defense Forces (search and rescue, emergency repairs, medical support, support for the supply of water and food, bathing support, transport of supplies)
National Police Agency	・Police disaster response units	Ministry of the Environment	・Disaster Waste Treatment Support Network (D.Waste-Net)
Fire and Disaster Management Agency (FDMA)	・Emergency fire response teams	Ministry of Economy, Trade and Industry.	・Emergency fuel supply based on the Disaster Oil Supply Coordination Plan
Ministry of Land, Infrastructure Transport and Tourism (MLIT)	・Technical Emergency Control Force (TEC-FORCE) ・Deployment of emergency risk assessors ・Support for sewerage system repairs	Ministry of Agriculture, Forestry and Fisheries	・Farming and Rural Disaster Relief Unit (Midori Disaster Relief Squad)
Ministry of Health, Labour and Welfare	・Disaster medical assistance team (DMAT) ・Disaster psychiatric assistance team (DPAT) ・Deployment of public health nurses, etc. ・Matching the needs of social welfare facilities with welfare personnel ・Deployment of investigative and technical official to address damage to the water supply	Ministry of Education, Culture, Sports, Science and Technology	・Support for the reopening of schools ・Enhanced psychological care ・Deployment of senior cultural properties specialists ・Deployment of emergency risk assessors

Source: Produced by the Cabinet Office from materials distributed at the Fourth Meeting of the Working Group for Studying Emergency Response and Livelihood Support Measures in Light of the Kumamoto Earthquake

2-2 Living Conditions of Evacuees and Self-help/Mutual Support Initiatives

(1) Evacuation Centers

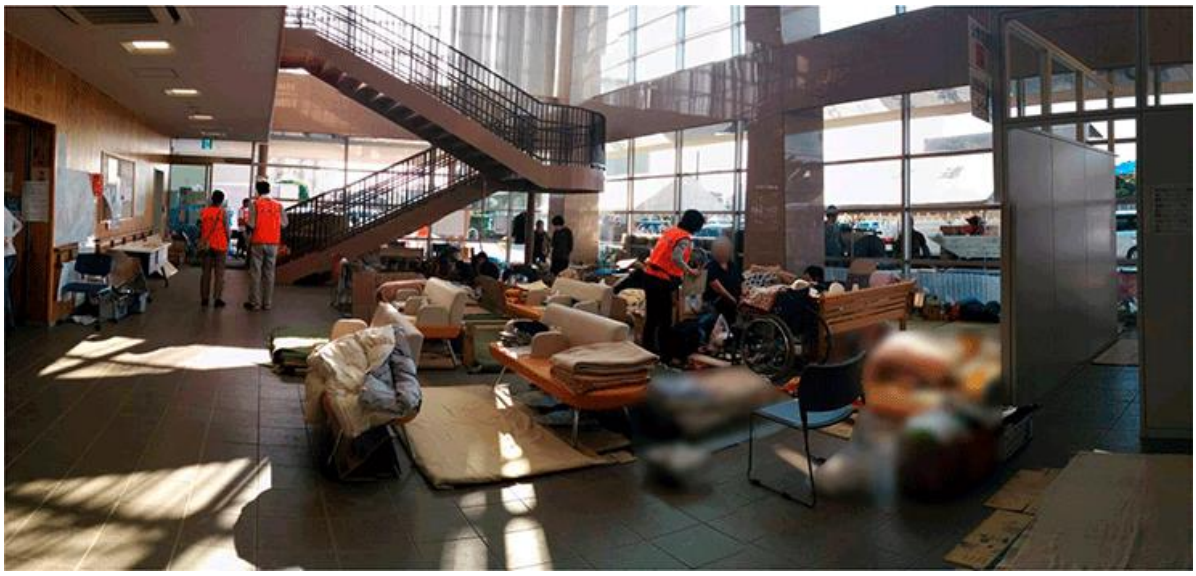
On April 17, 2016, the Cabinet Office published and circulated the Evacuation Center Management Guidelines, the Guidelines for Securing and Managing Toilets at Evacuation Centers, and the Guidelines for Managing and Operating Welfare Evacuation Centers, to facilitate the appropriate operation of evacuation centers by affected local governments. However, examples of evacuation center management that was not necessarily appropriate were also pointed out.

Accordingly, the Cabinet Office decided to put together an anthology of examples as a complement the Evacuation Center Management Guidelines, etc., to contribute to smoother evacuation center management. As such, it conducted a questionnaire-based survey of relevant local governments and affected citizens in January and February 2017 (Fig. 2-2-1). In addition, the Working Group for Studying Emergency Response and Livelihood Support Measures in Light of the Kumamoto Earthquake proposed that a system of advisors be established to support evacuation center management.

Fig. 2-2-1Major Comments Expressed in the Questionnaire (Excerpt)

Source: Cabinet Office

Evacuees take center in the first-floor lobby of Kumamoto City Office
(April 29, 2016)



Evacuees take center in the lobby of Mashiki Health and Welfare Center
(April 29, 2016)

A corridor and room at Mashiki Health and Welfare Center
(April 29, 2016)

(2) Activities by Individual Volunteers and NPOs

Several cases were observed where it was difficult to respond to the Kumamoto Earthquake only by interventions of government bodies and citizens. This is believed to have stemmed from the sheer scale of the disaster: evacuees exceeded 180,000 at one stage and the number of evacuation centers operated peaked at 855. Another reason is thought to have been the fact that local government officials and local citizens were not necessarily proficient in responding to a disaster that caused such a huge amount of damage. As such, the support provided by individual volunteers (described below) and NPOs, among others, was of great assistance to affected areas and citizens.

In Kumamoto, the support offered by NPOs led by the Hinokuni Conference for Kumamoto Earthquake Support (described below) is particularly noteworthy. An organization that works with government bodies and NPOs, the Hinokuni Conference is an initiative unprecedented in Japan, in terms of both the speed with which it was set up (having been established on April 19, 2016) and the scale of the support that it provided while coordinating duties between NPOs, in partnership with government bodies.

This section provides a broad overview of the activities of individual volunteers and NPOs, and examines future approaches to such activities.

(i) Individual volunteers

Individuals who go to affected areas at their own initiative to provide those affected by the disaster with support, without being affiliated to an organization of some kind are referred to here as individual volunteers. In most cases, the task of receiving these individual volunteers and allocating duties to them is carried out by the disaster volunteer centers (hereinafter “disaster VCs”) established by social welfare councils in disaster-afflicted areas. The social welfare councils of 17 affected municipalities began setting up disaster VCs on April 19, 2016 to receive individual volunteers.

In general, surveys to ascertain the needs of those affected by a disaster cannot be carried out in the immediate aftermath of the disaster, because those people have evacuated their homes. Immediately after the earthquake in Kumamoto, some disaster VCs took the step of restricting the volunteers sought on the basis of where prospective volunteers lived (for example, accepting only those who lived in Kumamoto Prefecture or in Kyushu), due to the impact of aftershocks, the need to prioritize efforts to rebuild the lives of local citizens and ensure the safety of volunteers, and concerns about dealing with prospective volunteers who were surplus to requirements. From the latter half of April through May, the needs of those affected by the disaster gradually became clearer and efforts by volunteers to tidy up homes and clear away rubble got underway in earnest. However, given concerns about road congestion during the consecutive national holidays in early May, the prefectural government put out a call on its website for people to take into account the need to alleviate such congestion.

At the same time, while some disaster VCs attracted more prospective volunteers than they could actually process, others struggled with a shortage of candidates. Accordingly, surplus volunteers were referred to disaster VCs without enough volunteers. After the consecutive national holidays in early May, the on-site disaster management headquarters put out a call via bodies such as the Kyushu Economic Federation, asking companies to participate in volunteer activities, while the Cabinet Office and various other bodies used their websites, Twitter, and other means to encourage people to volunteer.

By the end of November 2016, all evacuation centers had been closed and considerable progress had been made in moving those whose homes had been half or completely destroyed by the disaster into emergency temporary housing or provisional temporary housing. Accordingly, activities by large numbers of volunteers aimed at supporting the recovery of people’s daily lives were coming to an end. Consequently, the disaster VCs

switched to recruiting volunteers for activities on weekends only or were reorganized into “Daily Life Reconstruction Support VCs.” Since the end of 2016, virtually no volunteer activities aimed at responding to the disaster have taken place.

Fig. 2-2-2 Establishment of Disaster VCs Following the Kumamoto Earthquake

The main activities undertaken by individual volunteers include surveys of the needs of those affected by the disaster, tidying up homes, clearing and shifting rubble, support for the management of evacuation centers, and sorting of relief supplies. The status of the various disaster VCs is shown below.

Municipality	Date of Establishment (2016)	Number of Participants (Total)	Situation as of November 13, 2016	Recruitment Area Specified by Disaster VC
Kikuchi City	April 19	777	Reorganized into a Daily Life Reconstruction Support VC on May 22	
Uto City	April 19	3,166	Reorganized into a Daily Life Reconstruction Support VC (including clearance of sludge due to flooding, from June 25) on June 6	
Uki City	April 19	4,119	Reorganized into a Daily Life Reconstruction Support VC on June 1	
Minamiaso Village	April 20	6,768	Reorganized into a Daily Life Reconstruction Support VC on July 1 Reorganized into a VC to deal with all fields, not only the disaster (ordinary VC) on September 1	
Yamato Town	April 21	275	Reorganized into an ordinary VC on September 1	
Mashiki Town	April 21	34,268	Carried out activities on Fridays and Saturdays	Nationwide
Kumamoto City	April 22	38,267	Carried out activities on weekends	Nationwide
Ozu Town	April 22	3,178	Mainly carried out activities on Saturdays	Kyushu
Koshi City	April 22	802	Reorganized into a Daily Life Reconstruction Support VC on May 15	
Kikuyo Town	April 22	1,832	Reorganized into a Daily Life Reconstruction Support VC on May 21	
Misato Town	April 22	194	Ordinary VC	
Nishihara Village	April 24	14,357	Reorganized into a Daily Life Reconstruction Support VC on July 29. Carried out activities on weekends	Nationwide
Kosa Town	April 25	732	Reorganized into a Daily Life Reconstruction Support VC on June 21	
Aso City	April 26	729	Reorganized into an ordinary VC on May 4	
Kashima Town	April 26	2,238	Reorganized into a Daily Life Reconstruction Support VC on June 1	
Mifune Town	April 29	4,895	Including clearance of sludge due to flooding, from June 25.	
Yufu City (Oita Prefecture)	April 20	204	Disaster VC closed on April 26	
Total		116,801		

Source: Data from the Ministry of Health, Labour and Welfare (as of November 13, 2016)

Kumamoto City Disaster Volunteer Center

(ii) Initiatives drawing on the know-how and expertise of NPOs and other support groups

At least 300 NPOs and other support groups from Kumamoto and outside it carried out a variety of activities in the aftermath of the Kumamoto Earthquake, including running evacuation centers and making improvements to the living environment that government bodies would have found difficult to carry out unaided, as well as preparing meals for evacuees; conducting surveys of evacuees centering in their own damaged homes or in cars and providing them with support; managing, transporting, and distributing donated goods; and supporting the management of Disaster VCs.

Fig. 2-2-3 Examples of NPO Activities

- Conducting surveys of the living environment at 118 evacuation centers in Kumamoto Prefecture
- Improving toilets, beds, meals, and the sanitation environment
- Devising evacuation center layouts, setting them up, and arranging spaces with consideration for evacuees
- Supporting the layout, setup, and management of welfare evacuation centers
- Managing and delivering donated supplies
- Arranging cardboard beds and nursing care supplies
- Coordinating meal provision for evacuation centers
- Delivering programs aimed at preventing “inactive lifestyle syndrome,” including conversation groups and footbaths
- Supporting local citizens in transitioning to self-management
- Supporting consolidation into hub evacuation centers and efforts to close all evacuation centers

etc.

<Evacuation center assessments>

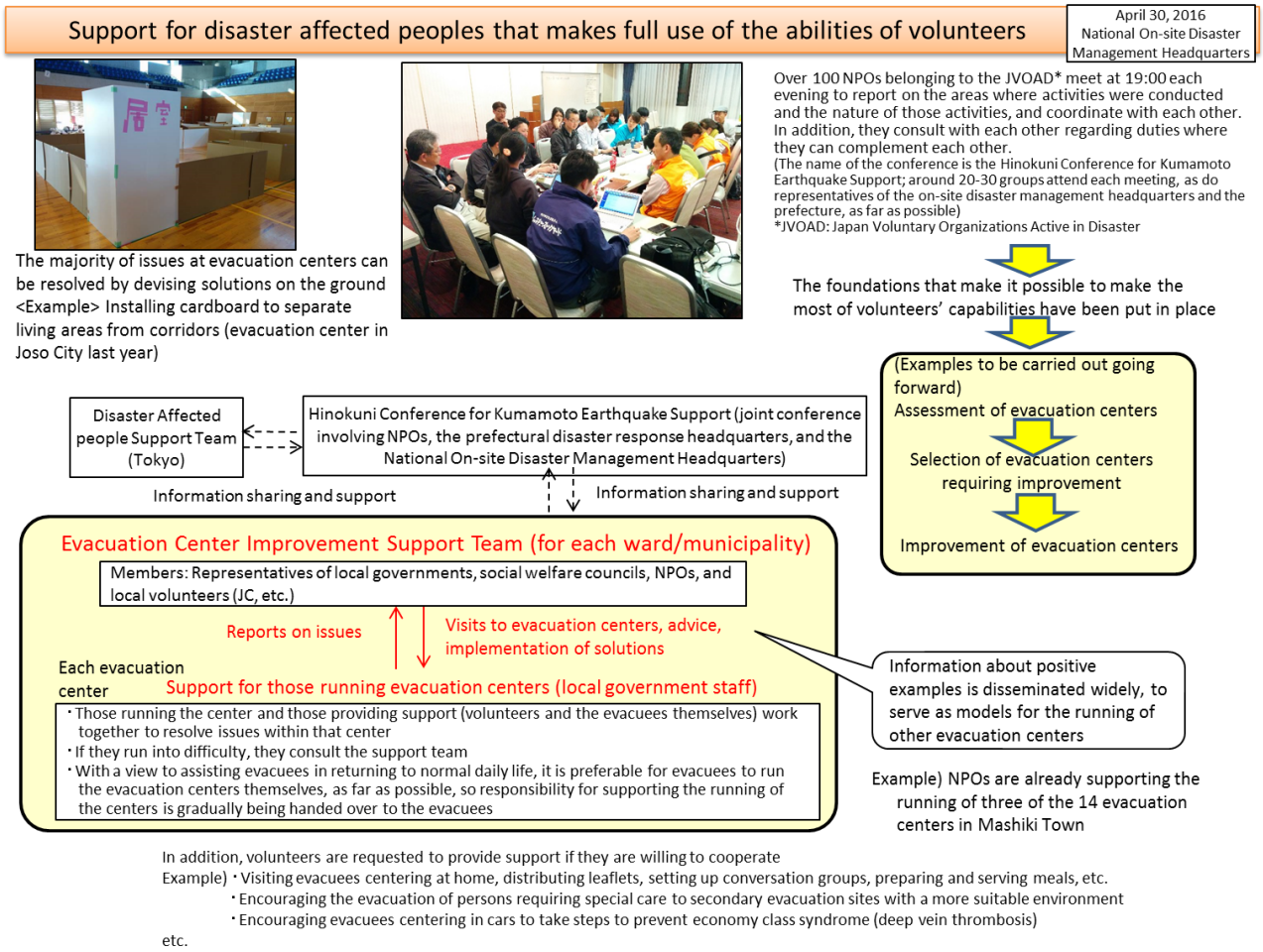
Following the Kumamoto Earthquake, the large number of evacuation centers meant that a lack of understanding of the situation at the centers was an issue. Accordingly, NPOs worked with the on-site disaster management headquarters and the Kumamoto prefectural government’s Health and Welfare Department to conduct evacuation center assessments at 118 of the more than 400 evacuation centers that were open as of late April 2016. These 118 centers were selected because neither Kumamoto Prefecture nor Kumamoto City had ascertained the situation there. Several NPOs worked together, dividing up the centers to be visited into groups and visiting them in turn to find out issues to be solved. The prefectural government provided assistance by lending NPO members official prefectural armbands to use when conducting these assessments and also notified the relevant departments at each municipality. The evacuation center assessments conducted by NPOs looked at a wide range of matters, including whether the toilets were in a hygienic state, whether the ban on entering living areas while wearing shoes was being thoroughly enforced, whether the minimum necessary

living space per person had been secured, and whether there was a women-only space. The results of the assessments formed the basis of proposals for improvements to evacuation centers (Figs. 2-2-4 and 2-2-5).

It would be fair to say that the evacuation center assessments were highly effective, because they provided an overall picture of the situation at evacuation centers and subsequently led to improvements in evacuation center living environments.

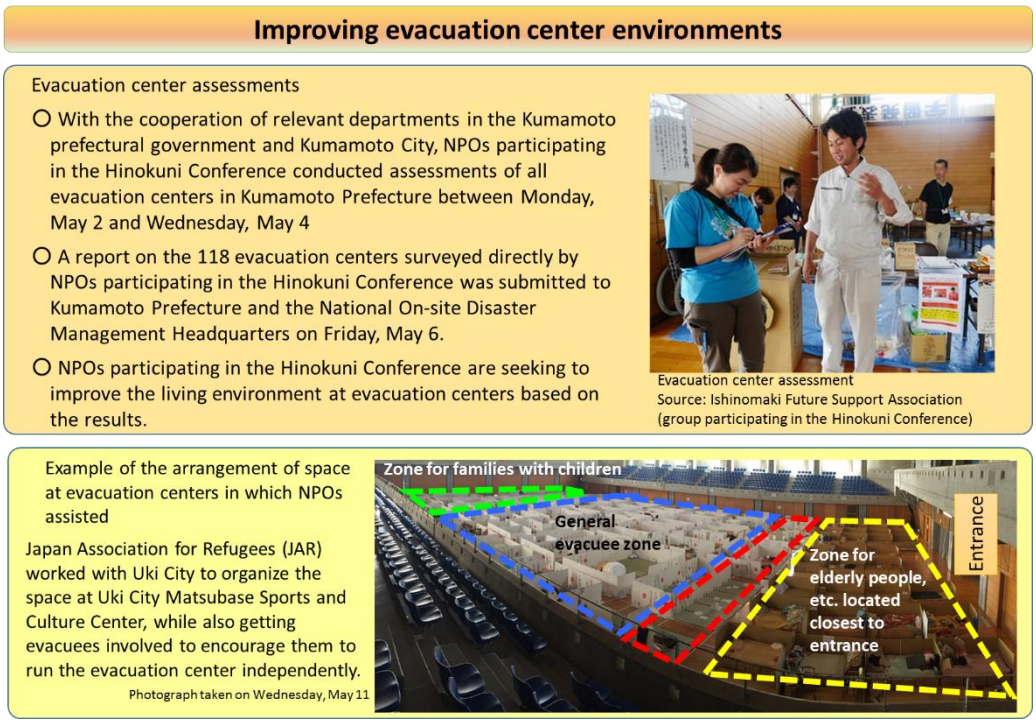
Since December 2016, once all evacuation centers had been closed, more finely tuned support for those affected by the disaster in rebuilding their lives has been expected, including care for temporary housing tenants and efforts to build a sense of community among them, working in partnership with Community Mutual Support Centers.

Fig. 2-2-4 Example of NPO Activities



Source: Excerpt from materials circulated at the 21st meeting of the National On-site Disaster Management Headquarters / 24th meeting of the Kumamoto Prefecture Disaster Response Headquarters (April 30)

Fig. 2-2-5 Example of NPO Activities



Source: Excerpt from materials circulated by the Major Disaster Management Headquarters on May 13, 2016

(iii) Partnerships between government bodies and support groups such as NPOs, and among various support groups

a. Overview

In Kumamoto, NPOs from various parts of the country (hereinafter “external support groups”) and NPOs from within the prefecture (hereinafter “local groups”) undertook support activities. Activities of this nature are undertaken independently and at the initiative of the group concerned; however, on the other hand, if each group is permitted to work as it chooses, there is a tendency for support to become imbalanced, with assistance concentrated in communities that receive the greatest media coverage while other communities miss out on support entirely. Accordingly, it is necessary to undertake support activities that keep the big picture in mind, ensuring that groups share information with each other and work in partnership with local government.

In Kumamoto, there were groups (hereinafter “intermediate support organizations”) that carried out functions such as liaising and sharing information with NPOs, and coordinating the nature of the activities conducted and the areas in which they were carried out, both at a national and at a prefectural level. These intermediate support organizations held conferences for NPOs to share information with each other and collaboration meetings between NPOs and local government bodies, thereby ensuring that external support groups and local groups worked in partnership in the course of their activities.

From the emergency phase immediately after the disaster occurred to the interim response phase and on through the recovery and reconstruction phases, external support groups drew upon their abundant experience of responding to a variety of disasters as they worked in partnership with local groups. Through this collaboration, the external support groups passed on their know-how to local groups, who gradually took over the support of those affected by the disaster as the situation changed in its aftermath.

b. Building frameworks for partnerships between NPOs and government bodies

In 2015, Japan Voluntary Organizations Active in Disaster (JVOAD), a national intermediate support

organization consisting of NPOs and other bodies, began engaging in activities to provide affected areas with support from a more comprehensive perspective, fulfilling liaison and coordination functions between support organizations and government bodies (at the time of the Kumamoto Earthquake, JVOAD was positioned as a preparatory committee and subsequently became incorporated as a specified nonprofit corporation on November 1, 2016). The Cabinet Office routinely shares information with JVOAD under ordinary circumstances as well.

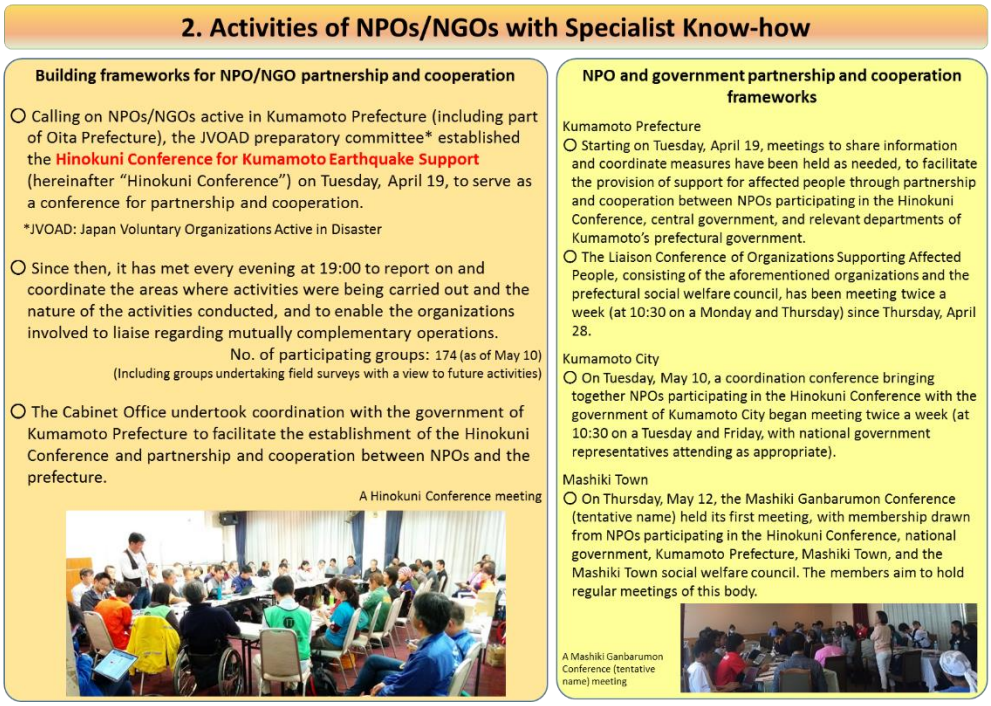
On April 15, 2016, NPO kumamoto, an intermediate support organization based in Kumamoto Prefecture, began coordinating with NPOs within the prefecture, in partnership with JVOAD.

While this collaborative inter-NPO framework was being formed, the Cabinet Office suggested to Kumamoto Prefecture that it should collaborate with these NPOs. Accordingly, NPOs and local government began working in partnership to support those affected by the disaster. From April 19, the Hinokuni Conference for Kumamoto Earthquake Support (hereinafter “Hinokuni Conference”) — a meeting of NPOs to share information — began to be held each evening and the Hinokuni Conference Secretariat was set up in a conference room at Kumamoto Prefectural Office to serve as a hub for NPO collaboration. The Hinokuni Conference not only served as a forum for sharing information about affected areas and evacuation centers, but also facilitated the coordination of efforts by NPOs to complement each other’s activities, as well as offering opportunities for groups that had joined the relief effort at a later stage to obtain information. During the consecutive public holidays in early May, when many NPOs came to the affected areas, over 100 people attended the Hinokuni Conference, facilitating the sharing of information.

Furthermore, from April 25, a partnership meeting attended by representatives of Kumamoto prefectural government, Kumamoto Prefecture Social Welfare Council, and NPOs was held twice a week to facilitate collaboration with local governments and the social welfare council, which was managing disaster VCs. As Kumamoto City is a government ordinance-designated city, similar partnership meetings to those involving the prefecture were launched on May 13, with the participation of the municipal government, Kumamoto City Social Welfare Council, and NPOs. These meetings became established as a means for local governments to share their policies with NPOs, as well as being a means for information about issues at evacuation centers gathered from NPOs to be passed on quickly to local governments. These moves spread to other affected municipalities and resulted in partnership meetings involving the local governments, social welfare councils, and NPOs being held (Figs. 2-2-6 and 2-2-7).

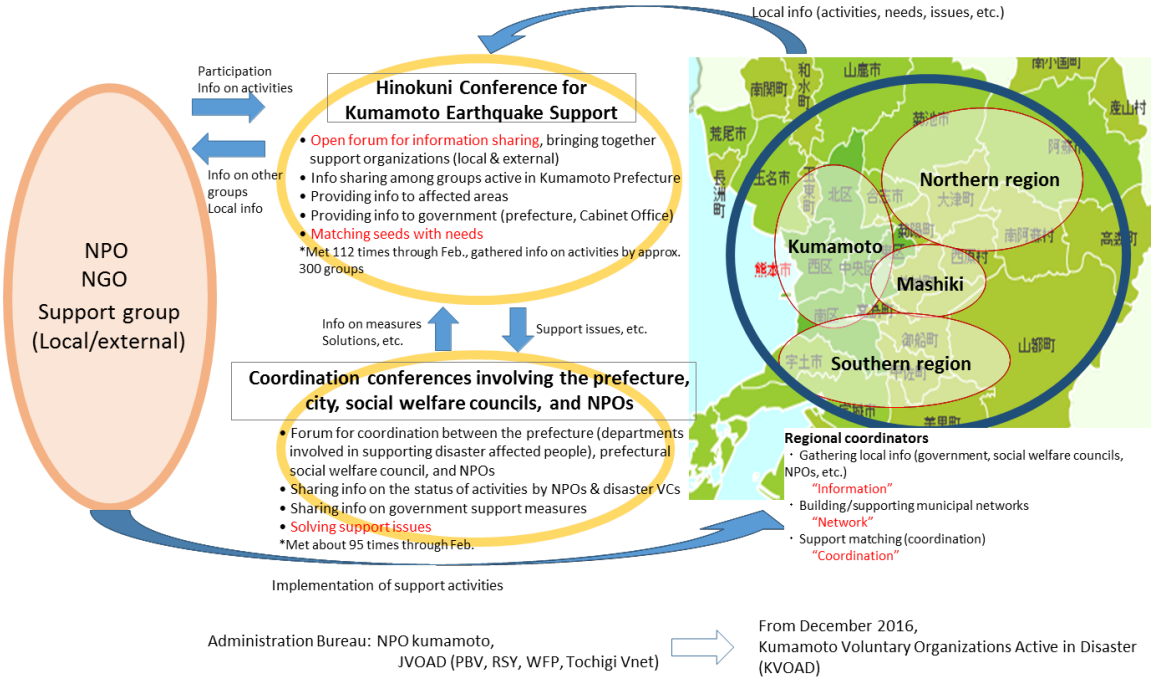
Coordination of areas of activity and activity details at the Hinokuni Conference
(The first example of systematic coordination between different groups while disaster response was underway)

Fig. 2-2-6 Examples of Collaboration Between Government Bodies and NPOs, etc.



Source: Excerpt from materials circulated by the Major Disaster Management Headquarters on May 13, 2016

Fig. 2-2-7 Coordination of Support Following the Kumamoto Earthquake



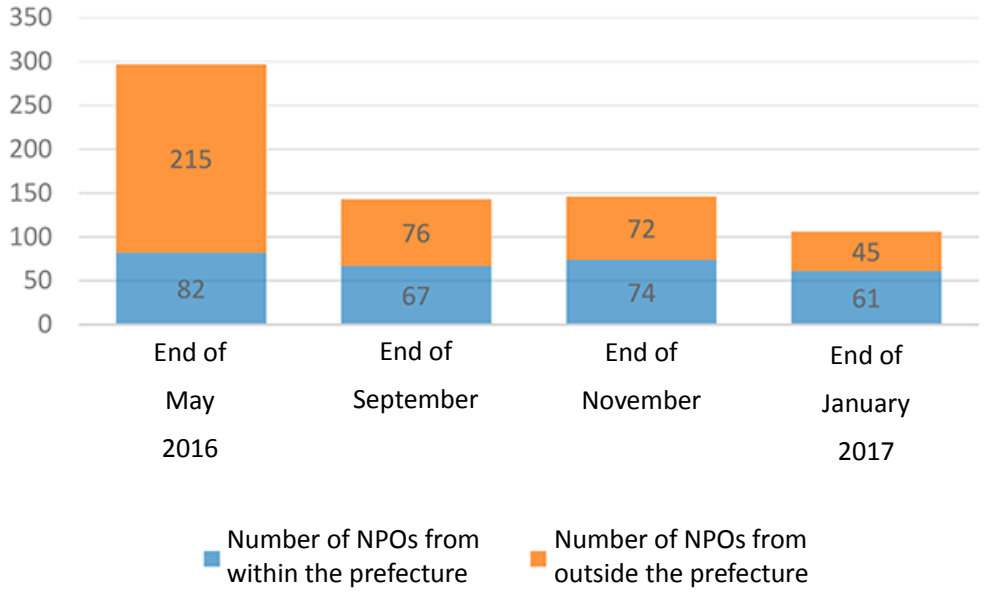
Source: Provided by JVOAD

(iv) Tasks for the Future

While NPOs from across the country that have experience in responding to disaster participate in support activities in affected areas, it is not practical for external support groups to conduct activities in such areas in the long term (Fig. 2-2-8). It is expected that local groups, which have difficulty in carrying out activities in the immediate aftermath of a disaster or which have little experience of disaster response because they usually conduct activities in other areas, will gradually come to play a central role in activities. For example, if the situation has reached the stage at which evacuation centers are being closed and those unable to return home are transitioning to temporary housing or provisional temporary housing, support rooted in the local community is required and the "localization" of support becomes more desirable. Kumamoto Voluntary Organizations Active in Disaster (KVOAD) was established to facilitate this kind of community-based support (initial meeting of association members held October 2016, incorporated as a specified nonprofit corporation in April 2017), with organizations such as NPO kumamoto and Junior Chamber International Kumamoto playing a central role. KVOAD worked in partnership with community mutual support centers and assisted with activities to support tenants of temporary housing or provisional temporary housing, with the aim of building networks between various groups and strengthening collaboration between the bodies involved.

Sharing information regularly under normal circumstances is crucial to facilitating collaboration between NPOs and local government bodies. In February 2017, the Fire and Disaster Management Agency held the Training Course on Enhancing the Environment for Disaster Volunteer Activities, which was attended by prefectural government officials, among others. The speakers included a representative of Kumamoto Prefecture, who talked about cooperation between local government and disaster volunteers in the wake of the Kumamoto Earthquake, based on real examples of collaboration measures implemented by the Hinokuni Conference. Going forward, it would be desirable to hold more training courses of this nature and establish specific forums for exchange, as well as rolling out initiatives focused on gathering and sharing examples of best practice, and facilitating more in-depth collaboration between NPOs and local government bodies in each prefecture.

Fig. 2-2-8 Changes in the Number of NPOs Following the Kumamoto Earthquake



Source: Produced by the Cabinet Office from materials supplied by JVOAD and KVOAD

Outdoor reading area set up by an NPO (Grandmesse Kumamoto)

Source: Provided by Shapla Neer = Citizens' Committee in Japan for Overseas Support

NPO volunteers serve coffee

(Grandmesse Kumamoto; April 29, 2016)

(3) Self-help/Mutual Support Initiatives

Following the Kumamoto Earthquake, self-help and mutual support initiatives formed the basis for rescue activities and the running of evacuation centers. For example, prior to the earthquake, there were concerns that Nishihara Village in Kumamoto Prefecture could be cut off in the event of disaster, because of its location which is immediately above an active fault. Accordingly, local volunteer fire corps undertook consultations under normal circumstances regarding measures in case the community became isolated. These preparations were put into action at the time of the Kumamoto Earthquake, with volunteer fire corps in the village confirming the safety of the villagers and rescuing those who were trapped under collapsed houses, before rescue teams from outside the village arrived. In running evacuation centers, villagers themselves shared out responsibility for tasks such as providing food and first aid, undertaking these independently. Other self-help and mutual support initiatives included villagers procuring foodstuffs unaided (Fig. 2-2-9). Similarly, in Mifune Town, Kumamoto Prefecture, local citizens autonomously ran their evacuation centers (Figs. 2-2-10 to 2-2-12).

As described in detail in Chapter 2 2-2 (2), new activities were undertaken by NPOs working in partnership with local governments in the aftermath of the Kumamoto Earthquake, providing a renewed awareness of the power of disaster management volunteers and NPOs.

Thus, self-help by individual citizens and mutual support within the context of community, corporate, and volunteer frameworks can address key areas that cannot be fully covered by public support from local government bodies. Accordingly, it is essential to facilitate coordination between self-help, mutual support, and public support, striking the right balance, in order to improve the overall disaster management capability as a nation.

As such, the Cabinet Office is promoting self-help and mutual support initiatives, such as efforts to enhance the environment for activities by disaster management volunteers and NPOs, and the widespread formulation of Community Disaster Management Plans (see Part I, Chapter 1, Section 1-4 (1)), under which communities identify and share information about local disaster management issues, make preparations to address them, and take steps in the event of a disaster, including emergency response, and various activities during the recovery and reconstruction period.

Fig. 2-2-9 Example of Food Procurement with the Citizens' Own Initiatives

(L) Foodstuffs contributed by local people. The rule that people should bring the food that they had in the event of a disaster had been considered beforehand.
(R) A changing room built by a local carpenter after hearing that female evacuees were in need of a place where they could get changed at the evacuation center.

Source: Provided by Mayumi Sakamoto, Associate Professor, Graduate School of Disaster Resilience and Governance, University of Hyogo (explanations also provided by Associate Professor Sakamoto)

Fig. 2-2-10 Example of an Evacuation Center Managed Autonomously by Local Citizens

<Mifune Town: Evacuation center run autonomously at Ozaka Elementary School>

- Once the floor is dirty, people stop abiding by the rule prohibiting shoes to be worn, so the floors around the entrance and exit were kept clean to naturally encourage people to change between outdoor and indoor shoes
- Toilets were kept scrupulously clean to prevent infectious disease
- Rather than simply labeling children's clothing that arrived among the relief supplies as "for children," the clothes were arranged by size (e.g. 120cm, 130cm, 140cm, etc.)

Orderly arrangement of relief supplies
(Citizens living at the evacuation center came up with the idea that, when accepting relief supplies, they should arrange them so that lightweight items were selected first, with heavy items being chosen last.)

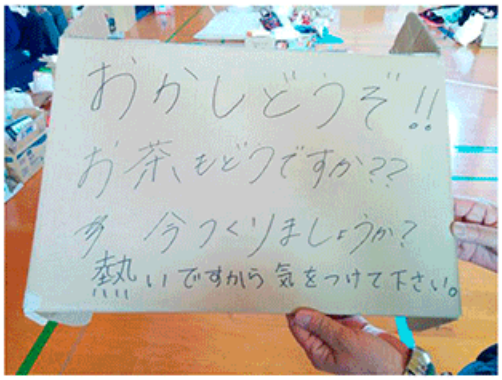
Example of lightweight items
(Moist towelettes)

Example of heavy items
(Water)

At Ozaka Elementary School, Mifune Town (April 29, 2016)

Fig. 2-2-11 Example of Autonomous Participation by Students in Running Evacuation Centers

Junior and senior high school students currently or previously resident at the evacuation center make disinfectant wipes soaked in alcohol



High school students encourage elderly people living at the evacuation center to get together for a cup of tea and a chat (the high school students are also evacuees). With homemade panels in hand, students visit each of the elderly residents of the evacuation center, many of whom spend a great deal of their time asleep.

Evacuees get together for a cup of tea and a chat

Social interaction can stagnate in evacuation centers, because people sleep and spend their time apart from each other, but there were cases in which these conversation groups helped to encourage people to leave their sleeping mats and get together for a chat. In some cases, it was the first time in a long time that people had got up to talk to others.

At Mifune Junior High School (April 29, 2016)

Fig. 2-2-12 Example of Support for Disaster Affected People Provided by Companies Outside the Prefecture

Hair-washing service provided by a business operator from Osaka

Meals served by a major Nagasaki *champon* noodle chain

At Ozaka Elementary School, Mifune Town (April 29, 2016)

2-3 Initiatives Aimed at Securing Temporary Housing

(1) Damage Certification Surveys and Issuance of Disaster Affected Certificate

The Disaster Affected Certificate certifies such matters as the extent of damage to an individual's home resulting from a disaster. It plays an important role in facilitating the smooth and appropriate provision of support to those affected by a disaster, as it is used as basic documentation in the application of support measures, including the provision of livelihood recovery support payments for disaster affected people, emergency repairs of homes, and the allocation of donations, etc. (Fig. 2-3-1).

On April 15, 2016, the Cabinet Office issued a notice to all prefectures in Kyushu and to Ehime Prefecture that they should appropriately take such steps as conducting surveys to certify damage arising from the disaster (hereinafter "damage certification surveys") and issuing disaster affected certificates. Briefings were held for officials in Kumamoto Prefecture on April 20 and in Oita Prefecture on April 21, to facilitate the necessary procedures. Thereafter, the Cabinet Office provided the governments of Kumamoto Prefecture and Oita Prefecture, and municipalities within both prefectures with advice to ensure that damage certification surveys were conducted and disaster affected certificates issued in a timely and appropriate manner (Fig. 2-3-2).

Fig. 2-3-1 Damage Certification Survey and Disaster Affected Certificate Issuance Process

If a disaster occurs within the boundaries of a municipality and affected people by that disaster submits an application, the mayor of that municipality must order a survey of the damage to the house or other form of damage specified by the mayor in question without delay and issue a Disaster Affected Certificate (document certifying the extent of the damage resulting from the disaster in question) (Article 90-2 of the Basic Act on Disaster Management). The Disaster Affected Certificate is widely used as material for determining the applicability of various disaster affected people support measures.

<Process toward the application of support measures>

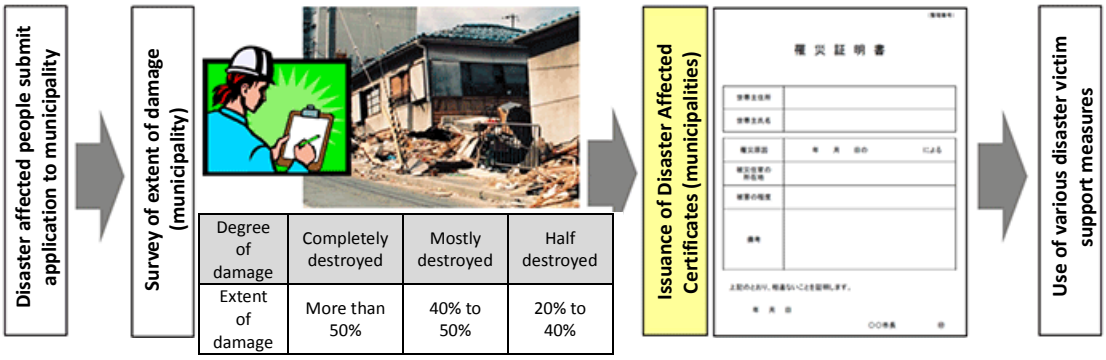


Fig. 2-3-2 Key Cabinet Office Initiatives Relating to Damage Certification Surveys and Issuance of Disaster Affected Certificate (2016)

April 15 "Proper Implementation of Support for Affected People of the 2016 Kumamoto Earthquake" issued
- Appropriately implementing steps such as conducting damage certification surveys and issuing Disaster Affected Certificate

April 20 & 21 Briefings on housing damage certification surveys, etc. held in Kumamoto and Oita prefectures
- Overview and procedure for damage certification surveys and issuance of Disaster Affected Certificates

April 26 "Expediting Damage Certification Surveys and the Issuance of Disaster Affected Certificate Following the 2016 Kumamoto Earthquake" issued
- Providing personnel and technical support for municipalities that had sustained immense damage, and devising ways of expediting the issuance of Disaster Affected Certificate

May 20 "Key Issues for Consideration Regarding Damage Certification Surveys and the Issuance of Disaster Affected Certificates Following the 2016 Kumamoto Earthquake" issued
- Surveys and methods of evaluating damage to homes due to subsidence and slope failure

May 30 "Key Issues for Consideration Regarding Notification of Secondary Surveys for Certification of Damage in Respect of Disaster Affected Certificates" issued
- Notifying disaster affected peoples of secondary surveys, support measures relating to homes whose foundations have been damaged

June 6 "Key Issues for Consideration Regarding Damage Certification Surveys and the Issuance of Disaster Affected Certificates" issued
- Utilization of damage certification standards, handling of the results of judgments

Where applications for certificates had been received by mid-May 2016, it was mostly possible to issue the Disaster Affected Certificate by the end of that month if the individual concerned came to the issuance desk so that they could be informed of the report on the completion of the survey. Looking at the number of Disaster Affected Certificates issued as a percentage of all applications received, approximately 78% had been issued by the end of June 2016, while around 95% had been issued by the end of the following month.

Fig. 2-3-3 shows the number of applications for Disaster Affected Certificates and the number issued in Kumamoto Prefecture as of March 31, 2017 (Disaster Affected Certificates had been issued in response to approximately 96% of applications).

Fig. 2-3-3 Number of Applications for Disaster Affected Certificates and Number Issued in Kumamoto Prefecture

(As of March 31, 2017)

Number of applications (a)	Number issued (b) (b/a)	Completely destroyed	Mostly destroyed	Half destroyed	Significant partial damage
208,983	201,399 (96.4%)	12,492	12,320	53,965	122,622

Source: Excerpt from Kumamoto Prefecture, *Extent of Damage Due to the Kumamoto Earthquake, etc. (Report No. 231)*

(2) Provision of Temporary Housing

In addition to "constructed temporary housing," the menu of options for providing evacuees with emergency temporary housing includes "rented temporary housing," which is housing rented from the private sector, and public housing. Following liaison and coordination with local government bodies both within and outside the prefecture and with the national government, Kumamoto Prefecture progressively provided evacuees with emergency temporary housing, taking into account the overall picture, such as local circumstances and the time that it would take to provide such housing (Fig. 2-3-4).

As of the end of March 2017, 4,303 constructed temporary housing dwellings had been built and approximately 11,000 people had moved into around 4,200 of these. Furthermore, the prefecture had rented

about 14,700 dwellings from the private sector for use as rented temporary housing, into which approximately 34,000 people had moved by this point. In addition, the prefecture was using around 1,300 public housing and national civil servant lodging units to house about 3,000 people (Fig. 2-3-5).

Under the Disaster Relief Act, temporary housing is, in principle, provided to those who have nowhere to live because their houses have been classified as “completely destroyed” and are unable to secure housing with their own financial resources. In cases where homes are classified as “mostly destroyed” or “half destroyed,” such temporary housing may be provided if the damage is equivalent to complete destruction and special circumstances apply.

In Kumamoto, the aftershocks were still continuing intermittently over a month after the April 16, 2016 earthquake. Amid this situation, many citizens felt unable to return to their own homes because of the risk of collapse, so they stayed on amid the inconvenience and psychological anxiety of life at the evacuation centers. Accordingly, the Cabinet Office issued Kumamoto Prefecture with a notice containing more specific, user-friendly instructions regarding eligibility for emergency temporary housing, to encourage its provision in an appropriate manner.

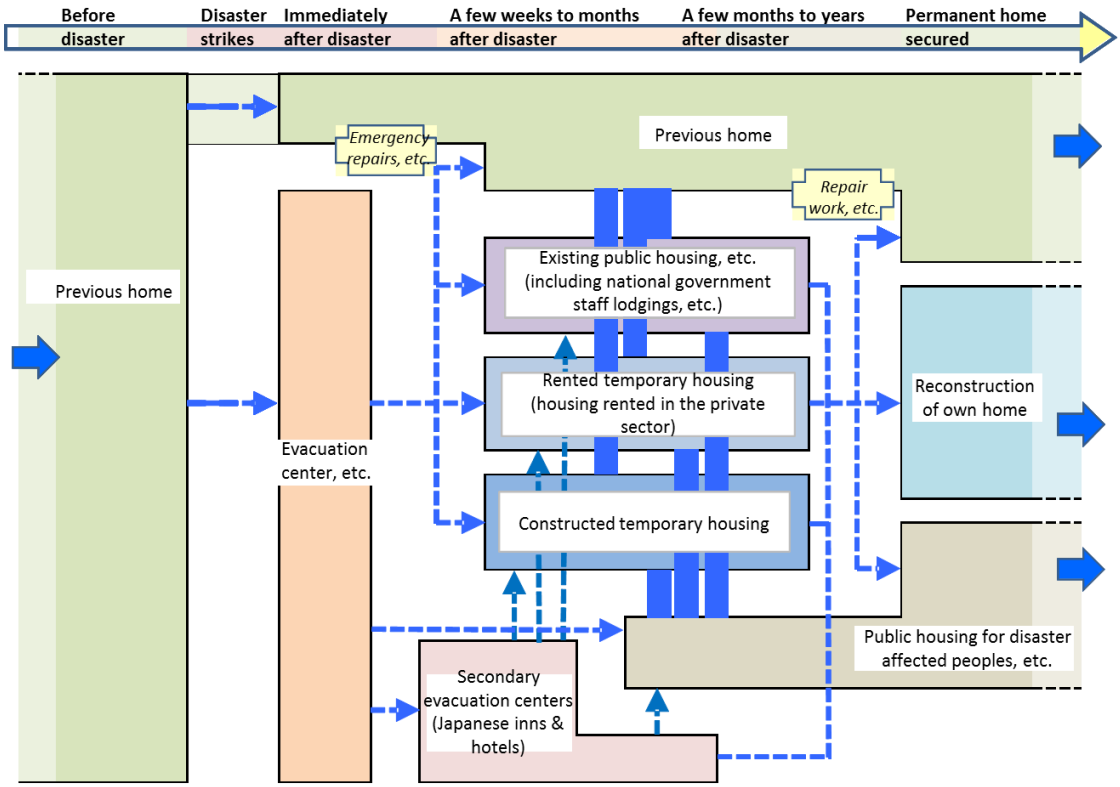
In the constructed temporary housing category, the prefecture offered not only conventional prefabricated temporary housing, but also wooden temporary housing built from timber originating in Kumamoto Prefecture and accessible temporary housing suitable for wheelchair users.

With aftershocks continuing, many of those affected by the disaster were forced to continue living in evacuation centers, so the need to secure interim housing for them was deemed to be particularly urgent. As such, the following special measures were taken in relation to rented temporary housing.

i) The National Treasury bore part of the cost of repairing private rental housing damaged by the earthquake, if it was then made available for use as temporary housing.

ii) Since some areas which did not have enough properties suitable for families, but had a surplus of studio and studio + kitchen properties, it was permitted that a single household could stay in multiple dwellings, as appropriate to the circumstances of those affected by the disaster and the local community.

Fig. 2-3-4 Housing After a Disaster



Source: Cabinet Office

Example of constructed temporary housing (wooden)

Example of constructed temporary housing (accessible housing suitable for wheelchair users)

Fig. 2-3-5 Status of Emergency Temporary Housing, etc.

Type	Number of dwellings occupied
Constructed temporary housing	4,179 dwellings
Rented temporary housing	14,705 dwellings
Public housing & housing for national civil servants, etc.	1,327 dwellings

Source: Kumamoto Prefecture (as of March 31, 2017)

2-4 Initiatives for the Transport of Relief Supplies

(1) Provision of Supplies via Push-mode Support

In light of the fact that successive earthquakes with a maximum seismic intensity of 7 centered on Mashiki Town, Kumamoto Prefecture occurred within a short period, then Minister of State for Disaster Management Taro Kono and Governor of Kumamoto Prefecture Ikuo Kabashima held a videoconference in the early hours of April 16, 2016, during which Governor Kabashima requested that the national government provide and manage supplies. In response to this request, the government set up a supplies procurement and transport team within the Major Disaster Management Headquarters executive office at 05:00 on April 16, which provided support in the area of supplies.

To get this process underway, the relevant ministries and agencies met to ensure national coordination and then, for the first time, provided "push-mode support," which involved procuring and transporting supplies without waiting for requests from affected areas (Fig. 2-4-1). Between April 17 and 22, the government supplied food sufficient for approximately 1.85 million meals and a large number of daily necessities, including underwear, face masks, and toilet necessities (Fig. 2-4-2).

By April 23, an adequate quantity of supplies had reached evacuation centers, so the government switched to "pull-mode support," which involves procuring and transporting supplies tailored to the diverse needs of evacuees. In Kumamoto, tablet devices and the like were used to ascertain the needs of evacuees (Fig. 2-4-4), enabling finely tuned support to be provided.

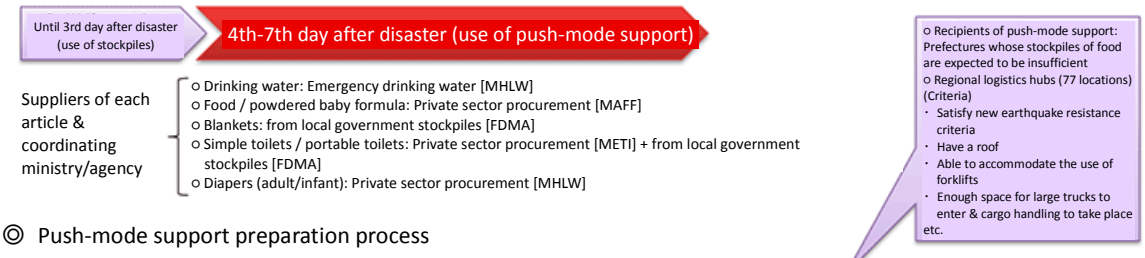
By May 6, food sufficient for approximately 2.78 million meals had been supplied following the Kumamoto Earthquake, through a combination of push- and pull-mode support (Figs. 2-4-2 and 2-4-3). The provision of push-mode support for the first time, based on the lessons learned from the Great East Japan Earthquake and other past disasters, proved to be an effective initial response.

In December 2016, a system designed to facilitate the smooth sharing of information about requests for and the procurement and transportation of supplies between national and prefectural governments began operating (Fig. 2-4-5).

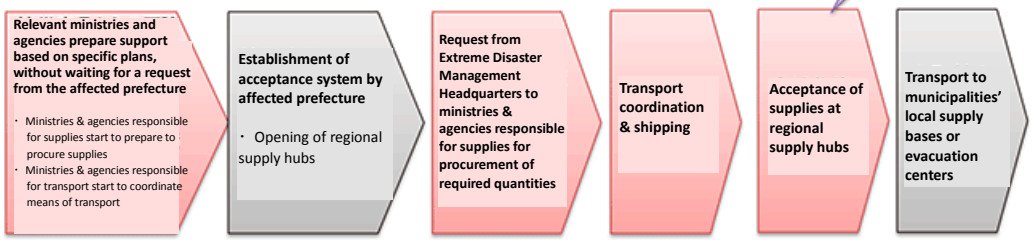
Fig. 2-4-1 Pull- and Push-mode Support in the Provision of Supplies

<Overview of the plan for the procurement of supplies in the event of a major earthquake (reference: Nankai Trough Earthquake)>

◎ Approach to the procurement of supplies



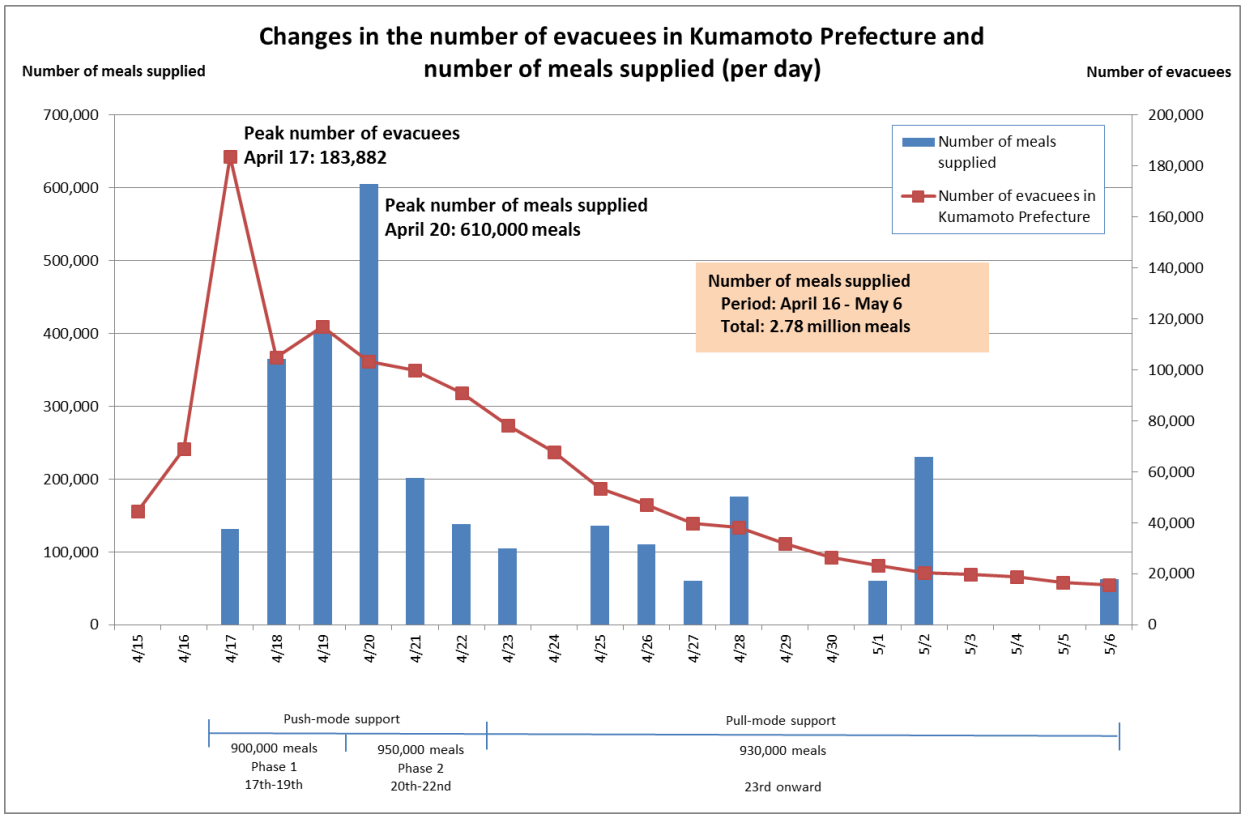
◎ Push-mode support preparation process



The two systems, pull- and push-mode support, are available for providing relief supplies in the event of disaster. Pull-mode support involves the procurement and transport of supplies in response to specific requests (a list of items required, etc.) from affected areas. Virtually all of the support at the time of the 2011 Great East Japan Earthquake was pull-mode support. While pull-mode support entails less waste in the procurement of supplies than push-mode support, it has the downside that procurement and transport take time, so the delivery of supplies can be delayed. When a disaster first occurs, it takes affected local governments time to ascertain accurate information and the ability of the private sector to secure supplies is also impeded, so disaster-affected local governments alone will likely not be able to quickly procure the supply volumes needed.

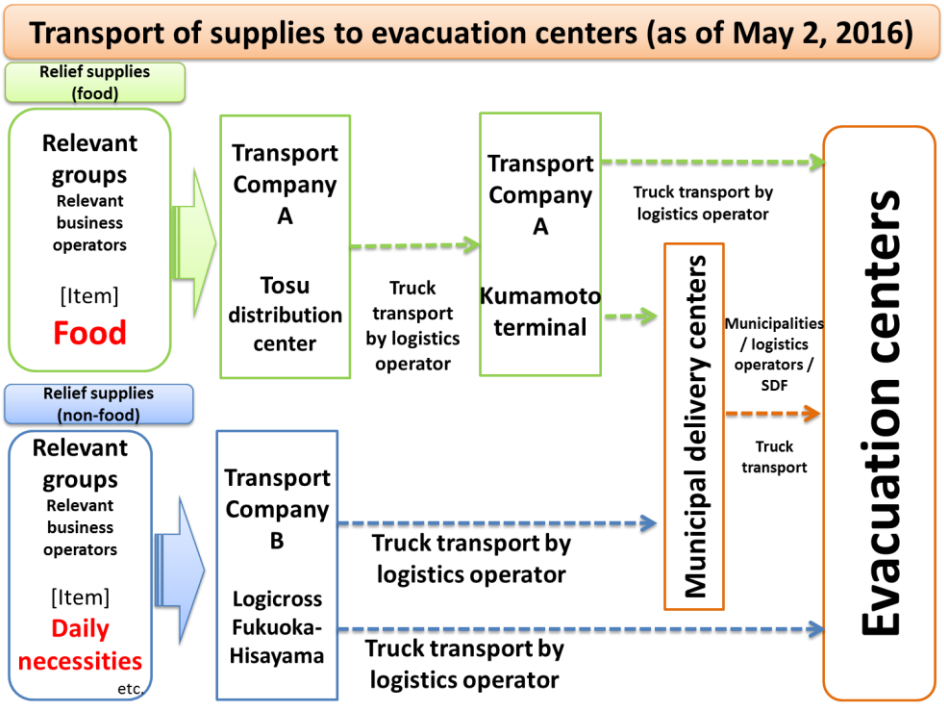
Source: Cabinet Office

Fig. 2-4-2 Number of Evacuees in Kumamoto Prefecture and Number of Meals Supplied



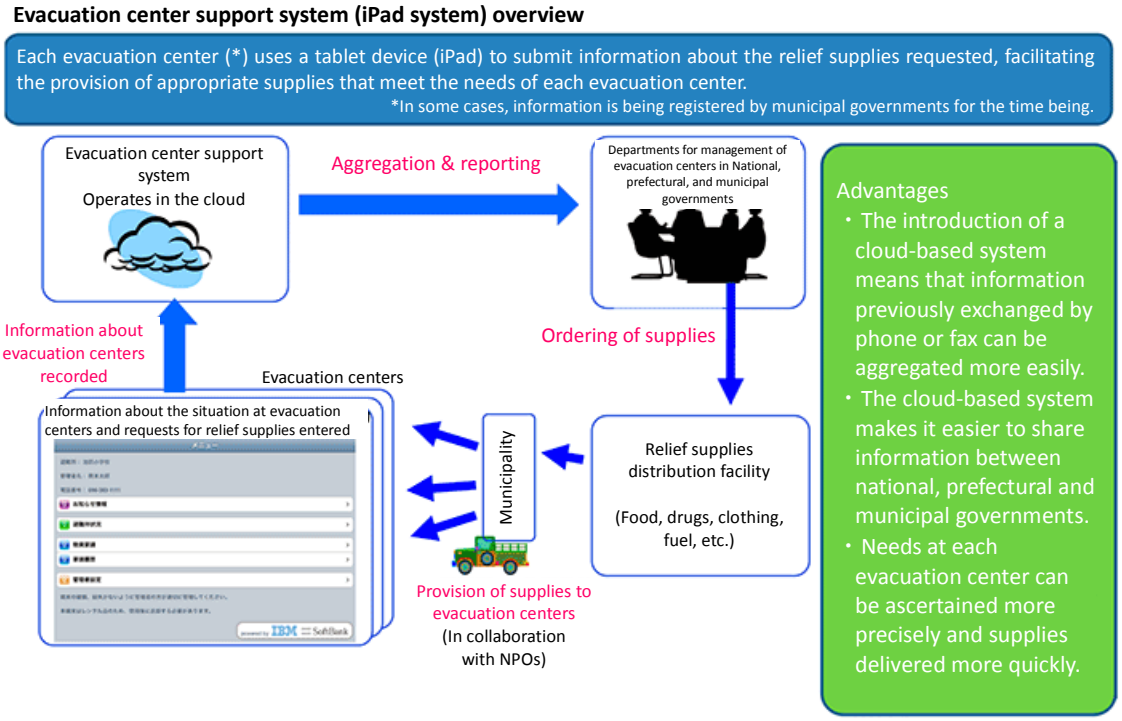
Source: Cabinet Office

Fig. 2-4-3 Transport Routes to Evacuation Centers for Supplies Provided as Push-mode Support Following the Kumamoto Earthquake (overview as of May 2, 2016)



Source: Cabinet Office

Fig. 2-4-4 Tablet-based Evacuation Center Support System

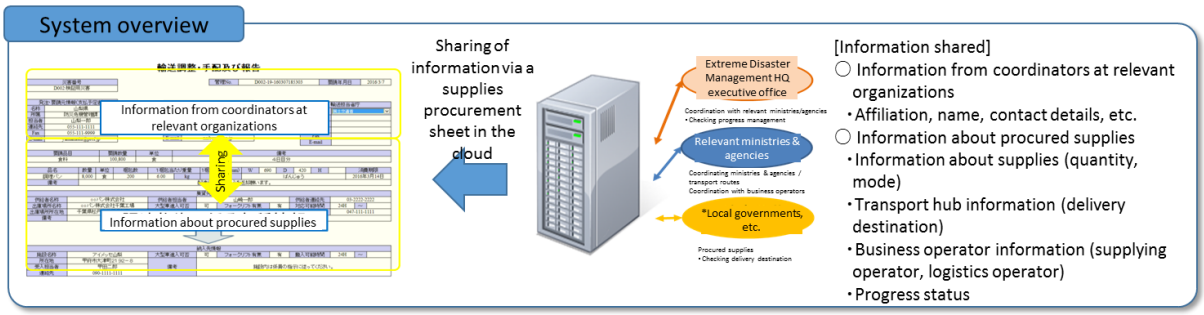


Source: Excerpt from materials circulated at the 16th meeting of the National On-site Disaster Management Headquarters / 19th meeting of the Kumamoto Prefecture Disaster Response Headquarters (April 25)

Fig. 2-4-5 System for Facilitating Information Sharing

Support system for the procurement of supplies and transport based on the system used after the Kumamoto Earthquake

○ The aim of this system is, in the wake of a major earthquake, to promote the efficient coordination of relief supplies procurement and transport between the executive office of the Major (Extreme) Disaster Management Headquarters set up by the government, relevant ministries and agencies, and affected local governments, and support the swift delivery of those supplies to affected areas.



⇒ System for sharing information between national and prefectural governments begins operating in early December 2016

○ In the next fiscal year, the system will be enhanced to allow sharing of information about municipal supply bases and dispatch of supplies to evacuation centers between natural, prefectural, and municipal governments.
It is envisaged that the system will be able to be used on tablet devices as well.

Source: Cabinet Office

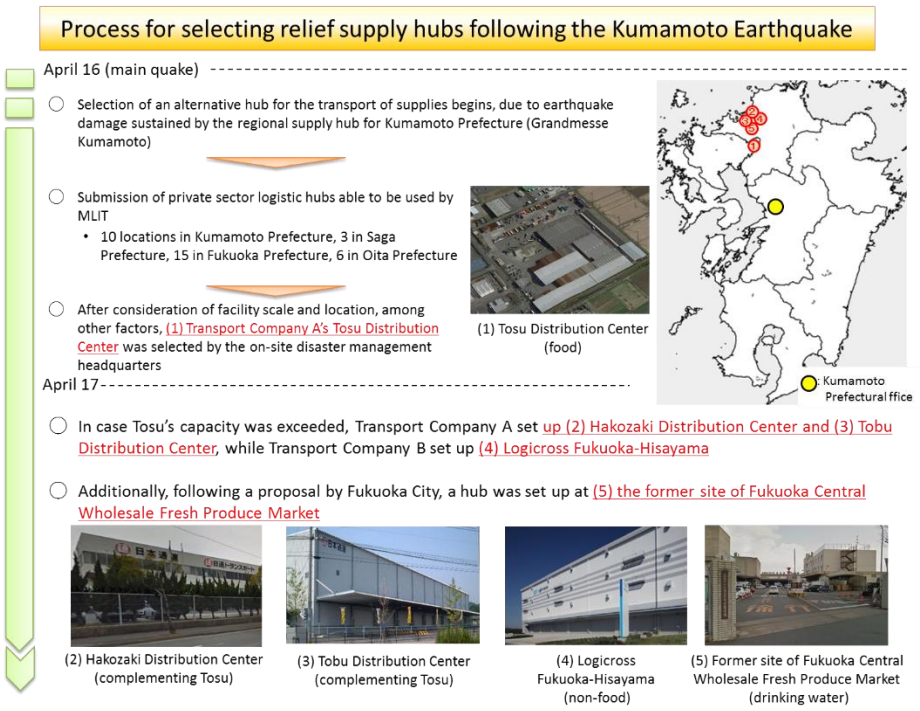
(2) Use of Private Sector's Logistic Hubs

The Kumamoto Earthquake damaged and rendered unusable many facilities that had been registered as prefectural supply hubs for storing relief supplies from the national government and delivering them to municipal supply bases and evacuation centers.

Accordingly, with the cooperation of private sector logistics operators, distribution centers in first Tosu City, Saga Prefecture, and then Hisayama Town, Fukuoka Prefecture were used for shipping supplies to municipal supply bases and evacuation centers, with the assistance of those logistics operators and the Self-Defense Forces (Fig. 2-4-6).

As the extent of a disaster could determine whether or not supply hubs managed by private sector logistics operators need to be used in this way, the *Handbook on the Opening and Management of Regional Supply Hubs* was revised from this perspective in March 2017.

Fig. 2-4-6 Process for Selecting Relief Supply Hubs Following the Kumamoto Earthquake



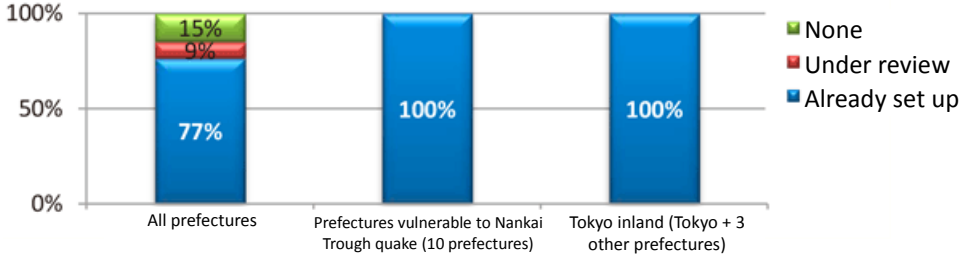
Source: Cabinet Office

Column: Results of a Questionnaire Concerning Supply Hubs

Various problems have been experienced in the establishment and management of prefectural and municipal bases for relief supplies. Accordingly, the Cabinet Office conducted a survey in October 2016, to discover more about the designation of disaster supply hubs by local governments nationwide, especially areas likely to be affected by Nankai Trough earthquake or Tokyo inland earthquake.

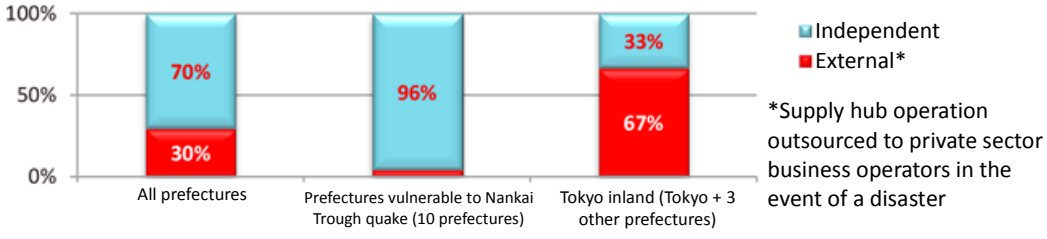
(a) Designation of regional supply hubs by prefectures

- 77% of prefectural regional logistics hubs have been designated (established), while 9% are under review (designation is being considered) from the perspective of the use of private sector facilities or their location, due to earthquakes or other issues.
- The ten prefectures vulnerable to Nankai Trough earthquake and Tokyo and the other 3 prefectures that would be affected by a Tokyo inland earthquake have designated all of their logistics hubs.



(b) Operation of regional logistics hubs

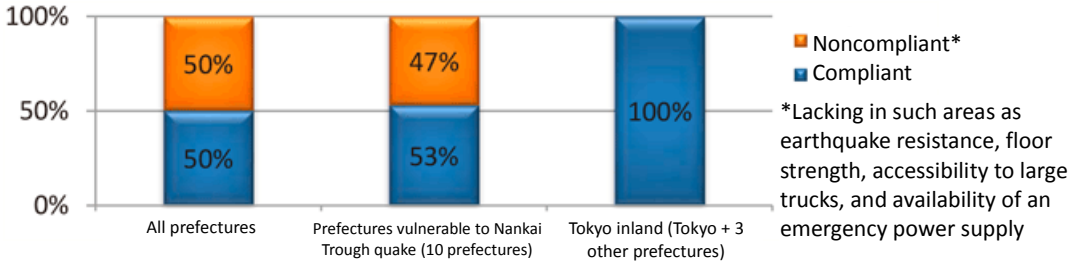
- Among the four prefectures that would be affected by a Tokyo inland earthquake, 67% of regional logistics hubs are due to be operated by private sector business operators.



*Supply hub operation outsourced to private sector business operators in the event of a disaster

(c) Safety of regional supply hubs

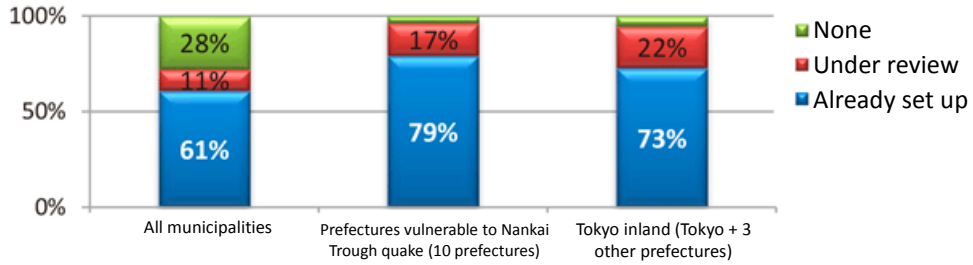
・50% of regional supply hubs nationwide and 47% of regional logistics hubs in prefectures vulnerable to Nankai Trough earthquake lacked adequate earthquake resistance or floor strength, were inaccessible to large trucks, or had other deficiencies in such areas as availability of an emergency power supply.



(d) Designation of local logistics bases by municipalities

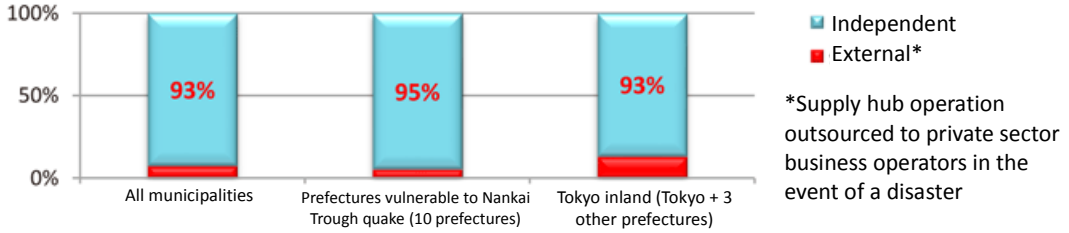
・61% of municipal local logistics bases have been designated, while 11% are under some kind of review in light of issues following the Kumamoto Earthquake.

・Among these, 79% of municipalities in prefectures vulnerable to Nankai Trough earthquake and 73% of municipalities in Tokyo and the 3 other prefectures that would be affected by a Tokyo inland earthquake have designated their logistics bases.



(e) Operation of local logistics bases by municipalities

・Most municipalities plan to operate their local logistics bases independently, with just 7% of municipalities nationwide planning to outsource their operation to private sector business operators.



<Glossary of Terms>

Regional logistics hub:

Hubs at which affected prefectures accept supplies coordinated by the government and dispatch them to local logistics bases and evacuation centers established by each municipality.

Prefectures vulnerable to Nankai Trough earthquake:

The 10 prefectures (Shizuoka Prefecture, Aichi Prefecture, Mie Prefecture, Wakayama Prefecture, Tokushima Prefecture, Kagawa Prefecture, Ehime Prefecture, Kochi Prefecture, Oita Prefecture, and Miyazaki Prefecture) that would be expected to suffer immense damage beyond the response capabilities of police and firefighting organizations within the affected areas, based on the damage estimates for Nankai Trough earthquake (August 2012, Working Group on Measures to Deal with Nankai Trough Megathrust Earthquake).

Tokyo and 3 other prefectures that would be affected by a Tokyo inland earthquake:

The prefectures that would be expected to suffer immense damage in the event of a Tokyo inland earthquake (Saitama Prefecture, Chiba Prefecture, Tokyo, Kanagawa Prefecture).

2-5 Corporate Business Continuity Initiatives

In the aftermath of a disaster, it is necessary not only to enable those affected to rebuild their lives as soon as possible, but also to ensure that business activities return to normal without delay, to facilitate recovery and reconstruction. Accordingly, corporate business continuity initiatives aimed at minimizing the damage caused by a disaster and facilitating swift recovery in the event of any damage or implementing alternative measures are crucial. In March 2017, the Cabinet Office conducted a questionnaire- and interview-based survey mainly focused on the extent of the damage suffered by affected companies in Kumamoto Prefecture, to discover more about companies' business continuity initiatives and learn lessons from them (Survey of the Impact of the Kumamoto Earthquake on Business Continuity for Companies (June 2017); hereinafter the "Business Continuity Survey.") The following provides a broad overview of company circumstances, based on the Business Continuity Survey, among other information.

(1) Overview

(i) General outline of companies

According to the basic survey in the 2014 Economic Census, there were 47,916 companies (total for private enterprises, corporations, and juridical persons other than these; Fig. 2-5-1) headquartered within the area of Kumamoto Prefecture defined as the "affected area" (Fig. 2-5-4). The Business Continuity Survey drew upon a "private sector survey" (see p. 41 <Definitions for the Business Continuity Survey> for definitions).

According to the private sector survey, at least 15,845 companies nationwide located outside the affected area have a business relationship (are "companies with a business relationship" (see p. 41 for definitions)) with "companies in the affected area" (see p. 41 for definitions) (16,509 companies) (Fig. 2-5-2). Fig. 2-5-3 shows their regional distribution.

Fig. 2-5-1 Location of Head Office of Companies (Government Statistics)

Location of head office	Number of companies	Share	Net sales (100 million yen)	Total production within the prefecture (100 million yen)
Affected area	47,916	1.2%	65,278	—
Kumamoto Prefecture (including the affected area)	58,158	1.4%	74,207	55,664
Kyushu & Okinawa	479,861	11.7%	705,130	477,869
Nationwide	4,098,284	100%	13,777,208	(Total for all prefectures) 5,086,456

Source: Number of companies and net sales are taken from the 2014 Economic Census basic survey (Ministry of Internal Affairs and Communications). Total production within the prefecture is taken from the FY2013 Annual Report on Prefectural Accounts (Cabinet Office). Figures for net sales cover those companies that provided figures for the necessary items.

Fig. 2-5-2 Location of Head Office of Companies (Private Sector Survey)

Location of head office	No. of companies	Share
Affected area	16,509	1.1%
Kumamoto Prefecture (including the affected area)	19,680	1.3%
Kyushu & Okinawa	167,645	11.2%
Nationwide	1,497,322	100%

Source: Private sector survey (results of a survey by Tokyo Shoko Research, Ltd. as of February 2017)

Fig. 2-5-3 Location of Head Office of Companies with a Business Relationship

	No. of companies	Share
Hokkaido & Tohoku	375	2.4%
Kanto	3,547	22.4%
Chubu	1,006	6.3%
Kinki	1,858	11.7%
Chugoku & Shikoku	851	5.4%
Kyushu & Okinawa (excluding Kumamoto)	6,632	41.9%
Kumamoto (excluding the affected area)	1,576	9.9%
Total	15,845	100%

Source: Private sector survey (results of a survey by Tokyo Shoko Research, Ltd. as of February 2017)

Fig. 2-5-4 Area of Focus of the Business Continuity Survey, etc. in regard to the Extent of the Damage (Affected Area)

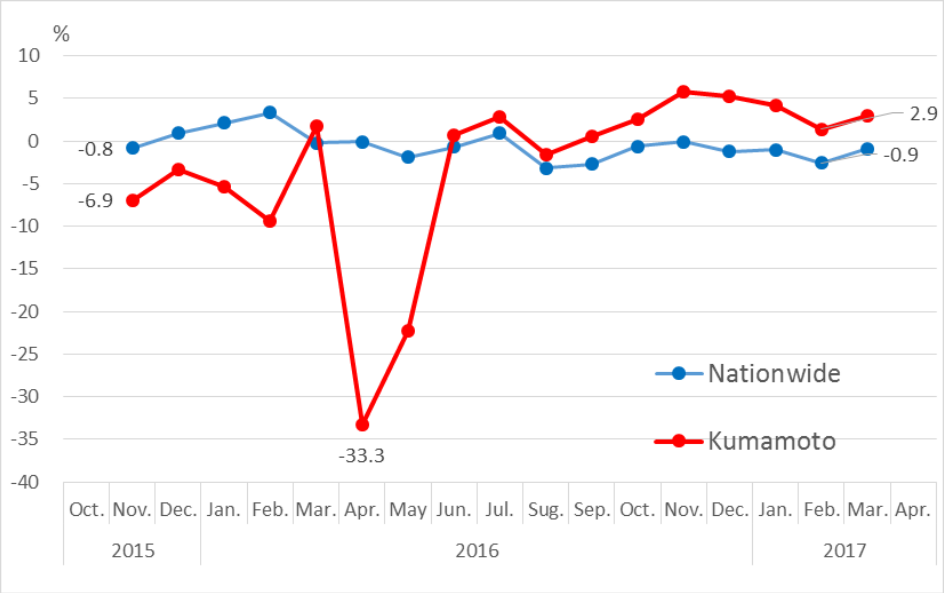
(See p. 41 for names of municipalities.)

(ii) General outline of the economy

An indicator that provides a broad overview of consumer spending in Kumamoto Prefecture is the value of sales at department stores and supermarkets on a store-wide basis compared with the same month of the previous year. In April 2016, when the Kumamoto Earthquake struck, this indicator fell by more than 30% from the same month of the previous year. Sales remained down thereafter, tracking between 1.6% and 5.8% lower than the same month of the previous year from June onward (Fig. 2-5-5).

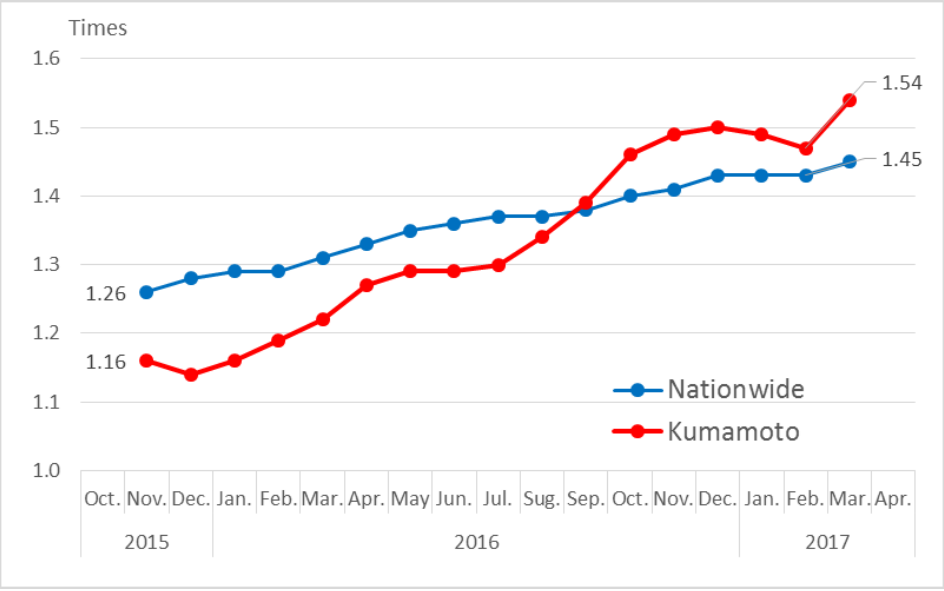
Although the ratio of active job openings to applicants (active opening ratio) in Kumamoto Prefecture was lower than the national figure through August 2016, it has been higher than the national figure since September 2016 (Fig. 2-5-6).

Fig. 2-5-5 Value of Department Store and Supermarket Sales Compared with the Same Month of the Previous Year



Source: Current Survey of Commerce (Ministry of Economy, Trade and Industry)

Fig. 2-5-6 Active Opening Ratio

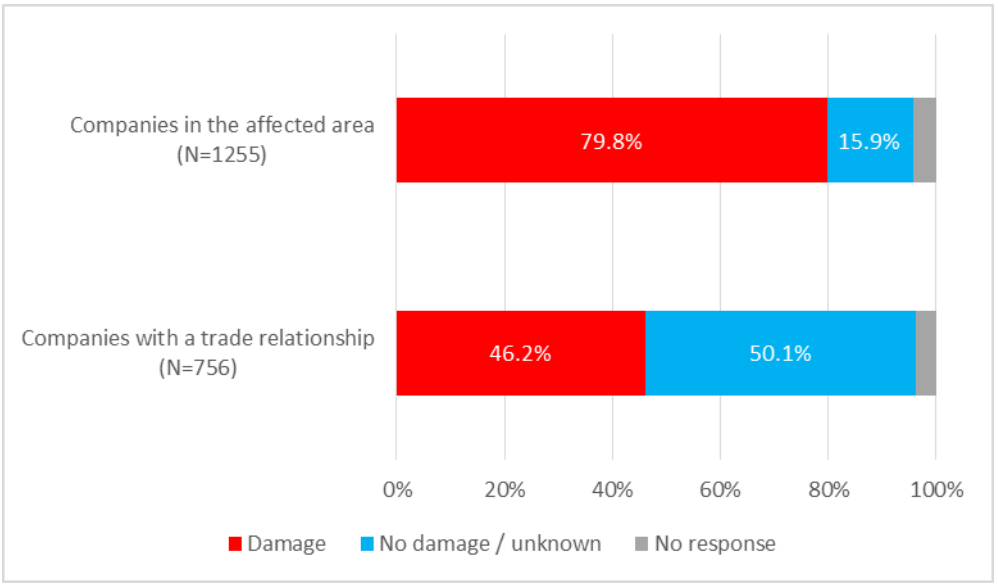


Source: Employment Referrals for General Workers (Report on Employment Service) (Ministry of Health, Labour and Welfare)

(2) Extent of the Damage to Companies

According to the Business Continuity Survey, approximately 80% of "companies in the affected area" suffered "some kind of damage" (see p. 41 for definitions), while approximately 46% of "companies with a trade relationship" suffered "some kind of damage" (Fig. 2-5-7).

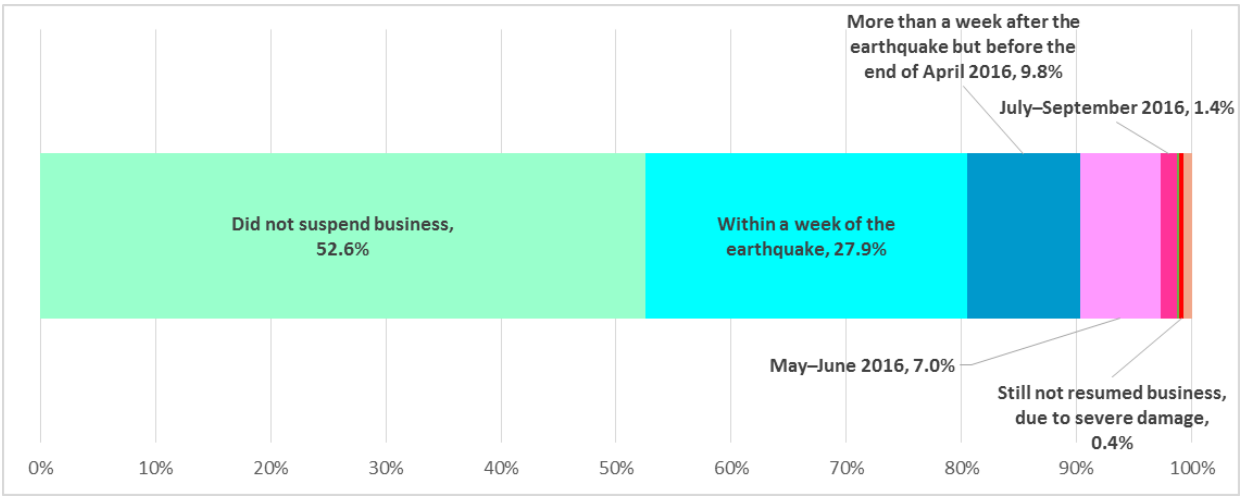
Fig. 2-5-7 Extent of Damage



Source: Produced by the Cabinet Office from Survey of the Impact of the Kumamoto Earthquake on Business Continuity for Companies (June 2017)

When "companies in the affected area" that had suffered some kind of damage were asked about the timing of their resumption of business in the wake of the earthquake, approximately 80% replied that they "did not suspend business" or resumed business "within a week of the earthquake." On the other hand, some companies responded that they have "still not resumed business, due to severe damage" (Fig. 2-5-8).

Fig. 2-5-8 Timing of the Resumption of Business by "Companies in the Affected Area" that Suffered "Some Kind of Damage" (N=1002)

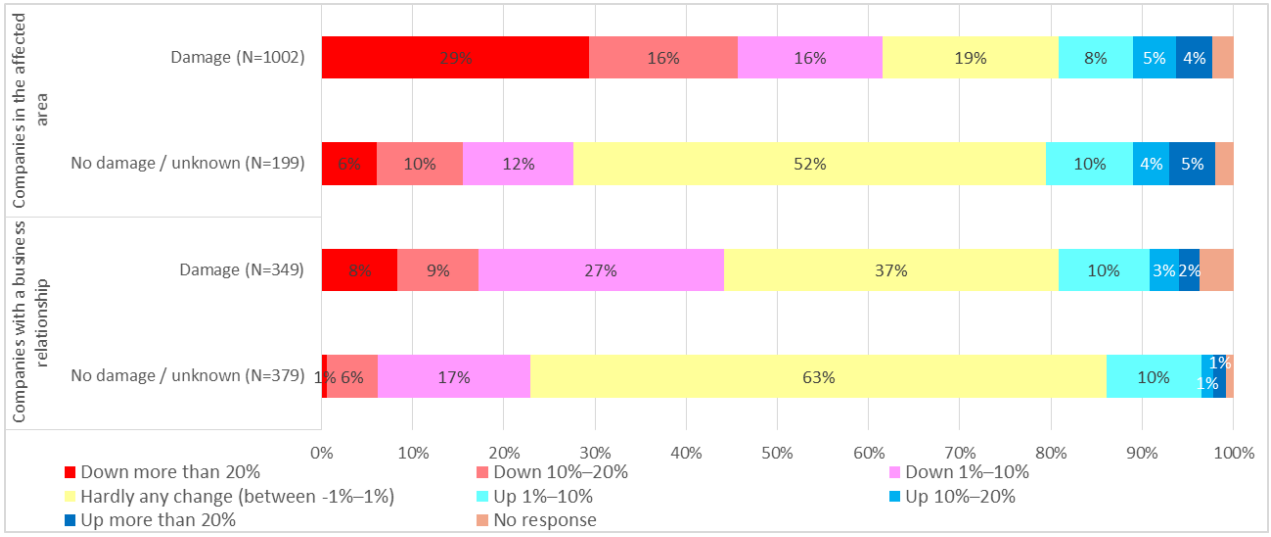


Source: Produced by the Cabinet Office from Survey of the Impact of the Kumamoto Earthquake on Business Continuity for Companies (June 2017)

When “companies in the affected area” were asked about their net sales between April and June 2016 (the first quarter of the fiscal year), at least 60% of companies that had suffered some kind of damage stated that net sales were down from the previous year, with almost 30% reporting a fall in excess of 20%. On the other hand, among companies that did not suffer any damage, at least 70% stated that the fluctuation had been within 10% of the figure for the previous year (Fig. 2-5-9).

Moreover, approximately 40% of “companies with a business relationship” that had suffered some kind of damage reported that their net sales for the period April to June 2016 had declined.

Fig. 2-5-9 April–June 2016 Net Sales of “Companies in the Affected Area” and “Companies with a Business Relationship”

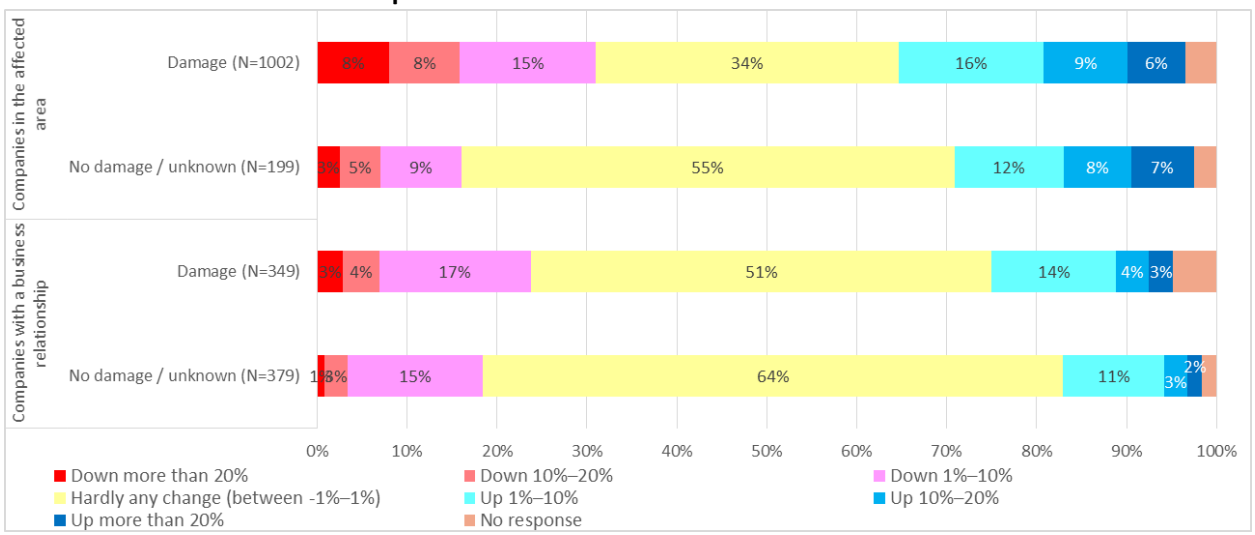


Source: Produced by the Cabinet Office from Survey of the Impact of the Kumamoto Earthquake on Business Continuity for Companies (June 2017)

Looking at net sales between October and December 2016 (the third quarter of the fiscal year) among “companies in the affected area,” around 8% of companies that had suffered some kind of damage reported having seen a fall in excess of 20%; when companies that reported a fall of more than 10% were included, the percentage of companies rose to just under 20% (Fig. 2-5-10).

It is observed that the difference in the extent of the decline in sales between companies that suffered damage and those that did not has decreased among both “companies in the affected area” and “companies with a business relationship” compared with the situation in the April–June period (first quarter).

Fig. 2-5-10 October–December 2016 Net Sales of "Companies in the Affected Area" and "Companies with a Business Relationship"



Source: Produced by the Cabinet Office from Survey of the Impact of the Kumamoto Earthquake on Business Continuity for Companies (June 2017)

(3) Business Continuity Initiatives

(i) Results of the Business Continuity Survey

(Companies surveyed)

Fig. 2-5-11 shows the number of completed questionnaires returned in this Business Continuity Survey. The distribution of company scale should be noted when looking at figures from the Business Continuity Survey.

Fig. 2-5-11 Return of Questionnaires in the Business Continuity Survey

Company scale / Classification	Total	Large corporations (Stated capital of ¥1 billion or more)	Second-tier corporations (Stated capital of ¥100 million or more, 100 or more employees, etc.)	Medium-sized companies (Stated capital of ¥100 million or more, fewer than 100 employees, etc.)	SMEs (Those not in the 3 groups to the left)
Total	5,000 (100%)	1,351 (27%)	600 (12%)	263 (5%)	2,786 (56%)
	2,011 (100%)	**428** (21%)	**179** (9%)	**90** (4%)	**1,314** (65%)
	40%	32%	30%	34%	47%
Companies in the affected area	2,500 (100%)	20 (1%)	45 (2%)	66 (3%)	2369 (95%)
	1,255 (100%)	10 (1%)	14 (1%)	33 (3%)	1198 (95%)
	50%	50%	31%	50%	51%
Companies with a business relationship	2,500 (100%)	1,331 (53%)	555 (22%)	197 (8%)	417 (17%)
	756 (100%)	418 (55%)	165 (22%)	57 (8%)	116 (15%)
	30%	31%	30%	29%	28%

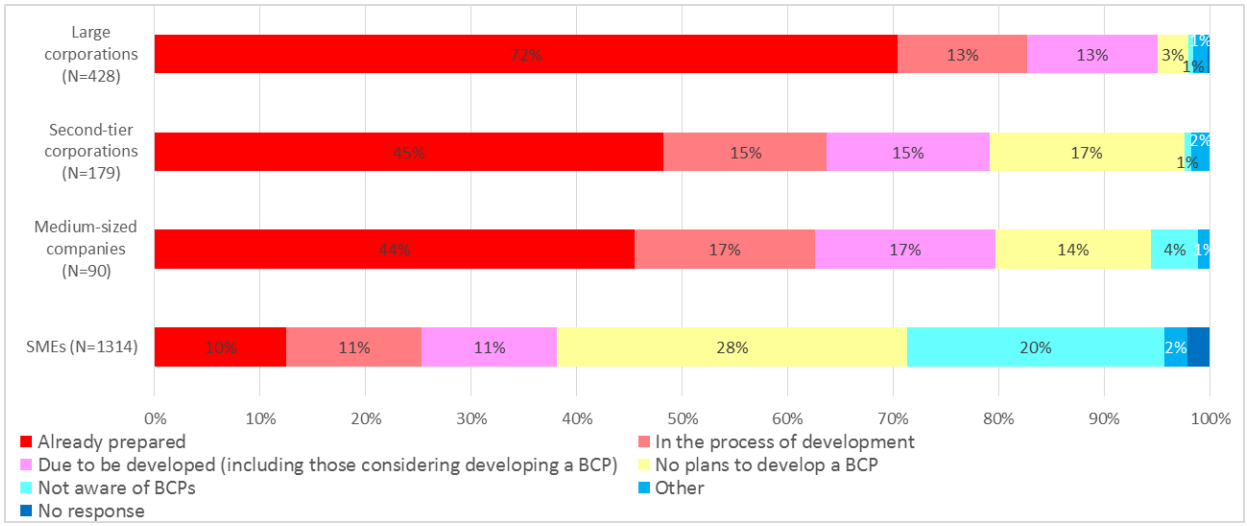
Source: Produced by the Cabinet Office from Survey of the Impact of the Kumamoto Earthquake on Business Continuity for Companies (June 2017)

In each category, the top row shows the number of questionnaires sent out, the middle row shows the number returned, and the bottom row shows the response rate. Figures in brackets in the top and middle rows show the number as a percentage of each total

(Development of Business Continuity Planning)

Fig. 2-5-12 shows the status of the preparation of business continuity plans (BCPs) according to this Business Continuity Survey.

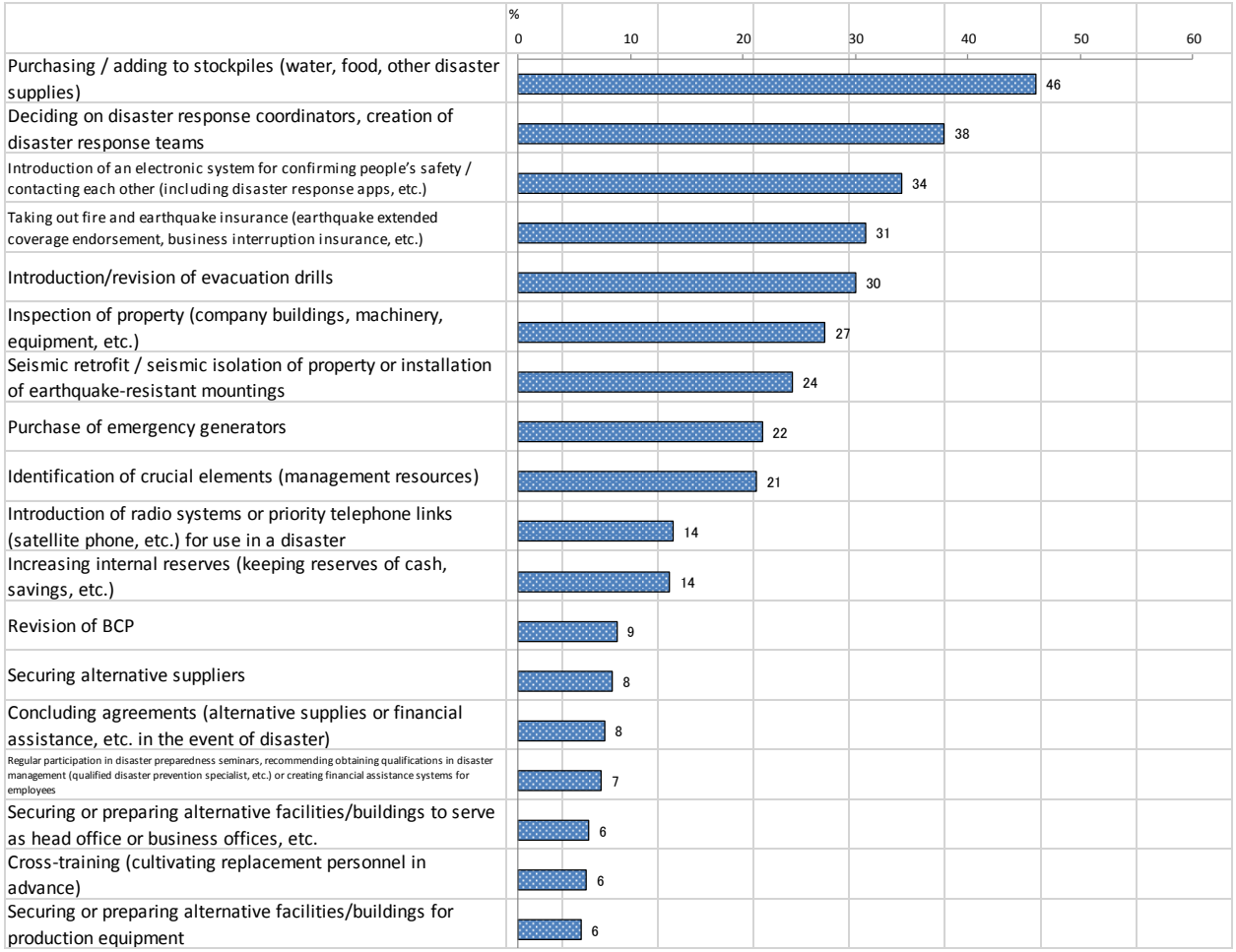
Fig. 2-5-12 Development of BCPs by Company Scale



Source: Produced by the Cabinet Office from Survey of the Impact of the Kumamoto Earthquake on Business Continuity for Companies (June 2017)

Companies that had suffered some kind of damage were asked about initiatives that had been effective at the time of the earthquake. At least 30% of companies that responded stated that “Purchasing / adding to stockpiles (water, food, other disaster supplies),” “Deciding on disaster response coordinators, etc.,” “Introduction of an electronic system for confirming people’s safety / contacting each other,” “Taking out fire and earthquake insurance, etc.,” and “Introduction/revision of evacuation drills” had been “effective” (Fig. 2-5-13).

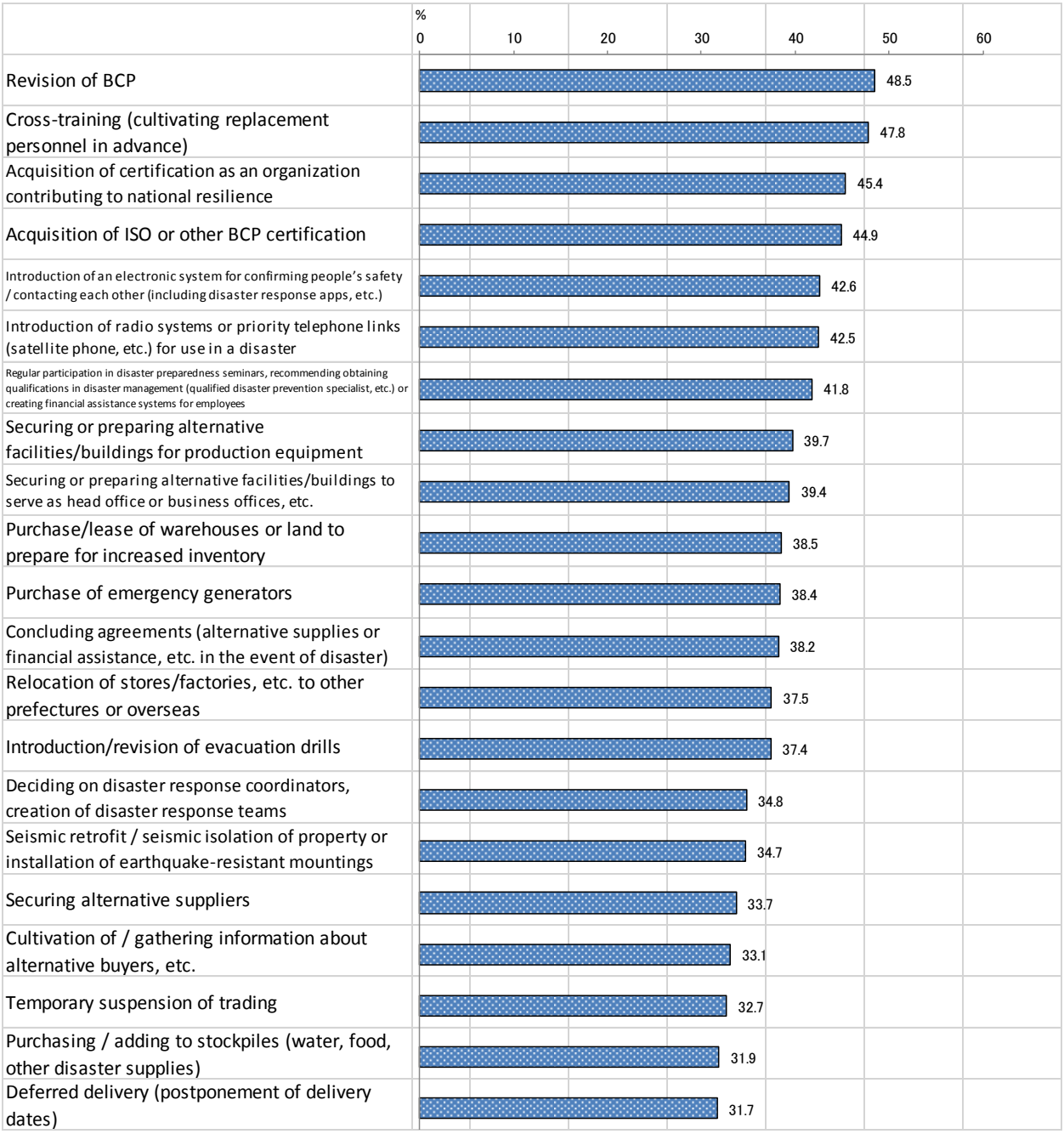
Fig. 2-5-13 Initiatives that were Effective at the Time of the Earthquake



Source: Produced by the Cabinet Office from Survey of the Impact of the Kumamoto Earthquake on Business Continuity for Companies (June 2017)
Excludes those that did not provide a response.

Similarly, companies that had suffered some kind of damage were asked about initiatives were asked about "actions that your company wishes to take but are not currently taking (actions that your company wishes to take going forward)." The companies that responded selected "Action that we wish to take going forward" in response to most statements, but a particularly large number of respondents selected this in relation to statements about rethinking the situation within their companies, such as "Revision of BCP," "Cultivating replacement personnel in advance," "Acquisition of certification as an organization contributing to national resilience," and "Acquisition of ISO or other BCP certification" (Fig. 2-5-14).

Fig. 2-5-14 Actions that Companies Wish to Take Going Forward (N=1294)



Source: Produced by the Cabinet Office from Survey of the Impact of the Kumamoto Earthquake on Business Continuity for Companies (June 2017)
Excludes those that did not provide a response.

(ii) Findings from interviews with companies

As part of the Business Continuity Survey, 10 companies — mainly in the manufacturing and distribution sectors — were interviewed. Some expressed the view that formulating a BCP or making advance preparations when constructing buildings had been helpful, while others stressed the importance of confirming the safety of employees and their families after a disaster, along with the transmission and sharing of information. The following provides a general outline of the findings from these interviews.

(Preparations that were useful at the time of the disaster)

- We had formulated a BCP based on our past experiences of being affected by a disaster, so we were able to get moving immediately after the earthquake struck.
- We succeeded in minimizing the damage that we suffered because we had increased the earthquake resistance of our building from the design stage to be prepared for an anticipated earthquake. This was based on the lessons learned from our business establishments outside Kumamoto that had experience of being affected by a disaster and also due to the presence of the Hinagu fault.
- Due in part to the fact that we had halted production at the time of the earthquake on April 14, we did not suffer any fatal equipment damage as a result of the April 16 earthquake.
- Regarding systems for communicating information and issuing instructions, we had already installed communications equipment as part of our routine set-up, so we were able to maintain uninterrupted contact with head office, etc.
- We have built a system enabling us to see the operational status of all our stores nationwide, which operate 24 hours a day, so we were able to grasp the severity of the situation immediately after the disaster occurred.
- We have a thin client IT system, so we were able to continue operations, even though we were prohibited from entering the office.

(Response at the time of the disaster)

- The first thing every company did was to confirm the safety of its employees.
- Most companies sent out messages to employees from senior executive management and are providing livelihood recovery support payments.
- We greatly admire our local employees, who worked enthusiastically and independently to repair our local business establishment, even though they themselves had been personally affected by the disaster.
- Our swift recovery was facilitated by the support of all group companies under the leadership of head office. This included dispatching engineers who promptly carried out a building diagnosis immediately after the disaster and determined that our building could be used, and making arrangements for relief supplies and materials and equipment to assist with repairs.
- Other parts of the group provided support by assembling a team of people with experience of Kumamoto or the Great East Japan Earthquake.
- Thanks to the presence of employees from other parts of the group, we were able to encourage our employees to take time off, so none of them suffered any major illnesses.
- It was essential to use alternative hubs for products that needed to be supplied without delay, due to the scale of the damage.
- We asked other companies in the same industry to lend us equipment components that we were unable to purchase or obtain by other means.
- Distribution operators have professionals in the procurement of supplies within the group, so we were able to provide supplies when we received orders from local governments. In doing so, we received support in preparing and storing manifests and breakdowns from other business establishments within the group that had experience of being affected by disaster, so we were able to carry out the reconciliation of accounts smoothly once we returned to normal operations.
- We had a backup system in which we arranged deliveries of bento meals to Kumamoto from Factory A, which is close to Kumamoto, and then made up the resultant shortfall from Factory A's usual output with products from Factory B, which is located in the neighboring region.
- Being able to start the sale of food and daily necessities as early as possible assists those affected by a disaster. We adjusted the payment method used at cash registered on a case-by-case basis, because different stores were doing business in different ways, with some forced to set up shop outdoors in the interim due to damage to the store itself, while others were able to partly reopen their premises.
- We shared information within the company about roads that were passable, based on the roads that our employees had been able to use.
- The power was restored promptly and we were able to communicate using smartphones, which helped us to recover swiftly.

・Many of our subcontractors are micro-enterprises, so we managed our business in such a way as to ensure that our suppliers did not run short of funds.
・We provided local citizens with supplies from our stockpile.

(Future initiatives)
・The fact that our employees did not sustain any great harm helped us to recover quickly, so we plan to review our BCP, etc. from the perspective of putting human life first.
・Preparation and circulation of an anthology of examples of impacts resulting from the Kumamoto Earthquake.
・Revision of our equipment layout, such as moving items away from walls, in case tremors cause equipment to move.
・Installation of sensors, so that we can ascertain the damage to the interior of the building or equipment without going inside.
・Revamp of our system so that it can deal with variations in business formats in the event of being affected by a disaster.
・Distributed storage of customer equipment maintenance tools, etc., in case we cannot enter our business premises.
・Augmenting our bases in other regions and developing closer cooperative relationships with other companies in the same industry.
・Greater collaboration with the community, such as opening our building up to the community for use as an evacuation center.
・Support for a volunteer group established by our employees, which is contributing to the community.

(iii) Conclusion

The Business Continuity Survey revealed that indirect damage had effects outside the affected area as well, while the interviews provided a renewed awareness that companies cannot respond to disaster if they have not made appropriate preparations. Most of the companies affected by the disaster are about to start revising their systems, so it is necessary to identify the priorities for business continuity, revise damage assumptions, and put in place alternative strategies.

<Definitions for the Business Continuity Survey>

■ **Definition of "affected area"**

The areas where a seismic intensity of 6-lower or more was recorded during the two earthquakes with a maximum seismic intensity of 7 (in the case of rural districts, those districts where multiple municipalities recorded a seismic intensity of 6-lower or more have mainly been selected). Specifically, these are Kumamoto City (Chuo-ku, Higashi-ku, Nishi-ku, Minami-ku, Kita-ku), Yatsushiro City, Tamana City, Kikuchi City, Uto City, Kamiamakusa City, Uki City, Aso City, Amakusa City, Koshi City, Misato Town in Shimomashiki District, Kikuchi District (Ozu Town, Kikuyo Town), Aso District (Minamioguni Town, Oguni Town, Ubuyama Village, Takamori Town, Nishihara Village, Minamiaso Village), Kamimashiki District (Mifune Town, Kashima Town, Mashiki Town, Kosa Town, Yamato Town). Due to data constraints, the Business Continuity Survey covers only areas of Kumamoto Prefecture affected by the disaster.

■ **Definition of "companies in the affected area"**

Companies with their head office in the affected area

■ **Definition of "companies with a business relationship"**

"Companies outside the affected area" which, based on the results of the survey by a private sector survey company, are supplied with "goods or services" by a company with its head office in the affected area of Kumamoto Prefecture or which supply "goods or services" to such a company

■ **Private sector survey**

Results of a survey by Tokyo Shoko Research, Ltd. as of February 2017

■ **Company scale**

	Wholesale	Retail	Service industry	Other
Large corporations	Stated capital of at least ¥1 billion and a regular workforce of at least 101 people	Stated capital of at least ¥1 billion and a regular workforce of at least 51 people	Stated capital of at least ¥1 billion and a regular workforce of at least 101 people	Stated capital of at least ¥1 billion and a regular workforce of at least 301 people
Second-tier corporations	Stated capital of at least ¥100 million but less than ¥1 billion and a regular workforce of at least 101 people	Stated capital of at least ¥50 million but less than ¥1 billion and a regular workforce of at least 51 people	Stated capital of at least ¥50 million but less than ¥1 billion and a regular workforce of at least 101 people	Stated capital of at least ¥300 million but less than ¥1 billion and a regular workforce of at least 301 people
Medium-sized companies	Stated capital of at least ¥100 million and a regular workforce of 100 people or fewer	Stated capital of at least ¥50 million and a regular workforce of 50 people or fewer	Stated capital of at least ¥50 million and a regular workforce of 100 people or fewer	Stated capital of at least ¥100 million but less than ¥300 million, and Stated capital of at least ¥300 million and a regular workforce of 300 people or fewer
SMEs	Companies other than the above			

■ **Regions**

Hokkaido & Tohoku: Hokkaido, Aomori Prefecture, Iwate Prefecture, Iwate Prefecture, Miyagi Prefecture, Akita Prefecture, Yamagata Prefecture, Fukushima Prefecture, Niigata Prefecture

Kanto: Ibaraki Prefecture, Tochigi Prefecture, Gunma Prefecture, Saitama Prefecture, Chiba Prefecture, Tokyo, Kanagawa Prefecture

Chubu: Toyama Prefecture, Ishikawa Prefecture, Fukui Prefecture, Yamanashi Prefecture, Nagano Prefecture, Gifu Prefecture, Shizuoka Prefecture, Aichi Prefecture, Mie Prefecture

Kinki: Shiga Prefecture, Kyoto Prefecture, Osaka Prefecture, Hyogo Prefecture, Nara Prefecture, Wakayama Prefecture

Chugoku & Shikoku: Tottori Prefecture, Shimane Prefecture, Okayama Prefecture, Hiroshima Prefecture, Yamaguchi Prefecture, Tokushima Prefecture, Kagawa Prefecture, Ehime Prefecture, Kochi Prefecture

Kyushu & Okinawa: Fukuoka Prefecture, Saga Prefecture, Nagasaki Prefecture, Kumamoto Prefecture, Oita Prefecture, Miyazaki Prefecture, Kagoshima Prefecture, Okinawa Prefecture

■ Damage

Direct damage: Physical damage arising from damage to stores, factories, equipment, etc.

Indirect damage: Impacts of the earthquake other than physical damage, such as suspension of business, decline in net sales, inability of employees to attend work, etc.

Some kind of damage (suffered damage): Direct and/or indirect damage

Chapter 3 Future Deployment in Light of the Kumamoto Earthquake

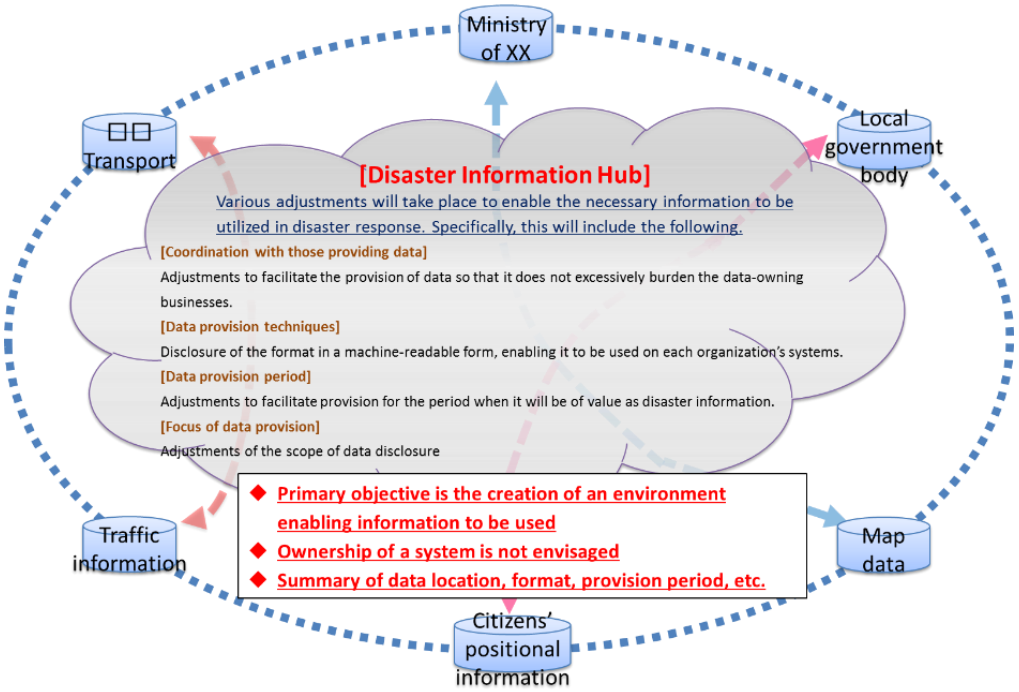
3-1 Use of ICT (Public-Private Partnerships Focused on Disaster Management Information)

A large number of those affected by the Kumamoto Earthquake ended up living in their cars, rather than staying at an evacuation center. As such, it was difficult to gather information about trends among such people, and to understand needs among disaster affected people in evacuation centers and progress regarding distribution of supplies to them. To resolve such issues, it is necessary to establish a framework for sharing information gathered by the national government, local governments, and private sector companies and organizations that will assist in disaster response. There is a particular need for a swift response based on public-private partnerships in times of disaster, so it is vital to ensure that information held by each organization is shared easily, based on certain rules.

Accordingly, the Cabinet Office decided to set up a team to consider the implementation of specific projects based on information and communications technology (ICT), which is thought likely to offer an effective means of sharing information. It will also examine rules concerning the sharing of information among organizations including national and local governments, and private companies and organizations, including the methods used to share information and the duration of such sharing, as well as promoting the exchange of information by this means (hereinafter, the “Disaster Information Hub”). As a result, the National and Local Government Public-Private Disaster Information Hub Promotion Team was established under the Working Group for the Promotion of Standardization of Disaster Measures of the National Disaster Management Council’s Disaster Management Implementation Committee and began its deliberations in FY2017.

Ahead of the team’s establishment, the Cabinet Office sought to solicit ideas from a wide range of sources concerning new techniques that could be employed through the use of IT. As such, it began seeking submissions from companies in November 2016 and held a hackathon (a portmanteau word coined from the words “hack” and “marathon.” It is a competitive event in which programmers, designers, and other creators get together and test their software development capabilities and ability to propose new services using IT within a short period of time) in January 2017. The most outstanding ideas obtained from the hackathon will form the basis for deliberations concerning the construction of the Disaster Information Hub (Fig. 3-1-1).

Fig. 3-1-1 Disaster Information Hub Concept



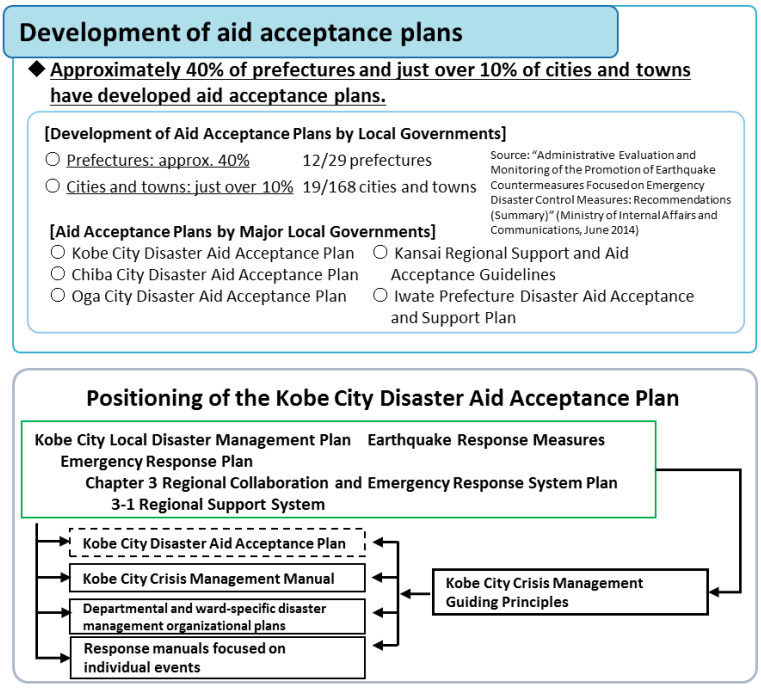
3-2 Local Government Support

(1) Promotion of a Disaster Management System Enabling Municipalities to Access Assistance (Aid Acceptance System)

Should a major disaster occur, it will be difficult for the affected municipalities to carry out an extensive range of disaster response operations singlehandedly. Accordingly, it is absolutely crucial for local governments to make preparations under normal circumstances by thinking about how to ensure the smooth acceptance of personnel and physical support from national and local governments, private companies, and volunteer groups, so that these resources can be effectively utilized in responding to disaster. It is also vital for local governments to put in place an aid acceptance system to this end.

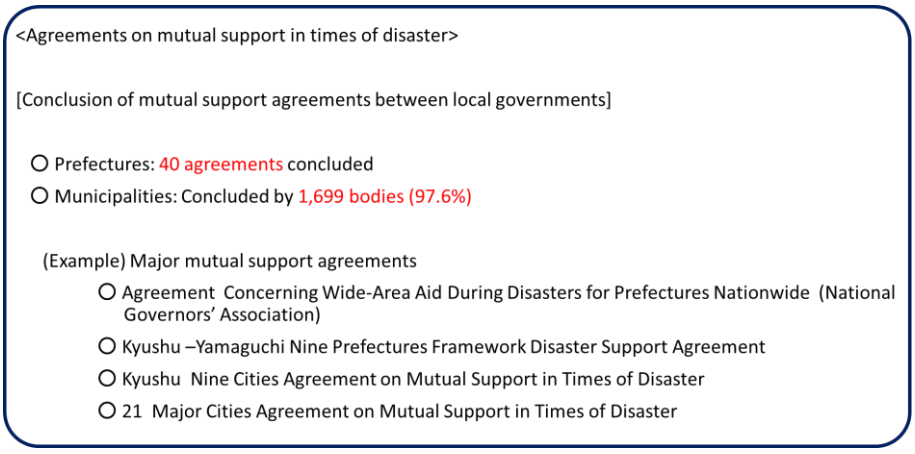
However, only 40% or so of prefectures and just over 10% of municipalities have formulated aid acceptance plans to date. Given the major earthquakes, storm and flood disasters of recent years, as well as fears that Nankai Trough earthquake or Tokyo inland earthquake could occur, it is imperative that local governments develop aid acceptance systems without delay (Figs. 3-2-1 and 3-2-2).

Fig. 3-2-1 Development of Aid Acceptance Plans



Source: Produced by the Cabinet Office from the Ministry of Internal Affairs and Communications report "Administrative Evaluation and Monitoring of the Promotion of Earthquake Countermeasures Focused on Emergency Disaster Control Measures: Recommendations (Summary)" (June 2014)

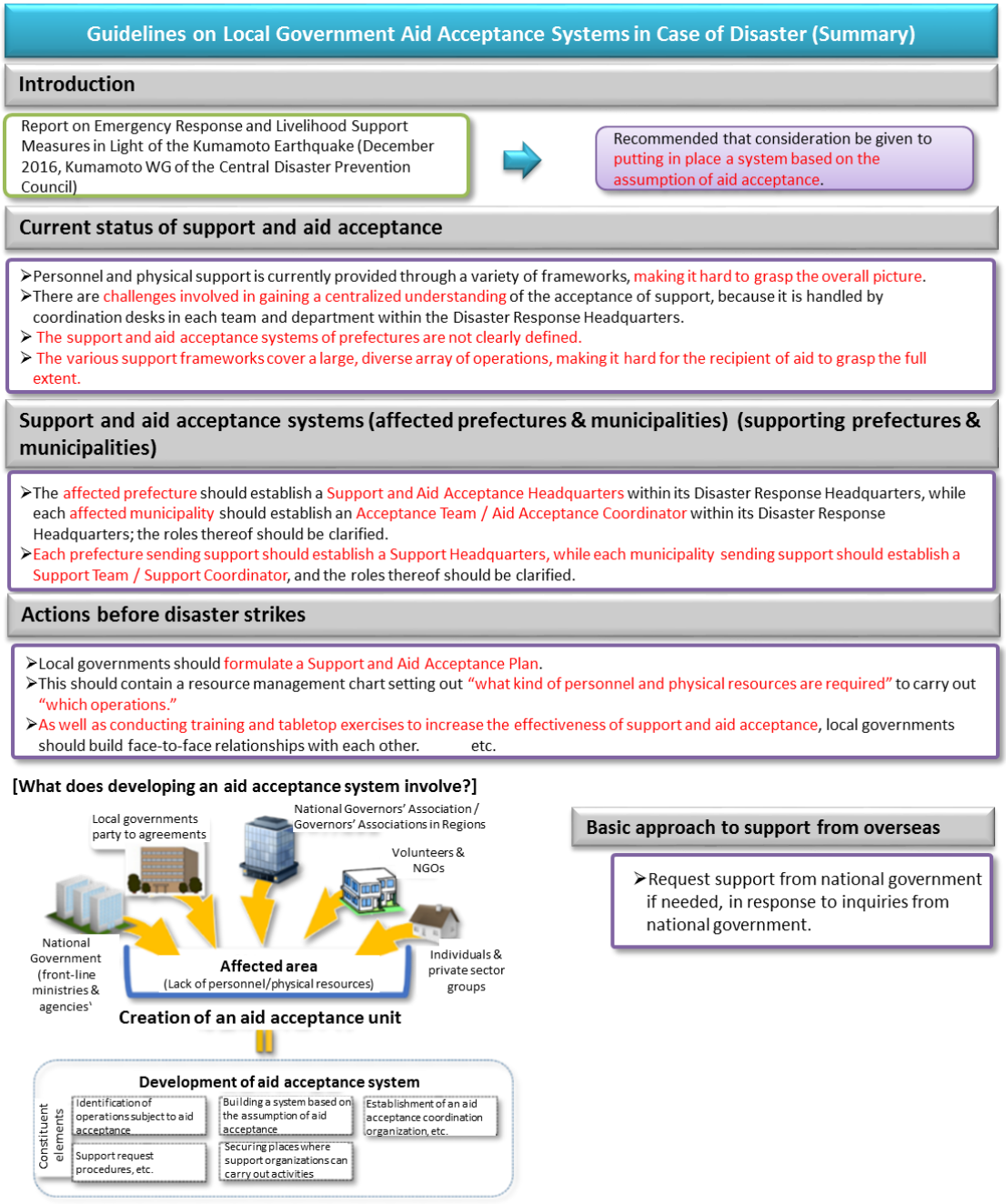
Fig. 3-2-2 Local Government Mutual Support Agreements



Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report "Status of Regional Disaster Management Administration"

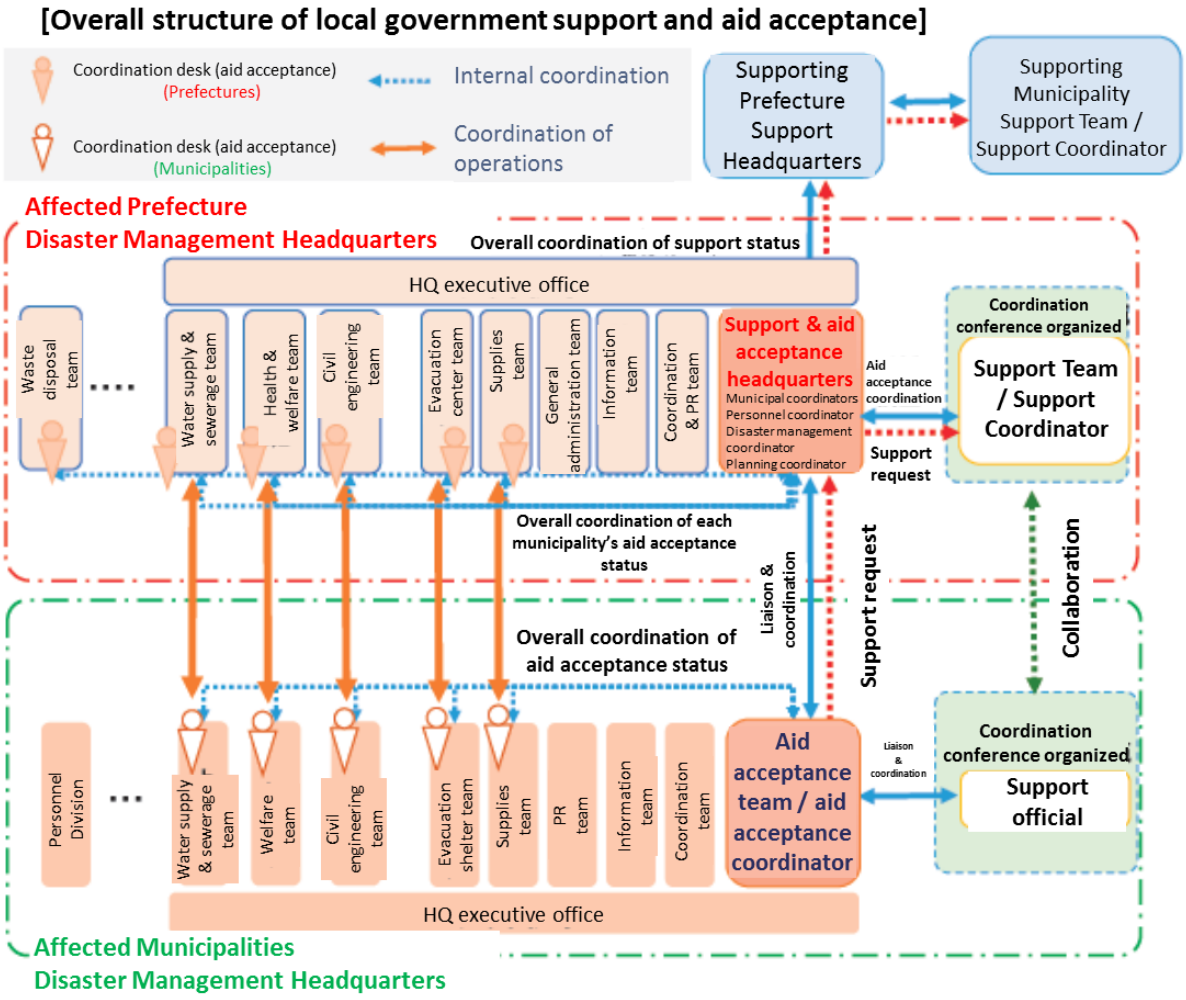
Accordingly, to enable local governments to establish aid acceptance measures without delay, the Cabinet Office set up the Study Group on Local Government Aid Acceptance Systems to undertake consultations on the formulation of guidelines. Taking into account the lessons of the Kumamoto Earthquake, the committee published the Guidelines on Local Government Aid Acceptance Systems in Case of Disaster in March 2017 (Figs. 3-2-3 and 3-2-4).

Fig. 3-2-3 Guidelines on Local Government Aid Acceptance Systems in Case of Disaster



Source: Cabinet Office

Fig. 3-2-4 Overall Structure of Local Government Support and Aid Acceptance



Source: Cabinet Office

(2) Enhancement of the Content of Training for Local Government Heads and Officials

The ability to respond swiftly and accurately to a disaster relies to a great extent on the knowledge and experience of the official tasked with disaster management. Accordingly, in FY2013, the Cabinet Office began offering Disaster Management Specialist Training Courses for national and local government employees, to cultivate personnel capable of responding swiftly and accurately to crises and personnel able to develop networks of national and local government organizations.

One of these, the Training Course at the Ariake no Oka Core Wide-area Disaster Prevention Base features lectures provided in collaboration with relevant ministries and agencies on such topics as “The Reality of Running an Evacuation Center” and “Emergency Operations Policy.” Efforts have been made to enhance the content of these courses in light of the recommendations in the aforementioned report.

Moreover, the Cabinet Office supports efforts to enhance the decision-making capacity of mayors, who lead the response in the event of a disaster. Accordingly, in partnership with the Fire and Disaster Management Agency, it organized the National Seminar on Disaster Prevention and Crisis Management for Heads of Local Government for city mayors from across Japan. At the FY2016 seminar, Professor Toshitaka Katada of Gunma University’s graduate school gave a lecture on “Initial Responses by Mayors,” while the Mayor of Sanjo City in Niigata Prefecture spoke of his experience of dealing with disaster in a lecture on “Torrential Rain Disasters and Disaster Management Measures Taken by the Mayor of Sanjo City.”

Furthermore, in April 2017, the Cabinet Office jointly organized the Special Training Course on Disaster Prevention and Crisis Management with the Cabinet Secretariat and the Fire and Disaster Management Agency. Held at the Local Autonomy College, this course was aimed at officials in charge of disaster prevention and crisis management at relevant ministries and agencies, prefectures, and cities designated by government ordinance.

It will be necessary to continue to enhance the content of training courses and strive to improve disaster prevention and response capabilities.

A lecture during the FY2016 Training Course at the Ariake no Oka Core Wide-area Disaster Prevention Base

A lecture during the FY2016 National Seminar on Disaster Prevention and Crisis Management for Heads of Local Government

Column: What Leaders Should Do in the Event of Disaster

The Flood Disaster Summit is a gathering of local government leaders who have experienced major flood disasters. At this summit, the views of local government leaders who have experienced such major earthquakes as the Great East Japan Earthquake and the Kumamoto Earthquake were added to "What Leaders Should Do in the Event of Disaster," a list of pointers for local leaders intended to provide them with the bare minimum knowledge that they should have in case of a flood disaster. This information is intended to be applicable to storm and flood disasters, and earthquake and tsunami disasters alike. It is hoped that this information will serve as an aid to decision-making in the event of future major disasters and will help to mitigate the damage.

What Leaders Should Do in the Event of Disaster (Digest)

Prepared by the Joint Committee for Compiling "What Leaders Should Do in the Event of Disaster"

Mayor of Rikuzentakata City, Iwate Prefecture; Mayor of Kamaishi City, Iwate Prefecture; Mayor of Ishinomaki City, Miyagi Prefecture; Mayor of Minamisanriku Town, Miyagi Prefecture; Mayor of Inashiki City, Ibaraki Prefecture; Mayor of Katori City, Chiba Prefecture; Mayor of Sanjo City, Niigata Prefecture; Mayor of Mitsuke City, Niigata Prefecture; Mayor of Hakuba Village, Nagano Prefecture; Mayor of Toyooka City, Hyogo Prefecture; Mayor of Kumamoto City, Kumamoto Prefecture; Mayor of Kashima Town, Kumamoto Prefecture; Mayor of Kosa Town, Kumamoto Prefecture; Mayor of Mashiki Town, Kumamoto Prefecture; Mayor of Nishihara Village, Kumamoto Prefecture

[I. Preparations Before Disaster Strikes]

1. Both legally and in practice, primary responsibility for dealing with the crisis posed by an impending disaster and facilitating the recovery and reconstruction of people's lives after a disaster is shouldered by the mayor of a municipality. Criticism also converges on the mayor. A leader must be prepared for this and strive to hone their skills.

2. For the most part, success or failure is determined when nature poses an imminent threat. The difficulty of decision-making in the event of a major disaster defies imagination. Efforts to deal with a crisis almost invariably fail unless practice drills and preparations have been implemented before disaster strikes.
3. While the responsibility shouldered by mayors is heavy, their ability to deal with a crisis is limited. On the other hand, there are no mechanisms to provide systematic and expert support for mayoral decision-making.

   At the very least, investigate in advance what kind of support capabilities are held by other organizations, such as the Self-Defense Forces, Ministry of Land, Infrastructure, Transport and Tourism's TEC-FORCE, and meteorological observatories. Through activities such as collaborative drills, build relationships within which you feel comfortable enough to ask for help.
4. Routinely engage in dialogue with local citizens; communicate with them and seek their understanding in advance regarding the decision-making process in the event of a crisis. This process will help to lessen any hesitation should the worst occur.
5. Routinely and openly inform local citizens that there are limits to what local government can do and ask them to be prepared to protect their own lives based on their own judgment.
6. A mayor can lose their own life in a disaster. An organization ceases to function in the absence of its leader. Ensure that you decide on the order of deputies in advance, without fail.
7. Routinely provide proactive support to disaster-stricken areas. The experience of official temporarily deployed to disaster-stricken areas helps to build disaster response know-how.

[II. Responding to the Immediate Crisis]

1. Delays in decision-making cost lives. Delays in the initial response are particularly critical. First and foremost, you must speed up your ability to make decisions as a leader.
2. Protecting lives must be the top priority; you must not hesitate to issue evacuation recommendations.
3. Be aware that people are not inclined to try to escape. When faced with a disaster, humans have a strong tendency to lapse into a mental state called "normalcy bias," in which they underestimate impending danger in an attempt to remain calm. Both in actual disasters and in psychology experiments, people have a tendency to delay their escape.

   Of course, the timing of evacuation recommendations is important, but more crucial still is acquiring the skills required to convince people to overcome their inclination against escaping to safety, such as providing danger warnings as needed and using words that convey a sense of urgency.
4. You will be inundated with telephone calls from local citizens and the media. Set up a call center or similar to deal with these.
5. Whatever happens, keep records.

[III. Dealing with Rescue, Recovery, and Reconstruction]

1. A leader must be as visible as possible to citizens via the media, communicating that the municipal office is doing its utmost to deal with the situation and encouraging those affected by the disaster. The eyes of local citizens are on the leader. Ensure that you are fully aware of the words that you use and your demeanor.
2. Set up a Volunteer Center straight away. Volunteers are not just a source of labor. The presence of volunteers brings courage to those affected by the disaster and helps to create a more cheerful atmosphere in disaster-stricken areas. Deploy official to serve as a link between the Volunteer Center and local government. (However, if an earthquake has occurred and there are concerns about aftershocks, ensure that consideration is given to preventing secondary disasters when setting up a Volunteer Center.)

3. Prioritize the allocation of tasks that only municipal official can fulfill to municipal official.
4. Understand the pain and sadness of local citizens and communicate the fact that the leader fully understands it. Knowing that others share their pain and sadness brings comfort to those affected by the disaster, reinforces their sense of unity, and helps to stimulate recovery and reconstruction.
5. Hold a press conference at a set time every day and continually supply information. The ironclad rules of crisis management are don't run away, don't hide, and don't lie. The media are sometimes a nuisance and can disrupt your work, but beyond them are local citizens and other worried people. Positive news brings courage to local citizens.
6. There will be a massive quantity of rubble and waste. Secure a spacious temporary holding site without delay. Call on local citizens to separate waste such as tatami mats, household electrical appliances, and tires as far as possible. This will help to speed up disposal later on.
7. Set up a one-stop service desk within the government building, to alleviate the burden on those affected by the disaster.
8. You should resolutely carry out everything necessary to rescue local citizens, without hesitation. Above all, in the immediate aftermath of the disaster, it is a race against time amid great turbulence. You also need to make it abundantly clear to official that they "must not worry about money. The mayor will sort something out." and that they should "do everything that they ought to. The mayor will take responsibility."
9. Graciously accept visits from official visitors who come to see the situation, even if you are busy. Those who see the situation on the ground will invariably become allies.
10. Keep expressing your gratitude to those who provide assistance and carry out rescue operations. Your official are affected by the disaster, too. Express your gratitude to your official and their families.
11. Make a conscious effort to ensure that official members have an opportunity to take a break.
12. Disasters are infinitely varied and you will bump up against a mountain of systems and practices that do not mesh with the reality of the situation. In partnership with the leaders of other disaster-stricken areas, demonstrating a strong sense of purposefulness, encourage a change in the situation or practice or the creation of new systems by calling for assistance from the high-ranking government officials and politicians who come to see the situation, and seeking to influence public opinion via the media.

3-3 Long-term Community Development

When undertaking reconstruction in the aftermath of a disaster, it is necessary for disaster affected local governments to formulate a basic vision promptly and ensure that reconstruction and community development proceed smoothly. Local governments can ensure a level-headed response from the early stages of a disaster by undertaking in advance the basic preparations, such as deliberations among relevant parties concerning the policy on formulating a vision for reconstruction in the aftermath of envisaged disasters, as well as drills focused on drawing up such visions. To encourage municipalities to prepare for reconstruction based on the assumption of a disaster before disaster actually strikes, the national government needs to promote the widespread implementation of scenario visualization and simulation exercises involving reconstruction and community development. It must also make available the requisite guides and manuals. Moreover, it would be desirable to promote the establishment of a scheme for providing introductions to experts who offer support in post-disaster reconstruction and community development.

Accordingly, the national government has decided to compile and publish the "Guide to Scenario Visualization and Simulation Exercises for Reconstruction and Community Development." As well as explaining the need for this form of visualization exercise and providing an overview of the process, the guide will cover the things that need to be prepared to carry out these exercises and points to bear in mind in running them. It was trialed at five local governments in FY2016 and the specific content of the exercises will be highlighted in the form of an anthology of examples. After publication, the government intends to promote widespread awareness and understanding of exercises based on the guide, as well as preparing guidelines on preparing for reconstruction before disaster strikes, which will reflect the content of the guide.

Some local governments have already embarked on initiatives of this kind. For example, Tokyo Metropolitan Government has put together the "TMG Earthquake Disaster Recovery Manual" (revised March 2016) to prepare for the Tokyo inland earthquake expected to strike in due course. This manual sets out the fundamental approach to reconstruction based on a combination of self-help, mutual support, and public support, involving a wide range of stakeholders, including not only national and local governments, but also disaster affected people, NPOs, volunteers, experts, and companies. It also presents mechanisms that enable citizens to proactively undertake reconstruction.

3-4 Conclusion

The government endeavored to ensure that recovery following the Kumamoto Earthquake were carried out promptly, including emergency recovery transport infrastructure to facilitate the distribution of supplies to the affected areas and recovery of rivers to prevent secondary damage. In addition to what has been learned from the stock of examples amassed since the Great East Japan Earthquake, a great deal of inspiration was obtained from new initiatives such as push-mode support and collaboration between NPOs and local government bodies. The national government, and prefectural and municipal governments must use these lessons to strengthen the systems needed in times of disaster, as well as enhancing their partnership and coordination functions. In addition, it is necessary to establish and revise the requisite systems, guidelines, and manuals.

In particular, if a major disaster such as Tokyo inland earthquake or Nankai Trough earthquake should occur, the damage will be extensive. This could give rise to problems never before experienced with past earthquakes, because not only will the ability of the national and local governments to rescue people be more diffuse, but there could also be a substantial reduction in rescue leadership functions if the core bodies of national government are damaged by Tokyo inland earthquake, for example. Moreover, it is also important to swell the ranks of those involved in disaster preparedness initiatives. This will encourage self-help and mutual support, to address aspects that support in the form of public support cannot fully cover.

Rather than waiting in the hope that public support will be available, the most important thing in increasing disaster prevention capabilities will be for each and every individual to love the area where they live; to regard the disaster risk of their local community as an issue that concerns them personally; and to think seriously about the preparations that they can make to address that risk and be ready and willing to take all possible measures in response. It is imperative that local citizens band together with others in their community to build systems that will enable them to mitigate disasters.

Part I

Current Disaster Management Measures in Japan

Part I Current Disaster Management Measures in Japan

Due to its natural conditions, Japan is prone to various natural disasters. A variety of natural disasters occurred in 2016, such as earthquakes, torrential rain disasters due to typhoon, and volcanic eruptions. Part I focuses on the recent countermeasures for disaster risk reduction, in particular the status of policies implemented intensively in 2015.

Chapter 1 Current Disaster Management Policies

Section 1: Reducing Disaster Risk in Advance Through Self-help and Mutual Support

1-1 Raising Awareness of Disaster Risk Reduction Among the Public

Japan experiences many natural disasters, so the government is continually undertaking initiatives that constitute "public support." These include measures undertaken before disaster strikes: for example, building embankments and other hard infrastructure measures, as well as soft infrastructure measures, such as conducting drills. In addition, in times of disaster, this public support includes providing supplies via push-mode support and deploying extra official to the affected region, as in the case of the April 2016 Kumamoto Earthquake. Other examples of public support include designating the damage resulting from 2016 Typhoon 10 as a Disaster of Extreme Severity and providing financial support under the Act on Support for Reconstructing Livelihoods of Disaster Victims to those affected by the conflagration that engulfed the downtown area of Itoigawa City in Niigata Prefecture.

However, there will be limits to the support that can be provided as public support in the event of a major disaster such as Nankai Trough earthquake, which is anticipated to occur in due course. In fact, a study showed that when the Great Hanshin-Awaji Earthquake struck, just under 70% of people were rescued as a result of self-help by themselves and their families, while approximately 30% were rescued through mutual support, such as the assistance of their neighbors (Fig. 1-1-1). With falling population numbers causing the depopulation of towns and villages, and membership of voluntary disaster management organizations and volunteer fire corps on the decline, it is vital to raise each and every person's awareness of disaster risk reduction and spur them to take specific steps to address it, ensuring that they regard disasters as something that affects them specifically, rather than something that happens to other people.

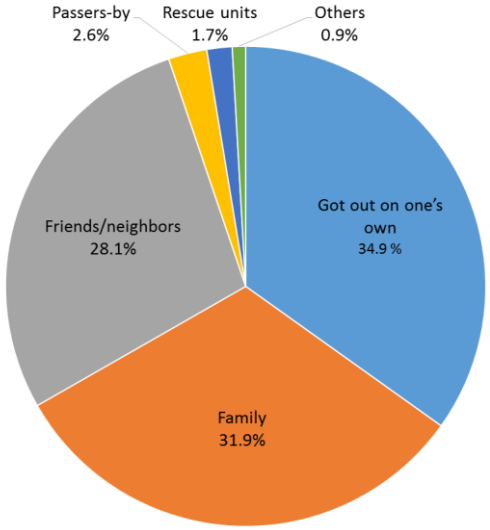
It is necessary to ensure that people understand disaster risk in their local area and make preparations, such as securing furniture and stockpiling food; take all opportunities to participate in evacuation drills, so that they are prepared to take appropriate evacuation actions; and undertake self-help and mutual support with their neighbors in the event of disasters.

In the Survey on Awareness of and Activities Related to Disaster Management in Daily Activities conducted by the Cabinet Office last year, the public demonstrated a high level of awareness of the possibility of a disaster occurring. More than 60% of respondents recognize the possibility of a major disaster occurring, including

those who believe that it is “almost certain to occur” and those who believe that it is “highly likely to occur” (Fig. 1-1-2). Meanwhile, when asked about disaster preparedness, the percentage of people who said either that they are making sufficient preparations or that they are making the preparations that can be made in daily life was lower than 40% (Fig. 1-1-3). While recognizing the possibility of a major disaster occurring, respondents do not acknowledge that their preparations are inadequate. In addition, the survey revealed that older age groups have a higher tendency to prepare for disasters than younger age groups.

In the future, it will be necessary to consider enlightenment activities to encourage people who are already aware of the possibility of disaster to make preparations for its occurrence. Focusing on reducing disaster risk in advance through self-help and mutual support, this chapter introduces a variety of measures.

Fig. 1-1-1 Types of Rescuers of Buried or Confined People at the Time of the Great Hanshin-Awaji Earthquake



Sample survey: See Japan Association for Fire Science and Engineering (1996) “Survey Report Concerning Fires at the Time of the Southern Hyogo Prefecture Earthquake in 1995.”

Fig. 1-1-2 Awareness of Disaster Possibility

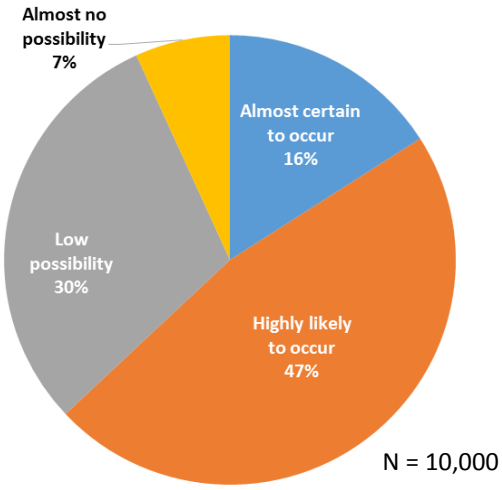
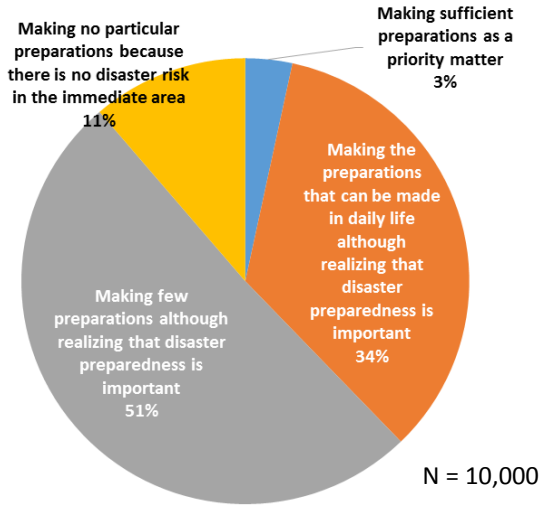


Fig. 1-1-3 Importance of Disaster Preparedness



Source: Prepared from the Survey on Awareness of and Activities Related to Disaster Management in Daily Activities (May 2016)

1-2 Efforts in Disaster Management Drills

In the event of a natural disaster, national government institutions, local governments, designated public corporations, and other institutions involved in disaster management must work as one in cooperation with local residents to respond appropriately to that disaster. Accordingly, it is vital to implement disaster risk reduction initiatives before disaster strikes, such as drills involving collaboration between relevant organizations. For this reason, institutions involved in disaster management implement disaster management drills based on the Basic Act on Disaster Management, Basic Plan for Disaster Risk Reduction, and other regulations to verify and confirm the emergency measures to be taken when a natural disaster strikes and to enhance residents' awareness of disasters.

In FY2016, the following drills were conducted in accordance with the 2016 Comprehensive Disaster Management Drill Framework, which prescribed the basic policy on conducting disaster management drills and details of the government's comprehensive disaster management drills.

(1) Comprehensive "Disaster Preparedness Day" Disaster Management Drills

On September 1, 2016, which is Disaster Preparedness Day in Japan, the government held a drill based on the scenario of the situation immediately after an earthquake. First, Prime Minister Abe and the rest of the Cabinet made their way on foot to the Prime Minister's Office. They then held a meeting of the Extreme Disaster Management Headquarters (a Disaster Response Headquarters set up in the event of an especially unusual and catastrophic major disaster, such as the Great East Japan Earthquake), which is attended by the whole Cabinet. This included video-conferences with the governors of Mie, Wakayama, and Kochi prefectures to ascertain the extent of the damage and the support requested, as well as reports by members of the Cabinet about the damage and the response to the disaster. Participants worked with local governments and other bodies to confirm response guidelines that assigned the highest priority to saving human lives, dispatch a governmental investigation team, and establish an On-site Disaster Management Headquarters. Throughout this process, they sought to ensure that the systems required for implementing emergency measures in the immediate aftermath of an earthquake were in place, as well as checking the procedures. In addition, part of the meeting was opened up to the media. Afterwards, Prime Minister Abe held a press conference and made a televised appeal to the public via NHK to request their cooperation and inform them of the government's initial response measures.

On the same day, a joint emergency drill involving nine prefectures and cities was held in a number of locations, primarily in Saitama City. Prime Minister Abe traveled by helicopter from the Prime Minister's Office to the drill venue, where he watched a rescue drill and casualty triage drill based on the scenario of an expressway accident. The Prime Minister also participated in a first aid drill to practice using an AED.

Government headquarters operational drill

(Extreme Disaster Management Headquarters meeting)

Prime Minister Abe takes part in a first aid drill using an AED

(2) Government Tabletop Exercises

In November 2016, a tabletop exercise based on the scenario of Nankai Trough earthquake was held to improve the knowledge and proficiency of officials from relevant ministries and agencies. A similar exercise, based on a Tokyo Inland Earthquake scenario, was held in January 2017. Using simulations that replicated near real-life disaster situations, participants tackled practical exercises without having been informed of the drill scenarios in advance. The drills were followed by a review of the effectiveness of emergency measures prescribed in plans and manuals.

Video-conference with the on-site disaster management headquarters

(Drill based on Nankai Trough Earthquake scenario)

Executive office drill

(Drill based on Nankai Trough Earthquake scenario)

Regional drills based on the running of an On-site Extreme Disaster Management Headquarters in the event of Nankai Trough earthquake were held in Shikoku (Takamatsu) in November 2016, in Wakayama in December 2016, and in Shizuoka in January 2017. A drill based on the running of an On-site Extreme Disaster Management Headquarters was also held in Tokyo in January 2017, using the scenario of a Tokyo inland earthquake.

State Minister of the Cabinet Office Matsumoto receives a briefing

(Wakayama On-site Extreme Disaster Management Headquarters operational drill)

1-3 Tsunami Preparedness Initiatives

Loss of life in the event of a tsunami can be minimized to some extent if people take swift, appropriate action. Accordingly, it is vital to provide people with a more profound understanding of tsunami and the specific nature of the damage that they cause, as well as the necessity of being prepared for a tsunami. The enactment of the Act on the Promotion of Measures for Tsunami was inspired by experiences of the Great East Japan Earthquake, which triggered a tsunami that caused unprecedented damage. As well as prescribing the obligation to make efforts to take both tangible and intangible tsunami countermeasures, this act establishes November 5 as Tsunami Preparedness Day and stipulates that both national and local governments should strive to hold events appropriate to the purpose thereof. Furthermore, a resolution proposed jointly by 142 countries including Japan was unanimously adopted by the United Nations (UN) General Assembly in December 2015, designating November 5 as World Tsunami Awareness Day. The Act on the Promotion of Measures for Tsunami was revised in March 2017 to add a provision specifying that contributions to the promotion of international cooperation in the area of tsunami countermeasures should also be considered, in light of the designation of November 5 — Tsunami Preparedness Day — as World Tsunami Awareness Day. As such, the Cabinet Office, relevant ministries and agencies, and local governments, among others, undertake initiatives around the country that assist in raise awareness of tsunami preparedness.

(1) Tsunami Evacuation Drills

In FY2016, the national government (9 ministries and agencies), local governments (167 government bodies), and private companies (120 organizations) held earthquake and tsunami preparedness events around the country in which approximately 650,000 people took part.

Among them were drills in which local citizens took part, which were held by the Cabinet Office in partnership with local governments in 10 locations across the country (Haboro Town in Hokkaido, Nikaho City in Akita Prefecture, Chigasaki City in Kanagawa Prefecture, Sado City in Niigata Prefecture, Matsusaka City in Mie Prefecture, Hirogawa Town in Wakayama Prefecture, Saka Town in Hiroshima Prefecture, Matsushige Town in Tokushima Prefecture, Kuroshio Town in Kochi Prefecture, and Ashiya Town in Fukuoka Prefecture). Approximately 25,000 people participated in these drills, in which people practiced protecting themselves when an earthquake occurred (shakeout drill) and evacuating to the nearest evacuation site once the tremors subsided (evacuation drill). In some areas, various other drills also took place, to practice such skills as setting up an evacuation center, preparing and serving food for evacuees, and first aid.

Night-time drill involving evacuation to a tsunami evacuation tower

(Kuroshio Town, Kochi Prefecture)

Evacuation drill at a nursery school

(Hirogawa Town, Wakayama Prefecture)

Disaster preparedness class given by local high school students

(Nikaho City, Akita Prefecture)

Shakeout drill

(Ashiya Town, Fukuoka Prefecture)

Moreover, the Relay Tsunami Disaster Drills for “World Tsunami Awareness Day” were held in various parts of the globe (Valparaiso, Chile; Miyazaki Prefecture, Japan; Aceh, Indonesia; Kochi Prefecture, Japan; Hawaii, USA), with the cooperation of relevant ministries and agencies, JICA, and local governments, aiming to link experiences of and lessons from tsunami around the world.

(2) Public Awareness Campaigns

(i) Public Awareness Campaign Involving the Tsunami Bosai Promotion Squad

The Tsunami Bosai Promotion Squad, a group of local mascot characters including Funassyi and Kumamon, was again involved in a public awareness campaign in FY2016. Various media were used to maximize exposure, in order to achieve greater public awareness nationwide about appropriate emergency evacuation actions in the event of a tsunami. These included the display of public awareness posters by companies and local governments across the country, the use of visuals on customer-facing cash registers and displays at major convenience stores and supermarkets, the dissemination of information via the dedicated Tsunami Bosai Promotion Squad website, and the screening of videos at cinemas and on monitors at commercial facilities. In addition, members of the Tsunami Bosai Promotion Squad appeared at a Tsunami Preparedness Day event to raise awareness (described below).

FY2016 public awareness poster

FY2016 tsunami preparedness awareness visual

(ii) FY2016 Tsunami Preparedness Day Public Awareness Event

On November 5, 2016, which was the first Tsunami Preparedness Day to be held since World Tsunami Awareness Day was adopted by the UN General Assembly, a public awareness event was held at Iino Hall and Conference Center in Chiyoda-ku, Tokyo, under the title "Passing on the Lessons from the Great East Japan Earthquake to Future Generations: Taking on the Challenge of Disaster Preparedness Education to Save Lives." The goal of this event was to pass on the lessons from the Great East Japan Earthquake and highlight the importance of initiatives to prepare for a tsunami before one actually strikes and of disaster preparedness education. It featured presentations about disaster preparedness knowledge and initiatives, by junior high school students from Kamaishi City in Iwate Prefecture, which is renowned for the fact that, when the Great East Japan Earthquake occurred, elementary and junior high school students took the initiative in evacuating to higher ground, thereby saving countless lives; and by junior high school students from Kuroshio Town in Kochi Prefecture, where the whole town is engaged in a Zero Victims initiative, aimed at ensuring that a tsunami would not claim any lives, despite the fact that estimates suggest that Nankai Trough megathrust earthquake could result in the town being struck by a tsunami with a maximum height of 34m. Responding to a questionnaire distributed to participants, 85.9% of respondents stated that the event had been useful, while 6.3% stated that it had been somewhat useful. Comments provided as feedback included, "Greater efforts should be made to provide disaster preparedness education at schools" and "I have a greater awareness of tsunami preparedness." The event was also broadcast live on the Internet, attracting more than 5,400 views.

Presentation by students from Ogata Junior High School, Kuroshio Town

Students from Kamaishi Junior High School

Talk session

(iii) World Tsunami Awareness Day Forum

On November 5, 2016, the Cabinet Secretariat (National Resilience Promotion Office) hosted the World Tsunami Awareness Day Forum. The primary objective of the forum was to ensure a proper understanding of national resilience as a means of preparing for tsunami and other major disasters among the relevant ministries and agencies and local governments that will need to lead national resilience measures, as well as among business operators and the public.

Through their speeches, the speakers helped participants to develop a shared understanding of the importance of sustainable socioeconomic growth in preparing for disaster and of the fact that Japan's contribution to disaster prevention and mitigation on the global stage helps to promote growth worldwide.

Storyteller Hirano Keiko

Discussion involving the three keynote speakers

(iv) International Conferences on Disaster Management

Various events to promote tsunami awareness have also been held overseas, spreading the message about the importance of tsunami preparedness worldwide. In particular, the 7th Asian Ministerial Conference on Disaster Risk Reduction, which was held in India, featured a special session on World Tsunami Awareness Day. During the session, entitled, "Asian Initiatives to Protect Precious Lives Against Natural Disaster! National Resilience Across Oceans," Liberal Democratic Party (LDP) Secretary-General Toshihiro Nikai gave a speech about the national resilience initiatives that have been undertaken over many years, mentioning the 2004 Indian Ocean tsunami and the Great East Japan Earthquake.

(v) Various Initiatives Associated with Tsunami Preparedness Day and World Tsunami Awareness Day

In addition to those described above, various other initiatives were undertaken. These included the High School Students Summit on "World Tsunami Awareness Day" in Kuroshio (hosted by Kochi Prefecture, Kochi Prefectural Board of Education, Kuroshio Town, and Kuroshio Town Board of Education), which brought together around 360 high school students from 30 countries around the world, including Japan, in Kuroshio Town in Kochi Prefecture to exchange views about natural disasters; and the founding by the Ministry of Land, Infrastructure, Transport and Tourism of the Hamaguchi Award (awarded by the Minister of Land, Infrastructure and Transport) for individuals and/or organizations within Japan or overseas that have made significant contributions in the field of technologies for coastal disaster risk reduction, especially tsunami preparedness.

Hamaguchi Award Ceremony

Column: Video to Raise Awareness of Disaster Preparedness

The Cabinet Office produces videos that can be used for raising awareness concerning disaster management and for disaster preparedness education in schools. These videos are published on the Team Bosai Japan portal (https://bosaijapan.jp/), a website that brings together information about disaster preparedness. The Cabinet Office hopes that these videos will be widely used as teaching materials in disaster preparedness education for elementary and junior high school students and in training courses for local government and other official tasked with disaster preparedness.

Pictures of videos on the Team Bosai Japan portal

1-4 Citizen-led Initiatives

(1) Promoting Widespread Adoption and Awareness of Community Disaster Management Plans

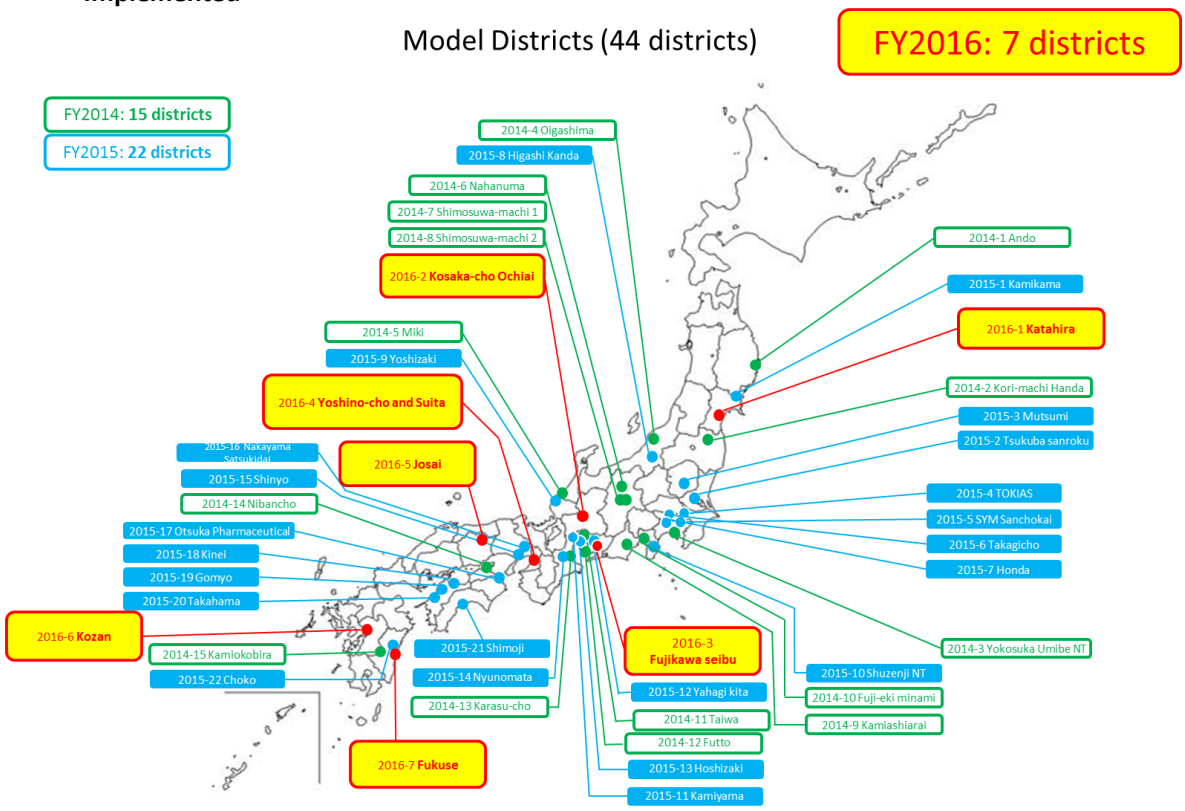
(i) FY2016 Model Projects

Citizens must gain an understanding of the regional attributes and risks of the area where they live and build relationships of trust with their neighbors before disaster strikes, to ensure that self-help and mutual support functions effectively in coordination with public support in the event of a disaster. An effective way of achieving this is for citizens to independently formulate action plans and share them with their neighbors before disaster strikes. As such, the Cabinet Office revised the Basic Act on Disaster Management, positioning Community Disaster Management Plans under the Local Disaster Management Plans of municipalities from April 2014. It implemented model projects in 44 districts over the three fiscal years through to FY2016, promoting initiatives in which local citizens put together plans for their community (Fig. 1-1-4).

In the FY2014 and FY2015 projects, the Cabinet Office issued a public call for applicants and selected 37 districts that it considered to be highly motivated about preparing plans for their communities. It then dispatched university professors and other experts (advisors) to them to provide support tailored to the progress of initiatives in each area. The initiatives carried out as a result took various forms, including initiatives focused on systems for supporting persons requiring special care, the formulation of plans for evacuation to other prefectures, partnerships with local companies, efforts by condominium management associations to confirm the safety of residents, and temporary hosting of evacuees.

In FY2016, the Cabinet Office decided to select the model districts from among prefectures (municipalities) that had not yet had model districts selected, while also seeking to ensure a good balance of geographical and regional features. To facilitate this initiative, the Cabinet Office held a meeting of the Advisory Panel on Promoting the Widespread Adoption of the Community Disaster Management Plans at which seven of the districts nominated by the experts and municipalities were selected on the basis of the aforementioned policy. Several workshops were held in each district and members of the Advisory Panel were dispatched as advisors to those districts, to assist in drawing up the plans. The results included a review of a Community Disaster Management Plan as a regional development measure for districts in the vicinity of a tourist attraction and an initiative centered on school districts in Kumamoto immediately after the disaster.

Fig. 1-1-4 Districts where Cabinet Office Community Disaster Management Plan Model Projects were Implemented



Source: Cabinet Office

As a result of the three years of model projects, 23 of the 44 districts drafted Community Disaster Management Plans and six districts' plans resulted in the Local Disaster Management Plans of the relevant municipalities being revised to reflect the community plans.

The Advisory Panel reviewed the outcomes of initiatives to date and the issues that arose, and published the Report on Community Disaster Management Plan Model Projects at the end of FY2016.

This report pointed out the effects of Community Disaster Management Plans, noting the fact that participation in the model projects awakened an awareness of disaster preparedness and a spirit of mutual support among local residents who did not usually talk about disasters, and also triggered regional revitalization. In addition, the projects acted as a catalyst for participants to make more specific mental preparations and visualize the disasters that could occur, including taking the initiative to check the risks foreseen in the area in which they live and the locations to which they should evacuate, as well as thinking about the division of roles in the event of disaster.

Moreover, the report identified a number of issues, including the need to maintain a moderate sense of distance between government official and local citizens while building relationships of trust between them, as well as the difficulty of maintaining the continuity of initiatives once plans have been drawn up and the necessity of generational change. The report recommended that drills be conducted on the basis of the plans to check the plans' effectiveness and identify any areas for improvement. It also pointed out the need to familiarize the citizens of surrounding districts with the content of the plans.

(ii) Community Disaster Management Plan Forum

On March 25, 2017, the Community Disaster Management Plan Forum was held in the city of Nagoya, Aichi

Prefecture (Nagoya International Center) to introduce the outcomes of the model projects to date and issues to be tackled going forward, thereby promoting the spread of such initiatives and raising awareness of them nationwide. At the forum, the Cabinet Office reviewed the model projects conducted to date and outlined the initiatives that had taken place in each district, as well as sharing the sum total of knowledge gained from the three years of projects, focusing on such themes as management to ensure the continuation of the plans and the future of Community Disaster Management Plans.

Workshop held as part of a model project

Community Disaster Management Plan Forum

It would be desirable for every district to take the initiative and begin putting a plan together, with reference to the model projects undertaken so far. It is likely that awareness of disaster mitigation and prevention will be propagated through the support provided by municipalities to these model districts and the roll-out of information both within the districts concerned and to other districts through seminars, etc. The Cabinet Office will continue with its endeavors to popularize these initiatives, in order to ensure full awareness of this system among the public.

(2) Citizens' Disaster Preparedness Councils

National and local governments implement various policies to raise awareness of disaster prevention and mitigation among local citizens. Among these are seminars held for local citizens by municipalities, but most of those who take part are already interested in disaster preparedness. The government therefore decided to investigate how to increase awareness concerning disaster preparedness in order to devise ways of attracting the participation of a broader range of local citizens.

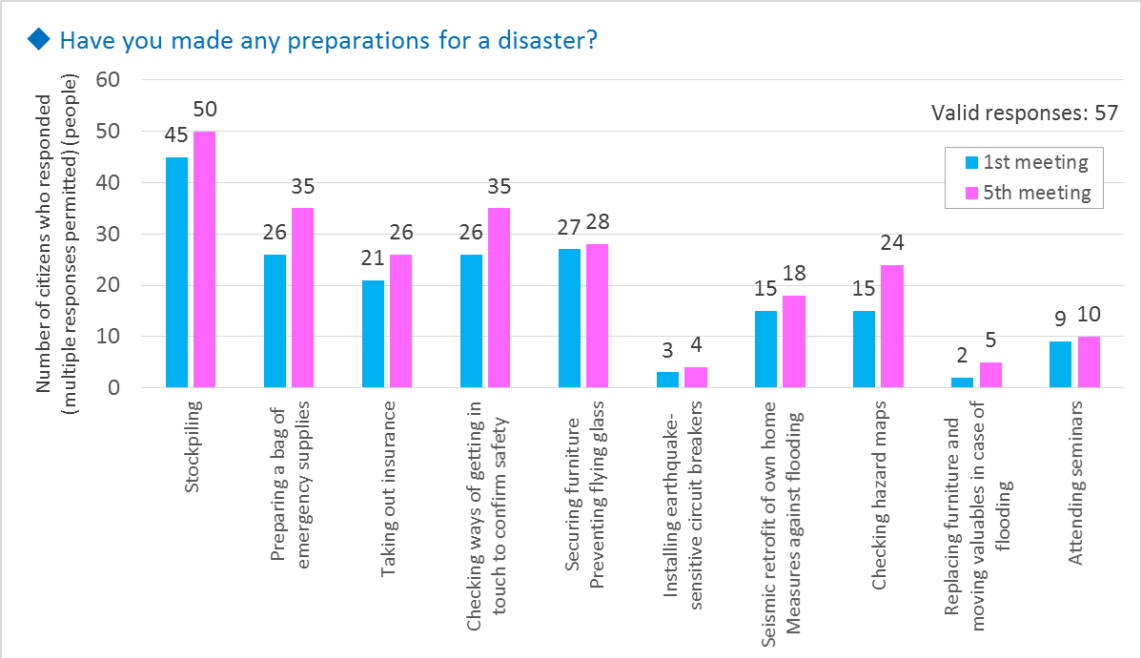
Accordingly, having identified Naka-ku in the Shizuoka Prefecture city of Hamamatsu as an area likely to be at risk of multiple disasters, such as tsunami and river flooding, the Cabinet Office selected the district as the venue for a trial initiative in FY2016 and held meetings of the Hamamatsu Citizens' Disaster Preparedness Council.

Local citizens with differing levels of awareness and interest in disasters were asked to participate, to investigate how to foster awareness during discussions. With the cooperation of Hamamatsu City Office, residents on the basic resident register were randomly sampled, with the Hamamatsu municipal government itself inviting members of the sample group to participate. This method secured the participation of local citizens (a total of 78 men and women) — including local high school students — with varying levels of awareness and interest, from teenagers to those in their 70s.

During the meetings, participants split up into groups in which they shared their awareness of danger from disasters with other citizens, while discussing responses in the event of disaster. Five meetings were held in total, with pre-project (first meeting) and post-project (fifth meeting) questionnaires distributed to participants.

This survey revealed that the number of citizens who had begun making preparations for disasters increased as a result of participation in the council, compared with the situation at the start (Fig. 1-1-5).

Fig. 1-1-5 Results of the Pre- and Post-project Questionnaire of Participants in the Citizens' Disaster Preparedness Council



Source: Results of a questionnaire distributed by the Cabinet Office

The Cabinet Office put together its findings from the trial citizens' council and compiled a list of similar examples, which it published in March 2016 as the "Guide to Initiatives to Increase Awareness of Disaster Preparedness Among Local Citizens via Random Sampling." It is hoped that this guide will be used to promote initiatives aimed at increasing awareness of disaster preparedness among local citizens.

Hamamatsu Citizens' Disaster Preparedness Council

Group discussion

Column: Disaster Imagination Games

There are a variety of disaster imagination games, which seek to increase people's ability to deal with disaster. Participating in these games provides an enjoyable way to think about disaster and learn about many other people's views. This column introduces a number of frequently used disaster imagination games.

<Crossroads>

Participants, who each have cards marked "Yes" and "No," are asked a yes–no question at random (for example, "Not enough food has been distributed to the evacuation center, but everyone is hungry. Do you decide on an order of priority and distribute the food accordingly, or do you refrain from distributing the food until more supplies arrive?") Each person decides on what they would do and they all show the card corresponding to their choice at the same time. This enables people to see the majority view, but it is not the case that the majority view is the best course of action. The important thing is to share with other members of the group one's thoughts about why that course of action should be taken. It is therefore better to split up into small groups of five or six people, rather than playing as a large group, so that participants can spend time discussing each other's opinions.

<DIG: Disaster Imagination Game>

This is a tabletop exercise game in which participants add information about their local community — such as the location of evacuation centers, public telephones, hazardous areas, and residents requiring assistance during a disaster — to a map (ground plan) of the area in which they live. In addition, participants consider evacuation routes that would need to be taken to reach evacuation sites or centers in a disaster scenario and think about preparedness measures.

<EVAG: Evacuation Activity Game>

This is a role-playing game that tests evacuation behavior. First, each person takes an "attribute card" and considers the timing at which the person on that card would leave for an evacuation center if a torrential rain disaster struck their neighborhood. There are dozens of different types of card, covering different genders, ages, and nationalities; conditions on the card impose constraints on the means of transport that the person on the card can use. Young people can take on the role of an elderly person and imagine their thought processes, while able-bodied people can think about the situation from the perspective of a person requiring special care.

<HUG: Hinanjyo Unei Game>

The Hinanjyo Unei Game (evacuation center management game) was devised by Shizuoka Prefecture to prepare for a Tokai earthquake. It uses site plans (ground plans) of evacuation centers and gymnasiums. The "evacuee card" detailing the evacuee's age, gender, nationality, and personal circumstances is used to represent the space actually required by the evacuee (three square meters per person). Participants then lay the cards on the ground plan to see how appropriately they can arrange them, and think about how to deal with problems that could actually arise in an actual evacuation center.

To prepare for a major disaster, the Ministry of Education, Culture, Sports, Science and Technology issued a notice in January 2017, regarding key points concerning cooperation in the running of evacuation centers in schools. In response, elementary schools in Tokyo's Taito-ku used HUG for a drill involving teachers and other school staff.

<LODE>

Acronym of Little children, Old people, Disabled people and Evacuation. Designed to explore responses to issues involving people who would be vulnerable in the event of disaster and people living in medium- and high-rise residential buildings, this game uses simplified elevation views of condominiums and colored stickers providing information about the residents in each apartment. More than other tabletop exercises, this game focuses on providing evacuation guidance to people requiring assistance to evacuate in the event of disaster.

1-5 Development of Business Continuity Systems

(1) Development of Business Continuity Systems by National Government's Ministries and Agencies

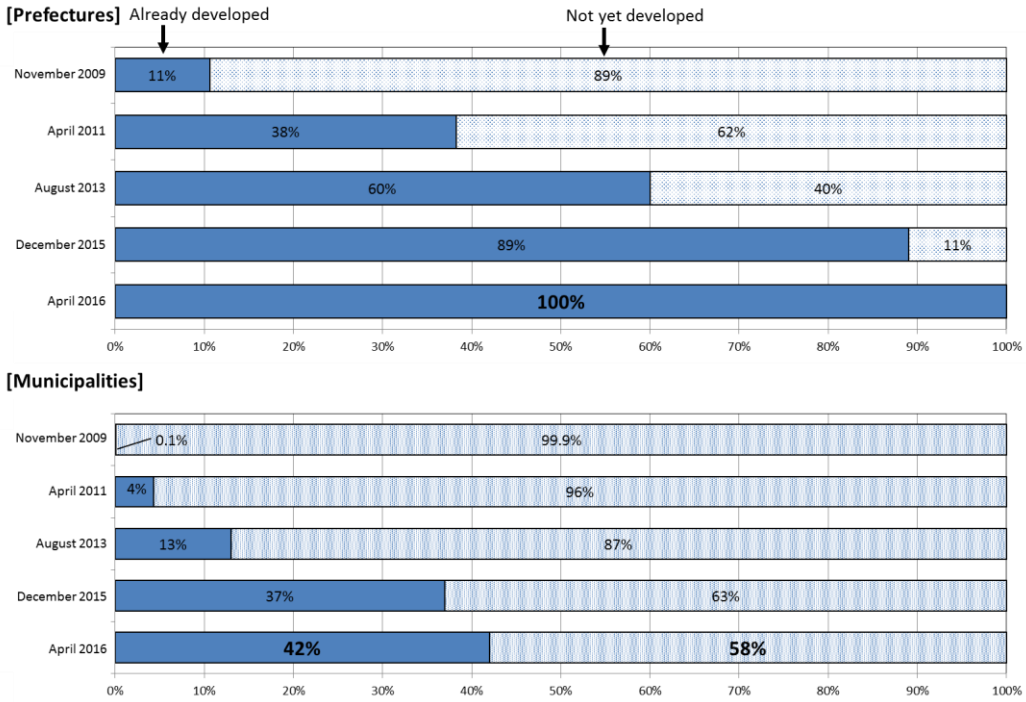
In March 2014, the Central Government's Business Continuity Plan (Measures for a Tokyo Inland Earthquake) was approved by the Cabinet. National government's ministries and agencies use this document as the basis for revisions of their own business continuity plans (BCPs), as needed. The Cabinet Office assessed the ministry and agency BCPs with experts on the basis of the Central Government BCP. In addition, it formulated the Business Continuity Guidelines for National Central Government Ministries: Second Edition (Measures to Deal With a Tokyo Inland Earthquake) in April 2016. Through such initiatives, the government is building business continuity systems that will enable the business of government to continue operating smoothly even in the event of a Tokyo inland earthquake.

(2) Development of Business Continuity Systems by Local Government

It is absolutely vital for local governments to develop a BCP to ensure business continuity in the event of a disaster. However, the BCP preparation rate remains low among municipalities, with only 42% of municipalities having formulated a BCP as of April 2016, as compared to 100% of prefectures (Fig. 1-1-6).

In response to this situation, the Cabinet Office published the Business Continuity Plan Formulation Guidelines for Municipalities in FY2015, with the aim of making it easier for small municipalities with a population of less than 10,000 to prepare a BCP. In addition, it amended the Business Continuity Manual for Local Governments During Earthquake Disasters (April 2010) to take account of past disasters, publishing the revised version under the title Business Continuity Manual for Local Governments During Major Disasters, which it issued as a notice to local governments. Moreover, since FY2015, the Cabinet Office has been holding workshops (co-organized by the Cabinet Office and the Fire and Disaster Management Agency) to train relevant municipal employees in preparing BCPs. Through such initiatives, the Cabinet Office will continue to support local governments in strengthening and enhancing their business continuity systems.

Fig. 1-1-6 Development of Business Continuity Plans by Local Governments



Source: November 2009 Survey of Business Continuity Plans Based on an Earthquake Disaster (Cabinet Office and Fire and Disaster Management Agency Survey)
April 2011 Local Government Information Management Report (March 2012) Ministry of Internal Affairs and Communications Local Administration Bureau Regional Information Policy Office Survey
August 2013 BCP Formulation Rate for Large-Scale Earthquakes and Other Natural Disasters (preliminary figures) (Fire and Disaster Management Agency Survey)
December 2015 Survey of the Current Status of the Formulation of Business Continuity Plans and the Formulation of Specific Criteria for the Issuance of Evacuation Recommendations by Local Governments (Fire and Disaster Management Agency Survey)
April 2016 Survey of the Current Status of the Formulation of Business Continuity Plans (Fire and Disaster Management Agency Survey)

(3) Development of Business Continuity Systems by Private Sector Companies

If a company's business activities stagnate due to a major disaster, the effects would not be confined to that company: the impact would also be felt by its business partners, the local economy and community, and, by extension, the economy of Japan and the world as a whole. Accordingly, in 2005, the Cabinet Office formulated the Business Continuity Guidelines, having determined that there was a need to examine guidelines concerning business continuity plans (BCPs). This decision was informed by the Basic Recommendation of a Disaster Management Strategy by Utilizing Civil and Market Abilities, a set of public-private partnership measures put together in 2004 by the Central Disaster Management Council's Special Board of Inquiry on Enhancing Disaster Management by Utilizing the Private Sector and Markets. The Great East Japan Earthquake in 2011 clearly highlighted the importance of incorporating business continuity management (BCM) into the routine management strategy of companies. As such, in 2013, the Cabinet Office revised the guidelines to incorporate the concept of BCM and published them under the title Business Continuity Guidelines (Third Edition) —Strategies and Responses for Surviving Critical Incidents—. This edition remains current today.

Following its revision in 2014, the Basic Plan for Disaster Risk Reduction specified that "companies should strive to promote BCM, while the national government and local governments should endeavor to support BCM." Accordingly, this stipulation was incorporated into a number of plans, including the Basic Plan for the Promotion of Tokyo Inland Earthquake Emergency Measures, which was approved in 2014. The Basic Plan for the Promotion of Nankai Trough Earthquake Countermeasures included a specific goal of ensuring that close to

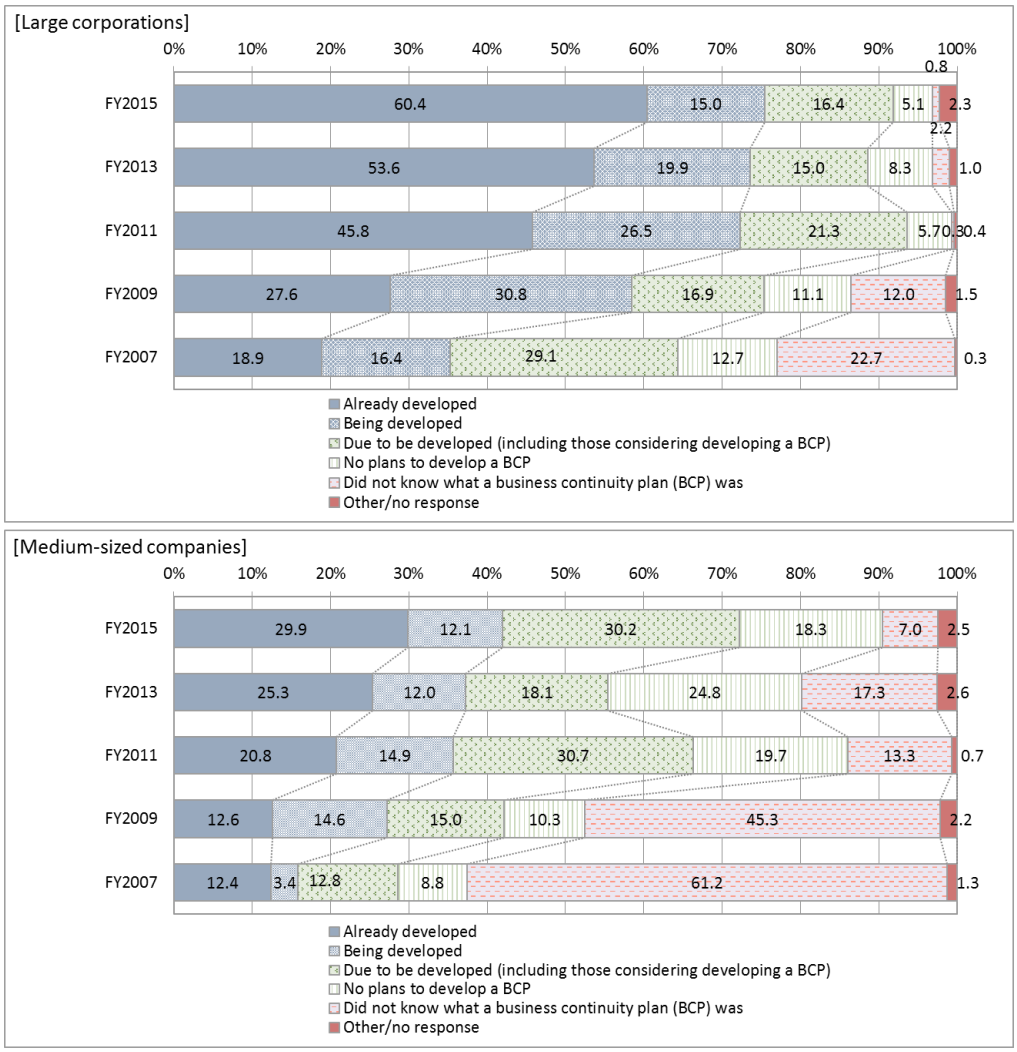
100% (nationwide) of large corporations and at least 50% (nationwide) of medium-sized companies have formulated BCPs.

In terms of specific government targets, the Action Plan for National Resilience 2016 sets a goal of ensuring that more or less 100% (nationwide) of large corporations and 50% (nationwide) of medium-sized companies have prepared BCPs by 2020.

As such, the Cabinet Office conducts a fact-finding survey every second fiscal year, to ascertain what proportion of private sector companies have formulated a BCP and investigate their disaster preparedness initiatives. The results of the FY2015 Fact-finding Survey on Company Business Continuity and Disaster Preparedness Initiatives, which was conducted in February 2016, showed that preparation of BCPs was on the rise, with 60.4% of large corporations (up from 53.6% in the previous survey) and 29.9% of medium-sized companies (up from 25.3% in the previous survey) having already prepared a BCP. When companies currently in the process of preparing a BCP are also included, these figures rise to just under 80% and just over 40%, respectively (the overall BCP preparation rate was 66.1%) (Fig. 1-1-7).

The Cabinet Office will continue to undertake initiatives to popularize and raise awareness of BCP preparation, with the aim of encouraging companies to formulate a BCP and engage in BCM.

Fig. 1-1-7 BCP Development by Large Corporations and Medium-Sized Companies



Source: "FY2015 Fact-finding Survey on Company Business Continuity and Disaster Preparedness Initiatives," Cabinet Office (March 2016)

1-6 Using Risk Finance to Prepare for a Disaster

While protecting human life is the top priority in the event of disaster, recovering from any economic damage without delay is also crucial to the swift, smooth recovery and reconstruction of the affected area. Disasters have a serious impact on business management, so ensuring business continuity through appropriate preparations before disaster strikes is essential to ensuring that the local economy recovers without delay. Moreover, securing somewhere to live is vital in enabling individuals (those affected by the disaster) to rebuild their lives; problems in rebuilding homes extinguish both people's motivation to work toward recovery and their hopes for the future. To facilitate swift recovery from such economic losses arising from disasters, it is important to utilize risk finance such as insurance and mutual insurance in preparing for a disaster.

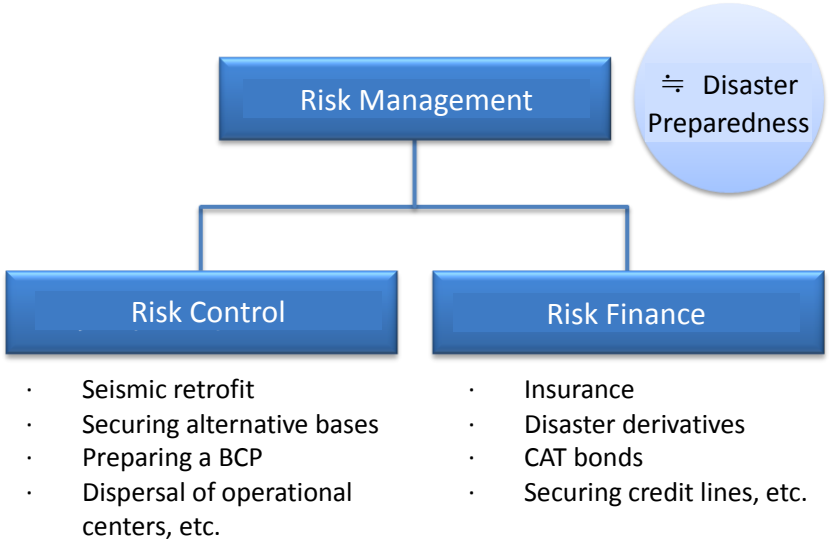
(1) Risk Finance among Business Operators

Disaster risk management by business operators to prepare for disaster can be divided into two categories: disaster risk control initiatives, which aim to reduce the level of risk itself through such measures as preparing a BCP and seismic retrofit of facilities; and disaster risk finance initiatives, which seek to alleviate any impacts on business management by sharing (relocating) risk or holding appropriate levels thereof through such measures as taking out insurance or securing credit lines (Fig. 1-1-8). It cannot be said that there has been enough discussion of the latter in present-day Japan, nor that the concept has become prevalent.

In light of this situation, the Study Group on Risk Finance for Catastrophic Natural Disasters began its meeting in September 2016. Aiming to summarize the current status of risk finance and relevant issues, and increase risk resilience to natural disasters among Japanese business operators, this panel of academic experts, practitioners, and representatives of relevant ministries and agencies published its report in March 2017.

The Study Group found that, despite hopes that risk finance initiatives among business operators would have a synergistic effect with risk control initiatives, risk finance initiatives have in fact not necessarily progressed as well as risk control initiatives. Moreover, it found that there is a gap between risk holders (business operators) and service providers (direct-writing insurance companies, etc.) in their awareness of risk, making it difficult for the private sector to independently encourage more widespread take-up at present. As such, the panel pointed out the need for "diverse actors" to provide services that contribute to risk management among relevant business operators through their core businesses. In addition, it recommended that principles serving as guidelines for the conduct for those diverse actors should be formulated to promote ongoing initiatives, and that public institutions such as the national government and local governments should support the creation of a framework for this.

Fig. 1-1-8 The Concept of Risk Management Concerning Natural Disasters



Source: Cabinet Office

(2) Encouraging Individuals to Enroll in Insurance/Mutual Insurance

A key concept in risk finance is that it is desirable to utilize insurance and mutual insurance to obtain recompense for damage caused by natural disasters.

Insurance and mutual insurance are an effective means of helping those whose homes or other assets have suffered major damage as a result of disaster to rebuild their lives. However, while around 80% of homeowning households are enrolled in insurance or mutual insurance with fire coverage, the enrollment rate in insurance or mutual insurance that offers coverage for flood or earthquake damage is low (Fig. 1-1-9).

Accordingly, in December 2016, the Cabinet Office set up the Study Group on Promoting Preparations for Disaster Using Insurance/Mutual Insurance, to summarize discussion points concerning the role of insurance and mutual insurance in rebuilding homes, challenges faced in promoting more widespread take-up of insurance/mutual insurance, and approaches to future initiatives. With the cooperation of relevant ministries, agencies, and organizations, the panel published a report on its findings in March 2017. This report set out the direction that needs to be taken going forward, to encourage enrollment in insurance and mutual insurance. This included initiatives and methods for raising awareness and promoting greater take-up via insurance broker channels, and techniques for providing risk information, such as using existing real estate information systems to show people hazard maps. Among the medium- to long-term challenges associated with insurance and mutual insurance mechanisms listed in the report were linkages to disaster mitigation measures and official support, the relationship to financial burden, and the advantages and disadvantages of each enrollment method.

Moreover, with the cooperation of relevant ministries, agencies, and organizations, the Cabinet Office summarized approaches to providing information when encouraging enrollment in insurance or mutual insurance, and put together a pamphlet for the general public. Based on these initiatives, the Cabinet Office will redouble its efforts to encourage enrollment in insurance and mutual insurance offering coverage against natural disasters.

Fig. 1-1-9 Number and Percentage of Enrollments in Insurance/Mutual Insurance (Building Only) by Homeowning Households (*1)

	Fire coverage	Flood coverage*5	Earthquake coverage*5
Insurance	21.23 million*2 (61%)	14.75 million*2 (42%)	12.09 million*3 (35%)
Mutual Insurance	11.68 million*4 (33%)	11.61 million*4 (33%)	7.7 million*4 (22%)
Insurance + Mutual Insurance (Simple total)	32.91 million (94%)	26.36 million (75%)	19.79 million (57%)
Insurance + Mutual Insurance (Adjusted for duplication*6)	28.8 million (82%) *No insurance/mutual insurance policy 18%	23.07 million (66%)	17.32 million (49%)

Source: The figures in the table above are provisional calculations by the Cabinet Office.

*1 The number of homeowning households is estimated at 35.02 million households. This figure was obtained by multiplying the total number of households (56.95 million households) in the FY2015 Survey of Population, Population Dynamics, and Number of Households Based on the Basic Resident Register conducted by the Ministry of Internal Affairs and Communications, by the percentage of homeowning households (61.5%) in the 2013 Housing and Land Survey of Japan conducted by the Ministry of Internal Affairs and Communications.

*2 According to data from the General Insurance Rating Organization of Japan (Total number of fire insurance policies held on buildings (homes) at the end of FY2015 (including housing loan fire insurance, but excluding condominium insurance). "Policies that include buildings in the insurance coverage" refers to policies that cover either the building alone or the building and contents, but does not include policies where the insurance coverage is unclear.)

*3 According to FY2015 statistics from the General Insurance Rating Organization of Japan. (Total number of policies held covering buildings (class A and class B buildings) as of FY2015.)

*4 According to data from the Japan Cooperative Insurance Association Incorporated. (Total number of mutual insurance policies held with the National Mutual Insurance Federation of Agricultural Cooperatives (ZENKYOREN), National Mutual Insurance Federation of Fishery Cooperative Associations (JF Kyosuiren), National Federation of Workers and Consumers Insurance Cooperatives (ZENROSAI), and Federation of Japanese Consumer Cooperatives (Zenkokuseikyoren) covering buildings (homes) at the end of FY2015.)

*5 Excluding those that pay out only a small sum or a token consolation payment even in cases where the building is completely destroyed.

*6 According to a questionnaire-based survey conducted among households that received a livelihood recovery support payment for disaster victims due to having suffered a loss caused by a natural disaster between FY2010 and FY2014, some people have multiple insurance/mutual insurance policies, so the number of policyholders is 87.5% of the number of policies held. (N=5,752 people)

Pamphlet aimed at the general public

Recommendations on Insurance/Mutual Insurance Scheme Enrollment

Section 2: Disaster Management Frameworks, Disaster Response, and the Preparation Thereof

2-1 Revision of the Basic Plan for Disaster Risk Reduction

The Basic Plan for Disaster Risk Reduction is a basic plan for disaster management in Japan, which is decided by the National Disaster Management Council in accordance with Article 34 of the Basic Act on Disaster Management. It is reviewed annually and revised when deemed necessary, to take account of the findings from scientific research concerning disasters and their prevention, as well as disasters that have occurred and the effects of emergency disaster control measures implemented in response. Local governments are required to develop Local Plans for Disaster Risk Reduction, while Designated Administrative Organizations and Designated Public Corporations are required to develop Disaster Management Operations Plans, which must be based on the Basic Plan for Disaster Risk Reduction.

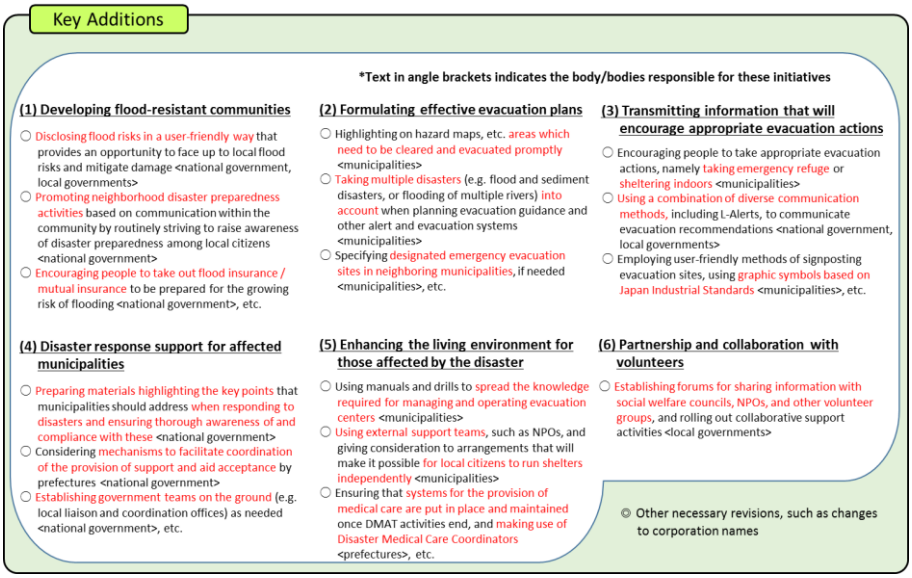
In FY2016, the Basic Plan for Disaster Risk Reduction was revised once, in May 2016 (Fig. 1-2-1).

Revisions based on lessons from the disaster resulting from the Torrential Rain of September 2015 in the Kanto and Tohoku Regions (May 2016)

The May 2016 revisions were based on the report by the Working Group on Study on Evacuation and Emergency Response Measures for Flood Disasters, which the government established under Disaster Management Implementation Committee in the National Disaster Management Council. The revisions mainly focused on enhancing disaster management measures in light of issues faced in dealing with the Torrential Rain of September 2015 in the Kanto and Tohoku Regions. These included the lack of adequate preparations for self-help and mutual support and the fact that there was scope for devising better ways to communicate information concerning evacuation.

More specifically, the content added covered such matters as the preparation of materials highlighting the key points that municipalities should address when responding to disaster and efforts to ensure thorough awareness of and compliance with these; efforts to encourage people to take out flood insurance / mutual insurance to be prepared for the growing risk of flooding; and highlighting on hazard maps those areas which need to be cleared and evacuated promptly.

Fig. 1-2-1 Overview of Revisions to the Basic Plan for Disaster Risk Reduction (May 2016)



Source: Cabinet Office

The National Disaster Management Council (Officers Meeting) discusses revisions to the Basic Plan for Disaster Risk Reduction (Parliamentary Vice-Minister of Cabinet Office Yasumasa Nagasaka makes a statement, as chair of the Officers Meeting)

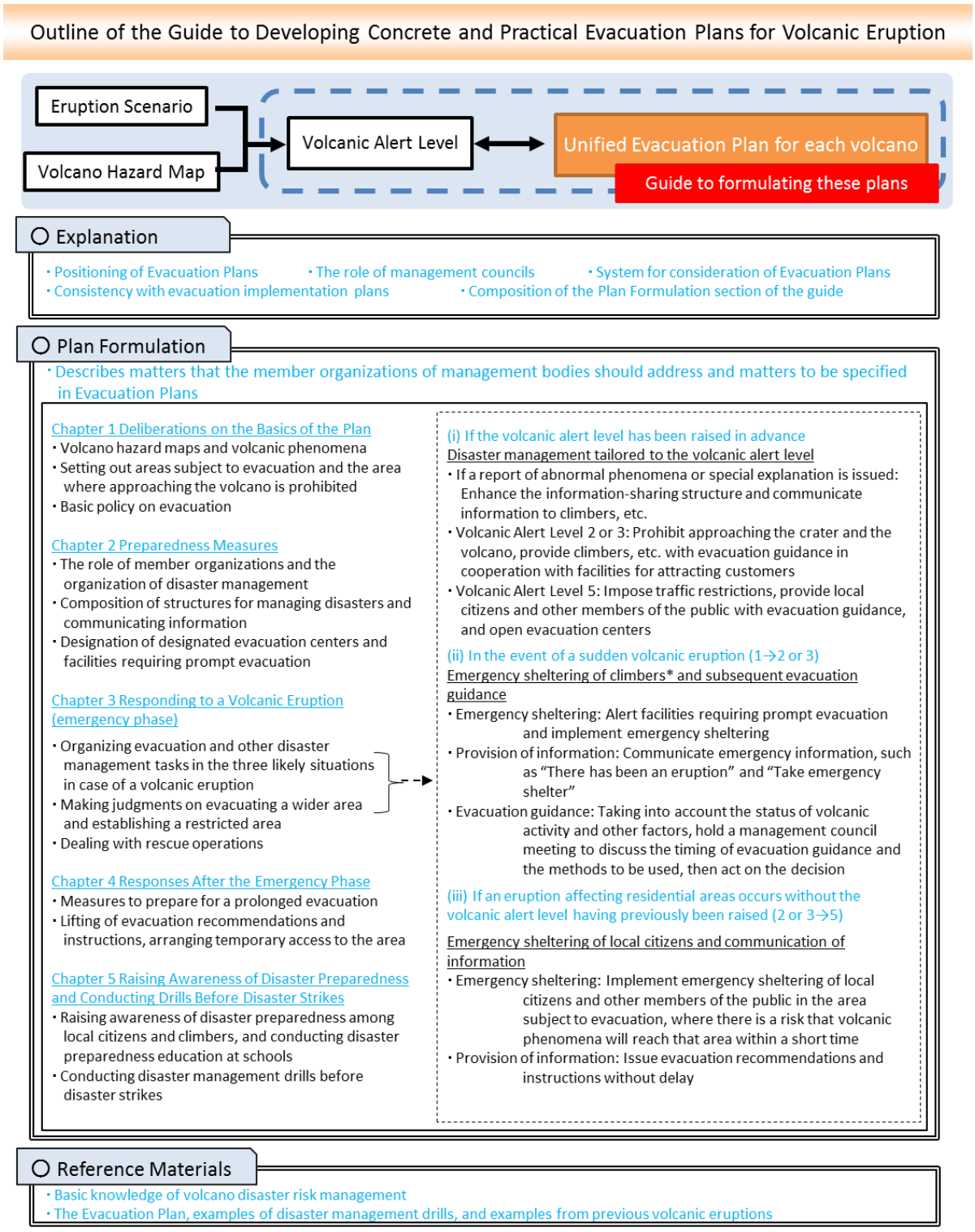
2-2 Volcanic Eruption Evacuation Plans

The Act on Special Measures for Active Volcanoes was revised in 2015 in light of lessons learned from the Mt. Ontake Eruption Disaster (September 2014). Under the revised act, local governments designated as volcanic eruption hazard zones (140 municipalities in 23 prefectures) are obliged to include a Volcanic Eruption Evacuation Plan in their Local Disaster Management Plan.

In March 2012, the Cabinet Office put together the Guide to Developing Concrete and Practical Evacuation Plans for Volcanic Eruption and has provided local governments with support in preparing these plans. This guide was revised in December 2016 to take account of the lessons of the Mt. Ontake Eruption Disaster, following deliberations by the Committee to Draft a Guide to Preparing Evacuation Plans in Case of a Volcanic Eruption, a panel consisting of volcanologists, local governments in volcanic regions, and individuals involved in mountain climbing and tourism, among others (Fig. 1-2-2).

More specifically, as well as ensuring that the guide provides a framework in preparing an Evacuation Plan which is required by Volcanic Disaster Management Councils to develop for each volcano, the panel enhanced the guide's measures targeting climbers and tourists, such as ensuring the rapid communication of information and the provision of evacuation guidance. In addition, the guide identified the bodies responsible for taking action to address the measures that the member organizations of Volcanic Disaster Management Councils (e.g. municipalities and prefectures) are expected to deal with, not only in cases in which the volcanic alert level has been raised in advance, but also in the event of a sudden eruption.

Fig. 1-2-2 Guide to Evacuation Plans (after revision)



Source: Cabinet Office

Column: Support for the Development of Volcanic Eruption Evacuation Plans Based on the Guide to Developing Evacuation Plans

Local governments obliged to put alert and evacuation systems in place need to consider a specific, practical Evacuation Plan. However, the scale of volcanic eruptions, the phenomena that occur, and the nature of the damage vary from one volcano to another, while only a very few employees actually have any experience of handling disaster management in the event of a volcanic eruption. This makes it difficult for most local governments to consider and formulate an Evacuation Plan without assistance.

Accordingly, the Cabinet Office conducted a survey about the issues faced in each volcanic region and set four key themes for consideration, based also on the views of relevant experts. Then, in FY2016, it undertook an initiative in which the Cabinet Office and local governments undertook collaborative deliberations concerning Evacuation Plans that addressed those issues in relation to 17 volcanoes.

In this initiative, Cabinet Office official worked in partnership with local governments officials, visiting each volcanic region to conduct field surveys of areas expected to suffer damage and considering specific matters relating to evacuation routes and evacuation centers in each area subject to evacuation. For each theme, deliberations were carried out with reference to the guide and other literature, examining such matters as criteria for restricting access to mountain trails and other areas, methods of evacuating large numbers of people from urban areas, Evacuation Plans tailored to multiple craters or eruption scenarios, and evacuation methods for outlying islands, covering both on- and off-island evacuation.

It is expected that initiatives involving collaborative deliberations on issues faced in preparing Volcanic Eruption Evacuation Plans will assist in the steady development of alert and evacuation systems in volcanic regions.

2-3 Revision of the Guidelines for Evacuation Recommendations

The flooding resulting from 2016 Typhoon 10 caused immense damage in the Tohoku and Hokkaido regions, including 27 fatalities and missing persons. Most notably, the failure to take appropriate emergency evacuation actions at a facility for elderly people in the Iwate Prefecture town of Iwaizumi took a serious human toll, with all nine residents losing their lives.

In light of this situation, the Cabinet Office set up the Study Group on Guidelines for Producing a Decision and Dissemination for Evacuation Recommendations, a panel of representatives from relevant ministries and agencies and experts in related fields, including disaster management and welfare. The Study Group examined ways to improve the provision of information concerning evacuation and published a report in December 2016.

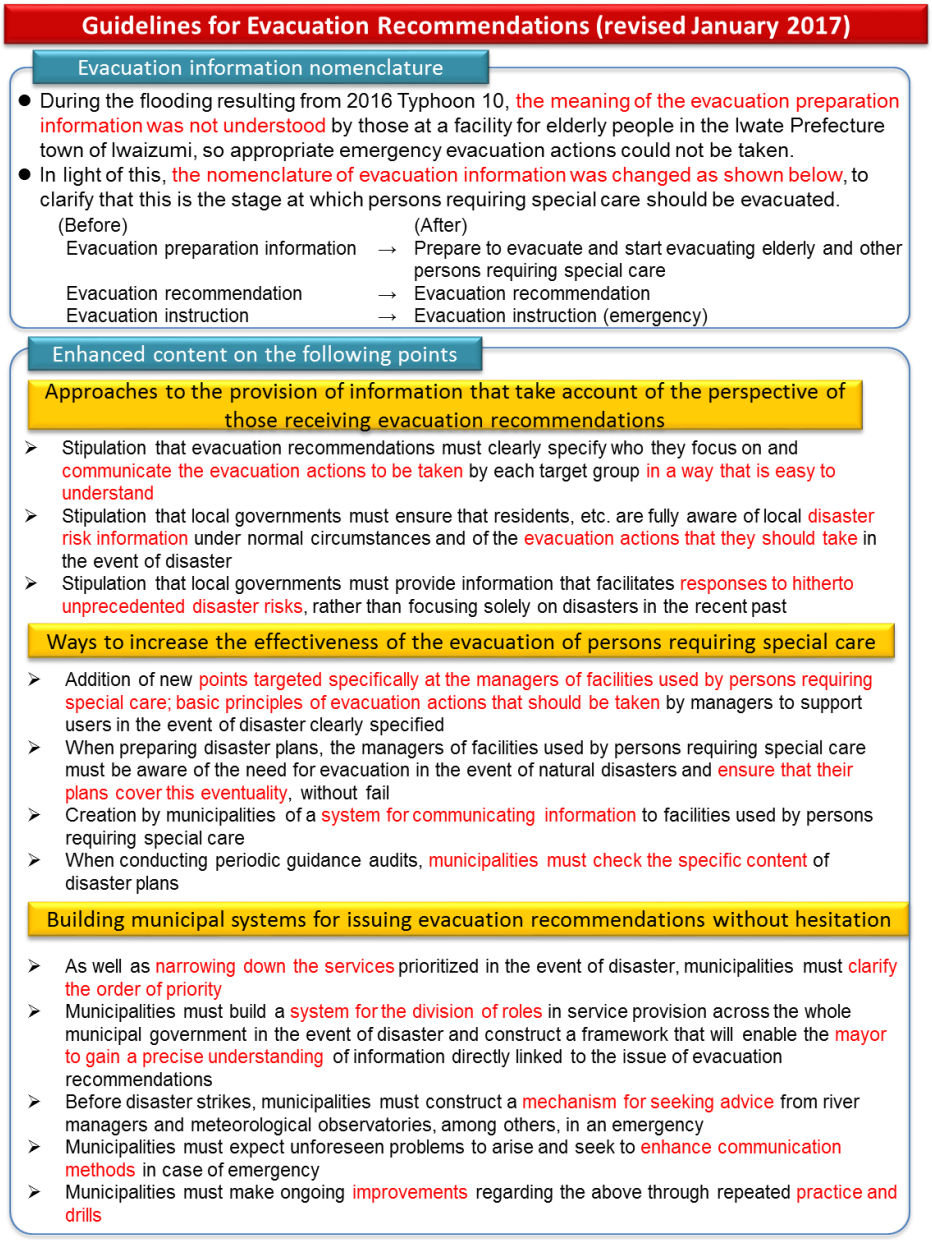
(See http://www.bousai.go.jp/oukyu/hinankankoku/h28_hinankankoku_guideline/index.html)

This report highlighted the issue that appropriate emergency evacuation actions could not be taken because the meaning of the evacuation preparation information was not conveyed to an elderly people's facility. To clarify the fact that this is the stage at which elderly and other vulnerable people should start to evacuate, the Cabinet Office changed the name "evacuation preparation information" to "prepare to evacuate and start evacuating elderly and other persons requiring special care." In addition, to clarify the difference between an evacuation recommendation and an evacuation instruction, the Cabinet Office changed the name "evacuation instruction" to "evacuation instruction (emergency)."

Furthermore, in light of this report, the Cabinet Office revised the Guidelines for Producing a Decision and Dissemination for Evacuation Recommendations to ensure that residents and managers of facilities for elderly people can take appropriate evacuation actions (the guidelines also renamed the title of the Guidance as "the Guidelines for Evacuation Recommendations.").

As well as the changes to evacuation information nomenclature described above, the main changes in the guidelines included enhancing the content of sections on "Approaches to the provision of information that take account of the perspective of those receiving evacuation recommendations," "Ways to increase the effectiveness of the evacuation of persons requiring special care," and "Building municipal systems for issuing evacuation recommendations without hesitation." In addition, various useful examples were added (Fig. 1-2-3).

Fig. 1-2-3 Main Changes in the Guidelines for Evacuation Recommendations (revised January 2017)



Source: Cabinet Office

Minister of State for Disaster Management Jun Matsumoto conducts a field survey following 2016 Typhoon 10 (Iwaizumi Town, Iwate Prefecture)

Column: Air Rescue Operations and Aviation Safety During the Torrential Rain of September 2015 in the Kanto and Tohoku Regions

Heavy rain on September 10, 2015 caused embankments along the Kinugawa River to be breached. As a result, the city of Joso in Ibaraki Prefecture and many other areas became flooded, leaving many people stranded. A request for a disaster relief deployment to rescue stranded people was received the same day from Ibaraki Prefecture, with further requests received from Miyagi and Tochigi prefectures the following day. In response, the Self-Defense Forces used helicopters and boats to conduct search and rescue operations.

Helicopter rescue to save lives

A large number of helicopters — including those belonging to the police, firefighters, Japan Coast Guard, and Self-Defense Forces — were operating over the affected areas. However, having so many helicopters concentrated in the same area actually impedes safe search and rescue operations. Accordingly, a landing guidance system (JTPN-P20) belonging to the Ground Self-Defense Force was installed at Shimotsuma Heliport (H/P) on September 11, where it provided information to a total of 374 helicopters belonging to relevant organizations.

The information provided by the JTPN-P20 covers the area south of the control area on the northern side of Shimotsuma H/P (Utsunomiya Air Field) and north of the control area on the southern side of the heliport (Kasumigaura Air Field). This information is provided to aircraft flying at an altitude of approximately 900 m or less, within a radius of 9.3 km of Shimotsuma H/P (excluding aircraft that are taking off from or landing at airports such as Haneda and Narita, as they do not enter this airspace). To facilitate the provision of information, information was gathered about the flight plans of relevant aircraft, air traffic information was shared on a common frequency, and detailed information gathered on pilot intentions.

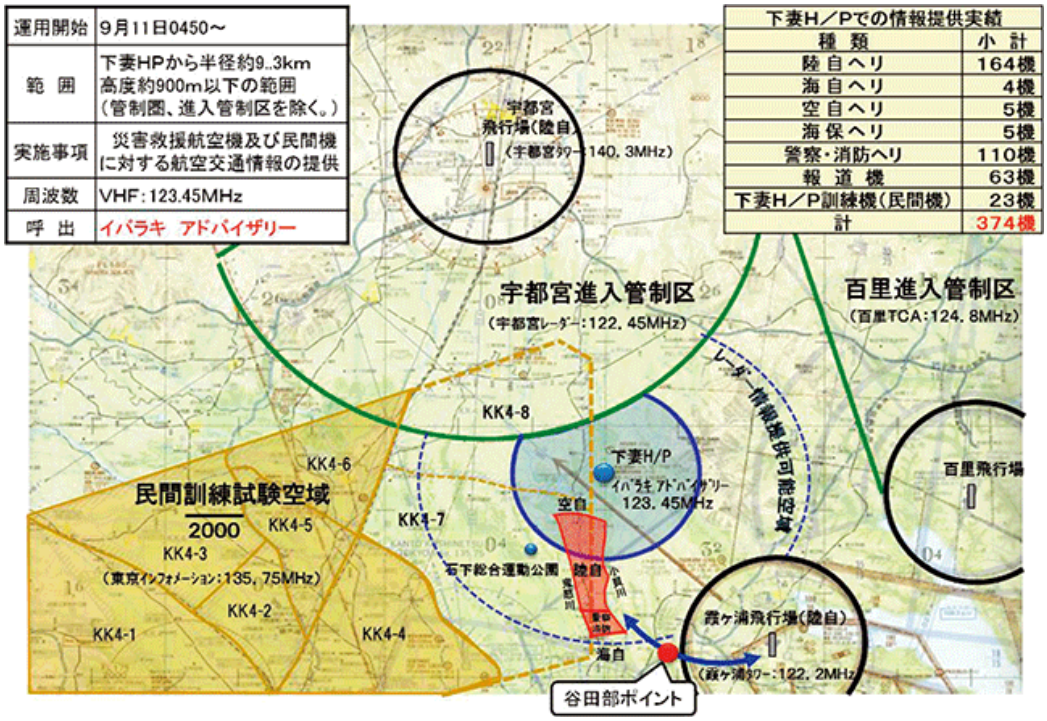
Moreover, flight controls were put in place to ensure that Ground Self-Defense Force helicopters taking off from Kasumigaura Air Field to carry out search and rescue operations passed Yatabe Point. This point ensures that the fastest, most efficient route to the waypoint is used when flying from Kasumigaura to the area where search and rescue operations are taking place. Yatabe Point is located in the airspace over the Yatabe expressway interchange; one reason for choosing this location was the absence of private homes, which means that there is no need for concern about excessive noise. Ultimately, search and rescue operations were concluded safely, without any accidents.

This disaster relief deployment highlighted the need to establish specific guidelines for undertaking search and rescue operations in the initial period after a disaster occurs, when a large number of aircraft belonging to the relevant organizations are operating. In light of this lesson, the first Tachikawa Helicopter Conference was held in March 2016, organized primarily by the Ground Self-Defense Force's Eastern Army Aviation Group. Participants in the conference, who included police officers, firefighters, and members of the US Army Aviation Battalion Japan, established a shared understanding concerning efforts to ensure air safety and guidelines for collaboration. At the second conference, which was held in July the same year and attended

by private sector business operators as well, participants established a shared understanding of the guidelines for helicopter operations in the event of Nankai Trough earthquake.

As swift communication of information with relevant organizations will be expected in the event of a disaster, there are plans to hold further conferences in the future, as needed.

Landing guidance system (JTPN-P20)
(A compact, vehicle-towed mobile air traffic control platform that consists of a surveillance radar, control devices, and communications equipment)



Range controlled by the landing guidance system (JTPN-P20)

2-4 Securing Designated Emergency Evacuation Sites and Designated Evacuation Sites

Designated emergency evacuation sites are positioned as facilities or places to which local citizens and others should evacuate urgently to safeguard their lives in the event of imminent danger from a tsunami, flood, or other such hazard. Designated evacuation sites are facilities for accommodating people who have evacuated until the danger posed by a disaster has passed or for accommodating them temporarily when a disaster prevents their returning home.

The distinction between evacuation sites and evacuation centers was not entirely clear at the time of the Great East Japan Earthquake, which was a factor that contributed to increasing the resultant harm. Accordingly, the Cabinet Office revised the Basic Act on Disaster Management in 2013 to require mayors of municipalities to designate both kinds of evacuation facility in advance, making a distinction between designated emergency evacuation sites and designated evacuation sites, and issue a public notice to notify citizens of details of these facilities. Fig. 1-2-4 shows the designation status of designated emergency evacuation sites as of April 1, 2016.

Fig. 1-2-4 Designation of Designated Emergency Evacuation Sites

	Flood	Sediment Disaster	Storm Surge	Earthquake	Tsunami	Widespread Fire	Rainfall Inundation	Volcanic Phenomena	Total
Number of Designated Evacuation Sites (Sites)	49,823	47,022	14,061	60,947	29,171	30,275	27,654	7,106	83,452
Expected Capacity (10,000 people)	9,484	9,473	3,694	16,301	5,873	11,413	4,714	1,583	—

Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report “Status of Regional Disaster Management Administration” (multiple responses permitted for each category)

Along with the Fire and Disaster Management Agency, the Cabinet Office is encouraging local governments to specify their designated emergency evacuation sites without delay. As local governments are required to specify designated emergency evacuation sites for each type of disaster, the Cabinet Office is calling on local governments nationwide to lose no time in starting to install signs that comply with the Hazard Specific Evacuation Guidance Sign System (JIS Z 9098), which was instituted to enable evacuees to clearly identify such facilities.

Example of a sign compliant with the Hazard Specific Evacuation Guidance Sign System

Fig. 1-2-5 shows the designation status of designated evacuation sites pursuant to Article 49-7 of the Basic Act on Disaster Management as of April 1, 2016. However, a Cabinet Office survey conducted among municipalities nationwide revealed that, as of October 1, 2016, the number of evacuation centers (including

agreements) was 92,561, while the number of welfare evacuation centers (including agreements) was 20,185.

Following situations that have arisen in recent disasters, various problems have been pointed out in relation to efforts to provide an appropriate living environment at evacuation centers, including the need to improve toilet facilities there. Even in the event of a disaster, when evacuees are compelled to lead their lives amid the inconvenient conditions of an evacuation center, it is important to improve the quality of life in centers and seek to ensure a good living environment. Accordingly, since July 2015, the Cabinet Office has been holding meetings of the Study Group on Securing Evacuation Centers and Improving their Quality, to consider and take the necessary steps to deal with a wide range of issues, including encouraging municipalities to designate evacuation centers and welfare evacuation centers, improving toilet facilities at evacuation centers, and developing support and consultation systems for persons requiring special care.

The Study Group has discussed efforts to secure evacuation centers and improve their quality in general terms. In addition, meetings of the Quality Improvement Working Group have been held to examine ways of improving the living environment in evacuation centers in general, and meetings of the Welfare Evacuation Center Working Group to consider efforts to promote the securing of welfare evacuation centers and ensure their smooth management in the event of a disaster. In their deliberations, these working groups have taken into account recent disasters including the Great East Japan Earthquake and the Hiroshima Landslide Disaster.

In FY2016, based on discussions by this committee, the Guidelines for Ensuring Satisfactory Living Conditions at Evacuation Centers (published by the Cabinet Office in August 2013) were partially revised the day after the main Kumamoto Earthquake. At the same time, based on these revised guidelines, the Cabinet Office published three other sets of guidelines: the Evacuation Center Management Guidelines; the Guidelines for Securing and Managing Toilets at Evacuation Centers; and the Guidelines for Securing and Managing Welfare Evacuation Centers (Fig. 1-2-6). Local governments must make preparations to ensure that evacuation centers can be operated appropriately in times of disaster, such as designating evacuation centers in advance based on the kinds of disaster that could occur in the area.

Fig. 1-2-5 Designation of Designated Evacuation Sites

Number of Designated Evacuation Sites (Sites)	65,330
Expected Capacity (million people)	35.88

Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report “Status of Regional Disaster Management Administration”

Fig. 1-2-6 Guidelines on Evacuation Centers

Evacuation Center Management Guidelines (April 2016)
These guidelines emphasize the establishment of systems for internal and external partnership and cooperation before disaster strikes, as well as attaching importance to maintaining the health of evacuees. In addition, they provide a specific checklist of 19 tasks that should be carried out at each stage of disaster response (preparation, initial response, emergency response, and recovery), specifying detailed tasks that tend to be overlooked, such as arrangements for toilets, beds, baths, and pets.

Guidelines for Securing and Managing Toilets at Evacuation Centers (April 2016)
These guidelines stress the importance of securing and managing toilets. This is because a growing number of disaster victims experience discomfort due to the unhygienic state of toilets in times of disaster, which leads them to refrain from using the toilet (by restricting food and/or water intake to reduce the need to use the toilet), running the risk of adverse impacts on their health or even their lives, in a worst-case scenario.

Guidelines for Securing and Managing Welfare Evacuation Centers (April 2016)
These guidelines have a particular focus on matters that should be addressed before disaster strikes, in relation to the designation of welfare evacuation centers. In addition, they cover such matters as consideration for the lessons of the Great East Japan Earthquake, systems for supporting persons requiring special care, securing means of transport, and devising ways to guide evacuees to appropriate evacuation centers.

Minister of State for Disaster Management Jun Matsumoto listens to an explanation while visiting an evacuation center (Mashiki Town, Kumamoto Prefecture)

Column: Online Information About Designated Emergency Evacuation Sites

Since the designated emergency evacuation site designation system was introduced by the 2013 revision of the Basic Act on Disaster Management, the Geospatial Information Authority of Japan, the Cabinet Office, and the Fire and Disaster Management Agency have worked with prefectural and municipal governments to develop data about designated emergency evacuation sites that can be displayed on online maps.

As a result of this work, the information about designated emergency evacuation sites supplied to the Geospatial Information Authority of Japan has been published online on the authority's GSI Map since February 22, 2017.

This data can easily be accessed on both computers and smartphones via the Geospatial Information Authority of Japan's website (http://www.gsi.go.jp/). Along with the name and location of each designated emergency evacuation site, users can access information about the type of disaster each site is intended to address, maps and aerial photographs, and a variety of other information. Using this website makes it easy for each and every citizen to check which designated emergency evacuation site they should evacuate to in the event of a disaster.

From the Geospatial Information Authority of Japan website

Section 3 Responding to Disasters Anticipated to Occur

3-1 Considering Disaster Management Responses Based on Seismic Observation and Evaluation Along Nankai Trough

The area likely to be affected by Tokai Earthquake is designated as an area subject to intensified earthquake countermeasures under the Act on Special Measures Concerning Countermeasures for Large-Scale Earthquakes, which was enacted in 1978. However, concerns currently center not simply on Tokai Earthquake, but on a major earthquake affecting an extensive area along Nankai Trough. Regarding the predictability of a major earthquake in the region in question, a May 2013 report by the Study Group on the Predictability of a Major Earthquake Along Nankai Trough, a panel established under the National Disaster Management Council's Committee for Policy Planning on Disaster Management, stated, "Based on current scientific knowledge, it is difficult to make highly accurate earthquake predictions."

In light of this situation, the Cabinet Office established the Working Group on Disaster Response Based on Seismic Observation and Evaluation Along Nankai Trough under the National Disaster Management Council's Disaster Management Implementation Committee in June 2016. Through this working group, the Cabinet Office is gathering scientific knowledge about the predictability of major earthquakes along Nankai Trough and considering approaches to earthquake preparedness with a view to leveraging the phenomena observed in Nankai Trough focal region.

(See http://www.bousai.go.jp/jishin/nankai/taio_wg/taio_wg.html)

3-2 Revision of the Plan for Specific Emergency Countermeasures and Activities in Light of the Kumamoto Earthquake

In March 2015, the government developed the Plan for Specific Emergency Countermeasures and Activities for Nankai Trough Earthquake (hereinafter the "Specific Plan for Nankai Trough Earthquake"), which details the emergency measures to be taken by the government in the aftermath of an earthquake.

The Specific Plan for Nankai Trough Earthquake provides specific details of the government's plans for emergency transportation routes; rescue, first aid, and firefighting; medical activities; goods procurement; fuel supplies; and disaster management bases. The plans are informed by the results of estimates by the Committee for Modeling Nankai Trough Megaquake of the distribution of seismic intensity and tsunami height in the event of the largest-possible earthquake and tsunami, based on the latest scientific knowledge. They also take into account the damage scenarios set out in a report by the Working Group on Measures to Deal with Nankai Trough Megathrust Earthquake.

Currently, the Specific Plan for Nankai Trough Earthquake is under discussion following a recent review by the Working Group for Studying Emergency Response and Livelihood Support Measures in Light of the Kumamoto Earthquake. Among the matters under consideration are the revision of systems for providing relief supplies, including a review of regional supply hubs, and the addition of temporary power and gas supplies to ensure the business continuity of key facilities.

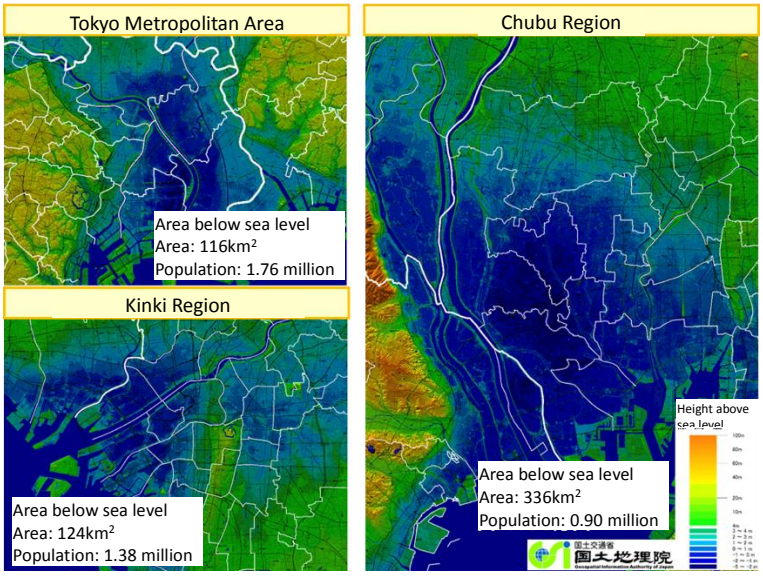
3-3 Deliberations on Large-scale, Extensive Evacuation from Flooding or Storm Surge Inundation in the Tokyo Metropolitan Area

Climate change caused by global warming in recent years makes it necessary to be prepared for increasingly catastrophic flooding beyond existing assumptions. Extensive portions of Japan's three major metropolitan areas are located below sea level. As such, large-scale flooding caused by the collapse of river embankments is expected to result in huge crowds as large numbers of residents seek to evacuate, as well as many people being left stranded after failing to escape in time (Fig. 1-3-1).

Accordingly, the Cabinet Office set up the Working Group for Studying Large-scale, Extensive Evacuation From Flooding or Storm Surge Inundation established under the National Disaster Management Council's Disaster Management Implementation Committee in June 2016. This working group is examining approaches to large-scale, extensive evacuation from flooding or storm surge inundation in Japan's three major metropolitan areas.

(See http://www.bousai.go.jp/fusuigai/kozuiworking/)

Fig. 1-3-1 Areas Below Sea Level in the Three Major Metropolitan Areas



Source: Geospatial Information Authority of Japan

Column: Multilingual Support in Times of Disaster

In February 2017, Tokyo Metropolitan Government and Shibuya City held a joint drill focused on measures to deal with stranded persons unable to return home in the event of a magnitude 7.3 Tokyo inland earthquake. Approximately 4,000 people, including foreign nationals, took part in the drill, which was held in the area around Shibuya Station. Foreign participants downloaded a multilingual app, which they used to check the evacuation route to a temporary evacuation center. In addition, a multilingual megaphone that automatically translates words into four languages (Japanese, English, Chinese, and Korean) was used to provide guidance to foreign participants.

Both smartphone apps and digital signage can be used to provide multilingual support. One of the various smartphone apps that have been developed is VoiceTra, which provides speech-to-speech translation into a number of languages just by speaking into the smartphone on which it is installed. Another is Safety tips, an app that provides useful information to foreign travelers in the event of an earthquake, tsunami, or other natural disaster. These apps are widely available and easy for the public to use.

多言語音声翻訳アプリ<ボイストラ>
VoiceTra

Flow charts that use illustrations to show evacuation actions enable even foreign travelers without prior experience of a natural disaster to find out what action they should take.

The Safety tips disaster information app

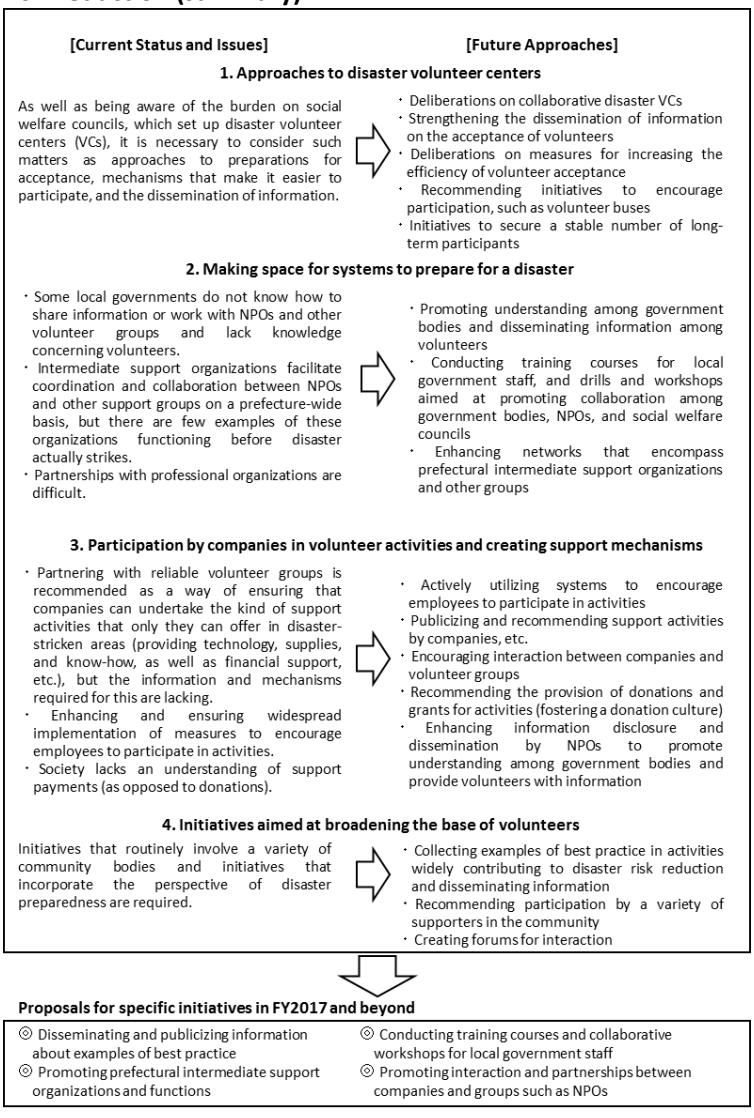
Section 4: Promotion of Disaster Risk Reduction Activities in Coordination with Diverse Stakeholders

4-1 Promotion of Volunteer Activities Widely Contributing to Disaster Risk Reduction

Since the Great Hanshin-Awaji Earthquake ushered in what has been called a new era of volunteerism, volunteers have come to play an important role in emergency response and support for reconstruction, undertaking widespread activities in affected areas. Moreover, the establishment of disaster volunteer centers by social welfare councils in affected areas to receive individual volunteers has gradually become firmly established. Furthermore, NPOs and other volunteer groups with expertise and know-how in such fields as running evacuation centers now undertake support activities, playing a major role in the aftermath of the Great East Japan Earthquake and the Kumamoto Earthquake.

The Cabinet Office formed the Study Group on Promoting Volunteer Activities Contributing Generally to Disaster Risk Reduction, which met a number of times in FY2015 and FY2016 to summarize the issues and consider measures for promoting such activities. In FY2016, having summarized a wide range of issues relating to volunteers in FY2015, this panel discussed future measures and approaches to address the highest-priority issues among those it had identified, and put together a set of recommendations (Fig. 1-4-1).

Fig. 1-4-1 Recommendations by the Study Group on Promoting Volunteer Activities Contributing Generally to Disaster Risk Reduction (summary)



Company staff and NPO members work together in preparing to distribute supplies
(Relief supplies contributed by the company from its stockpiles)

4-2 National Council for Promoting Disaster Risk Reduction and the National Conference on Promoting Disaster Risk Reduction

The Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR), which was adopted at the Third UN World Conference on Disaster Risk Reduction in Sendai in March 2015, prescribed that all stakeholders (including companies, the academic community, volunteers and other community groups, and the media) should encourage disaster risk reduction (DRR) initiatives. In response, the National Council for the Promotion of Disaster Prevention, consisting of leaders of groups in all sections of society, was set up in September 2015 at the urging of Prime Minister Abe, who chairs the Central Disaster Management Council. The panel's objective is to use the networks of groups in all sections of society to improve DRR awareness among a broad swathe of the public. In partnership with the National Council for the Promotion of Disaster Prevention and the Council for Promoting Disaster Risk Reduction, which mainly consists of industry groups associated with disaster management, the Cabinet Office held the First National Conference on Promoting Disaster Risk Reduction. Featuring symposiums and exhibitions on the subject of disaster risk reduction, this event brought together a range of groups and organizations from all sections of society. The aim of this event was to increase awareness of disaster risk reduction by establishing a shared understanding of the importance of self-help and mutual support.

(1) First National Conference on Promoting Disaster Risk Reduction

Focused on the theme "Preparing for a Major Disaster: Learning From the Past to Lay a Path for the Future," the First National Conference on Promoting Disaster Risk Reduction took place on Saturday, August 27 and Sunday, August 28, 2016 at the University of Tokyo's Hongo campus.

The opening ceremony was held in the Yasuda Auditorium, which was the main venue. Minister of State for Disaster Management Jun Matsumoto kicked off proceedings with the opening declaration, in which he stressed the importance of self-help and mutual support, and the need for collaboration between all stakeholders. President of the Science Council of Japan Takashi Onishi then gave a keynote address on the conference theme, preparing for a major disaster. This was followed by a symposium involving representatives of the worlds of business and academia, and field-specific discussions on such topics as citizen organizations and partnerships with companies. During these discussions, representatives of the various sections of society spoke of the need for extensive collaboration with other groups and organizations, and the importance of building partnerships before disaster strikes.

There were many attractions for children and families, including the Earthquake Cushion, which allows the user to experience long-period ground motion and other tremors caused by real earthquakes; HERASEON, which simulates the experience of a typhoon; and Dr. Nadarenja's Disaster Prevention Science Show, in which PET plastic bottles and other everyday items are used to explain various natural disaster phenomena. Kumamon made a special appearance to thank people for their support in the aftermath of the Kumamoto Earthquake and call for reconstruction of the region. A wide variety of other events that showcased the specific skills and attributes of the various presenters and exhibitors also took place as part of the conference, including specialist lectures by academics, such as one entitled "Disseminating Disaster Research From Tohoku," which described vanguard research into the most recent disasters and future prospects for such research; discussions by disaster management experts active on the front line in various fields, on topics such as the Community Disaster Management Plan Forum and public-private partnerships focused on community development for disaster prevention and mitigation; workshops offering the chance to gain basic knowledge about methods of creating disaster preparedness maps and first aid techniques; and panels and videos explaining disaster risk reduction initiatives by various groups.

The event attracted approximately 12,000 visitors over the course of the weekend, while the online live feed was watched by around 12,000 people. Coupled with media coverage on television and in the newspapers, the event succeeded in reaching a large audience. In particular, 95% of those who completed a questionnaire

distributed to visitors stated, “My awareness of disaster risk reduction has improved as a result of my visit,” which was a very positive outcome. Around half of all visitors had no particular links to the field of disaster risk reduction, while many had never participated in a disaster prevention drill and stated, “I want to actively participate in local disaster prevention drills in future.” In the questionnaire for presenters/exhibitors, all of the groups that responded stated that they would like to present/exhibit again next time. With feedback comments including “It was very meaningful, because we were able to interact with other groups taking part,” this event appears to have been highly effective in promoting collaboration between groups.

The 2017 conference is due to take place at Sendai International Center on Sunday, November 26 and Monday, November 27.

Opening ceremony

Minister of State for Disaster Management Jun Matsumoto makes the opening declaration

The Earthquake Cushion replicates the experience of an earthquake

A lecture at the Sanjo Conference Hall

(2) Second Meeting of the National Council for Promoting Disaster Risk Reduction

The second meeting of the National Council for Promoting Disaster Risk Reduction was held on October 20, 2016 in the Grand Hall of the Prime Minister’s Office, attended by the leaders of groups in all sections of society. As host, Prime Minister Abe opened proceedings with some words of welcome, in which he expressed his gratitude to the participating groups and spoke of his hope that the meeting would result in knowledge concerning disaster preparedness being shared widely by the public, enabling each and every to take action to protect their lives. The Prime Minister also expressed a wish that the meeting should increase the nation’s overall ability to undertake disaster risk reduction through self-help and mutual support, and that it would help to broadcast Japan’s knowledge as a leader in the field of disaster risk reduction to a global audience.

Following on from this, council chairman Tadateru Konoe (President, Japanese Red Cross Society) reported on the body’s activities, focusing primarily on the aforementioned First National Conference on Promoting Disaster Risk Reduction. He also outlined the proposed policy for future activities and a resolution on this was passed. The Japanese Consumers’ Co-operative Union and the Japanese Nursing Association, which are both members of the council, then reported on their routine initiatives and the support activities that they conducted following the Kumamoto Earthquake.

4-3 Partnerships with Industrial Sector

The Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR), which was adopted at the Third UN World Conference on Disaster Risk Reduction in Sendai in March 2015, highlighted the importance of public-private partnerships in disaster risk reduction. It is necessary to establish close cooperation and build relationships of trust between the private sector and governmental organizations at both the national and local levels.

Given that Japan's private sector companies have accumulated advanced technologies and know-how in the field of disaster risk reduction through their wealth of experience of disasters to date, it is anticipated that partnerships between government and private sector companies will contribute significantly to disaster measures in the future.

The Disaster Risk Reduction Industry Conference of Japan is a body established in July 2015 with the participation of companies from various business sectors, to promote the development and cultivation of a disaster preparedness industry by the private sector. Organized by a Japanese newspaper company, the conference has 30 member companies as of April 1, 2017. This body aims to build a cooperative inter-industry framework for cooperation that encompasses all industries, not only those focused on equipment and systems relating to disaster management. Its objective is to achieve innovation by mobilizing the advanced technology and know-how held in industries relevant to disaster preparedness. In FY2016, it established an Information Subcommittee and a Goods and Technology Subcommittee, which undertook activities aimed at collaboration between companies in each field.

Moreover, it holds regular meetings of the Round Table on Public-Private Cooperation, at which the conference's member companies exchange views with representatives from the Cabinet Office and other relevant ministries and agencies, as well as practitioners from local governments. The aim of these gatherings is to establish frameworks for public-private partnerships that can be leveraged both before and after disaster strikes. Two meetings were held in FY2016, with a lively exchange of views taking place. In the field of information, discussions centered on greater efficiency in disaster response through information sharing by the public and private sectors. Talks on the subject of goods and technology looked at issues brought to the surface by the Kumamoto Earthquake and considered the creation of "disaster-ready evacuation centers" through public-private partnerships, focusing on evacuation centers as places where the technologies of each company can be brought together.

State Minister of the Cabinet Office Jun Matsumoto gives the opening address at the Fourth Round Table on Public-Private Cooperation

It is preferable to engage in a variety of public-private partnership activities not only in the aftermath of a disaster, but also before disaster strikes. Experiences of the use of disaster support agreements in the wake of the Kumamoto Earthquake have triggered a fresh understanding that the steady conclusion of such agreements will be increasingly important in future. Some local governments are systematically concluding agreements with numerous companies in specific fields. This approach is expected to facilitate swift, effective functioning in the event of disaster (Fig. 1-4-2).

Fig. 1-4-2 Examples of Support Agreements in Case of Disasters

Support agreements in Case of Disasters concluded by Sakura City (as of July 2016)

Government/public bodies	Municipalities and special district authorities in Chiba Prefecture	Mutual assistance in firefighting activities
	42 water suppliers, Shibayama Town, 6 bulk water suppliers, 1 rural water supplier, Chiba Prefecture	Mutual support in the event of a water supply disaster
	Chiba Prefecture and municipalities within the prefecture	Mutual assistance in the event of disaster
	Municipalities in Chiba Prefecture and 18 cleaning and sanitation associations	Treatment of garbage, human waste, and disaster waste
	Prefectural high schools within the city	Use of facilities in the event of disaster
	Ministry of Land, Infrastructure, Transport and Tourism Kanto Regional Development Bureau	Information exchange
	Local governments that belong to the liaison council of the National Iris Summit for Municipalities	Mutual assistance in the event of disaster
	Chiba Prefecture	Opening and use of a region-wide disaster management base

Lifeline utilities	Chiba branch of an electric power company	Publicizing widespread power outages via the disaster management radio communications system
	Cable TV station A	Publicizing widespread transmission outages via the disaster management radio communications system
	Gas company A Gas company B	Publicizing widespread gas outages via the disaster management radio communications system
	Chiba City, Ichikawa City, Funabashi City, Narita City, Narashino City, Urayasu City, Yotsukaido City, Shisui Town, Tomisato City, Katori City, district municipal administration association, Sakurashi Yachimatashi Shisuimachi Firefighting Association, Itako City, Rokko District Authority	Using expressways in the course of firefighting activities
	Chiba LPG Association, Inba Branch	Supplying fuel
	Sakura City Oil Commercial Cooperative	
	Water supply and sewerage company A	Repairing water supply facilities, etc.
	Sakura City Plumbing Cooperative Association	Repairing water supply facilities, assisting in the supply of water

Medical care	Sakura City Pharmaceutical Association	Supplying pharmaceuticals
	Inba Medical Association	Cooperation in medical care and rescue activities
	Inba Dental Association	Cooperation in dental care
	Chiba Prefecture Midwives Association	Cooperation in midwifery activities
	Hospital A	Accepting those requiring midwifery services
	Hospital B	

Emergency repair activities	Post offices in Sakura City Cable TV station A	Providing facilities and land, etc.
	Materials and equipment company A	Supplying machinery for rent
	Chiba Civil Engineering and Construction Labor Union, Sakura Branch	Cooperation in emergency countermeasures and activities
	Sakura City Construction Industry Association for Disaster Management	
	Sakura Chamber of Commerce and Industry	
	Chiba Society of Architects and Building Engineers, Sakura Branch Chiba Association of Architectural Firms	Cooperation in damage certification surveys
	Chiba Prefecture Association of Land and House Investigators	
	Materials and equipment company B	Supply of materials and equipment

Water, food, and daily necessities	Yachiyo City's water utility administrator	Mutual assistance in water supply activities
	Sakura Chamber of Commerce and Industry	Supplying daily necessities
	CO-OP Mirai	
	Home improvement store	
	Convenience store	
	Distribution company A Distribution company B	
	Food company A	Supply of food
	Food company B	
	Inba agricultural cooperative	
	Food company C	
	Transport company	Supplying drinking water
	Food company D	Supplying remaining products in vending machines free of charge
	Food company E	
	Food company F	
	Food distribution company A	
	Food distribution company B	

Information transmission system	Chiba Prefecture	Installing disaster management wireless stations, disaster management information systems, and seismometers
	Communications systems company	Deployment of engineers
	Cable TV station A	Broadcasting disaster information, opening a temporary emergency FM radio station (disaster FM)
	Broadcasting station	Broadcast of disaster information
	Communications company B	Installation of special public telephones
	System development company	Provision of information about evacuation centers nationwide via an app

Transport	Chiba Trucking Association, Inba Branch	Transport of supplies
	Bus company A	Transport of evacuees
	Bus company B	
	Taxi company A	
	Taxi company B	

Other	Ceremonial Occasion Mutual Aid Society	Pick-up, transport, and laying out of dead bodies
	Chiba Central Funeral Directors Cooperative	
	Japan Hearse Association	
	Sakura City Social Welfare Council	Opening and operation of volunteer centers
	17 social welfare service corporations with facilities in Sakura City	Opening and operation of welfare evacuation centers
	Hotel A	Temporary use of facilities
	Hotel B	
	Equipment company	Installation of information boards at evacuation sites
	The Association of Care Goods Providers	Provision of care goods

Source: Produced by the Cabinet Office from the Report on Approaches to Emergency Response and Livelihood Support Measures in Light of the Kumamoto Earthquake

4-4 Initiatives by Academic Communities

A wide range of research is being conducted in Japan on the subject of disaster management, covering a variety of fields, including natural phenomena such as earthquakes, tsunami, volcanoes, and meteorological phenomena; civil engineering; buildings; earthquake-resistant structures; emergency medical care; environmental health and other medical care and hygiene issues; geography; history and other aspects of human life; information; and energy. The Great East Japan Earthquake led to an awareness that disaster management and mitigation research from a comprehensive perspective that integrated all these fields is essential, giving rise to a need for interdisciplinary collaboration through information sharing and interaction with other fields across the boundaries of different specialisms. Accordingly, following discussions with the Science Council of Japan and various other relevant academic societies, the Japan Academic Network for Disaster Reduction was established to serve as a network of academic societies involved in disaster management, mitigation, and reconstruction. The network counted 47 academic societies among its membership at the time of its launch in January 2016, but this figure had grown to 55 by the end of March 2017.

Following the Kumamoto Earthquake, the network held an emergency press conference on April 18 and an emergency briefing on May 2, at which researchers from various academic societies presented information. Through such endeavors, the network strives to share and disseminate information aimed at communicating technical content in a way that is easy for the public to understand. In addition, a symposium entitled “Mobilizing 52 Academic Societies to Take on the Challenge of Disaster Risk Reduction: Initiatives Following the Kumamoto Earthquake” was held during the First National Conference on Promoting Disaster Risk Reduction (August 27-28, 2016). At this symposium, academic societies from the network gave presentations concerning seismic observation and the explanation of phenomena, and measures focused on hard infrastructure such as buildings and soft infrastructure such as the provision of information. Network members also pledged to work together to increase Japan’s disaster resilience.

The network is mainly focused on collaboration in sharing and disseminating information at present, but it aims to expand its activities to include surveys and research conducted jointly by participating academic societies.

Mobilizing 52 Academic Societies to Take on the Challenge of Disaster Risk Reduction: Initiatives Following the Kumamoto Earthquake
(August 28, 2016, First National Conference on Promoting Disaster Risk Reduction)

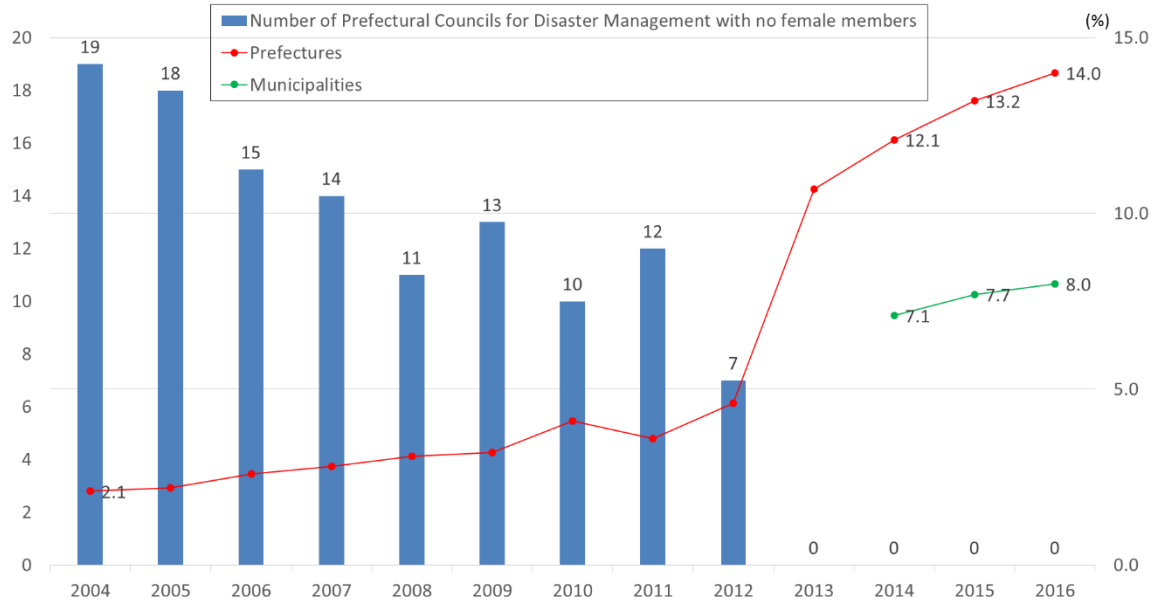
4-5 Initiatives from the Perspective of Gender Equality (based on the response to the 2016 Kumamoto Earthquake)

In the Fourth Basic Plan for Gender Equality (approved by the Cabinet on December 25, 2015) and the Basic Plan for Disaster Risk Reduction (approved by the National Disaster Management Council on February 16, 2016), the Cabinet Office has specified that consideration must be given to the differing needs of men and women in all aspects of disaster management, including prevention (before disaster strikes), emergency response, and recovery and reconstruction. Moreover, these plans require efforts to be made to promote women's participation in decision-making forums relating to both disaster management and reconstruction (Figs. 1-4-3 to 1-4-5).

In addition, the Cabinet Office formulated the Guidelines on Disaster Management and Reconstruction Initiatives from a Gender Equality Perspective (2013), based on experiences from the Great East Japan Earthquake and responses to other past disasters. Serving as a basic set of guidelines for local governments to follow from a gender equality perspective when implementing the necessary measures and responses, these have been shared with local governments, as well as relevant groups and organizations. Various problems emerged at the time of the Great East Japan Earthquake, due to a failure to give sufficient consideration to the stockpiling and provision of supplies and the running of evacuation centers. Among the issues raised were a lack of supplies for women and the failure to provide places where women could breastfeed or get changed.

Using these guidelines, the Cabinet Office has sought to encourage local governments to take action before disaster strikes, by such means as increasing female representation on Local Councils for Disaster Management and undertaking initiatives aimed at reflecting the perspective of gender equality when preparing and revising Local Plans for Disaster Risk Reduction. When the Kumamoto Earthquake occurred, the Cabinet Office made an initial request to both Kumamoto Prefecture and Kumamoto City, asking them to adopt the perspective of gender equality based on these guidelines, especially in the running of evacuation centers. The Cabinet Office has continued to liaise with both the prefectural and the municipal governments since then, working to ascertain the status of local initiatives and providing advice where required.

Fig. 1-4-3 Female Representation on Local Councils for Disaster Management



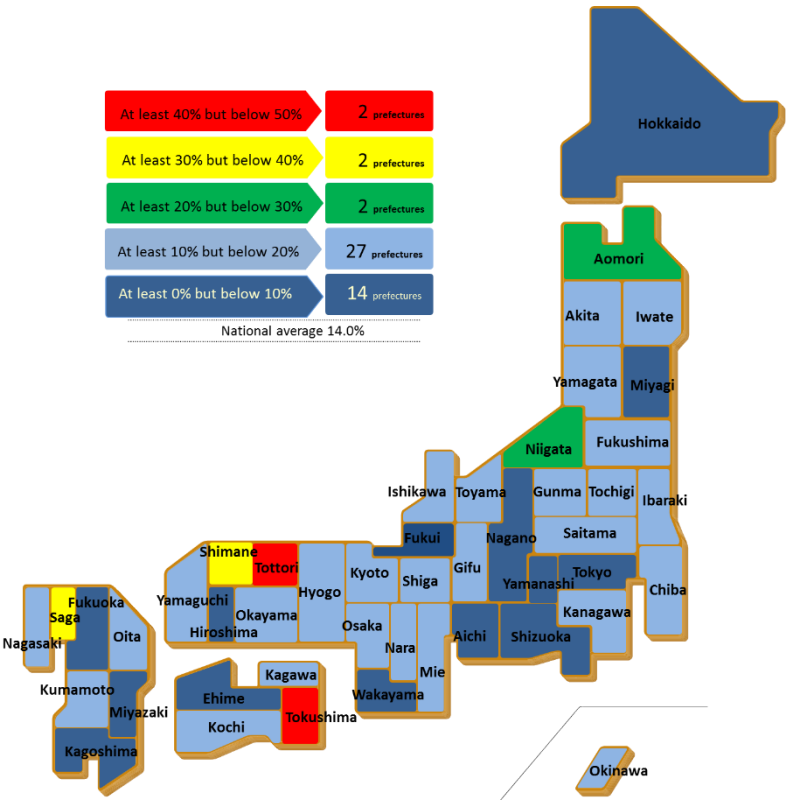
Note: Following its revision in June 2012, the Basic Act on Disaster Management specified that members of voluntary disaster prevention organizations and/or individuals with a relevant academic background should be added to the membership of Local Councils for Disaster Management, in addition to the staff of disaster management organizations who are already ex officio members, in order to reflect the views of a more diverse range of bodies in the preparation of Local Disaster Management Plans and the like.

Notes: 1. Compiled from Cabinet Office, Progress of Local Government Measures Focused on Women or the Promotion of a Gender-Equal Society

2. Figures for April 1 each year, in principle.
3. Due to the impact of the Great East Japan Earthquake, figures for 2011 do not include parts of Iwate Prefecture (Hanamaki City, Rikuzentakata City, Kamaishi City, Otsuchi Town), Miyagi Prefecture (Onagawa Town, Minamisanriku Town), and Fukushima Prefecture (Minamisoma City, Shimogo Town, Hirono Town, Naraha Town, Tomioka Town, Okuma Town, Futaba Town, Namie Town, Iitate Village), while figures for 2012 do not include parts of Fukushima Prefecture (Kawauchi Village, Katsurao Village, Iitate Village).
4. Data for Municipal Councils for Disaster Management in 2015 is based on a survey of 1,741 municipalities nationwide, using figures for 1,644 municipalities, which was the number remaining after excluding the 97 that either failed to respond or reported having 0 members. Special wards are included in “Wards other than those in cities designated by government ordinance.”

Fig. 1-4-4 Female Representation on Prefectural Councils for Disaster Management

Prefecture	Total members	Of which, female members (Percentage of female members)	
Tokushima	79	39	(49.4)
Tottori	67	29	(43.3)
Shimane	71	25	(35.2)
Saga	68	22	(32.4)
Niigata	72	18	(25.0)
Aomori	44	9	(20.5)
Gifu	61	11	(18.0)
Yamagata	59	10	(16.9)
Shiga	56	9	(16.1)
Tochigi	52	8	(15.4)
Kyoto	65	10	(15.4)
Iwate	73	11	(15.1)
Kanagawa	55	8	(14.5)
Toyama	65	9	(13.8)
Kagawa	59	8	(13.6)
Chiba	61	8	(13.1)
Okinawa	54	7	(13.0)
Okayama	56	7	(12.5)
Yamaguchi	56	7	(12.5)
Nara	59	7	(11.9)
Fukushima	51	6	(11.8)
Ibaraki	51	6	(11.8)
Akita	60	7	(11.7)
Mie	55	6	(10.9)
Hyogo	55	6	(10.9)
Kumamoto	56	6	(10.7)
Gunma	47	5	(10.6)
Nagasaki	66	7	(10.6)
Kochi	57	6	(10.5)
Osaka	59	6	(10.2)
Saitama	69	7	(10.1)
Ishikawa	70	7	(10.0)
Oita	50	5	(10.0)
Miyagi	53	5	(9.4)
Nagano	64	6	(9.4)
Kagoshima	60	5	(8.3)
Ehime	61	5	(8.2)
Hokkaido	66	5	(7.6)
Miyazaki	53	4	(7.5)
Shizuoka	55	4	(7.3)
Yamanashi	61	4	(6.6)
Fukuoka	58	3	(5.2)
Wakayama	51	2	(3.9)
Fukui	56	2	(3.6)
Hiroshima	58	2	(3.4)
Tokyo	66	2	(3.0)
Aichi	75	2	(2.7)
Total	2,815	393	(14.0)



Notes. 1. The shapes of the 47 prefectures have been simplified to show female participation in each prefecture's disaster management council
2. Compiled from Cabinet Office, Progress of Local Government Measures Focused on Women or the Promotion of a Gender-Equal Society
3. In principle, figures are based on the preliminary results of the April 2016 survey, but the situation differs according to the local government concerned.

Fig. 1-4-5 Target Outcomes for Prefectural Councils for Disaster Management and Municipal Councils for Disaster Management in the Fourth Basic Plan for Gender Equality

Item	Current	Target (Deadline)
Female Representation on Prefectural Councils for Disaster Management	13.2% (2015)	30% (2020)
Female Representation on Municipal Councils for Disaster Management	・Number of bodies with no women appointed as members: 515 (2014) ・Women as a proportion of the membership: 7.7% (2015)	・Number of bodies with no women appointed as members: 0 (2030) ・Women as a proportion of the membership: 10% (ASAP), aiming for 30% in due course (2020)

Even in the immediate aftermath of the April 2016 Kumamoto Earthquake, some evacuation centers were already taking the female perspective into account in their running, providing separate toilets for men and women, and involving women in the running of the evacuation centers. Moreover, some childcare facilities reopened early on, to enable women to return to the workplace without delay. On the other hand, there were areas in which the perspective of gender equality was lacking at evacuation centers and in other systems to support those affected by the disaster, so the Cabinet Office received feedback that responses taking the female perspective into consideration were inadequate (delayed).

In light of this, in FY2016, the Cabinet Office began to gather information about the preparations made before disaster struck by local governments in affected areas that had to deal with the Kumamoto Earthquake, local governments that provided support in affected areas, and private sector groups, among others. It also sought to find out about their responses at the time of the disaster and the status of recovery and reconstruction efforts to date, collecting a variety of examples. Furthermore, the Cabinet Office conducted a survey of responses by various groups and examples of their activities, with the objective of clarifying issues that need to be solved for the future. After analyzing and considering the results from the perspective of gender equality, the Cabinet Office published its findings in March 2017, in the Report on the Survey of Responses to the 2016 Kumamoto Earthquake from the Perspective of Gender Equality.

This report also outlined the status of disaster response from the perspective of gender equality after the Kumamoto Earthquake and described the situation in various settings. Some expressed the view that initiatives focused on the perspective of gender equality were embarked on earlier than in the case of the Great East Japan Earthquake and were successfully implemented, thanks to advice and support from the national government, local governments nationwide, and private sector support groups, especially those in the Tohoku region.

On the other hand, the survey revealed that problems had occurred. For example, there were evacuation centers where consideration for women, elderly people, people with disabilities, and infants and young children was not adequate. In addition, diverse needs were not clearly identified in some cases, due to a lack of awareness of the perspective of gender equality. Among the data obtained from the results of the questionnaire was the finding that just under 60% of evacuation centers surveyed had involved women in the running of the evacuation centers within a week (Fig. 1-4-6).

Fig. 1-4-6 Results of a Questionnaire-based Survey Regarding Gender Equality Perspectives

(i) Implementation status of initiatives reflecting the perspective of gender equality at evacuation centers (top: number of municipalities; bottom: %)

Initiatives Reflecting the Perspective of Gender Equality	Implemented within 1 month				Total implemented after 1 month or more	No	Don't know
	Within 1 week	Within half a month	Within 1 month	Total			
(1) Ensuring privacy using partitions	2	7	4	13	1	10	0
	8.3%	29.2%	16.7%	54.2%	4.2%	41.7%	0.0%
(2) Women's changing room	5	5	1	11	3	10	0
	0.8%	20.8%	4.2%	45.8%	12.5%	41.7%	0.0%
(3) Breastfeeding room	7	3	1	11	2	10	1
	29.2%	12.5%	4.2%	45.8%	8.3%	41.7%	4.2%
(4) Women-only laundry drying area	0	1	0	1	4	16	3
	0.0%	4.2%	0.0%	4.2%	16.7%	66.7%	12.5%
(5) Separate toilets for men and women	17	2	1	20	0	4	0
	70.8%	8.3%	4.2%	83.3%	0.0%	16.7%	0.0%
(6) Providing more women's toilets than men's	3	1	0	4	0	15	5
	12.5%	4.2%	0.0%	16.7%	0.0%	62.5%	20.8%
(7) Female participation in the operational frameworks of evacuation centers	14	1	0	15	0	7	2
	58.3%	4.2%	0.0%	62.5%	0.0%	29.2%	8.3%
(8) Distribution of supplies for women (sanitary protection, underwear, etc.) by women	7	1	0	8	2	13	1
	29.2%	4.2%	0.0%	33.3%	8.3%	54.2%	4.2%
(9) Efforts to ascertain women's needs	4	4	0	8	3	12	1
	16.7%	16.7%	0.0%	33.3%	12.5%	50.0%	4.2%
(10) Measures to prevent violence against women	2	2	0	4	1	14	5
	8.3%	8.3%	0.0%	16.7%	4.2%	58.3%	20.8%
(11) Opening and publicizing an advice desk for women	1	4	1	6	3	12	3
	4.2%	16.7%	4.2%	25.0%	12.5%	50.0%	12.5%
(12) Providing a dedicated section for families with infants and young children	3	4	1	8	0	12	4
	12.5%	16.7%	4.2%	33.3%	0.0%	50.0%	16.7%
(13) Providing a dedicated women's and/or mother-and-child section	2	3	1	6	0	15	3
	8.3%	12.5%	4.2%	25.0%	0.0%	62.5%	12.5%
(14) Initiatives to avoid the fixed division of roles on the basis of sex or age in the running of evacuation centers, such as assigning the cooking and serving of food to women only	3	0	0	3	1	17	3
	12.5%	0.0%	0.0%	12.5%	4.2%	70.8%	12.5%

(ii) Status of the department in charge of gender equality at the time of the disaster (within a month of occurrence) (top: number of municipalities; bottom: %)

	Asked relevant organizations to incorporate the perspective of gender equality into their response and staff from the department themselves visited evacuation centers	Asked relevant organizations to incorporate the perspective of gender equality into their response	Engaged in other disaster response tasks	Carrying out normal duties	Other
Prefecture	1	0	0	1	0
	50.0	0.0	0.0	50.0	0.0
Municipality	1	3	19	11	3
	2.7	8.1	51.4	29.7	8.1
Total	2	3	19	12	3
	5.1	7.7	48.7	30.8	2.6

Source: Survey of Responses to the 2016 Kumamoto Earthquake from the Perspective of Gender Equality (Cabinet Office)

Section 5: International Cooperation on Disaster Risk Reduction

Japan has accumulated a great deal of experience and knowledge concerning disasters, along with numerous policies on disaster risk reduction. By sharing these, it is driving global discussions in the field of disaster risk reduction and contributing to initiatives in this field in countries worldwide. In particular, the international communities expect Japan to play a leading role in the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR), which was concluded at the Third UN World Conference on Disaster Risk Reduction, hosted by Japan in Sendai City in March 2015. Accordingly, the Cabinet Office Disaster Management Bureau is proactively promoting cooperation in disaster risk reduction through the UN and other international organizations, as well as bilateral disaster risk reduction cooperation.

5-1 Disaster Risk Reduction Cooperation through the UN and Other International Organizations

(1) Disaster Risk Reduction Cooperation through the United Nations Office for Disaster Risk Reduction (UNISDR)

The United Nations Office for Disaster Risk Reduction (UNISDR) is undertaking intensive activities focused on the following three strategic objectives, to promote the SFDRR.

Strategic objective 1: Strengthen global monitoring, analysis and coordination of Sendai Framework implementation

Strategic objective 2: Support to regional and national Sendai Framework implementation

Strategic objective 3: Catalyse action through Member States and Partners

As well as playing a leading role in the activities of UNISDR, Japan provides financial support for those activities, contributing a total of approximately $2.89 million (approximately ¥346.8 million) through the Ministry of Foreign Affairs and the Cabinet Office in FY2016.

The establishment of an Open-Ended Intergovernmental Expert Working Group (OEIWG) to formulate indicators to measure progress toward the global targets and relevant terminology was approved by the UN General Assembly in June 2015 and the OEIWG began its deliberations that September. In this process, Japan made a substantial contribution to the OEIWG's discussions, conducting a prior survey to ascertain whether countries held any data concerning indicators that were tabled for consideration. As a result of these deliberations, the Recommendations of the Open-ended Intergovernmental Expert Working Group on Global Indicators for the Global Targets of the Sendai Framework for Disaster Risk Reduction 2015-2030 and on the Follow-up to and Operationalization of the Indicators were adopted at the UN General Assembly in February 2017 (Fig. 1-5-1).

In conjunction with the Seventh Asian Ministerial Conference on Disaster Risk Reduction, which was held in New Delhi, India, on November 3–5, 2016, the Vice-Minister for Policy Coordination held talks with Robert Glasser, Special Representative of the UN Secretary-General for Disaster Risk Reduction (SRSG) on November 4. The SRSG expressed his gratitude to Japan for its leadership of the OEIWG and established a shared understanding with the vice-minister through discussions on such topics as closer partnership and cooperation between the Government of Japan (Cabinet Office) and UNISDR in promoting the SFDRR.

Fig. 1-5-1 Recommendations of the Open-ended Intergovernmental Expert Working Group (OIEWG) on Global Indicators for the Global Targets of the Sendai Framework for Disaster Risk Reduction 2015-2030 and on the Follow-up to and Operationalization of the Indicators

Global target A: Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared with 2005-2015.	
A-1 (compound)	Number of deaths and missing persons attributed to disasters, per 100,000 population.
A-2	Number of deaths attributed to disasters, per 100,000 population.
A-3	Number of missing persons attributed to disasters, per 100,000 population. *The scope of disaster in this and subsequent targets is defined in paragraph 15 of the Sendai Framework for Disaster Risk Reduction 2015-2030 and applies to small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters caused by natural or man-made hazards, as well as related environmental, technological and biological hazards and risk.*

Global target B: Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared with 2005-2015.	
B-1 (compound)	Number of directly affected people attributed to disasters, per 100,000 population.
B-2	Number of injured or ill people attributed to disasters, per 100,000 population.
B-3	Number of people whose damaged dwellings were attributed to disasters.
B-4	Number of people whose destroyed dwellings were attributed to disasters.
B-5	Number of people whose livelihoods were disrupted or destroyed, attributed to disasters.

Global target C: Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.	
C-1 (compound)	Direct economic loss attributed to disasters in relation to global gross domestic product.
C-2	Direct agricultural loss attributed to disasters. *Agriculture is understood to include the crops, livestock, fisheries, apiculture, aquaculture and forest sectors as well as associated facilities and infrastructure.*
C-3	Direct economic loss to all other damaged or destroyed productive assets attributed to disasters. *Productive assets would be disaggregated by economic sector, including services, according to standard international classifications. Countries would report against those economic sectors relevant to their economies. This would be described in the associated metadata.*
C-4	Direct economic loss in the housing sector attributed to disasters. *Data would be disaggregated according to damaged and destroyed dwellings.*
C-5	Direct economic loss resulting from damaged or destroyed critical infrastructure attributed to disasters. *The decision regarding those elements of critical infrastructure to be included in the calculation will be left to the Member States and described in the accompanying metadata. Protective infrastructure and green infrastructure should be included where relevant.*
C-6	Direct economic loss to cultural heritage damaged or destroyed attributed to disasters.

Global target D: Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.	
D-1 (compound)	Damage to critical infrastructure attributed to disasters.
D-2	Number of destroyed or damaged health facilities attributed to disasters.
D-3	Number of destroyed or damaged educational facilities attributed to disasters.
D-4	Number of other destroyed or damaged critical infrastructure units and facilities attributed to disasters. *The decision regarding those elements of critical infrastructure to be included in the calculation will be left to the Member States and described in the accompanying metadata. Protective infrastructure and green infrastructure should be included where relevant.*
D-5 (compound)	Number of disruptions to basic services attributed to disasters.
D-6	Number of disruptions to educational services attributed to disasters.
D-7	Number of disruptions to health services attributed to disasters.
D-8	Number of disruptions to other basic services attributed to disasters. *The decision regarding those elements of basic services to be included in the calculation will be left to the Member States and described in the accompanying metadata.*

Global target E:	
Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.	
E-1	Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030.
E-2	Percentage of local governments that adopt and implement local disaster risk reduction strategies in line with national strategies. *Information should be provided on the appropriate levels of government below the national level with responsibility for disaster risk reduction.*

Global target F:	
Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030.	
F-1	Total official international support, (official development assistance (ODA) plus other official flows), for national disaster risk reduction actions. *Reporting of the provision or receipt of international cooperation for disaster risk reduction shall be done in accordance with the modalities applied in respective countries. Recipient countries are encouraged to provide information on the estimated amount of national disaster risk reduction expenditure.*
F-2	Total official international support (ODA plus other official flows) for national disaster risk reduction actions provided by multilateral agencies.
F-3	Total official international support (ODA plus other official flows) for national disaster risk reduction actions provided bilaterally.
F-4	Total official international support (ODA plus other official flows) for the transfer and exchange of disaster risk reduction-related technology.
F-5	Number of international, regional and bilateral programmes and initiatives for the transfer and exchange of science, technology and innovation in disaster risk reduction for developing countries.
F-6	Total official international support (ODA plus other official flows) for disaster risk reduction capacity-building.
F-7	Number of international, regional and bilateral programmes and initiatives for disaster risk reduction-related capacity-building in developing countries.
F-8	Number of developing countries supported by international, regional and bilateral initiatives to strengthen their disaster risk reduction-related statistical capacity

Global target G:	
Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.	
G-1	Number of countries that have multi-hazard early warning systems. (compound G2-G5)
G-2	Number of countries that have multi-hazard monitoring and forecasting systems.
G-3	Number of people per 100,000 that are covered by early warning information through local governments or through national dissemination mechanisms.
G-4	Percentage of local governments having a plan to act on early warnings.
G-5	Number of countries that have accessible, understandable, usable and relevant disaster risk information and assessment available to the people at the national and local levels.
G-6	Percentage of population exposed to or at risk from disasters protected through pre-emptive evacuation following early warning. *Member States in a position to do so are encouraged to provide information on the number of evacuated people.*

Source: (The section on follow-up and operationalization of the indicators has been omitted)
United Nations General Assembly (Seventy-first session)
Agenda item 19(c)
Sustainable development: disaster risk reduction
Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction

(2) Seventh Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR)

The Indian government (Ministry of Home Affairs) and UNISDR hosted the Seventh Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR) in New Delhi, India, on November 3–5, 2016. This conference of ministers responsible for disaster risk reduction is held once every two years, to provide an overview of the outcomes of Asian initiatives aimed at mitigating the harm caused by disasters and challenges to these efforts.

The key objective of the most recent conference was to discuss the implementation status of the SFDRR (adopted at the Third UN World Conference on Disaster Risk Reduction) by Asian countries and their measures to promote the framework. It was attended by around 4,500 people, including ministers from the Asia-Pacific countries and other government representatives from a total of 51 countries, as well as representatives of international organizations, regional bodies, and NGOs, among others.

Japan was represented by the Vice-Minister for Policy Coordination, who chaired a technical session on the theme "Disaster Preparedness for effective response and 'to build back better.'" The conference was also attended by a delegation of Diet members, which included Liberal Democratic Party (LDP) Secretary-General Toshihiro Nikai, former Minister of Economy, Trade and Industry Motoo Hayashi, and former Minister of State for Disaster Management Tatsuo Hirano. Members of the delegation gave speeches on the importance of tsunami preparedness and prior investment at a special pre-event session on November 2 to mark World Tsunami Awareness Day and also at the opening ceremony.

The Vice-Minister for Policy Coordination (on the right-hand side of the screen) chairs a technical session

(3) International Recovery Platform (IRP)

The Hyogo Framework for Action was adopted in 2005 at the Second UN World Conference on Disaster Risk Reduction, which was held in the city of Kobe, Hyogo Prefecture. In response to this, the IRP was established in the city the same year, to enhance networks and frameworks for supporting smoother post-disaster reconstruction, disseminate lessons concerning reconstruction and develop common techniques and mechanisms to facilitate reconstruction, and provide advice and support to those formulating reconstruction plans and visions following a disaster. The IRP's activities include holding the International Recovery Forum, preparing guidance notes on recovery, and organizing workshops for human resource development. The SFDRR advocates that the IRP should be enhanced, as an international mechanism for promoting the "build back better" approach, which is positioned in the SFDRR as the fourth priority area for action. The Government of Japan (Cabinet Office) supports the activities of the IRP, as well as contributing to enhancing the infrastructure for its development, as Co-Chair of the IRP Steering Committee.

The FY2016 International Recovery Forum was held in Kobe on January 24, focusing on the theme "Sending the Message of Build Back Better from Hyogo, Japan." It was attended by around 140 people from 33 countries and 16 international organizations, including Hyogo Prefectural Governor Toshizo Ido, the Vice-Minister for Policy Coordination, and Vice Minister for Interior of Thailand Police Lieutenant General Nadhapit Snidvongs. At the forum, participating countries discussed practical matters and experiences in such areas as post-disaster reconstruction and health and medical care measures.

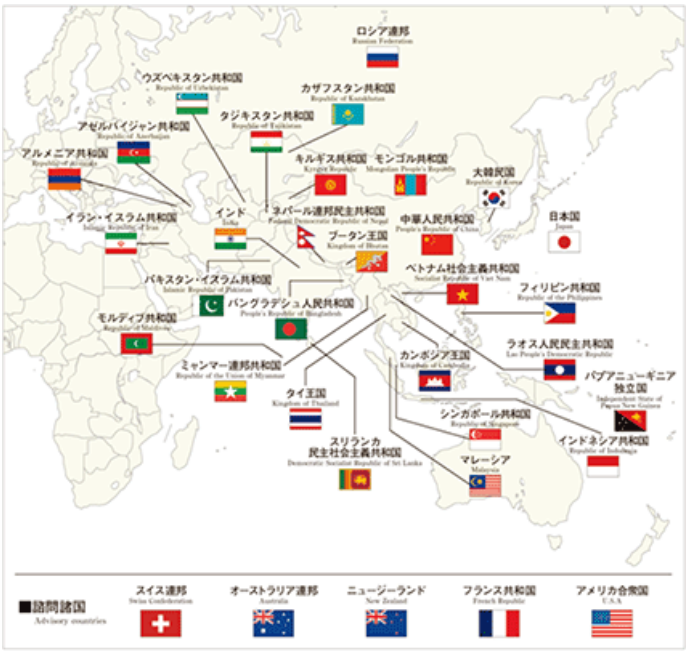
The International Recovery Forum

(4) Asia-Pacific Economic Cooperation (APEC) Senior Disaster Management Officials Forum

The 10th Asia-Pacific Economic Cooperation (APEC) Senior Disaster Management Officials Forum (SDMOF) was held in Iquitos, Peru on October 8–9, 2016. Focusing on the theme "Emergency Preparedness for Supply Chain and Emergency Food Security," participants discussed topics including food supply chain resilience in the event of disaster and the provision of food support for affected areas. Japan was represented by Cabinet Office Policy Advisor Yasuyuki Ishii, who talked about the provision of push-type support and other experiences in the wake of the Kumamoto Earthquake.

(5) Disaster Risk Reduction Cooperation through the Activities of the Asian Disaster Reduction Center

The Asian Disaster Reduction Center (ADRC) was established in Kobe City, Hyogo Prefecture in 1998 to share the lessons of the 1995 Great Hanshin-Awaji Earthquake and other disasters in Japan with the rest of Asia. The ADRC currently has 30 member countries and its activities center on four key areas: sharing information about disasters, human resource development in member countries, improving the disaster management capabilities of communities, and promoting partnerships with member countries, international organizations, local organizations, and NGOs. It also hosts visiting researchers from member countries each year: as of March 2017, the ADRC had hosted a total of 99 such researchers, thereby helping to cultivate personnel who contribute to policymaking in the field of disaster risk reduction in member countries. The ADRC also gathers information about disaster management systems and the latest disasters in each country and publishes this on its website, as well as providing information obtained from satellite observation of the extent of the damage when a disaster occurs.



Asian Disaster Reduction Center member countries and advisory countries

After a major natural disaster in a member country, the ADRC deploys government experts from various countries to conduct field surveys. In December 2016, with the cooperation of Kumamoto Prefecture, Kumamoto City, and Mashiki Town, among others, the ADRC sent a delegation of representatives of disaster management organizations from 23 Asian member countries to inspect areas affected by the Kumamoto Earthquake.

Some member countries were devastated by the 2004 Indian Ocean tsunami triggered by a major earthquake off the Indonesian island of Sumatra, so they have a particularly strong interest in tsunami. As such, the ADRC takes advantage of World Tsunami Awareness Day to share each country's experiences and knowledge, in order to promote tsunami preparedness. Accordingly, the ADRC held two tsunami workshops in FY2016. One, which was timed to coincide with a meeting of the APEC Emergency Preparedness Working Group, was held in Lima, with the cooperation of Peru's National Institute of Civil Defense, which is responsible for disaster preparedness (August 2016). The other, focused on anti-tsunami measures at the local level, was held in Krabi in September 2016, with the cooperation of the Thai Ministry of Interior's Department of Disaster Prevention and Mitigation. At the workshop, representatives of the Thai government, private sector, and NGOs discussed tsunami preparedness initiatives after the Indian Ocean tsunami and the Great East Japan Earthquake with experts from Japan and Indonesia.

A workshop in Krabi, Thailand

5-2 Bilateral Disaster Risk Reduction Cooperation

In addition to the initiatives of international organizations in which it engages, Japan is building stronger partnerships with the disaster management authorities of national governments across the globe by sharing its experiences of disaster management policy through opportunities such as more than 10 visits by ministerial-level officials involved in the field of disaster management in other countries. The following describes Japan's bilateral partnership with the U.S.A. and its trilateral partnership with China and South Korea.

(1) Partnership between the Cabinet Office and the U.S. Federal Emergency Management Agency (FEMA)

Based on the Memorandum of Cooperation signed by the Cabinet Office and the U.S. Federal Emergency Management Agency (FEMA) in December 2014, an annual meeting was held on September 14, 2016 at FEMA's headquarters in Washington, D.C. Japan was represented by State Minister of the Cabinet Office Jun Matsumoto, while FEMA was represented by its then Administrator Craig Fugate. During the meeting, they shared information about their countries' disaster management policies and agreed on cooperation in the areas of disaster information sharing and workshop participation in FY2016/17.

State Minister of the Cabinet Office Jun Matsumoto and then FEMA Administrator Craig Fugate

(2) Disaster Risk Reduction Cooperation among Japan, China, and South Korea

Based on the matters agreed upon in the Leaders' Declaration at the 4th Japan-China-Republic of Korea Summit Meeting held in Tokyo in May 2011, the Japan-China-Republic of Korea Trilateral Tabletop Exercise on Disaster Management is held to improve all three countries' capabilities in providing and accepting support. In FY2016, this exercise was held in Seoul, South Korea in June, based on the scenario of a major typhoon making landfall in South Korea. During the exercise, the participants discussed effective, efficient methods of providing/receiving support between the three countries.

Section 6: Efforts to Promote National Resilience

6-1 Approval of the Action Plan for National Resilience 2016

On May 24, 2016, the Action Plan for National Resilience 2016 (hereinafter the “Action Plan 2016”) was approved by the National Resilience Promotion Office.

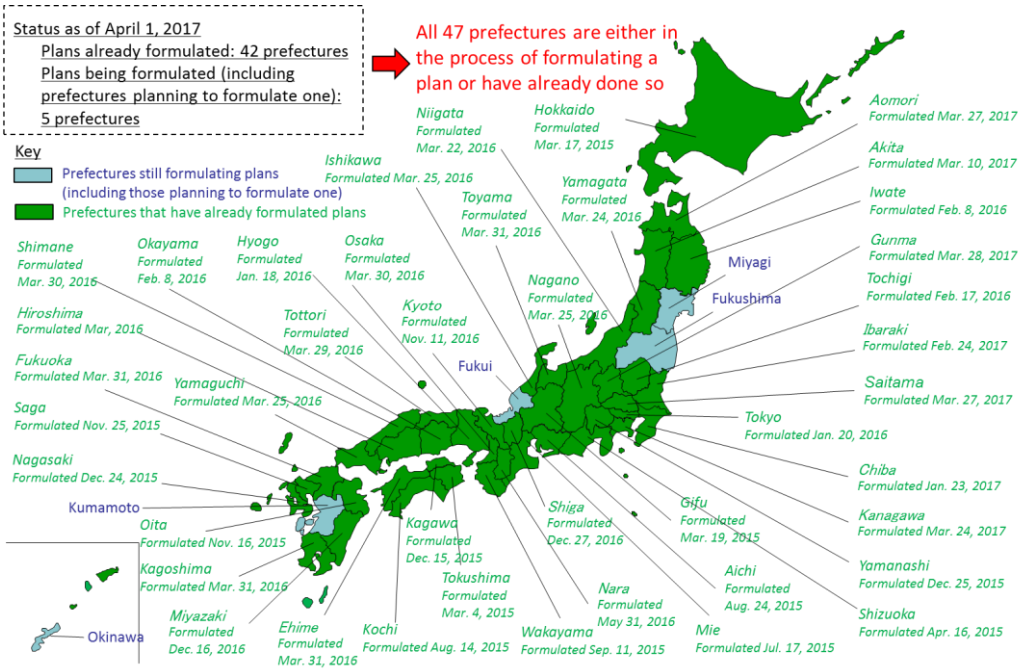
The Action Plan 2016 sought to enhance measures in response to such disasters as the Torrential Rain of September 2015 in the Kanto and Tohoku Regions and the volcanic eruptions of Mt. Ontake and Kuchinoerabu-jima. In addition, it aimed to strengthen initiatives aimed at broadening the base of those involved in national resilience endeavors by encouraging local governments and the private sector to implement initiatives and by raising awareness both within Japan and overseas.

Regarding the 2016 Kumamoto Earthquake, the Action Plan 2016 stated, “Taking the opportunity of this recent earthquake, the government will undertake more in-depth discussions, position the necessary measures firmly within the national resilience framework, and promote these measures as a priority.” Based on this, relevant ministries and agencies worked together to check their national resilience measures in light of the Kumamoto Earthquake, putting together a summary of issues and approaches to be taken in response.

6-2 Support for the Preparation of Fundamental Plans for Regional Resilience

Local governments are in the process of preparing Fundamental Plans for Regional Resilience (hereinafter “Regional Plans”). As of April 1, 2017, five prefectures and 31 municipalities were working toward the formulation of a Regional Plan, while 42 prefectures and 40 municipalities had already formulated one (Fig. 1-6-1). Staff from the Cabinet Secretariat held briefings to support local governments in formulating Regional Plans. In addition, 32 grants and subsidies under the jurisdiction of relevant ministries and agencies were available to provide financial assistance for initiatives undertaken by local governments based on these Regional Plans. Follow-up surveys were conducted to ascertain the implementation status of support provided via these ministries and agencies, and local governments were informed of the results.

Fig. 1-6-1 Preparation of Fundamental Plans for Regional Resilience by Prefectures



Source: National Resilience Promotion Office, Cabinet Secretariat

6-3 Promotion of Private Sector Initiatives Contributing to National Resilience

In FY2016, the government launched a system under which companies actively implementing business continuity initiatives can apply for third-party certification as an Organization Contributing to National Resilience. The objective of this system is to encourage private sector initiatives contributing to national resilience. A total of 71 organizations had been certified under this system as of the end of March 2017.

In conjunction with this, in FY2016, the government held seminars in 16 cities across the country and sought applications from businesses to participate in the Model Projects for Promoting Widespread Adoption of BCP initiative. Under this initiative, the successful applicants undertook model projects in which they prepared business continuity plans (BCPs) with the assistance of experts. Going forward, the common issues faced by SMEs and tips for formulating BCPs will be identified, with a view to promoting the spread of such initiatives.

Column: High School Students Summit on "World Tsunami Awareness Day" in Kuroshio

In a world first, the High School Students Summit on "World Tsunami Awareness Day" in Kuroshio was held over two days from November 25, 2016 in Kuroshio Town, Kochi Prefecture.

Focusing on the overall theme "What we, who are responsible for the next generation, can do to survive disasters – From the perspectives of self-help, mutual support and public support," the summit brought together around 360 high school students from 30 countries around the world, including Japan. Participants gave presentations and exchanged opinions on their countries' initiatives in three thematic areas: 1) Understanding the risks of disasters caused by natural hazards; 2) Preparing for disasters caused by natural hazards; and 3) Recovery and reconstruction from damage caused by disasters. In addition, participants learned about initiatives by Kochi Prefecture and Kuroshio Town to prepare for Nankai Trough earthquake by observing a tsunami evacuation drill involving evacuation to high ground and going to see a tsunami evacuation tower. The participating high school students had differing levels of knowledge and awareness concerning natural disasters and disaster preparedness, but among them were students who had actually experienced disaster and sought to ensure that their survival was meaningful by actively learning more about disaster preparedness and telling others about it.

These lively, cross-border discussions culminated in the unanimous adoption of the Kuroshio Declaration by the participants. The declaration states, "we all share the common goal of saving all human lives from disasters" and goes on to make a commitment that participants will continue to do their utmost to understand the risks and effects of tsunami, pass on their predecessors' experiences and knowledge of disaster mitigation and risk reduction to future generations, and save people's lives from tsunami and other hazards. This summit appears to have provided the high school students who took part with a valuable opportunity to broaden their horizons from an international perspective by getting to know people from a diverse array of countries and regions, and sharing knowledge concerning disaster risk reduction initiatives.

Just 11 days after the summit, on December 7, a magnitude 6.5 earthquake struck northern Aceh province in Indonesia. Participating students who had returned home to Indonesia reportedly received many e-mails from participating students from other countries, checking that they were safe. It is hoped that in the future, the participating students from each country will go on to play an active role as Young Tsunami Preparedness Ambassadors (Disaster Preparedness Leaders) and build networks that transcend the boundaries between countries and regions.

Plenary session of the High School Students Summit on "World Tsunami Awareness Day"

Chapter 2 Measures for Nuclear Disasters

Section 1: Nuclear Emergency Preparedness Systems

1-1 Nuclear Emergency Preparedness System under Non-Emergency Conditions

In the case of a nuclear emergency, the resultant damage would be immense and extensive, so the whole government must work together cohesively to develop and promote nuclear emergency response measures. Accordingly, the Nuclear Emergency Preparedness Council has been established within the Cabinet to promote nuclear emergency preparedness measures by the government as a whole under non-emergency conditions.

The main role of this Council, whose members include representatives of the Cabinet Office and other relevant ministries and agencies and local governments, is to take national responsibility for verifying the effectiveness of the emergency response plans drawn up by each region and grant approval for those that meet the necessary standard. The Nuclear Emergency Preparedness Council is chaired by the Prime Minister, with the Chief Cabinet Secretary, Minister of the Environment, Cabinet Office Minister of State for Nuclear Emergency Preparedness, and the Chairman of the NRA as vice-chairs, and all Ministers of State and the Deputy Chief Cabinet Secretary for Crisis Management, among others, serving as commissioners (Fig. 2-1-1).

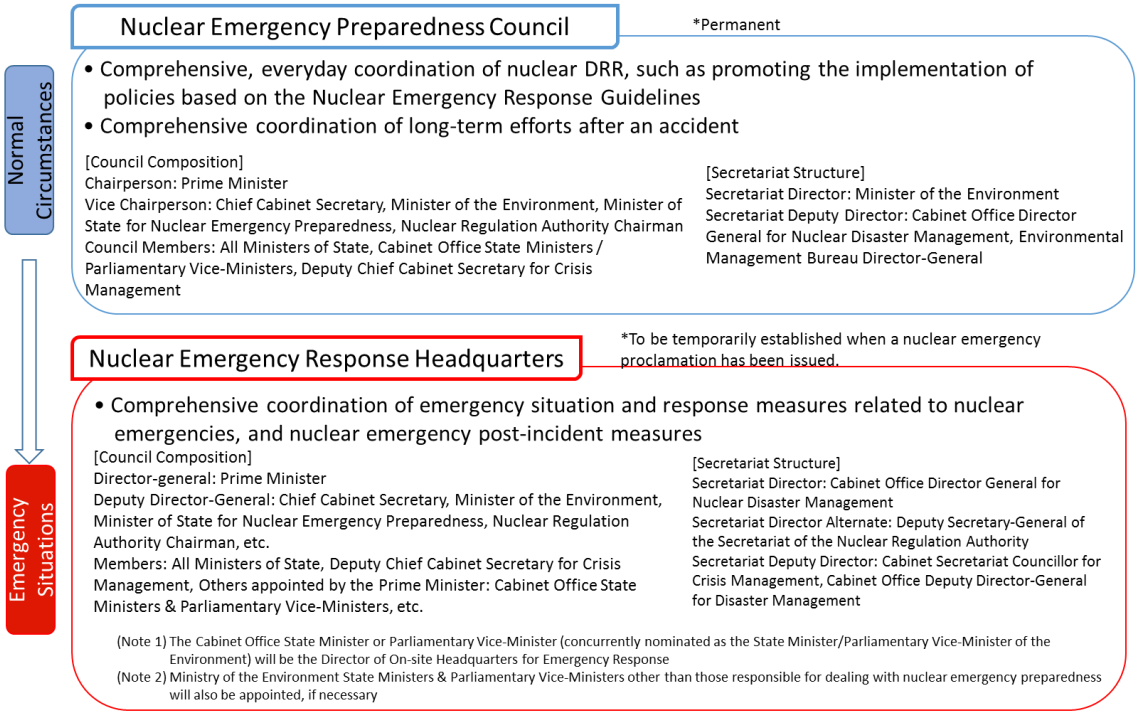
1-2 Nuclear Emergency Preparedness System in an Emergency

In the event of a nuclear emergency involving the release of a large quantity of radioactive material, a Nuclear Emergency Response Headquarters will be established. The main role of this headquarters will be to ascertain the actual situation on the field and the extent of the damage and to take overall charge of coordinating relevant national government organizations and local government bodies to ensure that emergency response measures suited to the situation are implemented swiftly and accurately. The Prime Minister will serve as Director-General of the Nuclear Emergency Response Headquarters, with the Chief Cabinet Secretary, Minister of the Environment, Cabinet Office Minister of State for Nuclear Emergency Preparedness, and the Chairman of the NRA as deputy directors-general, and all Ministers of State and the Deputy Chief Cabinet Secretary for Crisis Management, among others, serving as regular members (Fig. 2-1-1).

In the Headquarters, the NRA holds primary responsibility for decisions on technical and specialized matters (on-site), while matters relating to the procurement of equipment and supplies required to deal with the nuclear facilities and all matters associated with the response outside the facilities (off-site) are handled by the relevant ministries and agencies, based on the directions of the director-general (the Prime Minister). The organization headed by the Cabinet Office Director General for Nuclear Disaster Management that was launched on October 14, 2014, will serve as the Secretariat of the Nuclear Emergency Response Headquarters.

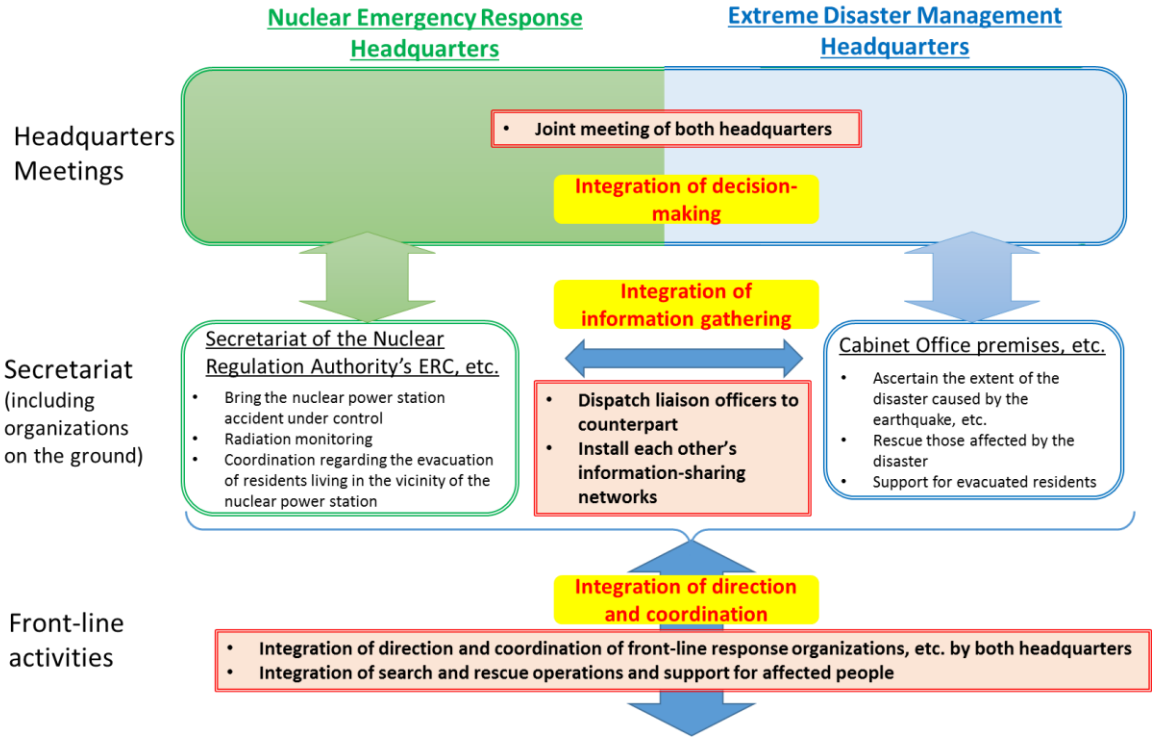
Moreover, the Basic Plan for Disaster Risk Reduction was revised in July 2015 to enhance the system for dealing with a complex disaster. This revision put in place a cooperation framework that will, in the event of a complex disaster, enable the Extreme Disaster Management Headquarters (which deals with natural disasters) and the Nuclear Emergency Response Headquarters (which deals with nuclear emergencies) to undertake integrated information gathering, decision making, and direction and coordination (Fig. 2-1-2). In addition, the 2016 Comprehensive Nuclear Emergency Response Exercise, which was held on November 13 and 14, 2016, was based on the scenario of a complex disaster involving an earthquake and tsunami, along with a nuclear power plant accident. To review cooperation between the headquarters, the exercise included joint meetings between the Major Disaster Management Headquarters and the Nuclear Accident Response Headquarters, and between the Major Disaster Management Headquarters and the Nuclear Emergency Response Headquarters.

Fig. 2-1-1 Nuclear Emergency Preparedness Systems Under Emergency and Non-emergency Conditions



Source: Cabinet Office

Fig. 2-1-2 Illustration of Responses by Both Headquarters in the Event of a Major Complex Disaster



Source: Cabinet Office

Section 2: Bolstering Nuclear Disaster Management and Radiation Monitoring Under the NRA

It is absolutely vital to implement ongoing initiatives to ensure trust in the administration of nuclear energy regulation, taking into account the lessons from the accident at Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station.

The Nuclear Regulation Authority (NRA) is tackling various policy challenges, based on its guiding principles of independent decision making, effective actions, open and transparent organization, improvement and commitment, and emergency response, in order to fulfill its mission of protecting the general public and the environment through rigorous and reliable regulation of nuclear activities.

2-1 Efforts in Nuclear Disaster Management

The NRA strives to enhance the Nuclear Emergency Response Guidelines by actively incorporating the latest international knowledge, in order to ensure that the optimal judgment criteria are used in formulating disaster prevention plans at all times. Over the last year, the Study Team on Nuclear Emergency Preparedness Measures has been examining approaches to nuclear emergency response measures relating to nuclear fuel facilities. On December 28, 2016, the draft revisions to the Nuclear Emergency Response Guidelines formulated in light of the outcomes of this panel's deliberations were opened up for public comment and the guidelines were revised on March 22, 2017.

The revision of the Emergency Action Levels (EALs) for commercial power reactors and the setting of EALs for nuclear fuel facilities, etc. were also considered and a framework opinion on these matters was published on March 8, 2017.

Steady progress is being made in developing a medical care system for use in the event of a nuclear emergency, with support being provided to promote the designation of nuclear disaster base hospitals.

2-2 Emergency Response Efforts

In FY2016, the NRA again actively participated in disaster prevention drills held by nuclear operators, sending staff to take part. The NRA is also endeavoring to maintain and improve its emergency response capabilities by such means as conducting information-sharing exercises involving the Secretariat of the NRA's Emergency Response Center (ERC) and rapid response centers and emergency response rooms at nuclear facilities.

In addition, at the debriefing on the disaster prevention drills held by nuclear operators in FY2016, the NRA decided to revise five of the evaluation indicators and criteria, including public relations activities and exercise participation rates, based on the findings from evaluations of the disaster prevention drills held by nuclear operators. The revised indicators and criteria will be applied to evaluations starting in FY2016.

2-3 Bolstering Radiation Monitoring

To conduct effective emergency monitoring in accordance with the Nuclear Emergency Response Guidelines, the NRA opened Local Radiation Monitoring Offices in Hokkaido and Niigata Prefecture in April 2016. Moreover, the NRA increased the number of Local Radiation Monitoring Officers at the Saga Local Radiation Monitoring Office in December 2016, thereby bolstering the local emergency monitoring framework. In addition, on September 26, 2016, and March 22, 2017, the Secretariat of the NRA published revised editions of "About Emergency Monitoring (Nuclear Emergency Response Guidelines Supplementary Reference Materials)," which provides detailed guidance concerning emergency monitoring. Furthermore, the Emergency Radiation Monitoring Information Sharing and Disclosure System began operating in June 2015, enabling the results of emergency monitoring to be swiftly consolidated, shared with relevant parties, and published.

Pursuant to the Comprehensive Radiation Monitoring Plan (approved by the Monitoring Coordination Council on August 2, 2011, revised April 28, 2017), the NRA conducts monitoring related to the Fukushima Daiichi Nuclear Power Station accident. It monitors aerial radiation rates in Fukushima Prefecture and throughout Japan, and publishes its results monthly. Just as in FY2015, experts from the Environment Laboratories of the International Atomic Energy Agency (IAEA) visited Japan in May and November 2016. They jointly collected ocean water samples around the Fukushima Daiichi Nuclear Station with the NRA and compared the results of their analyses with those of Japanese analysis laboratories. Following similar comparisons in both 2014 and 2015, the IAEA concluded from the results that the participating Japanese analysis laboratories demonstrate strong capabilities and achieve high standards of accuracy in their analyses.

In light of decisions taken at the NRA's 55th meeting in FY2015, which took place on February 10, 2016, detailed monitoring of areas to which it will be difficult to return was carried out and the results published in November that year.

In addition, to study the impact of radiation in the areas around nuclear facilities and environmental radiation levels nationwide, the IAEA provided support for environmental radiation level surveys in all 47 prefectures, ocean water radiation analyses in areas around nuclear power plants (all 16 seas), and radiation surveys conducted by the locations and neighboring prefectures of nuclear facilities (24 prefectures). To improve radioactivity analysis skills among local government employees and enhance the effectiveness of emergency monitoring, the NRA held three training courses: the Environmental Radioactivity Analysis Training Course, the Practical Training Course in Monitoring, and the Training Course on Emergency Monitoring Centers.

2-4 Accidents and Problems

The Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors requires a licensee of nuclear energy activity, etc. to report accidents that occur at nuclear power facilities to the NRA, while the Act on Prevention of Radiation Hazards due to Radioisotopes, etc. requires that permission or notification users, etc. do the same. Of the reports received in FY2016, five came from licensee of nuclear energy activity, etc. and three from permission or notification users, etc.

Section 3: Enhancing and Strengthening Local Nuclear Emergency Preparedness Systems

3-1 Formulating and Supporting Local Plans for Disaster Risk Reduction / Evacuation Plans

Under the Basic Act on Disaster Management, local governments must prepare Local Plans for Disaster Risk Reduction with Nuclear Emergency Response Measures (hereinafter "Local Plans for Disaster Risk Reduction") that set out the basic response to be adopted by prefectures and municipalities in dealing with a nuclear emergency.

Currently, relevant local governments within a radius of around 30km of a nuclear power plant are preparing Local Plans for Disaster Risk Reduction based on the Basic Plan for Disaster Risk Reduction and the Nuclear Emergency Response Guidelines (Fig. 2-3-1). Ensuring that the content of Local Plans for Disaster Risk Reduction is highly specific and effective is crucial, so the government provides proactive support regarding measures to tackle issues that are difficult for local governments alone to resolve in developing more specific Evacuation Plans and measures to assist persons requiring special care.

Fig. 2-3-1 Status of Local Plans for Disaster Risk Reduction / Evacuation Plans (as of March 31, 2017)

	Municipalities Concerned	Number of Local Plans for Disaster Risk Reduction Formulated	Number of Evacuation Plans Formulated	Remarks
Tomari region	13	13	13	
Higashidori region	5	5	5	
Onagawa region	7	7	7	
Fukushima region*	13	11	8	In December 2016, Fukushima Prefecture revised the Fukushima Prefecture Region-wide Evacuation Plan in Case of Nuclear Emergency.
Kashiwazaki-Kariwa region	9	9	9	
Tokai region	14	13	0	In March 2015, Ibaraki Prefecture formulated the Plan for Region-wide Evacuation in Ibaraki Prefecture in Case of a Nuclear Emergency.
Hamaoka region	11	11	1	In March 2017, Shizuoka Prefecture revised the Plan for Region-wide Evacuation in Case of a Nuclear Emergency in the Hamaoka Region.
Shika region	9	9	9	
Fukui area	23	23	23	
Shimane region	6	6	6	
Ikata region	8	8	8	
Genkai region	8	8	8	
Sendai region	9	9	9	
Total for the 13 regions	135	132	106	

Note: * Readers should be aware that Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station, which is a Specified Nuclear Facility, is located in the Fukushima region and that the area around it is an evacuation instruction area.

Source: Cabinet Office

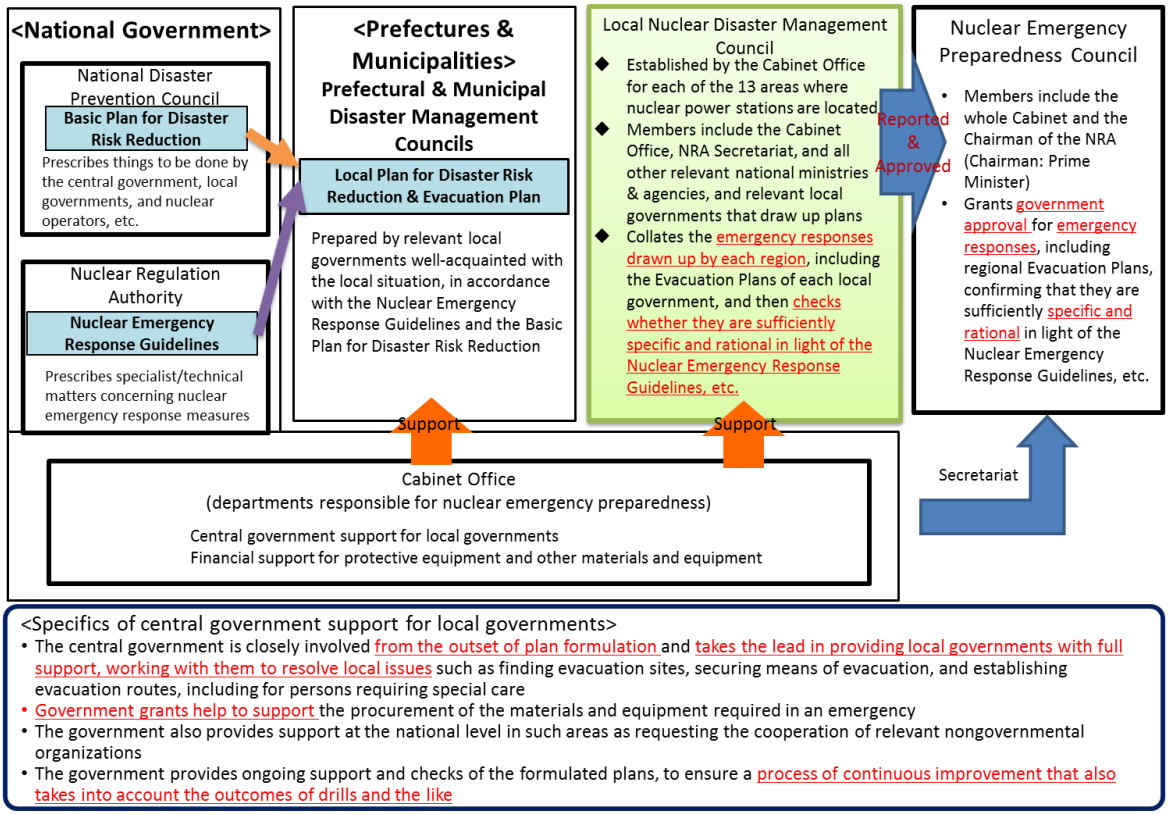
In March 2015, the Cabinet Office established Local Nuclear Disaster Management Councils (hereinafter "Management Councils") to serve as working teams for resolving issues in areas where nuclear power plants are located. Its aim in doing so was to support efforts to flesh out and enhance the content of the Local Plans for Disaster Risk Reduction and Evacuation Plans formulated by prefectures and municipalities in accordance with "Future Responses to Enhancing Local Plans for Disaster Risk Reduction" (approved by the Nuclear Emergency Preparedness Council in September 2013). The Cabinet Office also established working groups

reporting to these Management Councils. The working groups in each region are considering support and region-wide coordination in the formulation of Evacuation Plans, and the assistance provided by national front-line response organizations, while the national government and relevant local governments are working together to develop more specific, enhanced Local Plans for Disaster Risk Reduction and Evacuation Plans (Fig. 2-3-2).

Areas where more specific, enhanced Local Plans for Disaster Risk Reduction and Evacuation Plans have been developed, must summarize their emergency response including evacuation plans and have it checked by the Management Councils, to ensure that it is specific and rational. The Cabinet Office then reports the councils' findings to the Nuclear Emergency Preparedness Council, to seek the Council's approval. A PDCA review cycle is introduced for regions whose emergency response has been checked: in addition to support for enhancing the emergency response and making it more specific, followed by checks of the emergency response (Plan), a drill is carried out by the Management Council based on the checked emergency response (Do), areas for improvement are identified from the outcomes of the drill (Check), and the emergency response of the region in question is improved on the basis of those areas for improvement (Action). Thus, the local nuclear emergency preparedness system goes through an ongoing process of enhancement and strengthening.

In FY2016, the Tomari Local Nuclear Disaster Management Council checked the Tomari Region Emergency Response and the Genkai Area Local Nuclear Disaster Management Council checked the Genkai Region Emergency Response, with the Nuclear Emergency Preparedness Council approving the findings of both councils (Fig. 2-3-3). Also, the Ikata Local Nuclear Disaster Management Council revised the Ikata Region Emergency Response.

Fig. 2-3-2 Formulation of Local Plans for Disaster Risk Reduction and Evacuation Plans



Source: Cabinet Office

In the Tomari region, the working group assisting the Tomari Local Nuclear Disaster Management Council has met 10 times to consider the emergency response in the event of a nuclear emergency. The Tomari Region Emergency Response was put together at the September 2, 2016, meeting of the Tomari Local Nuclear Disaster Management Council.

Fig. 2-3-3 List of Regions Whose Emergency Response Has Been Approved by the Nuclear Emergency Preparedness Council in FY2016

		Tomari Region	Genkai Region
Relevant Local Governments	Prefecture	Hokkaido	Saga, Nagasaki, Fukuoka
	Municipality	Tomari Village, Kyowa Town, Iwanai Town. Kamoenai Village, Suttu Town, Rankoshi Town, Niseko Town, Kutchan Town, Shakotan Town, Furubira Town, Niki Toen, Yoichi Town, Akaigawa Village	Genkai Town, Karatsu City, Imari City, Matsuura City, Mayor of Matsuura City, Sasebo City, Hirado City, Iki City, Itoshima City
Nuclear Emergency Preparedness Council Date Held		October 14, 2016	December 9, 2016
Local Nuclear Disaster Management Council Date Held		September 2, 2016	November 22, 2016
Working Group Meetings Held		○FY2013: October 22, November 6, November 22 ○FY2014: May 14, January 30, March 23 ○FY2015: July 30, December 22, January 14, February 25 ○FY2016: April 25, May 24, June 30, July 19, August 29 (Held as Working Team meetings through December 2, 2014)	○FY2013: November 6 ○FY2014: March 12 ○FY2015: June 1, August 28, January 19, February 4, February 19, March 15, March 23 ○FY2016: April 14, June 3, August 4, August 31, September 16, October 26, November 17 (Held as Working Team meetings through December 2, 2014)

*The representatives of relevant local governments participated as members of Local Nuclear Disaster Management Councils or observers

Source: Cabinet Office

The four key points of the Tomari Region Emergency Response are as follows.

(1) The PAZ (within a radius of around 5km of the power plant, encompassing around 3,000 people) will be evacuated immediately in the event of a General Emergency. Evacuation sites will be secured outside the 30km radius. However, in the event of blizzards, sheltering indoors will be prioritized until the weather improves.

(2) Evacuation of residents of social welfare facilities, those requiring care support in their own homes, and children at schools, nurseries, and kindergartens within the PAZ will begin at an early stage following an accident (Site Area Emergency) before a General Emergency is announced. Those whose health would be at risk if evacuated when not absolutely necessary will not be evacuated unless necessary and will shelter indoors temporarily in facilities equipped with radiation protection.

(3) People in the UPZ (within a radius of around 5-30km from the power plant, encompassing around 76,000 people) will be advised to shelter indoors in the event of a General Emergency. Temporary relocation will be carried out within about a week in areas where emergency environmental radiation monitoring shows that the radiation dose is above a certain level. Evacuation sites capable of dealing with the 76,000 or so people from within the UPZ will be secured.

(4) Tourists and others staying in the area temporarily will be sent home or evacuated outside the UPZ in the event of a Site Area Emergency. Information will be provided in English and other languages for foreign visitors.

<For more information about the PAZ and UPZ, see p. 111 (Fig. 2-4-1)*.>

The Hokkaido government informed the Tomari Local Nuclear Disaster Management Council that, based on its awareness that developing nuclear emergency preparedness measures is an ongoing process without an end point, it will work with relevant local governments to further enhance such measures. In addition, the national government stated that it will continue to provide support via the Tomari Local Nuclear Disaster Management Council, while four front-line response organizations — the police, firefighters, Japan Coast Guard, and Self-Defense Forces — announced that they will provide support as required based on the needs and requests of the Hokkaido government and relevant municipalities in the event of unforeseen circumstances. Moreover, Hokkaido Electric Power Company stated that it will steadily address the matters that it should deal with as a nuclear operator, such as ensuring the availability of vehicles for people with disabilities. Accordingly, the responses of the Hokkaido government and other relevant governments, and of relevant ministries and agencies were deemed to be specific and were confirmed to be sufficiently specific and rational in light of the Nuclear Emergency Response Guidelines, etc.

In the Genkai region, the working group assisting the Genkai Local Nuclear Disaster Management Council has met 14 times to consider the emergency response in the event of a nuclear emergency. The Genkai Region Emergency Response was put together at the November 22, 2016, meeting of the Genkai Local Nuclear Disaster Management Council.

The three key points of the Genkai Region Emergency Response are as follows.

(1) If temporary relocation of people from 20 outlying islands within the UPZ is required, those people will be temporarily relocated by sea and other means. If evacuation by sea, etc. is not possible, people on those islands will continue to shelter indoors in facilities equipped with radiation protection. Facilities equipped with radiation protection, which have the capacity to hold all the island's citizens, will be established on every island, except islands where people can evacuate to other parts of the island or from which people can evacuate to the mainland via bridges.

(2) Multiple evacuation routes and evacuation destinations will be secured for the PAZ (which has a population of around 8,100). The transport capacity required for evacuation will be secured using buses and other methods. Evacuation facilities sufficient to house approximately 8,600 ordinary members of the public (18 facilities) and approximately 7,200 people requiring care support (127 facilities) will be secured. Facilities equipped with radiation protection (six facilities) will be established for those whose health would be at risk if evacuated when not absolutely necessary.

(3) Multiple evacuation routes and temporary relocation sites will be secured for the UPZ (which has a population of around 255,000). The transport capacity required for temporary relocation will be secured using buses and other methods. Facilities sufficient to house approximately 300,000 people (approximately 2,200 facilities) will be secured at evacuation destinations.

The governments of Saga, Nagasaki, and Fukuoka prefectures informed the Genkai Local Nuclear Disaster Management Council that they will work with relevant local governments to further enhance nuclear emergency preparedness measures. In addition, the national government stated that it will continue to provide support via the Genkai Local Nuclear Disaster Management Council, while four front-line response organizations — the police, firefighters, Japan Coast Guard, and Self-Defense Forces — announced that they will provide support as required based on the needs and requests of relevant local governments in the event of unforeseen circumstances. Moreover, Kyushu Electric Power Company stated that it will steadily address the matters that it should deal with as a nuclear operator, such as ensuring the availability of vehicles for people

with disabilities. Accordingly, the responses of relevant local governments, including Saga Prefecture, Nagasaki Prefecture, and Fukuoka Prefecture, and of relevant ministries and agencies were deemed to be specific and were confirmed to be sufficiently specific and rational in light of the Nuclear Emergency Response Guidelines, etc.

In the Ikata region, the Ikata Local Nuclear Disaster Management Council finalized the Ikata Region Emergency Response in August 2015; the report confirming the final outcome was submitted to and approved by the Nuclear Emergency Preparedness Council in October that year. In November the same year, a National Comprehensive Nuclear Emergency Response Exercise was held to verify the effectiveness of the response in an emergency. In light of the lessons from the exercise, which were detailed in the March 2016 Report on the Findings from the Comprehensive Nuclear Emergency Response Exercise, the Ikata Local Nuclear Disaster Management Council revised the Ikata Region Emergency Response on July 14, 2016, to further flesh out and enhance the region's emergency response.

The five key points of the revisions made to the Ikata Region Emergency Response based on the exercise are as follows.

(1) Provision of more specific details concerning response methods in the Precautionary Evacuation Area (the Sadamisaki Peninsula west of the PAZ) in the event that the evacuation route is cut off along the way. These details include evacuation destinations for land and sea evacuation, evacuation routes, and means of evacuation
(2) Clarification of evacuation routes to evacuation destinations and places to conduct inspections when evacuating each area for each local government within the UPZ and establishment of multiple routes in case a natural disaster renders one or more routes impassable
(3) Establishment of evacuation routes to each temporary assembly point in the PAZ and Precautionary Evacuation Area; specification of the size of vehicles to be used for evacuation, taking into account such matters as road width, when establishing evacuation routes to temporary assembly points
(4) Implementation of evacuation guidance and traffic restrictions using information gathered via the transmission of video footage (regarding traffic congestion and evacuation status)
(5) In addition to existing facilities equipped with radiation protection, two new such facilities will be developed (at the former Sadamisaki Elementary School (Sadamisaki Peninsula Precautionary Evacuation Area) and at Kashima Elementary School (on an outlying island in the UPZ))

Among the other revisions were improved communication of information to citizens and enhanced emergency environmental radiation monitoring systems.

Ehime Prefecture informed the Ikata Local Nuclear Disaster Management Council that, based on its awareness that developing nuclear emergency preparedness measures is an ongoing process without an end point, it will strive to further enhance evacuation measures by revising the Plan for Region-wide Evacuation and conducting exercises that take into account revisions to the emergency response. The national government expressed its intention to continue providing support via the Ikata Local Nuclear Disaster Management Council. These revisions were confirmed to have further fleshed out and enhanced the emergency response in light of the lessons from the FY2015 Comprehensive Nuclear Emergency Response Exercise.

The Basic Policy on Economic and Fiscal Management and Reform 2016 (approved by the Cabinet on June 2, 2016) stipulated, "In the area of measures against a nuclear disaster, evacuation plans will be created, and human resource development programs for training and education will be created. Road projects to secure

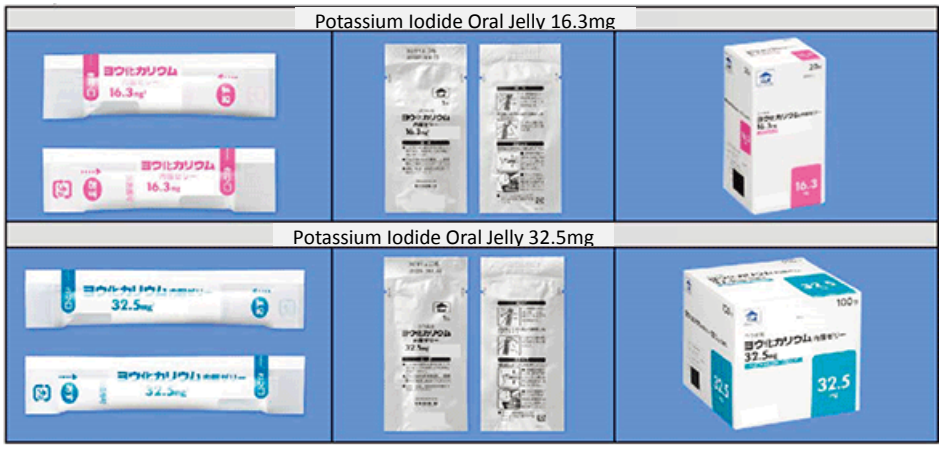
evacuation routes and construction of radiation-proof facilities will be implemented." In light of this, relevant ministries and agencies worked together to promote ongoing efforts to enhance and strengthen measures. A study financed under the Second Supplementary Budget for FY2016 is being conducted, regarding the status of evacuation routes and support for facilities equipped with radiation protection for persons requiring special care of the highest priority. In a project financed under the initial budget for FY2017, the government will provide local governments with support in acquiring radiation meters, protective clothing, and other materials and equipment required for their disaster management activities.

3-2 Stockpiling and Distribution of a Stable Iodine Agent in Jelly Form; Guidance on Evacuation Time Estimation in Case of a Nuclear Emergency, etc.

(1) Stockpiling and Distribution of a Stable Iodine Agent in Jelly Form

Stable iodine agents in pill form are not suitable for infants and young children (aged under three) because their swallowing ability is not fully developed by that stage. In an emergency, a pharmacist or other trained person has to administer a powdered stable iodine agent dissolved in syrup, so agents suitable for such children cannot be distributed in advance, which is a major issue.

In March 2016, the manufacturer of the pills developed a prepackaged product consisting of the active ingredient (potassium iodide) dissolved in a jelly. Accordingly, local governments in the PAZ and UPZ worked in partnership with the Cabinet Office to build up a stockpile of this dosage form. Specifically, between September 2016 and March 2017, these local governments purchased and stockpiled around 1.5 times the number of doses of the stable iodine agent in jelly form required for all infants and young children in the PAZ and UPZ, to ensure that an adequate quantity could be distributed. The purchase was funded with financial assistance from the national government and advance distribution of the jellies was carried out once the necessary preparations had been made.



[Usage and dosage]
Potassium iodide should be administered orally. The usual dosage is 100 mg/time for individuals aged 13 or over; 50 mg/time for children aged at least 3 but under 13; 32.5 mg/time for infants aged at least 1 month but under 3; and 16.3 mg for newborn infants.

Stable iodine agent in jelly form

(2) Guidance on Evacuation Time Estimation in Case of a Nuclear Emergency

In April 2016, the Cabinet Office developed guidance on evacuation time estimation (ETE) in case of a nuclear emergency, with the objective of further enhancing evacuation plans. This guidance was based on existing examples of ETE prepared by local governments, as well as the Nuclear Emergency Response Guidelines and international trends in ETE (Fig. 2-3-4).

This guidance provides local government practitioners with an explanation of the basic approaches and technical procedures required in ETE. The main content is as follows.

(i) Establishing the purpose of ETE based on the method of use

Measures for using ETE to improve the effectiveness of evacuation plans, assist in responding to an emergency, and raise awareness of the evacuation plan among local citizens

(ii) Approaches to establishing scenarios based on the purpose of ETE

Approaches to establishing scenarios required to appropriately evaluate the effects of evacuation plans and various measures (evacuation management, establishing evacuation routes, considering means of evacuation, traffic measures, management of places to conduct inspections when evacuating each area and of evacuation destinations, etc.)

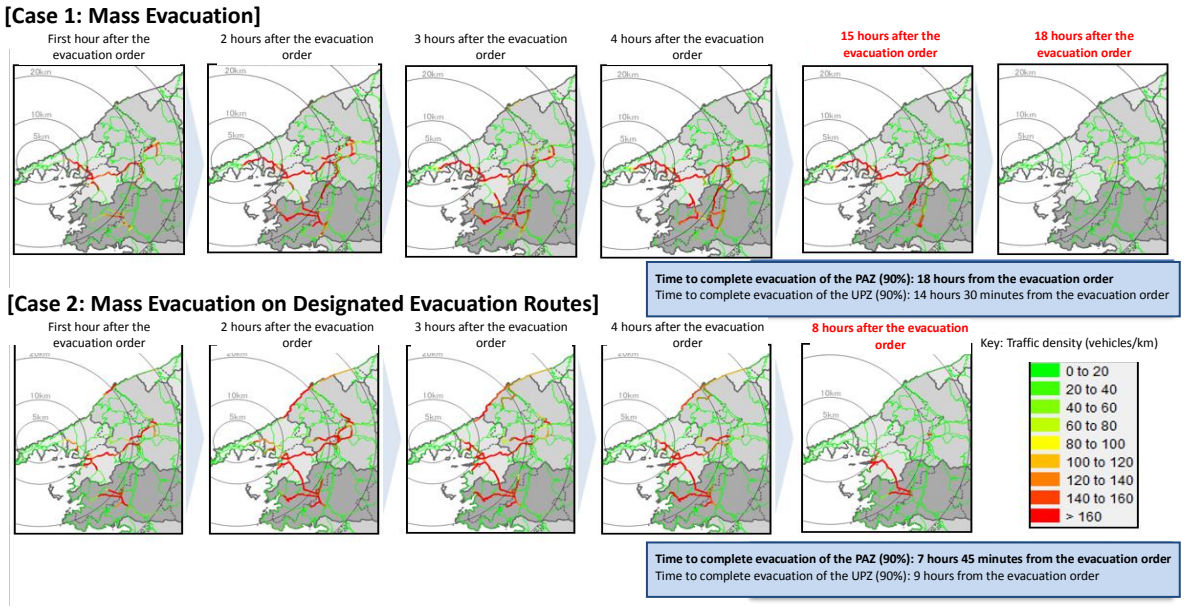
(iii) Developing input data appropriate to each scenario

Points to bear in mind regarding the places from which the requisite input data should be obtained, and the development of input data that help to ensure that scenarios are practical and effective

(iv) Evaluating and using ETE

Methods of summarizing ETE results to appropriately evaluate evacuation plans and various measures, and methods of evaluating and using ETE results tailored to the purpose of their use

Fig. 2-3-4 Evacuation Times in an Evacuation Time Estimation (using Ehime Prefecture as an example)



Source: Cabinet Office

(3) Designation of Off-site Centers

Under Article 12 (1) of the Act on Special Measures Concerning Nuclear Emergency Preparedness, the Prime Minister is required to designate an emergency response base facility (known as “an off-site center”) for each nuclear site, for the coordination of emergency response measures.

The requirements that off-site centers must satisfy are prescribed in the Cabinet Office Ordinance on Off-site Centers Pursuant to the Act on Special Measures Concerning Nuclear Emergency Preparedness. Based on the lessons from the accident at Fukushima Daiichi Nuclear Power Station, the siting requirements for the off-site centers of commercial power reactors were revised in September 2012 to state specifically that off-site centers should be sited within a radius of 5-30km from the power station (i.e. within the Urgent Protective action planning Zone (UPZ)).

In light of this revision, the off-site centers for Fukushima Daiichi Nuclear Power Station and Fukushima Daini Nuclear Power Station of Tokyo Electric Power Company Holdings, and Chubu Electric Power Company’s Hamaoka Power Station were relocated and the new facilities were designated as off-site centers in July 2016, in accordance with the provisions of Article 12 of the Act.

In July 2016, then Cabinet Office Minister of State for Nuclear Emergency Preparedness Tamayo Marukawa, the Governor of Fukushima Prefecture, and local Diet members and municipal leaders attended the opening ceremony for the new off-site centers of Tokyo Electric Power Company Holdings’ Fukushima Daiichi Nuclear Power Station and Fukushima Daini Nuclear Power Station, in Soma City and Naraha Town, Fukushima Prefecture.

Opening ceremony for the Minamisoma Center for Nuclear Emergency Response Measures, Fukushima Prefecture

Naraha Center for Nuclear Emergency Response Measures, Fukushima Prefecture (exterior)

(4) Enhancing Nuclear Emergency Response Measures

At a meeting of the Inter-Ministerial Council for Nuclear Power in March 2016, a document concerning nuclear energy policy, entitled Stance on Enhancing Nuclear Emergency Response Measures, was put together at the request of the National Governors’ Association, in response to calls from local governments in charge of local disaster management. The Committee of Relevant Ministries and Agencies on Nuclear Emergency Response Measures was convened in April 2016 to facilitate a government-wide effort to enhance nuclear emergency response measures in light of this stance. At this meeting, committee members decided to establish subcommittees focused on three themes: cooperation between front-line response units (No. 1 Subcommittee), cooperation between private sector business operators (No. 2 Subcommittee), and approaches to the provision of information, including diffusion calculations (No. 3 Subcommittee). Each subcommittee is engaged in specialist, practical deliberations that take into account the views of local governments.

3-3 Disaster Management Drill and Training Initiatives by Local Governments and Nuclear Operators

(1) Support for Nuclear Emergency Preparedness Drills Conducted by Local Governments

Under the Basic Act on Disaster Management, etc., local governments are required to hold a nuclear emergency preparedness drill on a regular basis (Fig. 2-3-5). Drills organized by relevant prefectural governments are carried out with the participation of prefectural governors and local governments, as well as national and regional front-line response organizations, namely the police, firefighters, the Japan Coast Guard, and the Self-Defense Forces. They include exercises in evacuating local citizens and conducting inspections when evacuating each area.

In regions where the Local Plan for Disaster Risk Reduction and Evacuation Plan have been enhanced and made more specific, the Management Council provides the necessary support in such areas as planning and implementing the drills, promoting the widespread use of evaluation methods, and operating the PDCA cycle via the drills, with the goal of verifying the specificity and effectiveness of the Local Plan for Disaster Risk Reduction and Evacuation Plan.

Drill in the Takahama region
(August 2016)

Drill in the Sendai region
(January 2017)

Fig. 2-3-5 Nuclear Emergency Response Exercises Held by Local Governments in FY2016

Region	Name of Drill	Date
Tomari	Hokkaido Nuclear Emergency Response Exercise (Held as the National Comprehensive Nuclear Emergency Response Exercise)	November 13 and 14, 2016 (comprehensive exercise) February 4, 2017 (winter exercise)
Higashidori	Aomori Prefecture Nuclear Emergency Response Exercise	October 25, 2016
Onagawa	Miyagi Prefecture Nuclear Emergency Response Exercise	November 11, 2016
Fukushima	Fukushima Prefecture Nuclear Emergency Response Exercise	October 14 and 22, 2016
Shika	Ishikawa Prefecture Nuclear Emergency Response Exercise Toyama Prefecture Nuclear Emergency Response Exercise	November 20, 2016
Fukui	(i) Fukui Prefecture Nuclear Emergency Response Exercise (ii) Kyoto Prefecture Nuclear Emergency Response Exercise (iii) Shiga Prefecture Nuclear Emergency Response Exercise (iv) Gifu Prefecture Nuclear Emergency Response Exercise	August 27, 2016 (held jointly by (i)–(iii)) August 28, 2016 ((i)) November 27, 2016 ((iv))
Hamaoka	Shizuoka Prefecture Nuclear Emergency Response Exercise	February 9 and 10, 2017
Shimane	Shimane Prefecture Nuclear Emergency Response Exercise Tottori Prefecture Nuclear Emergency Response Exercise	November 14 and 19, 2016
Ikata	Ehime Prefecture Nuclear Emergency Response Exercise Yamaguchi Prefecture Nuclear Emergency Response Exercise	September 4, 2016 (only Ehime Prefecture) November 11, 2016
Genkai	Saga Prefecture Nuclear Emergency Response Exercise Nagasaki Prefecture Nuclear Emergency Response Exercise Fukuoka Prefecture Nuclear Emergency Response Exercise	October 10, 2016
Sendai	Kagoshima Prefecture Nuclear Emergency Response Exercise	January 28, 2017

Source: Cabinet Office

(2) Training for Staff of Local Governments and Front-line Response Organizations

The Cabinet Office has organized training for drivers of buses and other commercial vehicles, basic training in nuclear emergency preparedness, training of key nuclear emergency response personnel, and tabletop exercises for Nuclear Emergency Response Headquarters. The objective of these initiatives was to provide local governments and other disaster response personnel with an understanding of approaches to protection measures in the Nuclear Emergency Response Guidelines and to improve their ability to respond in the event of a nuclear emergency.

(i) Training for drivers of buses and other commercial vehicles

Training is provided for drivers of buses and other commercial vehicles who carry out activities to protect local citizens from radiation in the event of a nuclear emergency. As well as providing drivers with the basic knowledge required for radiation protection, this course teaches them about the basic approach to protecting citizens from radiation and the sequence of protective activities. These training sessions were held on 29 occasions in FY2016. The main topics covered in the training are as follows.

- Basic knowledge concerning radiation
- Handling of radiation meters and how to put on and take off protective clothing, etc.
- Basic approach to the protection of citizens in accordance with the Nuclear Emergency Response Guidelines, etc.

(ii) Basic training in nuclear emergency preparedness

Basic training in nuclear emergency preparedness is provided to key disaster response personnel at local governments who deal with nuclear emergency preparedness, to teach them the basic knowledge required for

radiation protection. These training sessions were held on 43 occasions in FY2016. The main topics covered in the training are as follows.

- Basic knowledge concerning radiation
- Handling of radiation meters and how to put on and take off protective clothing, etc.

(iii) Training of key nuclear emergency response personnel

Training is provided to key disaster response personnel at local governments who deal with nuclear emergency preparedness, to teach them basic knowledge required for nuclear emergency management. The course covers legislation concerning nuclear emergency preparedness, the Nuclear Emergency Response Guidelines, and lessons from the accident at Fukushima Nuclear Power Station. These training sessions were held on 34 occasions in FY2016. The main topics covered in the training are as follows.

- Legislation concerning nuclear emergency preparedness
- Approaches to radiation protection in accordance with the Nuclear Emergency Response Guidelines
- Lessons from the accident at Fukushima Nuclear Power Station, etc.

(iv) Tabletop Exercises for Nuclear Emergency Response Headquarters

Tabletop Exercises for Nuclear Emergency Response Headquarters are organized for key disaster response personnel at local governments who deal with nuclear emergency preparedness, to provide them with the ability to respond in the event of an emergency and also to review and improve the Local Plans for Disaster Risk Reduction and Evacuation Plans formulated by local governments. These exercises were held on 8 occasions in FY2016. The main topics covered in the training are as follows.

- Activities at off-site centers (classroom learning and practical training)
- Exercises focused on challenges specific to each functional team
- Tabletop exercise based on scenarios, etc.

Lecture
(Basic knowledge concerning radiation)

Practical training
(How to put on and take off protective clothing, etc.)

3-4 Strengthening International Partnerships

International organizations such as the International Atomic Energy Agency (IAEA) and various countries undertake initiatives concerning off-site nuclear emergency preparedness. Such advanced knowledge is required to raise the standard of Japan's own nuclear emergency preparedness.

Accordingly, the government has sought to share its knowledge and experience of nuclear emergency

preparedness with other countries by such means as strengthening cooperative frameworks with authorities responsible for nuclear emergency preparedness in other countries, conducting regular exchanges of opinions with them, and participating in multilateral exercises. In addition, Japan conducts surveys of the IAEA's standards regarding off-site nuclear emergency preparedness and the systems/management of major countries engaging in nuclear power generation.

(1) Cooperation Focused on Nuclear Emergency Preparedness Systems

(i) Cooperation with the U.S.A.

Japan is deepening its partnership with the U.S.A. in the area of nuclear emergency prevention systems via reciprocal invitations to exercises and regular exchanges of opinions with such bodies as the Department of Energy (DOE), the Federal Emergency Management Agency (FEMA), and the Nuclear Regulatory Commission (NRC), based on the U.S.-Japan Bilateral Commission on Civil Nuclear Cooperation framework established in 2012 under the Emergency Management Working Group (EMWG).

More specifically, in FY2016, Japan and the U.S.A. held two exchanges of opinions and issued two reciprocal invitations to exercises, etc. under this framework, exchanging opinions regarding such matters as both countries' experiences and lessons regarding the accident at Fukushima Daiichi Nuclear Power Station and other nuclear emergencies, as well as their on-site emergency organizations, and human resource development and training programs. First, in September 2016, Japan participated in an educational program concerning nuclear emergency response held in California, U.S.A. for senior officials, taking part in an exchange of views concerning nuclear emergency preparedness education and training. Then, in November last year, Japan invited relevant individuals from the U.S.A. to observe the Comprehensive Nuclear Emergency Response Exercise held to verify systems for responding to a nuclear emergency at Hokkaido Electric Power Company's Tomari Nuclear Power Station. After the exercise, representatives of the two countries held an exchange of views.

With the aims of strengthening international cooperation between Japan and the U.S.A., then Cabinet Office Minister of State for Nuclear Emergency Preparedness Tamayo Marukawa visited FEMA, the NRC, and the DOE in July that year, where she exchanged views with representatives of those organizations concerning inspection systems and initiatives for increasing the effectiveness of evacuation plans.

Then Cabinet Office Minister of State for Nuclear Emergency Preparedness Tamayo Marukawa and then FEMA Administrator Craig Fugate hold talks

(ii) Cooperation with France

The Memorandum of Cooperation Between the Minister of State for Nuclear Emergency Preparedness of the Cabinet Office of Japan and the Ministry of the Interior (Director-General for Civil Security and Crisis Management) of France on Emergency Management related to Nuclear Accidents was signed on May 5, 2015. Based on this memorandum, the Cabinet Office is pursuing closer collaboration with the French Ministry of the Interior (Director-General for Civil Security and Crisis Management) and other relevant French organizations in the area of nuclear emergency prevention systems through exchanges of opinions and reciprocal invitations to exercises. Specifically, then State Minister of the Cabinet Office Shinji Inoue held an exchange of views concerning nuclear emergency preparedness with officials from the Ministry of the Interior in May 2016. In addition, in November the same year, State Minister Inoue observed a nuclear emergency response exercise held in the Gironde department in the French region of Bordeaux, sharing his feedback on the structure of the exercise and the scenario formulated.

Then State Minister of the Cabinet Office Shinji Inoue during his visit to France

(iii) Other international cooperation

Japan has also engaged in exchanges of opinions and issued reciprocal invitations to observe exercises with international organizations such as the IAEA and the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA), as well as countries including the UK, France, China, the Republic of Korea, and Taiwan.

In November 2016, Japan invited 17 representatives of international organizations and the nuclear emergency preparedness organizations in various countries to observe the Comprehensive Nuclear Emergency Response Exercise held to verify systems for responding to a nuclear emergency at Hokkaido Electric Power Company's Tomari Nuclear Power Station. Members of the delegation of observers spent three days in the area, during which time they attended a pre-exercise briefing and a meeting to exchange views on the exercise, giving them the opportunity to observe the evacuation of residents and the Prime Minister's declaration of a nuclear emergency.

(2) Participation in Multilateral Exercises

INEX-5, an international nuclear emergency preparedness drill organized by OECD/NEA, was held in November 2016.

INEX is a "question-driven" tabletop nuclear emergency preparedness exercise organized by OECD/NEA.

INEX-5, which is the sixth such exercise, focused on decision-making processes when a complex disaster causes the loss of communication functions. Japan was primarily involved in two thematic areas: communicating information to other countries and accepting international emergency relief.

(3) Holding International Workshops

In November 2016, OECD/NEA and the Cabinet Office co-hosted an international workshop on "Post-accident Food Safety Science" in Fukushima Prefecture.

This workshop was an opportunity to tell the world not only about the current situation in Fukushima and initiatives by producers but also about the valuable experiences of people from the area, including the management of food within the prefecture and the views of local consumers. Scientists from around the world compared the situation in Fukushima with international standards and responses in the wake of Chernobyl and concluded afresh that Fukushima producers, local governments, and the national government are acting rationally from a scientific viewpoint. Participants confirmed that the OECD and other organizations would take this into account when discussing approaches to safety in relation to radioactive material in food.

In addition, students from Fukushima Prefectural Soma Agricultural High School mapped out their vision for the future of Fukushima's agriculture at the workshop. The students' involvement seems set to open up future opportunities, as their vision was included in a report compiled by OECD/NEA and they received an invitation to an exchange event for students organized by OECD/NEA in France.

State Minister of the Cabinet Office Tadahiko Ito gives the opening address at the workshop

Exchange of views with students from Soma Agricultural High School

(4) Surveys of International Standards, etc.

December 2015 saw the first meeting of the IAEA's new Emergency Preparedness and Response Standards Committee (EPReSC), which has been established to examine the IAEA's standards regarding off-site nuclear emergency preparedness and the systems/management of major countries engaging in nuclear power generation. Japan attended this meeting, participating in discussions with experts from the IAEA and other member countries.

Section 4: 2016 Comprehensive Nuclear Emergency Response Exercise

4-1 Overview of Exercise

(1) Positioning and Objectives

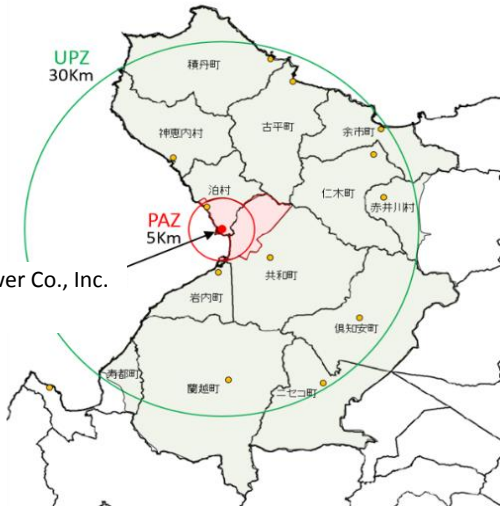
The Comprehensive Nuclear Emergency Response Exercise is a joint exercise involving the national government, local governments, and nuclear operators, in accordance with the Act on Special Measures Concerning Nuclear Emergency Preparedness. Based on the scenario of a nuclear emergency, it aims to verify systems for responding to such an emergency. The 2016 Comprehensive Nuclear Emergency Response Exercise had the following objectives:

- To check the effectiveness of the disaster preparedness systems of the national government, local governments, and nuclear operators, and the cooperative frameworks of relevant organizations
- To check national and local systems and procedures specified in manuals for responding to a nuclear emergency
- To examine the Evacuation Plan based on the Tomari Region Emergency Response
- To identify lessons from the outcomes of the exercise and improve emergency responses
- To enhance the skills of key personnel involved in nuclear emergency response measures and promote public understanding of nuclear emergency preparedness

(2) Timing and Power Plant

The exercise was held on November 13 and 14, 2016, focusing on Hokkaido Electric Power Co., Inc's Tomari Power Station.

Fig. 2-4-1 Tomari Region Priority Zones for Nuclear Emergency Response



*PAZ: Precautionary Action Zone

*UPZ: Urgent Protective action planning Zone

Source: Cabinet Office

(3) Participants, etc.

(Number of participating organizations: approximately 360; number of participants, including local citizens: approximately 18,000)

- Governmental organizations: Cabinet Secretariat, Cabinet Office, NRA, and other relevant ministries and

agencies

- Local governments: Hokkaido Prefecture, Tomari Village, Kyowa Town, 11 municipalities within the UPZ and other relevant prefectures and municipalities
- Nuclear operator: Hokkaido Electric Power Co., Inc.
- Relevant organizations: National Institute of Radiological Sciences of the National Institutes for Quantum and Radiological Science and Technology, Japan Atomic Energy Agency, etc.

(4) Accident Scenario

In this scenario, an earthquake with a hypocenter located off the southwest coast of Hokkaido leads to a major tsunami warning being issued. Leakage of reactor coolant subsequently escalates into a General Emergency due to the loss of function in the reactor water injection system, resulting in the release of radioactive material.

(5) Content of Exercise

This exercise was held with the aim of further improving the effectiveness of the Evacuation Plan based on the Tomari Region Emergency Response. It involved decision-making and operational drills relating to the evacuation of residents, tailored to the escalation of the situation in a complex disaster scenario based on a tsunami and nuclear emergency.

(6) Winter Exercise

As part of the Comprehensive Nuclear Emergency Response Exercise, a component exercise was held on February 4, 2017, to check procedures for snow removal and evacuation in the event of a winter blizzard.

4-2 Overview of Performance

(1) Comprehensive Exercise Held in November 2016

(i) Exercise in Rapid Establishment of an Initial Response System

The national government, local governments, and nuclear operator mobilized key personnel to set up an initial response system at their respective operational bases following an earthquake and major tsunami warning and gathered information about the status of the natural disaster and the power station. In addition, they used teleconferencing and other systems to strengthen communication between relevant organizations and prepare for an escalation of the situation.

Key personnel gather information
(Off-site Center)

(ii) Exercise in Making Decisions Concerning the Evacuation Plan, etc. Based on Collaboration Between National and Local Bodies

Following an escalation of the situation, the Prime Minister's Office and the other bases worked together to formulate and decide on protection measures, including the evacuation of local citizens. At the Prime Minister's Office, the Prime Minister declared a nuclear emergency in response to the General Emergency and, with the participation of relevant Cabinet ministers, held a meeting of the Nuclear Emergency Response Headquarters. During this meeting, they checked initiatives relating to protection measures, including the evacuation of local citizens, and approved the government's basic guidelines on emergency response measures.

Meeting of the Nuclear Emergency Response Headquarters (at the Prime Minister's Office) with the participation of Prime Minister Abe and relevant Cabinet ministers

(iii) Field Training Exercise in Response to General Emergency

In this exercise, following the General Emergency, evacuation destinations were coordinated and means of transport secured for residents within the PAZ, based on the extent of the damage caused by the tsunami. In addition, residents took stable iodine agents before evacuating. As the scenario envisaged radioactive releases, residents of the UPZ sheltered indoors and stable iodine agents were urgently distributed. This was followed by temporary relocation and inspections when evacuating each area. For each evacuation, video footage transmitted by Hokkaido Prefectural Police helicopters was used to gain an understanding of the situation on the ground.

Exercise in evacuation by bus
(From Kyowa Town to Rusutsu Village)

Distribution of stable iodine agents
(Furubira Town)

(2) Winter Exercise Held in February 2017

An exercise was carried out based on a scenario in which a nuclear emergency escalates during a severe blizzard centered on Hokkaido's Shiribeshi region. It involved decision-making and operational drills focused on measures to protect residents amid this situation.

Exercise in making decisions on the evacuation of residents during a headquarters meeting

(Hokkaido Prefectural Office)

Exercise in using snowplows to lead an evacuation convoy

(Kyowa Town)

4-3 Post-exercise Initiatives

Following the 2016 Comprehensive Nuclear Emergency Response Exercise, areas for improvement were identified from views expressed by experts and responses to a questionnaire distributed to local citizens who participated in the drill. These are summarized in the Report on the Findings from the 2016 Comprehensive Nuclear Emergency Response Exercise. Going forward, the Tomari Local Nuclear Disaster Management Council will make improvements to the Tomari Region Emergency Response and various manuals, following deliberations informed by the lessons and response guidelines described in this report. Moreover, the government will seek to further enhance the methods used for conducting the Comprehensive Nuclear Emergency Response Exercise, as well as the menu of scenarios and exercises, constantly reviewing the exercise to make it more realistic.

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9. Japan's International Cooperation

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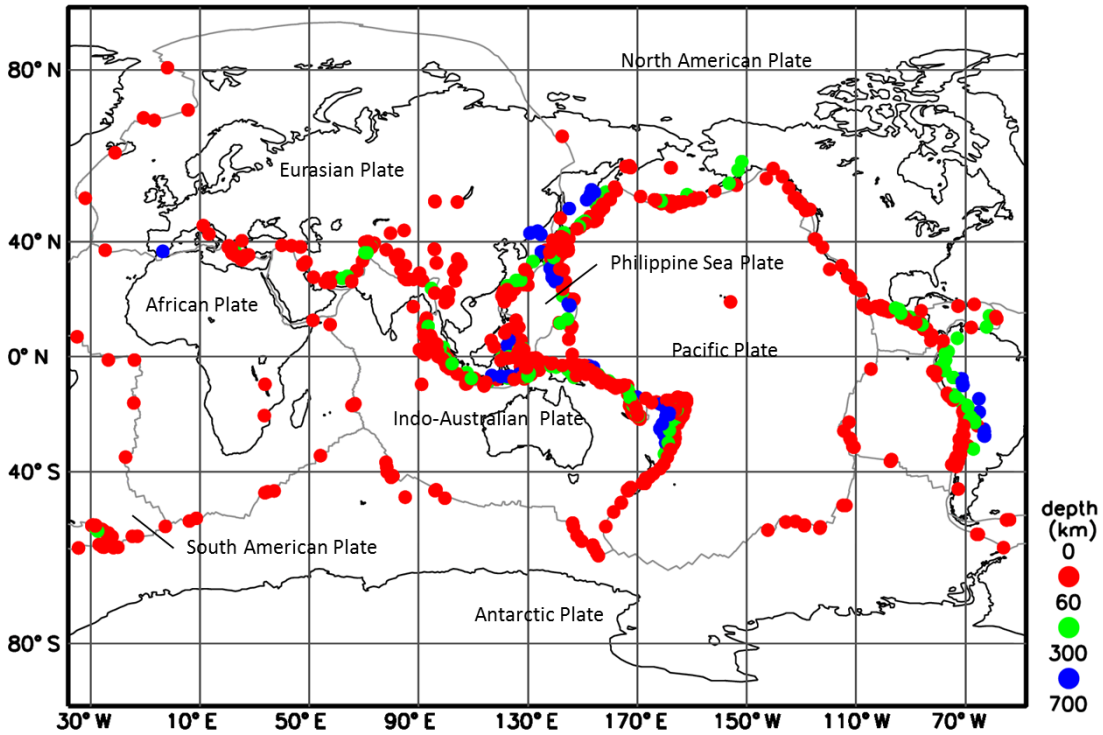
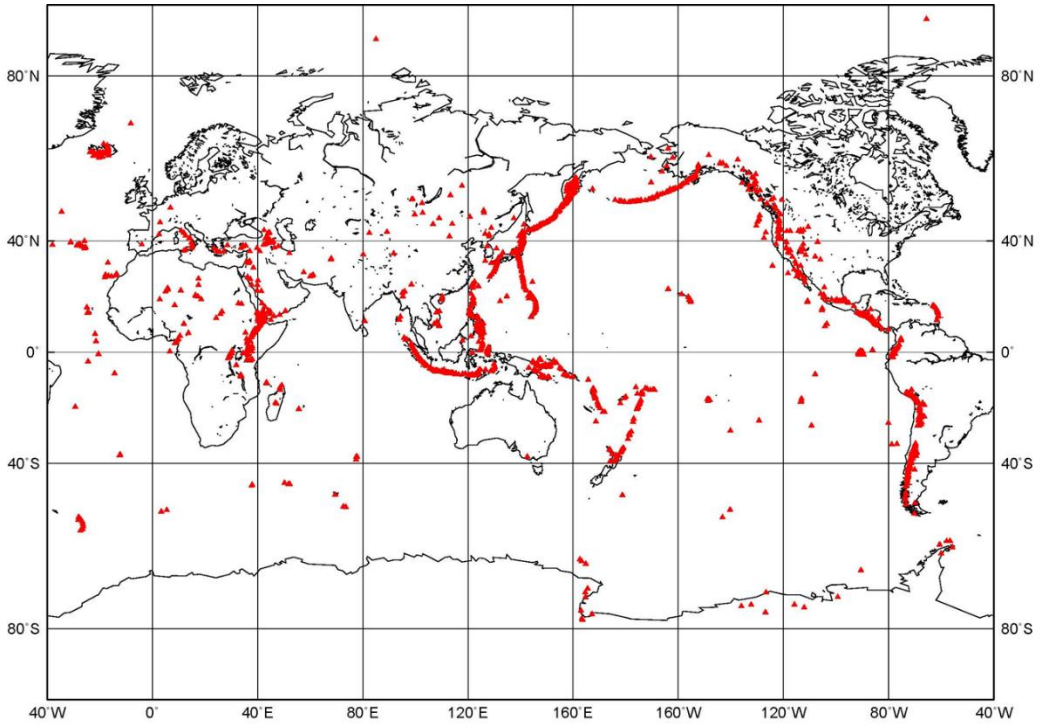
1. Overview of Japan's National Land

Fig. A-1 **Worldwide Hypocenter Distribution (for Magnitude 6 and Higher Earthquakes) and Plate Boundaries**



Note: 2006–2015
Source: Created by the Japan Meteorological Agency based on earthquake data from the U.S. Geological Survey

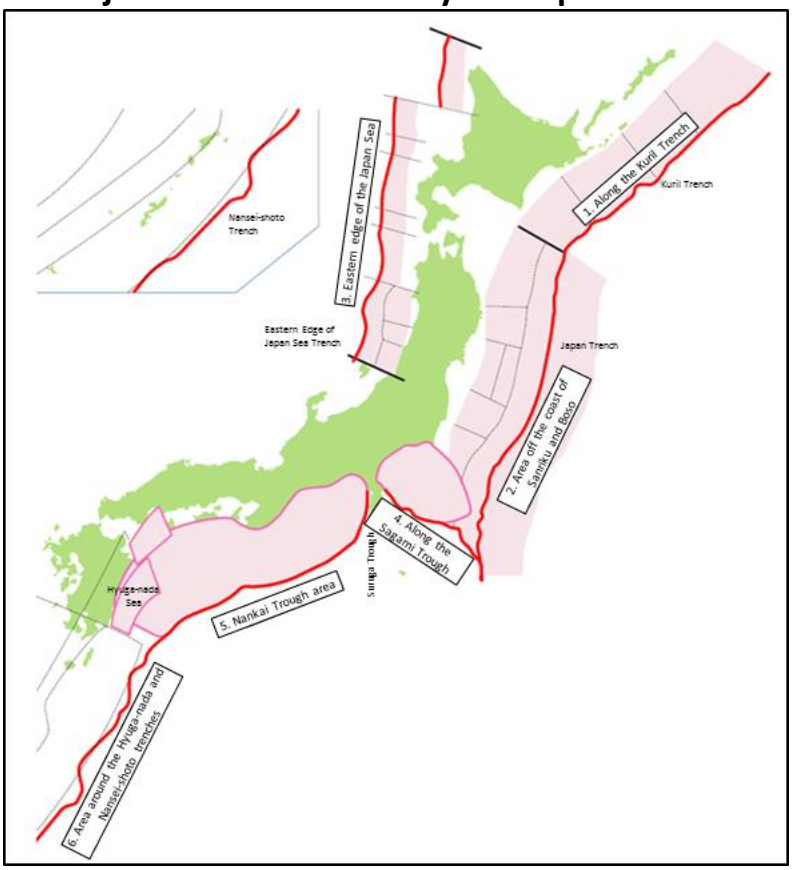
Fig. A-2 **Distribution of Volcanoes Worldwide**



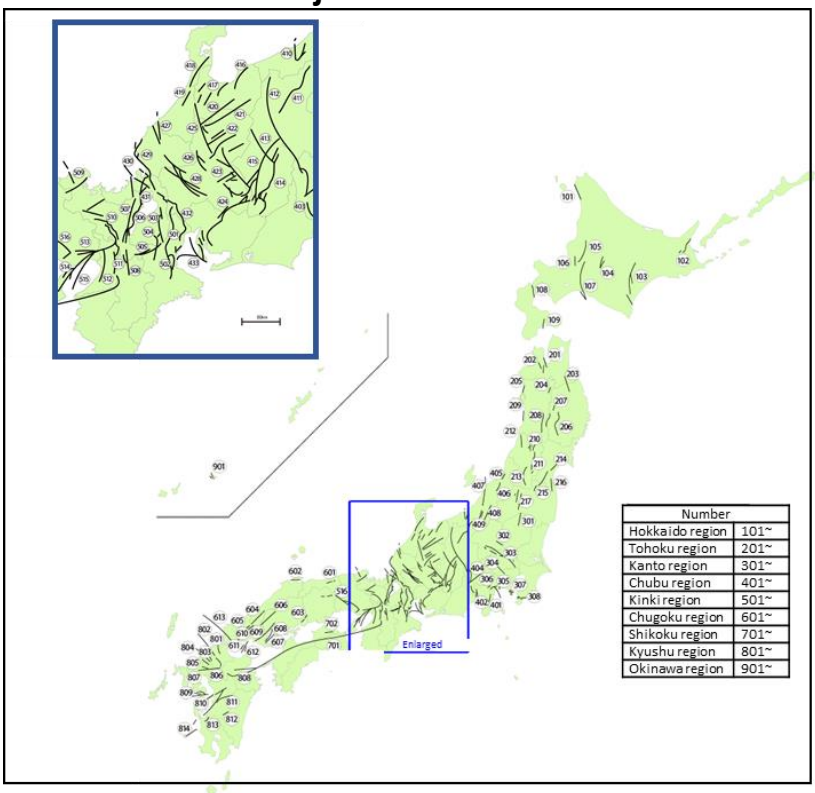
Source: Japan Meteorological Agency

Fig. A-3 Overview of Major Trenches and Major Active Faults

Major Trenches and Likely Earthquake Zones



Major Active Faults

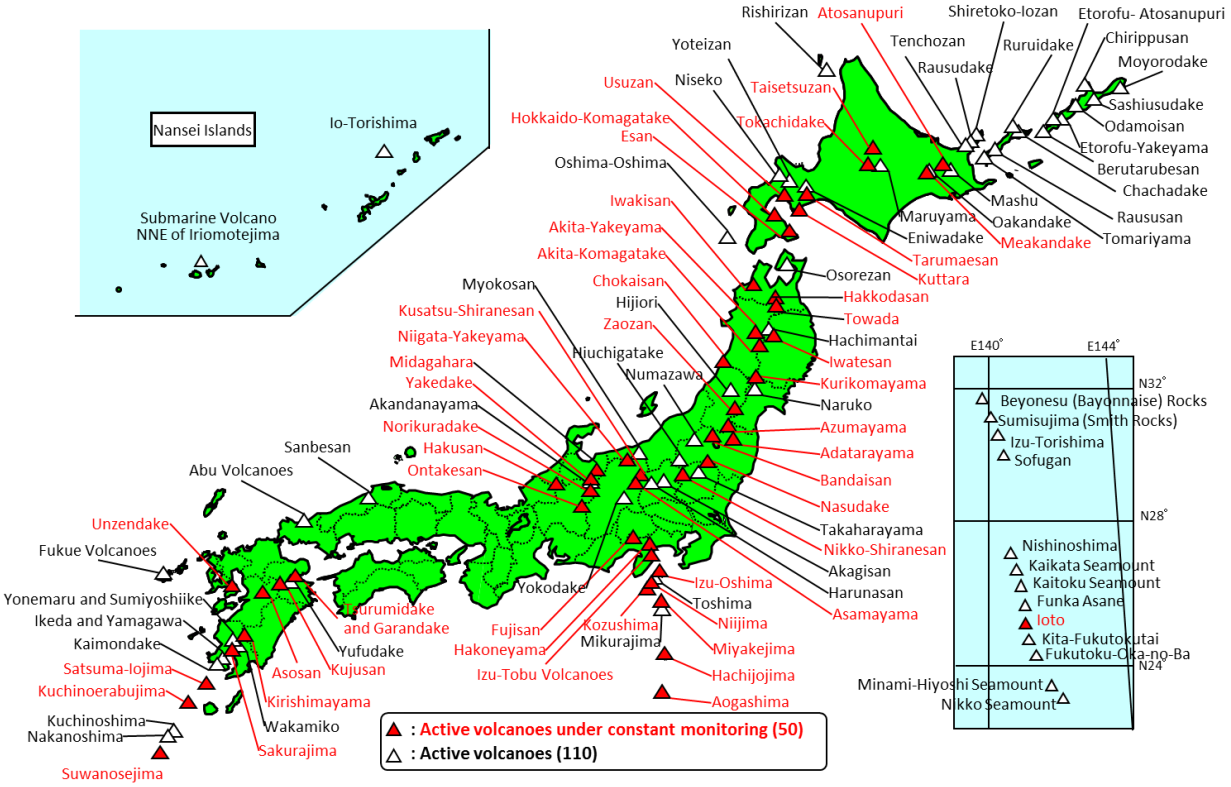


Source: Ministry of Education, Culture, Sports, Science and Technology

No.	Name of Fault	No.	Name of Fault
101	Sarobetsu fault zone	424	Byoubuyama Enasan fault zone & Sanageyama fault zone
102	Shibetsu fault zone	425	Shokawa fault zone
103	Tokachi-heiya fault zone	426	Nagaragawa-joryu fault zone
104	Furano fault zone	427	Fukui-heiya-toen fault zone
105	Mashike-sanchi-toen fault zone · Numata-Sunagawa fault zone	428	Noubi fault zone
106	Toubetsu fault	429	Yanagase Sekigahara fault zone
107	Ishikari-teichi-toen fault zone	430	Nosaka Shufukuji fault zone
108	Kuromatsunai-teichi fault zone	431	Kohoku-sanchi fault zone
109	Hakodate-teiya-seien fault zone	432	Yoro-Kuwana-Yokkaichi
201	Aomori-wan-seigan fault zone	433	Isewan fault zone
202	Tsugaru-sanchi-seien fault zone	501	Suzuka-toen fault zone
203	Oritsume fault	502	Nunobiki-sanchi-toen fault zone
204	Hanawa-higashi fault zone	503	Suzuka-seien fault zone
205	Noshiro fault zone	504	Tongu fault
206	Kitakami-teichi-seien fault zone	505	Kizugawa fault zone
207	Shizukuishi-bonchi-seien - Mahiru-sanchi-toen fault zone	506	Biwako-seigan fault zone
208	Yokote-bonchi-toen fault zone	507	Mikata Hanaore fault zone
209	Kitayuri fault	508	Sourthern fault zone of Kyoto-bonchi-Nara-bonchi (Nara-bonchi-toen fault zone)
210	Shinjo-bonchi fault zone	509	Yamada fault zone
211	Yamagata-bonchi fault zone	510	Mitoke Kyoto Nishiyama fault zone
212	Shonai-heiya-toen fault zone	511	Ikoma fault zone
213	Nagai-bonchi-seien fault zone	512	Uemachi fault zone
214	Nagamachi-Rifu Line fault zone	513	Arima-Takatsuki fault zone
215	Fukushima-bonchi-seien fault zone	514	Rokko Awajishima fault zone
216	Futaba fault	515	Osaka-wan fault zone
217	Aizu-bonchi-seien-toen fault zone	516	Yamasaki fault zone
301	Sekiya fault	601	Shikano-Yoshioka fault
302	Okubo fault	602	Shinji (Kashima) fault
303	Fukaya Fault Zone and the Ayasegawa Fault (Kanto-heiya hokuseien fault zone and Motoarakawa fault zone)	603	Chojagahara-Yoshii fault
304	Tachikawa fault zone	604	Yasaka fault
305	Isehara fault	605	Jifuku fault
306	Shiozawa fault zone, Hirayama-Matsuda-kita fault zone and Kouzu-Matsuda fault zone (Kannawa Kouzu-Matsuda fault zone)	606	Tsutsuga fault
307	Miura-hanto fault group	607	Hiroshima-wan-Iwakuni-oki fault zone
308	Kamogawa-teichi fault zone	608	Akinada fault zone
401	Kitaizu fault zone	609	Iwakuni-Itsukaichi fault zone
402	Fujikawa-kako fault zone	610	Oharako fault
403	Minobu fault	611	Ogori fault
404	Sone-kyuryo fault zone	612	Suounada fault zone
405	Kushigata-sanmyaku fault zone	613	Kikugawa fault zone
406	Tsukioka fault zone	701	Chuo-kozosen fault zone (Kongo-sanchi-toen – Iyonada)
407	Nagaoka-heiya-seien fault zone	702	Nagao fault zone
408	Muikamachi fault zone	801	Fukuchiyama fault zone
409	Tokamachi fault zone	802	Nishiyama fault zone
410	Takada-heiya fault zone	803	Umi fault
411	Nagano-bonchi-seien fault zone (Shinanogawa fault zone)	804	Kego fault zone
412	Itoigawa-Shizuoka-kozosen fault zone	805	Hinata-toge-Okasagi-toge fault zone
413	Sakaitoge Kamiya fault zone	806	Minoh fault zone
414	Inadani fault zone	807	Saga-heiya-hokuen fault zone
415	Kiso-sanmyaku-seien fault zone	808	Beppu-Haneyama fault zone
416	Uozu fault zone	809	Unzen fault group
417	Tonami-heiya fault zone · Kurehayama fault zone	810	Futagawa-Hinagu fault zone
418	Ouchigata fault zone	811	Midorikawa fault zone
419	Morimoto Togashi fault zone	812	Hitoyoshi-bonchi-nanen fault
420	Ushikubi fault zone	813	Izumi fault zone
421	Atotsugawa fault zone	814	Koshiki fault zone
422	Takayama Oppara fault zone	901	Miyakojima fault zone
423	Atera fault zone		

Source: Ministry of Education, Culture, Sports, Science and Technology

Fig. A-4 Distribution of Active Volcanoes in Japan



Source: Created by the Cabinet Office from the Japan Meteorological Agency website (As of March 2017)

2. Disasters in Japan

Fig. A-5 Major Earthquake Damage in Japan (Since the Meiji Period)

Disaster		Date	Number of Fatalities and Missing Persons
Nobi Earthquake	(M8.0)	October 28, 1891	7,273
Meiji Sanriku Earthquake and Tsunami	(M8.25)	June 15, 1896	Approx. 22,000
Great Kanto Earthquake	(M7.9)	September 1, 1923	Approx. 105,000
1927 Kita Tango Earthquake	(M7.3)	March 7, 1927	2,925
Showa Sanriku Earthquake Tsunami	(M8.1)	March 3, 1933	3,064
1943 Tottori Earthquake	(M7.2)	September 10, 1943	1,083
Tonankai Earthquake	(M7.9)	December 7, 1944	1,251
Mikawa Earthquake	(M6.8)	January 13, 1945	2,306
Nankai Earthquake	(M8.0)	December 21, 1946	1,443
Fukui Earthquake	(M7.1)	June 28, 1948	3,769
Tokachi-oki Earthquake	(M8.2)	March 4, 1952	33
1960 Chile Earthquake and Tsunami	(Mw9.5)	May 23, 1960	142
1964 Niigata Earthquake	(M7.5)	June 16, 1964	26
1968 Tokachi-oki Earthquake	(M7.9)	May 16, 1968	52
1974 Izu-hanto-oki Earthquake	(M6.9)	May 9, 1974	30
1978 Izu-Oshima-kinkai Earthquake	(M7.0)	January 14, 1978	25
1978 Miyagi-ken-oki Earthquake	(M7.4)	June 12, 1978	28
Nihon-kai-chubu Earthquake	(M7.7)	May 26, 1983	104
Nagano-ken-seibu Earthquake	(M6.8)	September 14, 1984	29
Hokkaido-nansei-oki Earthquake	(M7.8)	July 12, 1993	230
Great Hanshin-Awaji Earthquake	(M7.3)	January 17, 1995	6,437
Mid Niigata Prefecture Earthquake	(M6.8)	October 23, 2004	68
Iwate–Miyagi Nairiku Earthquake	(M7.2)	June 14, 2008	23
Great East Japan Earthquake	(Mw9.0)	March 11, 2011	22,118
2016 Kumamoto Earthquake	(M7.3)	April 14, 2016	228

*Mw: Moment magnitude

Notes:

1. The earthquakes listed before World War II are those with more than 1,000 fatalities and missing persons, while the earthquakes listed after World War II are those with more than 20 fatalities and missing persons.
2. The number of fatalities and missing persons from the Great Kanto Earthquake are based on the revised Chronological Scientific Table (2006), which changed the number from approximately 142,000 to approximately 105,000.
3. The number of fatalities and missing persons from the Great Hanshin-Awaji Earthquake is the current figure as of December 22, 2005. The number of fatalities directly caused by structures collapsing, fire, and other factors caused by seismic shaking on the day of the earthquake, excluding so-called “related deaths,” is 5,515.
4. The number of fatalities (including disaster-related fatalities) and missing persons from the Great East Japan Earthquake is the current figure as of March 1, 2017.
5. The details given for the 2016 Kumamoto Earthquake is the current figure as of April 13, 2017.

Source: Chronological Scientific Tables, Fire and Disaster Management Agency materials, National Police Agency materials, Comprehensive List of Destructive Earthquakes in Japan, Extreme Disaster Management Headquarters materials, Major Disaster Management Headquarters materials

Fig. A-6 Major Natural Disaster in Japan Since 1945

Date	Disaster	Main Affected Areas	Number of Dead and Missing
January 13, 1945	Mikawa Earthquake (M6.8)	Southern Aichi	2,306
September 17-18, 1945	Typhoon Makurazaki	Western Japan (Especially in Hiroshima)	3,756
December 21, 1946	Nankai Earthquake (M8.0)	Various Places in West of Chubu	1,443
August 14, 1947	Mt. Asama Eruption	Around Mt. Asama	11
September 14-15, 1947	Typhoon Kathleen	North of Tokai	1,930
June 28, 1948	Fukui Earthquake (M7.1)	Around the Fukui Plains	3,769
September 15-17, 1948	Typhoon Ione	From Shikoku into Tohoku (Especially in Iwate)	838
September 2-4, 1950	Typhoon Jane	North of Shikoku (Especially in Osaka)	539
October 13-15, 1951	Typhoon Ruth	Nationwide (Especially in Yamaguchi)	943
March 4, 1952	Tokachi-oki Earthquake (M8.2)	Southern Hokkaido, Northern Tohoku	33
June 25-29, 1953	Heavy Rains	Kyushu, Shikoku, Chugoku (Especially Kitakyushu)	1,013
July 16-24, 1953	Torrential Rains	West of Tohoku (Especially in Wakayama)	1,124
May 8-12, 1954	Storm Disaster	Northern Japan, Kinki	670
September 25-27, 1954	Typhoon Toyamaru	Nationwide (Especially in Hokkaido and Shikoku)	1,761
July 25-28, 1957	Torrential Rains	Kyushu (Especially around Isahaya)	722
June 24, 1958	Mt. Aso Eruption	Around Mt. Aso	12
September 26-28, 1958	Typhoon Kanogawa	East of Kinki (Especially in Shizuoka)	1,269
September 26-27, 1959	Typhoon Ise-wan	Nationwide (Except for Kyushu, especially in Aichi)	5,098
May 23, 1960	Chile Earthquake Tsunami	Southern Coast of Hokkaido, Sanriku Coast, Shima Coast	142
January 1963	Heavy snowfall	Hokuriku, Sanin, Yamagata, Shiga, Gifu	231
June 16, 1964	Niigata Earthquake (M7.5)	Niigata, Akita, Yamagata	26
September 10-18, 1965	Typhoons 23, 24, 25	Nationwide (Especially in Tokushima, Hyogo, Fukui)	181
September 23-25, 1966	Typhoons 24, 26	Chubu, Kanto, Tohoku (Especially in Shizuoka, Yamanashi)	317
July to August 1967	Torrential Rains	West of Chubu, Southern Tohoku	256
May 16, 1968	Tokachi-oki Earthquake (M7.9)	Southern Hokkaido and Tohoku Area centering around Aomori	52
July 3-15, 1972	Typhoons 6, 7, 9 and Torrential Rains	Nationwide (Especially in Kitakyushu, Shimane, Hiroshima)	447
May 9, 1974	Izu-hanto-oki Earthquake (M6.9)	Southern Tip of Izu-hanto	30
September 8-14, 1976	Typhoon 17 and Torrential Rains	Nationwide (Especially in Kagawa, Okayama)	171
January 1977	Snow Disasters	Tohoku, Northern Kinki, Hokuriku	101
August 7, 1977- October 1978	Mt. Usu Eruption	Hokkaido	3
January 14, 1978	Izu-Oshima-kinkai Earthquake (M7.0)	Izu-hanto	25
June 12, 1978	Miyagi-ken-oki Earthquake (M7.4)	Miyagi	28
October 17-20, 1979	Typhoon 20	Nationwide (Especially Tokai, Kanto, Tohoku)	115
December 1980 - March 1981	Snow Disasters	Tohoku, Hokuriku	152
July to August 1982	Torrential Rains and Typhoon 10	Nationwide (Especially in Nagasaki, Kumamoto, Mie)	439
May 26, 1983	Nihon-kai-chubu Earthquake (M7.7)	Akita, Aomori	104
July 20-29, 1983	Torrential Rains	East of Sanin (Especially in Shimane)	117
October 3, 1983	Miyake Is. Eruption	Around Miyake-jima Island	—
December 1983 - March 1984	Snow Disasters	Tohoku, Hokuriku (Especially in Niigata, Toyama)	131
September 14, 1984	Nagano-ken-seibu Earthquake (M6.8)	Western Nagano	29
November 15 - December 18, 1986	Izu-Oshima Eruption	Izu Oshima Island	—
November 17, 1990 – June 3, 1995	Mr. Unzen Eruption	Nagasaki	44
July 12, 1993	Hokkaido-nansei-oki Earthquake (M7.8)	Hokkaido	230
July 31 - August7, 1993	Torrential Rains	Nationwide	79
January 17, 1995	Great Hanshin-Awaji Earthquake (M7.3)	Hyogo	6,437
March 31, 2000 - June 28, 2001	Mt. Usu Eruption	Hokkaido	—
June 25, 2001 - March 31, 2005	Miyake Is. Eruption and Niijima and Kozushima Is. Earthquake (M6.5)	Tokyo	1
October 20-21, 2004	Typhoon 23	Nationwide	98
October 23, 2004	Mid Niigata Prefecture Earthquake (M6.8)	Niigata	68
December 2005 - March 2006	Heavy Snowfall	Japan Sea Coast centering around Hokuriku Area	152
July 16, 2007	Niigataken Chuetsu-oki Earthquake (M6.8)	Niigata	15
June 14, 2008	Iwate-Miyagi Nairiku Earthquake (M7.2)	Tohoku (Especially in Miyagi, Iwate)	23
December 2010 - March 2011	Snow Disasters	From Northern Japan through into West Japan on the Japan Sea Coast	131
March 11, 2011	Great East Japan Earthquake (Mw9.0)	Eastern Japan (Especially in Miyagi, Iwate, Fukushima)	22,118
August 30 - September 5, 2011	Typhoon 12	Kinki, Shikoku	98
November 2011 - March 2012	Heavy Snowfall in 2011	From Northern Japan through into West Japan on the Japan Sea Coast	133
November 2012 - March 2013	Heavy Snowfall fin 2012	From Northern Japan through into West Japan on the Japan Sea Coast	104
November 2013 - May 2014	Heavy Snowfall in 2013	From Northern Japan through into Kanto-Koshinetsu Area (Especially in Yamanashi)	95
August 20, 2014	Torrential Rains of August 2014 (Hiroshima Sediment Disaster)	Hiroshima	77
September 27, 2014	2014 Eruption of Mt. Ontake	Nagano, Gifu	63
April 14 and 16, 2014	2016 Kumamoto Earthquake (M7.3)	Kyushu Area	228

Notes:
1. The disasters listed resulted in fatalities and missing persons as follows: 500 or more for storm and flood disasters, 100 or more for snow disasters, and 10 or more for earthquakes, tsunamis, and volcanic eruptions. It also includes disasters for which governmental Major Disaster Management Headquarters were established based on the Basic Act on Disaster Management.
2. The number of fatalities and missing persons for the Great Hanshin-Awaji Earthquake is the current figure as of December 22, 2005. The number of deaths directly caused by structural collapse, fire, and other factors caused by seismic shaking on the day of the earthquake, excluding so-called "related deaths," is 5,521.
3. The numbers of fatalities from the Miyake Is. Eruption and Niijima and Kozushima Is. Earthquake are from the earthquake of July 1, 2000.
4. The number of fatalities (including disaster-related fatalities) and missing persons resulting from the Great East Japan Earthquake is the current figure as of March 1, 2017.
5. The details given for the 2016 Kumamoto Earthquake show the toll as of April 13, 2017.

Source: Created by the Cabinet Office based on the meteorological almanac of Japan, Chronological Scientific Tables, National Police Agency materials, Fire and Disaster Management Agency materials, Extreme Disaster Management Headquarters materials, Major Disaster Management Headquarters materials, and Hyogo Prefecture materials

Fig. A-7 Major Natural Disasters in Japan in Recent Years

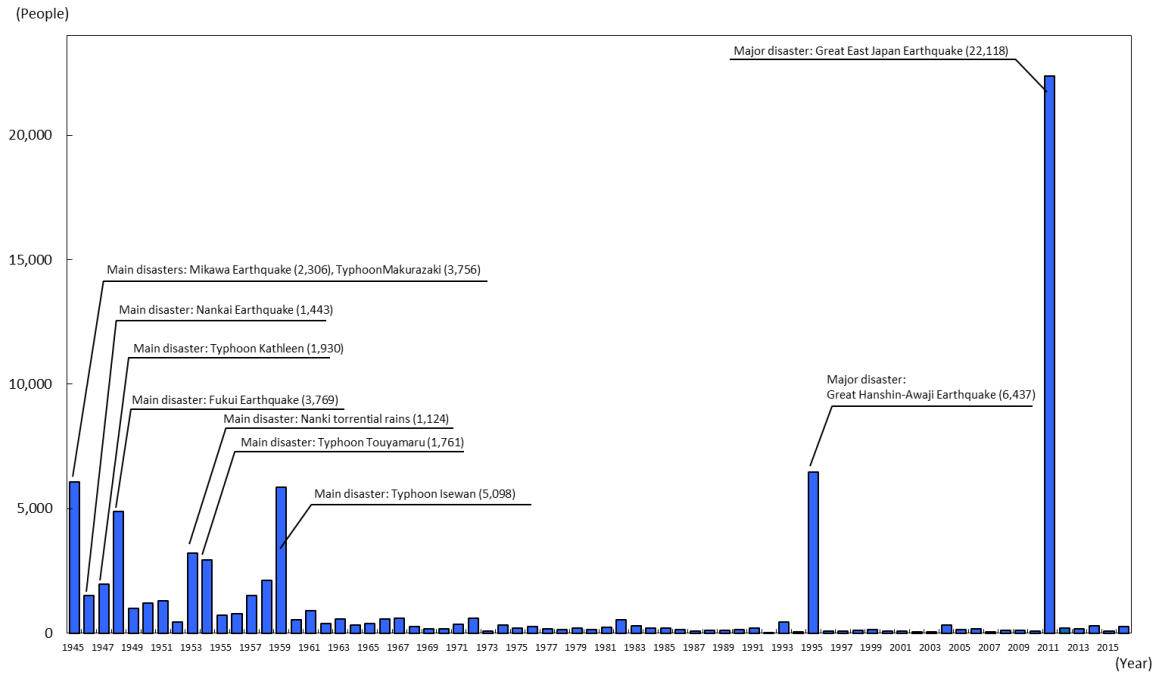
Date	Disaster	Main Affected Areas	Number of Dead and Missing
March 24, 2001	Geiyo Earthquake (M6.7)	Hiroshima, Ehime, Yamaguchi	2
April 3, 2001	Earthquake (M5.3) epicentered in central Shizuoka	Shizuoka	0
July 11-13, 2001	Heavy rains in northern Kyushu Region	Fukuoka, Saga, Kumamoto, Nagasaki, Yamaguchi	0
August 20-23, 2001	Typhoon 11	Nationwide centering around Western Japan	7
September 6-13, 2001	Typhoon 16	Okinawa, Western Japan	0
September 8-12, 2001	Typhoon 15	Nationwide centering around Eastern Japan	8
July 9-11, 2002	Typhoon 6	Nationwide centering around Tohoku	7
July 13-16, 2002	Typhoon 7	Nationwide centering around Kagoshima	0
October 1-2, 2002	Typhoon 21	Hokkaido, Tohoku, Kanto, Chubu	4
May 26, 2003	Earthquake (M7.1) epicentered off coast of Miyagi Prefecture	Tohoku	0
July 18-21, 2003	Torrential rains from seasonal rain front	Kyushu	23
July 26, 2003	Earthquake (M6.4) epicentered in northern Miyagi Prefecture	Miyagi	0
August 7-10, 2003	Typhoon 10	Nationwide centering around Hokkaido	19
September 11-14, 2003	Typhoon 14	Nationwide centering around Okinawa	3
September 26, 2003	Tokachi-oki Earthquake (M8.0)	Hokkaido	2
July 12-13, 2004	Torrential rains in Niigata and Fukushima in July 2004	Niigata, Fukushima	16
July 17-18, 2004	Torrential rains in Fukui in July 2004	Fukui	5
July 29 - August 6, 2004	Heavy rains from and related to Typhoons 10 and 11	Chugoku, Shikoku	3
August 17-20, 2004	Heavy rains from and related to Typhoon 15	Tohoku, Shikoku	10
August 27-31, 2004	Typhoon 16	Nationwide centering around Western Japan	17
September 5, 2004	Earthquakes (M7.1, M7.4) epicentered off coast of Kii Peninsula/off the coast of Tokaido	Aichi, Mie, Wakayama	0
September 4-8, 2004	Typhoon 18	Nationwide centering around Chugoku	46
September 26-30, 2004	Typhoon 21	Nationwide centering around Western Japan	27
October 8-10 , 2004	Typhoon 22	East Japan on the Pacific Ocean side	9
October 18-21 , 2004	Typhoon 23	Nationwide centering around Kinki and Shikoku	98
October 23, 2004	2004 Mid Niigata Prefecture Earthquake (M6.8)	Niigata	68
December 2004- March 2005	Snow disasters	Hokkaido, Tohoku, and Hokuriku Regions	88
March 20, 2005	Fukuoka-ken-Seihou-oki Earthquake (M7.0)	Fukuoka	1
June 27 - July 25, 2005	Heavy rains due to the seasonal rain front	From the southern Tohoku Region to the Kyushu Region	12
July 23, 2005	Earthquake (M6.0) epicentered in northwestern Chiba Prefecture	Tokyo, Saitama, Kanagawa and Chiba	0
August 16, 2005	Earthquake (M7.2) epicentered off coast of Miyagi Prefecture	Tohoku Region	0
August 25-26, 2005	Typhoon 11	Kanto and Tokai Regions	0
September 4-8, 2005	Typhoon 14	Nationwide centering around Chugoku, Shikoku, and Kyushu Regions	29
December 2005- March 2006	Heavy snowfall in 2006	Japan Sea side centering around Hokuriku Region	152
June 10 - July 29, 2006	Torrential rains due to seasonal rain front	Kanto, Chubu, Kinki, Chugoku, Kyushu Regions	33
September 15-20, 2006	Typhoon 13	Chugoku and Kyushu Regions	10
November 7, 2006	Tornado in town of Saroma	Hokkaido (Saroma-cho)	9
March 25 2007	Noto Hanto Earthquake (M6.9) of 2007	Ishikawa	1
April 15, 2007	Earthquake (M5.4) epicentered in central Mie Prefecture	Mie	0
July 5-17, 2007	Heavy rains from Typhoon 4 and seasonal rain front	Chubu, Shikoku and Kyushu Regions	7
July 16, 2007	2007 Niigataken Chuetsu-oki Earthquake (M6.8)	Niigata	15
August 2-4, 2007	Typhoon 5	Kyushu Region	0
September 6-8, 2007	Typhoon 9	Tohoku, Kanto and Chubu Regions	3
September 13-18, 2007	Heavy rains from Typhoon 11 and rain front	Tohoku Region	4
October 1, 2007	Earthquake (M4.9) epicentered is western Kanagawa Prefecture	Kanagawa	0
February 23-24, 2008	Damage from low-pressure system	Hokkaido, Tohoku and Chubu Regions	3
June 14, 2008	Iwate-Miyagi Nairiku Earthquake (M7.2) of 2008	Tohoku Region (Especially Miyagi and Iwate)	23
July 24, 2008	Earthquake (M6.8) epicentered on northern coast of Iwate Prefecture	Hokkaido and Tohoku Regions	1
July 28-29, 2008	Damage from heavy rains	Hokuriku and Kinki Regions (Especially Hyogo)	6
August 26-31, 2008	Torrential rains at the end of August 2008	Tohoku, Kanto, Tokai and Chugoku Regions (Especially Aichi)	2
July 21-26, 2009	Torrential rains in Chugoku and northern Kyushu Regions in July 2009	Chugoku and Kyushu Regions (Especially Yamaguchi and Fukuoka)	36
August 10-11, 2009	2009 Typhoon 9	Kinki and Shikoku Regions (Especially Hyogo)	27
August 11, 2009	Earthquake (M6.5) epicentered in Suruga Bay	Tokai Region	1
October 7-8, 2009	2009 Typhoon 18	Tohoku, Kanto, Chubu and Kinki Regions	5
February 28, 2010	Tsunami from an earthquake epicentered on central Chilean coast	Tohoku, Kanto, Tokai, Kinki and Shikoku Regions	0
June 11 - July 19, 2010	Heavy rains due to 2010 seasonal rain front	Nationwide centering around Chugoku and Kyushu Regions	22
October 18-30, 2010	Heavy rains in Amami region of Kagoshima Prefecture	Kagoshima (Amami)	3
November 2010- March 2011	Heavy snowfall in 2010	Hokkaido, Tohoku and Hokuriku Regions	131

Date	Disaster	Main Affected Areas	Number of Dead and Missing
January 26 - September 7, 2011	Mt. Kirishima (Shinmoedake) Eruption	Miyazaki and Kagoshima	0
March 11, 2011	Great East Japan Earthquake (Mw9.0)	Nationwide centering around Tohoku Region	22,118
July 19-24, 2011	2011 Typhoon 6	Kanto, Tokai, Kinki and Shikoku Regions	3
July 28-30, 2011	Torrential rains in Niigata and Fukushima in July 2011	Tohoku and Hokuriku Regions (Especially Niigata and Fukushima)	6
August 30 – September 5, 2011	2011 Typhoon 12	Kanto, Tokai, Kinki, Chugoku and Shikoku Regions	98
September 15-22, 2011	2011 Typhoon 15	Nationwide	20
November 2011- March 2012	Heavy snowfall in 2011	Hokkaido, Tohoku and Hokuriku Regions	133
May 6, 2012	Wind gusts occurring in May 2012	Kanto Region (Especially Ibaraki and Tochigi)	3
June 18-20, 2012	2012 Typhoon 4	Nationwide	1
July 2-9, 2012	Heavy rains from July 3, 2012	Nationwide centering around Kyushu and Okinawa Regions	2
July 11-14, 2012	Heavy rains from July 11, 2012	Nationwide centering around northern Kyushu Region	33
August 13-15, 2012	Heavy rains from August 13, 2012	Kinki and Chubu Regions	3
September 15-19, 2012	2012 Typhoon 16	Nationwide	0
September 28 - October 1, 2012	2012 Typhoon 17	Chubu, Kinki, Kyushu and Okinawa Regions	1
November 2012- March 2013	Heavy snowfall in 2012	Hokkaido, Tohoku and Hokuriku Regions	104
April 6-9, 2013	Low-pressure system from April 6, 2013	Nationwide	1
June 8 - August 9, 2013	Heavy rains in the 2013 rainy season	Tohoku and Chugoku Regions	17
August 23-28, 2013	Heavy rains from August 23, 2013	Nationwide centering around Chugoku Region	2
September 2 & 4, 2013	Tornados on September 2 and 4, 2013	Kanto Region	0
September 15-16, 2013	2013 Typhoon 18	From Northern Japan to Western Japan on the Japan Sea side (especially Kinki)	6
October 15-16, 2013 October 24-26, 2013	2013 Typhoon 26 & 27	From Eastern Japan to Western Japan on the Pacific Ocean side (especially Kanto)	45
November 2013- March 2014	Heavy snowfall in 2013	Tohoku and Kanto-Koshinetsu Regions	95
July 6-11, 2014	2014 Typhoon 8	Nationwide	3
July 30 - August 11, 2014	2014 Typhoon 12 & 11	Nationwide	5
August 15-26, 2014	Heavy rains from August 15, 2014 (Except Hiroshima Sediment Disaster)	Kinki, Hokuriku and Tokai Regions	8
August 20, 2014	Torrential rains of August 2014 (Hiroshima Sediment Disaster)	Hiroshima	77
September 27, 2014	2014 Eruption of Mt. Ontake	Nagano and Gifu	63
November 22, 2014	Earthquake (M6.7) epicentered in northern Nagano Prefecture	Nagano	0
November 2014 - March 2015	Heavy snowfall in 2014	Hokkaido, Tohoku, Hokuriku and Shikoku Regions	83
May 29, 2015	Kuchinoerabu-jima Eruption (Volcanic Alert Level 5)	Kagoshima	0
June 30, 2015	Eruption of Mt. Hakone (Volcanic Alert Level 3)	Kanagawa	0
July 16-18, 2015	2015 Typhoon 11	Various Places from Western to Eastern Japan	2
August 15, 2015	Volcanic activity at Sakurajima (Volcanic Alert Level 4)	Kagoshima	0
August 22-26, 2015	2015 Typhoon 15	Various Places in Western Japan	1
September 9-11, 2015	Torrential Rain of September 2015 in the Kanto and Tohoku Regions	Kanto and Tohoku Regions (especially Ibaraki, Tochigi, Miyagi)	14
September 27-28, 2015	2015 Typhoon 21	Okinawa	0
April 14 and 16, 2016	2016 Kumamoto Earthquake (M7.3)	Kyushu Region	228
June 16, 2016	Earthquake in Uchiura Bay (M5.3)	Hokkaido	0
June 20 - July 17, 2016	Heavy rains from June 20, 2016	Kyushu Region (especially Kumamoto)	7
August 16 - 18, 2016	2016 Typhoon 7	Hokkaido, Tohoku and Kanto Regisions	0
August 20 - 23, 2016	2016 Typhoon 11 & 9	Hokkaido, Tohoku and Kanto Regisions	2
August 26 - 31, 2016	2016 Typhoon 10	Hokkaido and Tohoku Regisions (especially Iwate)	27
September 1 - 5, 2016	2016 Typhoon 12	Kyushu Region	0
September 6 - 7, 2016	Heavy rains from 2016 Typhoon 13 and rain front	Nationwide	1
September 16 - 20, 2016	2016 Typhoon 16	Various Places from Western to Eastern Japan	1
September 30 - October 5, 2016	2016 Typhoon 18	Nationwide	0
October 8, 2016	Volcanic activity at Asosan (Volcanic Alert Level 3)	Kumamoto	0
October 21, 2016	Earthquake (M6.6) epicentered in central Tottori Prefecture	Tottori, Okayama	0
November 22, 2016	Earthquake (M7.4) epicentered off coast of Fukushima Prefecture	Fukushima	0
December 28, 2016	Earthquake (M6.3) epicentered in northern Ibaraki Prefecture	Ibaraki	0

Notes:
1. Natural disasters for which a Disaster Management Office or a Communication Office was set up in the Cabinet Office and which resulted in fatalities/missing persons.
2. The Great East Japan Earthquake (2011) includes damage from earthquakes deemed aftershocks.* The number of fatalities (including disaster-related fatalities) and missing persons is the current figure as of March 1, 2017.
(*April 7, 2011, earthquake hypocentered off the coast of Miyagi Prefecture, April 11, 2011, earthquake hypocentered in the Hamadori region of Fukushima Prefecture, March 14, 2012, earthquake hypocentered off the eastern coast of Chiba Prefecture, and December 7, 2012, earthquake hypocentered off the coast of Sanriku)
3. The details given for the 2016 Kumamoto Earthquake show the toll as of April 13, 2017.

Source: Meteorological Almanac of Japan, Chronological Scientific Tables, National Police Agency materials, Fire and Disaster Management Agency Materials, Major Disaster Management Headquarters materials

Fig. A-8 Number of Fatalities and Missing Persons Resulting from Natural Disasters



Note: Of the fatalities in 1995, the deaths from the Great Hanshin-Awaji Earthquake include 919 so-called "related deaths" (Hyogo Prefecture).
The fatalities and missing persons in 2016 are based on flash bulletins from the Cabinet Office.
(The earthquake/tsunami disaster figures for 2011 include disaster-related fatalities from the Great East Japan Earthquake based on the Fire and Disaster Management Agency document, “Damage Conditions of the 2011 Tohoku Region Pacific Coast Earthquake (Great East Japan Earthquake)” (March 1, 2017).)

Source: Fatalities and missing persons for the year 1945 came only from major disasters (source: Chronological Scientific Table). Years 1946–1952 use the Japanese Meteorological Disasters Annual Report; years 1953–1962 use National Police Agency documents; years 1963 and after created by the Cabinet Office based on Fire and Disaster Management Agency materials.

Fig. A-9 Breakdown of Fatalities and Missing Persons Caused by Natural Disasters

(Unit: persons)

Year	Storm/Flood	Earthquake/ Tsunami	Volcano	Snow	Other	Total
1993	183	234	1	9	11	438
1994	8	3	0	21	7	39
1995	19	6,437	4	14	8	6,482
1996	21	0	0	28	35	84
1997	51	0	0	16	4	71
1998	80	0	0	28	1	109
1999	109	0	0	29	3	141
2000	19	1	0	52	6	78
2001	27	2	0	59	2	90
2002	20	0	0	26	2	48
2003	48	2	0	12	0	62
2004	240	68	0	16	3	327
2005	43	1	0	98	6	148
2006	87	0	0	88	2	177
2007	14	16	0	5	4	39
2008	22	24	0	48	7	101
2009	76	1	0	35	3	115
2010	31	0	0	57	1	89
2011	136	22,122	0	125	2	22,385
2012	52	0	0	138	0	190
2013	75	0	0	92	6	173
2014	112	0	63	108	0	283
2015	22	0	0	49	0	71
2016	38	228	0	6	0	272

Notes: This table shows the number of deaths and missing persons between Jan. 1 and Dec. 31.
Fatalities and missing persons in 2016 are based on flash bulletins from the Cabinet Office.
(The earthquake/tsunami disaster figures for 2011 include disaster-related fatalities from the Great East Japan Earthquake based on “Damage Conditions of the 2011 Tohoku Region Pacific Coast Earthquake (Great East Japan Earthquake)” (March 1, 2017).)

Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report "Status of Regional Disaster Management Administration"

Fig. A-10 Recent Major Natural Disasters (Since the Great Hanshin-Awaji Earthquake)

(Total: As of March 21, 2016)

Name of Disaster	Major Events	Human Casualties (persons)		Houses Damaged (houses)			Remarks
		Fatalities/ Missing Persons	Injured	Completely Destroyed	Half Destroyed	Above-floor Flooding	
The Great Hanshin-Awaji Earthquake (January 17, 2005)	Maximum seismic intensity of 7. Unprecedented major disaster in Western Japan. Became a turning point in DRR measures for national and local governments, with various DRR measures developed and strengthened.	6,437	43,792	104,906	144,274	—	・Establishment of Extreme Disaster Management Headquarters[*1] ・Establishment of Major Disaster Management Headquarters ・Inspection by Prime Minister ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Special Measures Act for Specified Disaster ・Designation as an extremely severe disaster
The Great East Japan Earthquake (March 11, 2011)	Maximum seismic intensity of 7. Tsunami caused extreme damage mainly along the coast of Eastern Japan, including Iwate, Miyagi, and Fukushima Prefectures.	22,118	6,230	121,768	280,160	3,352	・Establishment of Extreme Disaster Management Headquarters ・Establishment of On-site Extreme Disaster Management Headquarters ・Inspection by Prime Minister ・Deployment of government survey team ・Inspection by Minister of State for Disaster Management ・Invocation of Disaster Relief Act ・Invocation of Act on Support for Reconstructing Livelihoods of Disaster Victims ・Invocation of Special Measures Act for Specified Disaster ・Designation as an extremely severe disaster
2000 Eruption of Mt. Usu (March 31, 2000 - June 28, 2001)	The Japan Meteorological Agency announced emergency volcano information and residents evacuated before the eruption began, resulting in no human casualties.	—	—	119	355	—	・Establishment of Major Disaster Management Headquarters ・Establishment of On-site Major Disaster Management Headquarters ・Inspection by Prime Minister ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2000 Miyake Is. Eruption and Niijima and Kozushima Is. Earthquake (June 25, 2000 - March 31, 2005)	A caldera was formed along with the summit eruption. Large amounts of volcanic gases were emitted over an extended period, and evacuation instructions were issued to all residents of the town of Miyake, which forced all residents to evacuate and live off the island.	1	15	15	20	—	・Establishment of Major Disaster Management Headquarters ・Inspection by Prime Minister ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2004 Typhoon 23 (October 18-21, 2004)	Very large number of human casualties due to rising river levels, sediment disasters, and high waves nationally, but concentrated in the Kinki and Shikoku regions. The Maruyama River, Izushigawa River, and other Maruyama River system rivers overflowed their banks and flooded.	98	555	909	7,776	14,323	・Establishment of Major Disaster Management Headquarters ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2004 Mid Niigata Prefecture Earthquake (October 23, 2004)	Maximum seismic intensity of 7. Homes were destroyed, landslides and other disasters caused many human casualties, communities were isolated, people were forced to evacuate, and there was massive damage to homes, lifelines, transportation, and agricultural land.	68	4,805	3,175	13,810	—	・Establishment of Major Disaster Management Headquarters ・Inspection by Prime Minister ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Fukuoka-ken-Seihouoki Earthquake (March 20, 2005)	Maximum seismic intensity of Lower 6. Homes were destroyed on Genkai Island and elsewhere, and window glass fell from buildings in Fukuoka City.	1	1,204	144	353	—	・Inspection by Prime Minister ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Invocation of Remote Islands Development Act
2005 Typhoon 14 (September 4-8, 2005)	Record-breaking rains fell, mainly in the Kyushu region, and sediment disasters caused many human casualties.	29	177	1,217	3,896	3,551	・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2006 Heavy Snowfalls (December 2005 - March 2006)	Following 1963, the second-largest number of fatalities and missing persons since WW II (on par with 1981.)	152	2,145	18	28	12	・Invocation of Disaster Relief Act
2006 Torrential Rains Due to Seasonal Rain Front (June 10–July 29, 2006)	Many fatalities due to sediment disasters in Nagano and Kagoshima Prefectures.	33	64	313	1,457	1,971	・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2006 Typhoon 13 (September 15–20, 2006)	Damage due to strong winds from the Okinawa region to the Kyushu region, and a tornado in Nobeoka City, Miyazaki Prefecture.	10	446	121	518	251	・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Tornado in Saroma Hokkaido Prefecture (November 7, 2006)	Highest number of fatalities on record attributed to a tornado.	9	31	7	7	—	・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims

Name of Disaster	Major Events	Human Casualties (persons)		Houses Damaged (houses)			Remarks
		Fatalities/ Missing Persons	Injured	Completely Destroyed	Half Destroyed	Above-floor Flooding	
2007 Noto Hanto Earthquake (March 25, 2007)	Maximum seismic intensity of Upper 6. Disaster in mountainous regions with a high percentage of aging population and advancing depopulation.	1	356	686	1,740	—	・Inspection by Prime Minister ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2007 Heavy Rains from Typhoon 4 and Seasonal Rain Front (July 5-31, 2007)	The typhoon that made landfall in July was very powerful. Record rainfalls in various regions.	7	75	33	33	434	・Deployment of government survey team ・Invocation of Disaster Relief Act ・Designation as an extremely severe disaster
2007 Niigataken Chuetsu-oki Earthquake (July 16, 2007)	Maximum seismic intensity of Upper 6. Many human causalities due to homes collapsing. Damage to homes, lifelines, transportation, and nuclear power plants.	15	2,346	1,331	5,710	—	・Inspection by Prime Minister ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Invocation of Special Measures Act for Specified Disaster ・Designation as an extremely severe disaster
2008 Iwate-Miyagi Nairiku Earthquake (June 14, 2008)	Maximum seismic intensity of Upper 6. Many human causalities due to landslides and other sediment disasters. Many river channels became blocked (natural dams) in rivers in mountainous areas.	23	426	30	146	—	・Inspection by Prime Minister ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Earthquake epicentered on Northern Coast of Iwate Prefecture (July 24, 2008)	Maximum seismic intensity of Lower 6. Earthquake with a deep hypocenter occurring inside a plate. Seismic intensity of Lower 5 and higher recorded in affected areas of inland Iwate and Miyagi Prefectures.	1	210	1	0	—	・Deployment of government survey team
Heavy Rains from July 28 (July 28-29, 2008)	Localized heavy rains in the Hokuriku and Kinki regions. Human casualties along the Togagawa River in Kobe City.	6	13	6	16	585	・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Torrential Rains at the End of August 2008 (August 26-31, 2008)	Record heavy rains in various regions, especially extensive flood damage in Aichi Prefecture.	2	7	6	7	3,106	・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims
July 2009 Torrential Rains in Chugoku and Northern Kyushu (July 19-26, 2009)	Record heavy rains in Yamaguchi and Fukuoka Prefectures due to seasonal rain front. Numerous fatalities from sediment disasters in Yamaguchi Prefecture and other prefectures.	36	59	52	102	2,139	・Inspection by Prime Minister ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2009 Typhoon 9 (August 8-11, 2009)	Heavy rains from the Chugoku and Shikoku regions to the Tohoku region due to the effects of the typhoon. Human casualties and homes damaged due to flooding in Hyogo Prefecture.	27	23	183	1,130	974	・Inspection by Prime Minister ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Earthquake epicentered in Suruga Bay (August 11, 2009)	Maximum seismic intensity of Lower 6. Tomei Expressway closed due to slope collapse.	1	319	0	6	—	
2009 Typhoon 18 (October 6-8, 2009)	Destructive storm and heavy rains over a wide area from the Okinawa region to Hokkaido Prefecture due to the effects of the typhoon. Winds and rains in Aichi Prefecture caused partial damage and flood damage to many homes.	5	139	9	86	571	・Designation as an extremely severe disaster
Tsunami from Earthquake epicentered in Central Chilean Coast (February 27-28, 2010)	An earthquake struck the central coast of Chile just after noon on Feb. 27. A tsunami was approaching Japan the next day on the 28th, and a major tsunami warning and tsunami warning were issued at 9:33 a.m. on the 28th. Extensive fishery damage to aquaculture facilities.	0	0	0	0	6	・Designation as an extremely severe disaster
2010 Heavy Rains Due to Seasonal Rain Front (June 11 - July 19, 2010)	The seasonal rain front stalled over the region from Kyushu to Honshu from mid-June, with intermittent bursts of activity. Southern Kyushu received more than twice its average annual rainfall. There were large-scale landslides in Kagoshima Prefecture, and fatalities and missing persons mainly in Hiroshima and Gifu Prefectures.	22	21	43	91	1,844	・Inspection by Prime Minister ・Inspection by Minister of State for Disaster Management ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Heavy Rains in Amami Region of Kagoshima Prefecture (October 18-25, 2010)	The rain front stalled over the Amami region, with moist air flowing in from the south toward this rain front, creating unstable atmospheric conditions. The Amami region received intense rainfall of more than 120 mm per hour, with more than 800 mm of rainfall since the rains began.	3	2	10	443	116	・Inspection by Minister of State for Disaster Management ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Heavy Snowfall in 2010 (November 2010 - March 2011)	Record snows fell from the end of the year to the beginning of the following year in some areas of the Japan Sea side of Western Japan. Fishing boats overturned and sank along with other damage in Tottori and Shimane Prefectures.	131	1,537	9	14	6	・Cabinet meeting held ・Inspection by Minister of State for Disaster Management ・Invocation of Disaster Relief Act

Name of Disaster	Major Events	Human Casualties (persons)		Houses Damaged (houses)			Remarks
		Fatalities/ Missing Persons	Injured	Completely Destroyed	Half Destroyed	Above-floor Flooding	
Mt. Kirishima (Shinmoedake) Eruption (January 26 - September 7, 2011)	Following a small eruption on January 19, a medium-sized eruption occurred at Shinmoedake on January 26 and the volcanic alert level was raised to 3. Eruptions continued repeatedly thereafter until early September, with air waves and cinders breaking windows and causing other damage. In addition, falling ash from the eruptions was recorded over a wide area mainly to the southeast of the mountain, including Kirishima City, Kagoshima Prefecture, and Miyakonojo City, Miyazaki Prefecture.	0	52	0	0	-	・Cabinet meeting held (twice) ・Inspection by Minister of State for Disaster Management ・Designation as an area requiring the emergency development of evacuation facilities and an ash prevention area ・Invocation of Disaster Relief Act
2011 Typhoon 6 (July 12-24, 2011)	The typhoon made landfall in southern Tokushima Prefecture around 12:30 a.m. on July 20. At the time of landfall, maximum peak winds of 40m/s were recorded, and the large typhoon maintained its powerful force. Record heavy rains were recorded in Western Japan, with rainfall of more than 1,000 mm recorded in some pars of the Shikoku region since the rains began.	3	54	0	1	28	・Designation as an extremely severe disaster
July 2011 Niigata and Fukushima Torrential Rains (July 27-30, 2011)	Rain began falling in Niigata Prefecture and Aizu, Fukushima Prefecture, from around noon on the 27th. Intermittent intense rains of more than 80 mm per hour fell starting on the 28th. In Niigata and Fukushima Prefectures, record heavy rains exceeding the July 2004 Niigata and Fukushima Torrential Rains were recorded.	6	13	74	1,000	1,082	・Deployment of government survey team (twice) ・Local survey by Minister of State for Disaster Management ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2011 Typhoon 12 (August 30 - September 5, 2011)	Record rains were recorded across a wide area from Western Japan to Northern Japan. Especially on the Kii Peninsula, the highest amount of rainfall since the rains began at 5:00 p.m. on August 30 exceeded 1,800 mm, and many river channels became blocked.	98	113	379	3,159	5,500	・Establishment of Major Disaster Management Headquarters ・Site inspection by Prime Minister Noda ・Deployment of government survey team (twice) ・Local survey by Minister of State for Disaster Management ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster (national)
2011 Typhoon 15 (September 15-22, 2011)	Strong winds and record rains were recorded across a wide area from Western Japan to Northern Japan. Total rainfall from 12:00 a.m., September 15 to 9:00 a.m., September 22 exceeded 1,000 mm in some parts of Kyushu and Shikoku, with many points recording rainfall of more than double the average rainfall for September.	20	425	34	1,524	2,270	・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Heavy Snowfall in 2011 (November 2011 - March 2012)	Record snows fell mainly on the Japan Sea side, with cumulative snowfall of more than 28% higher than the average for the past 5 years. In addition, in some regions the depth of the snowfall was more than double the average for the past 30 years.	133	1,990	13	12	3	・Cabinet meeting held (twice) ・Local survey by Minister of State for Disaster Management (twice) ・Invocation of Disaster Relief Act
Wind Gusts in May 2012 (May 6, 2012)	Lightning strikes, wind gusts, and hail were recorded from the Tokai region to the Tohoku region. From Joso City to Tsukuba City, Ibaraki Prefecture, a tornado formed that was estimated to be one of the strongest (F3) recorded in Japan. Multiple tornadoes were recorded in the region from Mooka City, Tochigi Prefecture, to Hitachi-Omiya City, Ibaraki Prefecture, including a destructive tornado of approx. 32 km, the second longest recorded since statistics have been kept.	3	61	103	234	—	・Deployment of government survey team ・Local survey by Minister of State for Disaster Management ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims
2012 Typhoon 4 (June 18-20, 2012)	Heavy rains fell across a wide area from the Okinawa region to the Tohoku region due to the typhoon and seasonal rain front. Following the path of the typhoon, strong winds, high waves, and a storm surge were recorded across a wide area from the Okinawa region to the Tohoku region.	1	85	1	3	49	・Designation as an extremely severe disaster
Heavy Rains from June 21 to July 7, 2012 (June 21 - July 7, 2012)	Due to the effects of the seasonal rain front and a low-pressure system in the Yellow Sea forming above the seasonal rain front, from June 21 to July 7, rains were recorded from Western to Eastern Japan, and Northern Japan, with heavy rains in parts of Kyushu and other locations.	2	7	36 (*2)	180 (*2)	1,131 (*2)	・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
July 2012 Northern Kyushu Torrential Rains (July 11-14, 2012)	From July 11 to 14, moist air from the south flowed in toward the seasonal rain front that was stalled near Honshu, and heavy rains were recorded across a wide area from Western to Eastern Japan. Extremely heavy rains fell intermittently with thunder especially in the northern region of Kyushu.	33	34	276 (*3)	2,306 (*3)	2,574 (*3)	・Site inspection by Prime Minister Noda ・Deployment of government survey team (twice) ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Heavy Snowfall in 2012 (November 2012 - March 2013)	Due to the cold, there was a long stretch of low-temperature days in Northern Japan, with a large amount of snow falling mainly on the Japan Sea side. This resulted in record snowfall recorded mainly on the Japan Sea side of Northern Japan, including snowfall with a depth of 566 cm recorded at Sukayu, Aomori Prefecture.	104	1,517	5	7	2	・Cabinet meeting held ・Deployment of government survey team ・Invocation of Disaster Relief Act

Name of Disaster	Major Events	Human Casualties (persons)		Houses Damaged (houses)			Remarks
		Fatalities/ Missing Persons	Injured	Completely Destroyed	Half Destroyed	Above-floor Flooding	
Earthquake epicentered Near Awajishima Island (April 13, 2013)	Maximum seismic intensity of Lower 6.	0	34	8	97	—	—
Heavy Rains in 2013 Seasonal Rain Front (Disaster due to torrential rains and destructive storms between June 8 and August 9, 2013)	・From June 8 to August 9, the seasonal rain front stalled from Kyushu to the vicinity of Honshu with intermittent bursts of activity. In addition, warm and very moist air surrounding a highpressure ridge flowed in even after the rainy season ended. During this time, Typhoons 4 and 7 approached Japan, causing heavy rains in various regions.	17	50	73	222	1,845	・Local survey by Prime Minister Abe ・Deployment of government survey team (seven times) ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Heavy Rains from August 23, 2013 (August 23-28, 2013)	Warm, moist air flowed in toward the rain front, creating extremely unstable atmospheric conditions and heavy rains mainly on the Japan Sea side of Eastern Japan, and Western Japan. On August 24, record heavy rains on par with the torrential rains of July 28 were recorded, especially in Shimane Prefecture. Some areas of Hokkaido Prefecture also received heavy rains.	2	4	9	53	243	・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Tornadoes on September 2 and 4, 2013 (September 2, 4, & 7, 2013)	・On September 2, F2 tornadoes were recorded in Saitama City, Koshigaya City, and Matsubushi Town, Saitama Prefecture, Noda City, Chiba Prefecture, and Bando City, Ibaraki Prefecture. ・On September 4, an F0 tornado was recorded in Sukumo City, Kochi Prefecture, an F0 tornado in Aki City, Kochi Prefecture, F1 tornadoes respectively from Kanuma City to Utsunomiya City, Tochigi Prefecture, and from Shioya Town, Shioya District to Yaita City, and F0 tornadoes from Ise City to Obata Town, Mie Prefecture. ・On September 7, F0 wind gusts were recorded in Komaki City, Hokkaido Prefecture.	0	67	13	38	0	・Deployment of government survey team (twice) ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims
Heavy Rains from 2013 Typhoon 18 (September 15-16, 2013)	On September 15, localized intense rains fell in Eastern Japan and Northern Japan. On the 16th, heavy rains fell across a wide area from Shikoku to Hokkaido. Record heavy rains fell especially in Fukui, Shiga, and Kyoto Prefectures. A total of ten F0–F1 tornadoes also occurred.	6	136	40	967	2,453	・Deployment of government survey team (five times) ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2013 Typhoon 26 & 27 (October 14-16, 2013) (October 24-26, 2013)	Heavy rains fell mainly on the Pacific Ocean side of Eastern Japan and Northern Japan. Driving rains of more than 100 mm per hour fell especially in Oshima-machi, Tokyo Prefecture, with record rainfall of 824 mm recorded in 24 hours.	45	140	65	63	2,011	・Local survey by Prime Minister Abe ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Heavy Snowfall in 2013 (November 2013 - March 2014)	・Record heavy snowfall was recorded across a wide area from Northern Japan to Kanto-Koshinetsu. ・Especially from February 14 to 16, record heavy snows fell, substantially surpassing past snowfall depths mainly in the Kanto-Koshinetsu region, including Kofu (Yamanashi Prefecture) with 114 cm, Chichibu (Saitama Prefecture) with 98 cm, and Maebashi (Gunma Prefecture) with 73 cm of snowfall.	95	1,770	28	40	3	・Establishment of Major Disaster Management Headquarters ・Establishment of On-site Major Disaster Management Headquarters ・Site inspection by Prime Minister Abe ・Deployment of government survey team (five times) ・Invocation of Disaster Relief Act
2014 Typhoon 8 (July 6-11, 2014)	・Record heavy rains were recorded on Okinawa Island. ・Due to the effects of the moist southerly wind surrounding the typhoon and the seasonal rain front, some regions even far from the typhoon received localized driving rains.	3	70	14	12	409	・Deployment of government survey team (three times) ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims
Torrential Rains of August 2014							
2014 Typhoon 12 & 11 (July 30 - August 11, 2014)	<Typhoon 12> ・From the night of the 5th, heavy rains were recorded in the Chugoku and Tohoku regions. Especially in Yamaguchi Prefecture, localized driving rains of more than 100 mm per hour were recorded in some places. <Typhoon 11> Heavy rains fell across a wide area from Western Japan to Northern Japan. Especially in Kochi Prefecture, total rainfall from the 7th to the 11th, when the heaviest rains fell, was more than 1,000 mm. Total rainfall from the Shikoku region to the Tokai region was more than 600 mm. Atmospheric conditions were extremely unstable, with extremely strong winds including tornadoes in Tochigi Prefecture and other areas.	5	93	22	374	1,529	・Deployment of government survey team (twice) ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster

Name of Disaster	Major Events	Human Casualties (persons)		Houses Damaged (houses)			Remarks
		Fatalities/ Missing Persons	Injured	Completely Destroyed	Half Destroyed	Above-floor Flooding	
Heavy Rains from August 15, 2014 (August 15-26, 2014) *Excludes Hiroshima Sediment Disaster on August 20	・Extremely intense localized rains with thunder. The amount of rainfall that fell during the 2 days of the 16th and 17th set new records in places such as Fukuchiyama City, Kyoto Prefecture, and Takayama City, Gifu Prefecture, with heavy rains mainly in the Kinki, Hokuriku, and Tokai regions.	8	7	38	332	2,240	・Deployment of government survey team (twice) ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Hiroshima Sediment Disaster on August 20, 2014 (Disaster in Hiroshima Prefecture due to heavy rains from August 19, 2014)	・ Warm, moist air flowed in toward the rain front, and extremely unstable atmospheric conditions were recorded mainly in the Chugoku region and northern Kyushu region. ・At 3:30 a.m. on the 20th, driving rains of approx. 120 mm per hour were recorded in Hiroshima Prefecture, and heavy rains, including a new record set for the highest recorded rainfall in a 24-hour period, were recorded.	77	68	179	217	1,086	・Establishment of Major Disaster Management Headquarters ・Establishment of On-site Major Disaster Management Headquarters ・Site inspection by Prime Minister Abe ・Deployment of government survey team (three times) ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2014 Eruption of Mt. Ontake (September 27, 2014)	・Volcanic tremors started at 11:41 a.m. on September 27, with an eruption on the same day around 11:52 a.m. ・Volcanic smoke descended the southern slope and was recorded for more than 3 km. Therefore, a level 3 volcano warning (mountain access restricted) was issued, with entry within 4 km of the crater restricted. ・Many mountain climbers suffered casualties due to this eruption.	63	69	0	0	0	・Establishment of Major Disaster Management Headquarters ・Establishment of On-site Major Disaster Management Headquarters ・Deployment of government survey team (twice) ・Invocation of Disaster Relief Act
Earthquake with a Seismic Source in Northern Nagano Prefecture (November 22, 2014)	Maximum seismic intensity of Lower 6.	0	46	81	133	0	・Site inspection by Prime Minister Abe ・Deployment of government survey team (twice) ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
Heavy Snowfall in 2014 (November 2014 - March 2015)	Due to the effects of a strong winter air-pressure pattern as well as a low-pressure system and cold air, heavy snows fell on the mountainous areas of the Japan Sea side from Northern Japan to Eastern Japan.	83	1,029	9	12	5	・Deployment of government survey team ・Invocation of Disaster Relief Act
Kuchinoerabu-jima Eruption [Volcanic Alert Level 5] (May 29, 2015)	・An explosive eruption occurred at Shindake at 9:59 am on May 29. This eruption triggered a volcanic cloud of black-gray smoke that rose 9,000m above the crater rim and a pyroclastic flow that reached the northwestern coast (Mukaehama district). ・At 10:07 am, the JMA raised the Volcanic Alert Level from 3 to 5 (evacuate). ・The municipal ferry, Ferry-Taiyo, and other vessels were used to evacuate all those on the island at the time of the eruption to Yakushima (all individuals were confirmed to be safe)	0	1	To be confirmed			・Installation of government on-site communications office (Yakushima Town, Kagoshima) ・Site inspection by Prime Minister Abe ・Deployment of government survey team ・Invocation of Disaster Relief Act
Eruption of Mt. Hakone [Volcanic Alert Level 3] (June 30, 2015)	・A very small amount of volcanic ash was observed inside the crater, which was thought to have been the result of a very small eruption, so the JMA raised the volcanic alert level from 2 to 3 (Do not approach the volcano) at 12:30 on June 30 ・At the same time, Hakone-machi imposed a ban on entering the area within around 1km of the crater and issued an evacuation instruction for parts of the Ubako, Kamiyuba, Shimoyuba, and Hakone Sounkyo Bessochi areas, as well as evacuating residents, etc. from those areas	0	0	0	0	0	・Deployment of a Cabinet Office advance information-gathering team
2015 Typhoon 11 (July 16-18, 2015)	・The typhoon and warm, moist air heading toward the typhoon caused increased rainfall, primarily over West and East Japan. The Kinki region in particular saw the highest rainfall in 24 hours since records began, with heavy rain in excess of the usual rainfall for the entire month of July in an ordinary year. ・This caused river flooding, damage to public civil engineering works, and suspension of transport services, mainly in West Japan.	2	57	5	10	85	・Appeal to the public by the Minister of State for Disaster Management

Name of Disaster	Major Events	Human Casualties (persons)		Houses Damaged (houses)			Remarks
		Fatalities/ Missing Persons	Injured	Completely Destroyed	Half Destroyed	Above-floor Flooding	
Volcanic activity at Sakurajima [Volcanic Alert Level 4] (August 15, 2015)	・At around 07:00 on August 15, a series of volcanic earthquakes centered on the island occurred. Rapid crustal movement indicative of inflation of the volcanic edifice was also observed. ・At 10:15 that day, the JMA raised the volcanic alert level from 3 to 4 (Prepare to evacuate) (caution required in Arimura-cho and Furusato-cho, within 3km of the Showa crater and the Minamidake summit crater). ・At 16:50 that day, Kagoshima City issued evacuation advisories to the residents of the Arimura district of Arimura-cho, the Furusato district of Furusato-cho (areas within 3km of the crater), and the Shioyagamoto district of Kurokami-cho. ・At 18:10 that day, evacuation of all residents (77 people from 51 households) in the areas subject to evacuation was completed.	0	0	0	0	0	・Field survey by Parliamentary Vice Minister Matsumoto ・Deployment of a Cabinet Office liaison team
2015 Typhoon 15 (August 22-26, 2015)	・The typhoon that made landfall near Arao City in Kumamoto Prefecture just after 06:00 on the 25th retained its powerful momentum as it moved northward to northern Kyushu, reaching the Sea of Japan during the daylight hours of the 25th. ・A maximum instantaneous wind speed of 71.0m was observed at 21:16 on the 23rd on Ishigaki Island, Okinawa Prefecture. In addition, the typhoon and warm, moist air flowing in from the south resulted in heavy rain over the Ryukyu Islands, West Japan, and the Tokai region, with more than 500mm of rain falling on Mie Prefecture in a single day on the 25th.	1	147	12	138	53	・Designation as an extremely severe disaster
Torrential Rain of September 2015 in the Kanto and Tohoku Regions [Including 2015 Typhoon 18] (September 9-11, 2015)	・After making landfall near Nishio City, Aichi Prefecture at around 09:30 on September 9, 2015 Typhoon 18 moved on to the Sea of Japan and turned into an extra-tropical cyclone at 15:00 that day. ・As a result of 2015 Typhoon 18 and weather fronts, heavy rain fell over a wide area from western to northern Japan. In particular, between the 9th and the 11th, a southerly wind flowing into the low-pressure system into which 2015 Typhoon 18 developed and, subsequently, a southeasterly wind from the vicinity of 2005 Typhoon 17 supplied flows of moist air that triggered a succession of line-shaped rainbands, causing record-breaking rainfall in the Kanto and Tohoku regions and prompting the issue of emergency heavy rain warnings for Tochigi, Ibaraki, and Miyagi prefectures.	14	80	81	7,045	2,495	・Minister of State for Disaster Management issues a list of requests to relevant ministries and agencies ・Deployment of a Cabinet Office advance information-gathering team ・Deployment of government survey team ・Cabinet meeting held (twice) ・Site inspection by Prime Minister Abe ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2015 Typhoon 21 (September 27-28, 2015)	・2015 Typhoon 21 approached the Ishigaki and Yonaguni island areas with ferocious intensity during the day on the 28th. ・On Yonaguni Island, a maximum instantaneous wind speed of 81.1m was observed at 15:41 on the 28th, the highest figure since statistics began to be compiled. A severe gale buffeted Yaeyama and the surrounding area, while the Sakishima Islands saw stormy seas with high swells and the Okinawa Island area was also battered by rough seas.	0	0	5	23	0	・Deployment of government survey team ・Invocation of Disaster Relief Act
2016 Kumamoto Earthquake (April 14 and 16, 2016)	・At 09:26 p.m. on April 14, 2016 Maximum seismic intensity of 7 ・At 01:25 a.m. on April 16, 2016 Maximum seismic intensity of 7	228	2,753	8,697	34,037	0	・Establishment of Major Disaster Management Headquarters ・Establishment of On-site Major Disaster Management Headquarters ・Site inspection by Prime Minister Abe (three times) ・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Invocation of Special Measures Act for Specified Disaster ・Partial invocation of the Act on Reconstruction from Large-Scale Disasters ・Designation as an extremely severe disaster

Name of Disaster	Major Events	Human Casualties (persons)		Houses Damaged (houses)			Remarks
		Fatalities/ Missing Persons	Injured	Completely Destroyed	Half Destroyed	Above-floor Flooding	
2016 Typhoon 7 (August 16-18, 2016)	・2016 Typhoon 7 moved northward along the Pacific coast of the Kanto and Tohoku regions, making landfall near Cape Erimo at around 17:30 on August 17. It then continued up through Hokkaido and turned into an extra-tropical cyclone near Sakhalin at 03:00 on the 18th. ・The passage of the cold front of the extra-tropical cyclone that was formerly Typhoon 7 caused localized driving rains in the Kanto region, with 83 mm per hour of rain recorded in Utsunomiya City, Tochigi Prefecture up to 03:14 on the 18th. ・The total rainfall between 00:00 on August 16 and 06:00 on August 18 exceeded 100 mm over an extensive area in the Kanto, Tohoku, and Hokkaido regions.	0	5	0	9	67	・Designation as an extremely severe disaster
2016 Typhoon 11 & 9 (August 20-23, 2016)	・2016 Typhoon 11 originated over the sea to the east of Japan at 09:00 on August 20 and approached the Tohoku region before making landfall near Kushiro City, Hokkaido after 23:00 on the 21st. It then continued up through Hokkaido and turned into an extra-tropical cyclone in the Sea of Okhotsk at 03:00 on the 22nd. ・2016 Typhoon 9 made landfall near Tateyama City, Chiba Prefecture at around 12:30 on August 22 and continued up through the Kanto and Tohoku regions, making landfall once more in the central Hidaka region of Hokkaido before 06:00 on the 23rd. It then continued up through Hokkaido before turning into an extra-tropical cyclone in the Sea of Okhotsk at 12:00 on the 23rd. ・These typhoons and weather fronts caused heavy rain in eastern and northern Japan. Between 00:00 on August 20 and 24:00 on the 23rd, there was 448.5 mm of rainfall at Mt. Amagi in Izu City, Shizuoka Prefecture; 297.5 mm at Ome in Ome City, Tokyo; and 296.0 mm at Itokushibetsu in Shibetsu Town, Hokkaido. Hokkaido experienced particularly heavy rain, receiving double the average rainfall for August.	2	87	6	17	665	・Deployment of government survey team ・Designation as an extremely severe disaster
2016 Typhoon 10 (August 26-31, 2016)	・2016 Typhoon 10 approached the Kanto region in the morning of August 30 and made landfall near Ofunato City, Iwate Prefecture at around 17:30 on the 30th, accompanied by a storm area. It then gathered speed as it passed through the Tohoku region on a peculiar course that saw it exit onto the Sea of Japan, and turned into an extra-tropical cyclone on the 31st. ・This was the first time that a typhoon had made landfall on the northeastern Pacific coast since the Japan Meteorological Agency began recording statistics in 1951.	27	14	513	2,280	278	・Installation of government on-site communications office ・Appeal to the public by the Minister of State for Disaster Management ・Local survey by Prime Minister Abe (twice) ・Deployment of government survey team (twice) ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims ・Designation as an extremely severe disaster
2016 Typhoon 16 (Sptember 16-20, 2016)	・With powerful momentum, 2016 Typhoon 16 made landfall on the Osumi Peninsula, Kagoshima Prefecture after 00:00 on September 20 and then headed northeast across the waters off Shikoku before making landfall once more near Tanabe City, Wakayama Prefecture at around 13:30 the same day. After making landfall yet again just after 17:00 that day near Tokoname City, Aichi Prefecture, it turned into an extra-tropical cyclone at 21:00 the same day over the waters off the Tokaido coast.	1	47	8	65	489	・Designation as an extremely severe disaster
2016 Earthquake centered in the central Tottori Prefecture (October 21, 2016)	Maximum seismic intensity of Lower 6 ・Time and date of quake: 14:07, October 21 ・Hypocenter, etc.: Central Tottori Prefecture, 11 km deep, M6.6	0	31	18	290	0	・Deployment of government survey team ・Invocation of Disaster Relief Act ・Invocation of Act Concerning Support for the Reconstruction of Livelihoods of Disaster Victims

*1 Established by a Cabinet meeting decision, and therefore not based on the Basic Act on Disaster Management.

*2 The number of damaged houses in the July 2012 Northern Kyushu Torrential Rains contains some duplications.

*3 The number of damaged houses due to heavy rains from June 21 to July 7, 2012 contains some duplications.

*4 The details given for the 2016 Kumamoto Earthquake show the toll as of April 13, 2017.

Source: Cabinet Office, Fire and Disaster Management Agency Materials, Major Disaster Management Headquarters materials

Fig. A-11 Establishment of Extreme Disaster Management Headquarters and Major Disaster Management Headquarters

As of March 31, 2017

	Name of Headquarters	Period of Establishment	Manager of Headquarters
1	Heavy Snowfall Major Disaster Management Headquarters	Jan. 29 - May 31, 1963	Minister of State
2	Niigata Earthquake Major Disaster Management Headquarters	Jun. 16 - Oct. 31, 1964	Minister of State
3	1965 Typhoon 23, 24, and 25 Major Disaster Management Headquarters	Sep. 17 - Dec. 17, 1965	Minister of State
4	1966 Typhoon 24 and 26 Major Disaster Management Headquarters	Sep. 26 - Dec. 27, 1966	Minister of State
5	1967 July and August Torrential Rains Major Disaster Management Headquarters	Jul. 9 - Dec. 26, 1967	Minister of State
6	1968 Tokachi-oki Earthquake Major Disaster Management Headquarters	May 16, 1968 - May 2, 1969	Minister of State
7	July 1972 Torrential Rains Major Disaster Management Headquarters	Jul. 8 - Dec. 19, 1972	Minister of State
8	1976 Typhoon 17 Major Disaster Management Headquarters	Sep. 13 - Dec. 10, 1976	Director General of National Land Agency (NLA)
9	1977 Mt. Usu Eruption Major Disaster Management Headquarters	Aug. 11, 1977 - Dec. 4, 1979	Director General of NLA
10	1978 Izu-Oshima-kinkai Earthquake Major Disaster Management Headquarters	Jan. 15 - Aug. 4, 1978	Director General of NLA
11	1978 Miyagi-ken-oki Earthquake Major Disaster Management Headquarters	Jun. 13 - Nov. 28, 1978	Director General of NLA
12	1979 Typhoon 20 Major Disaster Management Headquarters	Oct. 20 - Dec. 4, 1979	Director General of NLA
13	July and August 1982 Torrential Rains Major Disaster Management Headquarters	Jul. 24 - Dec. 24, 1982	Director General of NLA
14	1983 Nihon-kai-chubu Earthquake Major Disaster Management Headquarters	May 26 - Dec. 23, 1983	Director General of NLA
15	July 1983 Torrential Rains Major Disaster Management Headquarters	Jul. 23 - Dec. 23, 1983	Director General of NLA
16	1983 Miyake Island Eruption Major Disaster Management Headquarters	Oct. 4, 1983 - Jun. 5, 1984	Director General of NLA
17	1984 Nagano-ken-seibu Earthquake Major Disaster Management Headquarters	Sep. 16, 1984 - Feb. 19, 1985	Director General of NLA
18	1991 Mt. Unzen Eruption Major Disaster Management Headquarters	Jun. 4, 1991 - Jun. 4, 1996	Director General of NLA
19	1993 Hokkaido-nansei-oki Earthquake Major Disaster Management Headquarters	Jul. 13, 1993 - Mar. 31, 1996	Director General of NLA
20	August 1993 Torrential Rains Major Disaster Management Headquarters	Aug. 9, 1993 - Mar. 15, 1994	Director General of NLA
21	1995 Great Hanshin-Awaji Earthquake Major Disaster Management Headquarters	Jan. 17, 1995 - Apr. 21, 2002	Director General of NLA ↓ Minister of Great Hanshin-Awaji Earthquake Measures ↓ Director General of NLA ↓ Minister of State for Disaster Management
	Great Hanshin-Awaji Earthquake Extreme Disaster Management Headquarters[*1]	Jan. 19 - Apr. 28, 1995	Prime Minister
22	1997 Diamond Grace Oil Spill Major Disaster Management Headquarters	Jul. 2-11, 1997	Minister of Transport
23	2000 Mt. Usu Eruption Major Disaster Management Headquarters	Mar. 31, 2000 - Jun. 28, 2001[*2]	Director General of NLA ↓ Minister of State for Disaster Management
24	2000 Miyake Island Eruption and Niijima and Kozushima Island Earthquake Emergency Management Headquarters	Aug. 29, 2000 - May 15, 2002	Director General of NLA ↓ Minister of State for Disaster Management
	2000 Miyake Island Eruption Major Disaster Management Headquarters[*3]	May 16, 2002 - Mar. 31, 2005	
25	2004 Typhoon 23 Major Disaster Management Headquarters	Oct. 21, 2004 - Mar. 31, 2007	Minister of State for Disaster Management
26	2004 Mid Niigata Prefecture Earthquake Major Disaster Management Headquarters	Oct. 24, 2004 - Mar. 31, 2008	Minister of State for Disaster Management
27	2011 Great East Japan Earthquake Extreme Disaster Management Headquarters	Mar. 11, 2011 -	Prime Minister
28	2011 Typhoon 12 Major Disaster Management Headquarters	Sep. 4, 2011 - Dec. 26, 2014	Minister of State for Disaster Management
29	2014 Torrential Rains Major Disaster Management Headquarters	Feb. 18 - May 30, 2014	Minister of State for Disaster Management
30	August 2014 Torrential Rains Major Disaster Management Headquarters	Aug. 22, 2014 - Jan. 9, 2015	Minister of State for Disaster Management
31	2014 Mt. Ontake Eruption Major Disaster Management Headquarters	Sep. 28, 2014 – Nov. 9, 2015	Minister of State for Disaster Management
32	2016 Emergency Response Headquarters for the Earthquake Centered in the Kumamoto Region of Kumamoto Prefecture	April 14, 2016 -	Minister of State for Disaster Management

Notes: The above are Extreme Disaster Management Headquarters and Major Disaster Management Headquarters based on the Basic Act on Disaster Management (Act No. 223 of 1961).

*1 Established within the Cabinet Office based on a Cabinet meeting resolution, not based on the Basic Act on Disaster Management.

*2 Based on reports that the eruption had subsided. Upon dissolution of the Headquarters, the Mt. Usu Eruption Disaster Restoration and Recovery Measures Council was established.

*3 The names of Niijima Island and Kozushima Island were changed with the conclusion of response measures.

Source: Cabinet Office

Fig. A-12 Deployment of Government Survey Teams (Since the Great Hanshin-Awaji Earthquake)

As of March 31, 2017

Year	Name of Disaster	Deployment Dates	Prefecture Surveyed	Team Leader
1995	1995 Hyogo-ken-Nanbu Earthquake (Great Hanshin-Awaji Earthquake)	Jan. 17-18	Hyogo	Director General of National Land Agency (NLA)
1997	July 1997 Torrential Rains from Seasonal Rain Front	Jul. 11-12	Kagoshima, Kumamoto	Director General of NLA
1998	End of August 1998 Torrential Rains	Aug. 28	Tochigi, Fukushima	Parliamentary Vice-Minister of National Land
1999	Heavy Rains Starting June 23, 1999	Jun. 30 - Jul. 1	Hiroshima	Director General of NLA
	Heavy Rains from 1999 Typhoon 18 and Rain Front	Sep. 25	Kumamoto	Director General of NLA
2000	2000 Eruption of Mt. Usu	Mar. 31 - Apr. 1	Hokkaido	Director General of NLA
	2000 Tottori-seibu Earthquake	Oct. 7	Tottori	Director General of NLA
2001	2001 Geiyo Earthquake	Mar. 29	Hiroshima, Ehime	Parliamentary Vice-Minister of Cabinet Office
2003	July Seasonal Rain Front Torrential Rains	Jul. 22	Kumamoto, Kagoshima	Minister of State for Disaster Management
	Northern Miyagi Earthquake	Jul. 27	Miyagi	Minister of State for Disaster Management
	2003Tokachi-oki Earthquake	Sep. 26-27	Hokkaido	State-Minister of the Cabinet Office
2004	July 2004 Niigata and Fukushima Torrential Rains	Jul. 14	Niigata	Minister of State for Disaster Management
		Jul. 15	Fukushima	State-Minister of the Cabinet Office
	July 2004 Fukui Torrential Rains	Jul. 20	Fukui	State-Minister of the Cabinet Office
	2004 Typhoon 21	Oct. 1	Mie	Minister of State for Disaster Management
	2004 Typhoon 22	Oct. 14	Shizuoka	State Minister of the Cabinet Office
	2004 Typhoon 23	Oct. 22	Hyogo, Kyoto	Minister of State for Disaster Management
		Oct. 22	Kagawa, Okayama	State-Minister of the Cabinet Office
	2004 Mid Niigata Prefecture Earthquake	Oct. 24	Niigata	Minister of State for Disaster Management
2005	Fukuoka-ken-Seihou-oki Earthquake	Mar. 20-21	Fukuoka	State-Minister of the Cabinet Office
	Miyagi-ken-oki Earthquake	Aug. 16-17	Miyagi	Parliamentary Vice-Minister of Cabinet Office
	2005 Typhoon 14	Sep. 9	Miyazaki	Minister of State for Disaster Management
2006	Heavy Rains from Seasonal Rain Front Starting July 4	Jul. 21	Nagano	Minister of State for Disaster Management
		Jul. 25	Kagoshima	State-Minister of the Cabinet Office
	2006 Typhoon 13	Sep. 19	Miyazaki	Minister of State for Disaster Management
	Tornado in Saroma, Hokkaido	Nov. 7-8	Hokkaido	Minister of State for Disaster Management
2007	2007 Noto-hanto Earthquake	Mar. 25-26	Ishikawa	Minister of State for Disaster Management
	Heavy Rains from Typhoon 4 and Seasonal Rain Front	Jul. 13	Kumamoto	State-Minister of the Cabinet Office
	2007 Niigataken Chuetsu-oki Earthquake	Jul. 16	Niigata	Minister of State for Disaster Management
2008	2008 Iwate-Miyagi Nairiku Earthquake	Jun. 14-15	Iwate, Miyagi	Minister of State for Disaster Management
	Earthquake Epicentered Along Northern Coast of Iwate Prefecture	Jul. 24	Iwate, Aomori	Minister of State for Disaster Management
	End of August 2008 Torrential Rains	Aug. 29	Aichi	Minister of State for Disaster Management
2009	July 2009 Torrential Rains in Chubu and Northern Kyushu	Jul. 22	Yamaguchi	Minister of State for Disaster Management
		Jul. 27	Fukuoka	Minister of State for Disaster Management
	2009 Typhoon 9	Aug. 11	Hyogo, Okayama	Minister of State for Disaster Management
2011	2011 Tohoku Earthquake and Tsunami (Great East Japan Earthquake)	Mar. 11	Miyagi	State-Minister of the Cabinet Office
		Mar. 12	Iwate	State-Minister of the Cabinet Office
		Mar. 12	Fukushima	Parliamentary Vice-Minister of Finance
	July 2011 Niigata and Fukushima Torrential Rains	Jul. 31	Niigata, Fukushima	Minister of State for Disaster Management
		Aug. 2	Fukushima	State-Minister of the Cabinet Office
	2011 Typhoon 12	Sep. 4-7	Wakayama, Nara, Mie	Parliamentary Vice-Minister of Cabinet Office
		Sep. 6	Nara	Minister of Land, Infrastructure, Transport and Tourism
2012	May 2012 Gust	May 7	Ibaraki, Tochigi	State-Minister of the Cabinet Office
	July 2012 Torrential Rains in Northern Kyushu	Jul. 13-14	Kumamoto, Oita	Minister of State for Disaster Management
		Jul. 21-22	Fukuoka, Oita, Kagoshima	Minister of State for Disaster Management

Year	Name of Disaster	Deployment Dates	Prefecture Surveyed	Team Leader
2013	Heavy Snowfall in2012	Mar. 4-5	Hokkaido	Parliamentary Vice-Minister of Cabinet Office, Special Advisor to the Prime Minister
	Heavy Rains with Seasonal Rain Front	Jul. 29-30	Shimane, Yamaguchi	State-Minister of the Cabinet Office
		Aug. 3	Yamagata, Fukushima	Parliamentary Vice-Minister of Cabinet Office
		Aug. 3	Niigata	Parliamentary Vice-Minister of Agriculture, Forestry and Fisheries
		Aug. 3	Iwate, Miyagi	Parliamentary Vice-Minister of Land, Infrastructure, Transport and Tourism
		Aug. 9	Shimane, Yamaguchi	Minister of State for Disaster Management
		Aug. 13	Akita	State-Minister of the Cabinet Office
		Aug. 13	Iwate, Akita	Parliamentary Vice-Minister of Cabinet Office
	Tornadoes on September 2 and 4	Sep. 3	Saitama	Parliamentary Vice-Minister of Cabinet Office
		Sep. 4	Chiba	Parliamentary Vice-Minister of Cabinet Office
	Heavy Rains from Typhoon 18	Sep. 17	Saitama	Parliamentary Vice-Minister of Cabinet Office
		Sep. 18	Kyoto	Acting Minister of State for Disaster Management
		Sep. 18	Shiga, Fukui	State-Minister of the Cabinet Office
		Sep. 19	Mie	Parliamentary Vice-Minister of Cabinet Office
		Sep. 19-20	Aomori, Iwate, Akita	Special Advisor to the Prime Minister
	Typhoon 26	Oct. 19	Oshimacho (Tokyo)	Minister of State for Disaster Management
2014	Heavy Snowfall in 2013	Feb. 6	Akita	State-Minister of the Cabinet Office
		Feb. 17	Yamanashi	Parliamentary Vice-Minister of Cabinet Office
		Mar. 7	Tokyo, Yamanashi	State-Minister of the Cabinet Office, State-Minister of the Environment
		Mar. 10	Saitama	State-Minister of the Cabinet Office
		Mar. 15	Nagano, Gunma	State-Minister of the Cabinet Office
	Typhoon 8 and Seasonal Rain Front	Jul. 11	Nagano	Parliamentary Vice-Minister of Cabinet Office
		Jul. 12	Yamagata	Parliamentary Vice-Minister of Cabinet Office
		Jul. 14-15	Okinawa	Parliamentary Vice-Minister of Cabinet Office
	Typhoon 12 & 11	Aug. 11-13	Tokushima, Kochi	State-Minister of the Cabinet Office
		Aug. 11	Tochigi	Parliamentary Vice-Minister of Cabinet Office
	Heavy Rains Starting August 15	Aug. 18-19	Hyogo, Kyoto	State-Minister of the Cabinet Office
		Aug. 19	Gifu	Parliamentary Vice-Minister of Cabinet Office
	Heavy Rains in Hiroshima Prefecture Starting August 19	Aug. 20-21	Hiroshima	Minister of State for Disaster Management
		Sep. 6	Hiroshima	Minister of State for Disaster Management
		Sep. 17	Hiroshima	Parliamentary Vice-Minister of Cabinet Office
	Mt. Ontake Eruption	Sep. 28	Nagano	State-Minister of the Cabinet Office
		Oct. 11	Nagano	Minister of State for Disaster Management
	Earthquake Epicentered in Northern Nagano Prefecture	Nov. 23	Nagano	Parliamentary Vice-Minister of Cabinet Office
		Dec. 2	Nagano	Minister of State for Disaster Management
	Heavy Snowfall in 2014	Dec. 9	Tokushima	Minister of State for Disaster Management
2015	Eruption of Kuchinoerabu-jima	May 29-30	Kagoshima	State-Minister of the Cabinet Office
	Torrential Rain of September 2015 in the Kanto and Tohoku Regions	Sep. 11	Ibaraki, Tochigi	State-Minister of the Cabinet Office
	Typhoon 21	Sep. 30-Oct. 1	Okinawa	Parliamentary Vice-Minister of Cabinet Office
2016	2016 Kumamoto Earthquake	Apr. 15	Kumamoto	State-Minister of the Cabinet Office
	2016 Typhoon 11 & 9	Aug. 28-29	Hokkaido	Parliamentary Vice-Minister of Cabinet Office
	2016 Typhoon 10	Aug. 31-Sep. 1	Iwate	Parliamentary Vice-Minister of Cabinet Office
		Sep. 5	Hokkaido	Minister of State for Disaster Management
	Earthquake centered in the central Tottori Prefecture	Oct. 29	Tottori	State-Minister of the Cabinet Office

Source: Cabinet Office

Fig. A-13 Invocation History of the Disaster Relief Act (Since the Great Hanshin-Awaji Earthqauke)

As of March 31, 2017

Year	Name of Disaster	Date of Invocation	Prefecture	No. of Municipalities Invoking the Act
1995	1995 Hyogo-ken-Nanbu Earthquake (Great Hanshin-Awaji Earthquake)	Jan. 17	Hyogo	20
			Osaka	5
	Niigata-ken-Hokubu Earthquake	Apr. 1	Niigata	1
	July 1995 Seasonal Rain Front Torrential Rains	Jul. 11	Niigata	2
		Jul. 11, Jul. 12	Nagano	2
1997	July 1997 Seasonal Rain Front Torrential Rains	Jul. 1	Kagoshima	1
	1997 Typhoon 19	Sep. 16	Oita	1
			Miyazaki	4
			Kagoshima	1
1998	Early August 1998 Torrential Rains	Aug. 4	Niigata	3
	End of August 1998 Torrential Rains	Aug. 27	Fukushima	3
		Aug. 28	Ibaraki	1
		Aug. 27, Aug. 30	Tochigi	4
		Aug. 28	Saitama	1
		Aug. 3	Shizuoka	1
	1998 Typhoon 5	Sep. 16	Saitama	1
	1998 Typhoon 7	Sep. 22	Fukui	1
			Hyogo	1
			Nara	1
	Heavy Rains of September 23–25, 1998	Sep. 25	Kochi	6
	1998 Typhoon 10	Oct. 17	Okayama	4
1999	Heavy Rains Starting June 23, 1999	Jun. 29	Hiroshima	2
			Fukuoka	1
	Torrential Rains in Tsushima Region on August 27–28, 1999	Aug. 27	Nagasaki	1
	Heavy Rains from 1999 Typhoon 18 and Rain Front	Sep. 24	Yamaguchi	9
			Fukuoka	1
			Kumamoto	9
	Tokaimura Criticality Accident	Sep. 3	Ibaraki	2
	Heavy Rains Starting October 27, 1999	Oct. 28	Aomori	1
			Iwate	1
2000	2000 Eruption of Mt. Usu	Mar. 29	Hokkaido	3
	2000 Miyake Is. Eruption and Niijima and Kozushima Is. Earthquake	Jun. 26	Tokyo	1
	2000 Niijima and Kozushima Is. Earthquake	Jul. 1, Jul. 15	Tokyo	2
	2000 Typhoon 3	Jul. 8	Saitama	1
	Heavy Rains from 2000 Autumn Rain Front and Typhoon 14	Sep. 11	Aichi	21
			Gifu	1
	2000 Tottori-ken-Seibu Earthquake	Oct. 6	Tottori	6
			Shimane	2
2001	2001 Geiyo Earthquake	Mar. 24	Hiroshima	13
			Ehime	1
	Heavy Rains of September 6, 2001	Sep. 6	Kochi	2
	2001 Typhoon 16	Sep. 8, Sep. 11	Okinawa	2
2002	2002 Typhoon 6	Jul. 10	Iwate	1
		Jul. 11	Gifu	1
2003	July Seasonal Rain Front Torrential Rains	Jul. 19	Fukuoka	5
		Jul. 20	Kumamoto	1
	Northern Miyagi Earthquake	Jul. 26	Miyagi	5
	2003 Typhoon 10	Aug. 9	Hokkaido	3
2004	July 2004 Niigata and Fukushima Torrential Rains	Jul. 13	Niigata	7
	July 2004 Fukui Torrential Rains	Jul. 18	Fukui	5
	2004 Typhoon 10, Typhoon 11, and Related Heavy Rains	Jul. 31	Tokushima	2
	2004 Typhoon 15 and Heavy Rains from Rain Front	Aug. 17	Ehime	1
			Kochi	1

Year	Name of Disaster	Date of Invocation	Prefecture	No. of Municipalities Invoking the Act
2004	2004 Typhoon 16	Aug. 30	Okayama	9
			Kagawa	13
			Ehime	1
			Miyazaki	2
	2004 Typhoon 18	Sep. 7	Hiroshima	2
	2004 Typhoon 21	Sep. 29	Mie	5
			Ehime	4
			Hyogo	2
	2004 Typhoon 22	Oct. 9	Shizuoka	1
	2004 Typhoon 23	Oct. 2	Miyazaki	1
			Tokushima	4
			Kagawa	9
			Hyogo	18
			Gifu	1
			Kyoto	7
	2004 Mid Niigata Prefecture Earthquake	Oct. 23	Niigata	54
2005	2005 Fukuoka-ken-Seihou-oki Earthquake	Mar. 20	Fukuoka	1
	2005 Typhoon 14	Sep. 4	Tokyo	2
		Sep. 6	Yamaguchi	2
			Kochi	1
			Miyazaki	13
		Sep. 4	Kagoshima	1
	2006 Heavy Snowfall	Jan. 6, Jan. 8, Jan. 11, Jan. 13	Niigata	11
		Jan. 7, Jan. 12	Nagano	8
2006	June 2006 Extended Rain Landslide Disaster	Jun. 15	Okinawa	2
	Heavy Rains from Seasonal Rain Front Starting July 4	Jul. 19	Nagano	3
		Jul. 22	Kagoshima	6
			Miyazaki	1
	2006 Typhoon 13	Sep. 17	Miyazaki	1
	Tornado in Saroma, Hokkaido	Nov. 7	Hokkaido	1
2007	2007 Noto-hanto Earthquake	Mar. 25	Ishikawa	7
	Heavy Rains from Typhoon 4 and Seasonal Rain Front	Jul. 6	Kumamoto	1
	2007 Niigataken Chuetsu-oki Earthquake	Jul. 16	Niigata	10
	2007 Typhoon 5	Aug. 2	Miyazaki	1
	2007 Heavy Rains from Typhoon 11 and Rain Front	Sep. 17	Akita	2
2008	Low-Pressure System from February 23 to 24	Feb. 24	Toyama	1
	2008 Iwate-Miyagi Nairiku Earthquake	Jun. 14	Iwate	5
			Miyagi	2
	Heavy Rains Starting July 28	Jul. 28	Toyama	1
			Ishikawa	1
	End of August 2008 Torrential Rains	Aug. 28	Aichi	2
2009	July 2009 Torrential Rains in Chubu and Northern Kyushu	Jul. 21	Yamaguchi	2
		Jul. 24	Fukuoka	1
	2009 Typhoon 9	Aug. 9	Hyogo	3
			Okayama	1
2010	2010 Heavy Rains from Seasonal Rain Front	Jul. 14	Hiroshima	2
		Jul. 15	Yamaguchi	1
		Jul. 16	Hiroshima	1
	Heavy Rains in Amami Region, Kagoshima Prefecture	Oct. 20	Kagoshima	3
2011	Heavy Snowfall Starting November 2010	Jan. 27	Niigata	4
		Jan. 30	Niigata	2
		Jan. 31	Niigata	3
	Mt. Kirishima (Shinmoedake) Eruption	Jan. 30	Miyazaki	1
		Feb. 10	Miyazaki	1

Year	Name of Disaster	Date of Invocation	Prefecture	No. of Municipalities Invoking the Act
2011	2011 Great East Japan Earthquake	Mar. 11	Aomori	2
			Iwate	34
			Miyagi	35
			Fukushima	59
			Ibaraki	37
			Tochigi	15
			Chiba	8
			Tokyo	47
	July 2011 Niigata and Fukushima Torrential Rains	Jul. 29	Niigata	15
			Fukushima	9
	2011 Typhoon 12	Sep. 2	Mie	3
			Nara	10
			Wakayama	5
			Okayama	1
		Sep. 3	Tottori	2
	2011 Typhoon 15	Sep. 21	Aomori	1
			Fukushima	1
2012	Heavy Winter Snowfall	Jan. 14	Niigata	2
		Jan. 28	Niigata	4
		Jan.31	Niigata	1
		Feb. 1	Aomori	2
			Nagano	5
		Feb. 3	Niigata	4
		Feb. 4	Niigata	1
	May 2012 Gust	May 6	Ibaraki	4
			Tochigi	3
	Heavy Rains Starting July 3	Jul. 3	Fukuoka	1
			Oita	2
	Heavy Rains from Seasonal Rain Front Starting July 11	Jul. 12	Kumamoto	5
			Oita	1
		Jul. 13	Fukuoka	7
	Heavy Rains Starting August 13	Aug. 14	Kyoto	1
	2012 Typhoon 16	Sep. 15	Kagoshima	1
	November 27 Destructive Snow Storm	Nov. 27	Hokkaido	7
2013	Heavy Winter Snowfall	Feb. 22	Niigata	8
		Feb. 25	Niigata	1
		Feb. 26	Yamagata	1
		Feb. 28	Yamagata	1
	Snow Melt Landslide	May 1	Yamagata	1
	Heavy Rains Starting July 22	Jul. 22	Yamagata	4
	Heavy Rains Starting July 28	Jul. 28	Yamaguchi	3
			Shimane	1
	Heavy Rains Starting August 9	Aug. 9	Akita	3
			Iwate	1
	Heavy Rains Starting August 23	Aug. 23	Shimane	1
	September 2 Gust	Sep. 2	Saitama	2
	2013 Typhoon 18	Sep. 16	Saitama	1
			Kyoto	2
	2013 Typhoon 26	Oct. 16	Tokyo	1
			Chiba	1
2014	Heavy Winter Snowfall	Feb. 15	Nagano	4
			Gunma	1
			Yamanashi	16
		Feb. 17	Gunma	7
			Saitama	7
		Feb. 18	Gunma	1
			Yamanashi	3
		Feb. 21	Yamanashi	2

Year	Name of Disaster	Date of Invocation	Prefecture	No. of Municipalities Invoking the Act
2014	Heavy Rains from 2014 Typhoon 8	Jul. 9	Nagano	1
			Yamagata	1
	2014 Typhoon 12	Aug. 3	Kochi	1
	2014 Typhoon 11	Aug. 9	Kochi	3
			Tokushima	1
	Heavy Rains Starting August 15, 2014	Aug. 17	Kyoto	1
			Hyogo	1
	Heavy Rains Starting August 19, 2014	Aug. 20	Hiroshima	1
	Damage Related to Mt. Ontake Eruption	Sep. 27	Nagano	2
	Nagano Prefecture Kamishiro Fault Earthquake	Nov. 22	Nagano	3
	Heavy Snowfall Starting December 5	Dec. 8	Tokushima	3
2015	Eruption of Kuchinoerabu-jima	May 29	Kagoshima	1
	Torrential Rain of September 2015 in the Kanto and Tohoku Regions	Sep. 9	Ibaraki	10
			Tochigi	8
		Sep. 10	Miyagi	8
	2015 Typhoon 21	Sep. 28	Okinawa	1
2016	2016 Kumamoto Earthquake	Apr. 14	Kumamoto	45
	2016 Typhoon 10	Aug. 30	Hokkaido	20
			Iwate	12
	2016 Earthquake centered in the central Tottori Prefecture	Oct. 21	Tottori	4
	2016 Conflagration in Itoigawa City, Niigata Prefecture	Dec. 22	Niigata	1

Source: Cabinet Office

Fig. A-14 Actual Designations of Extremely Severe Disasters in the Past Five Years

Title of Legislation	Disaster Name	Main Affected Areas	Main Applicable Measures								Other Applicable Measures
			Art. 3, 4	Art. 5	Art. 6	Art. 7	Art. 12	Art. 16	Art. 17	Art. 19	Art. 24	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for the Great East Japan Earthquake	Great East Japan Earthquake	Aomori, Iwate, Miyagi, Fukushima, Ibaraki, Tochigi, Chiba, Niigata and Nagano Pref.	○	○	○	○ *2	○	○	○	○	○	○
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Specified Regions in 2010	2010 Regional Disasters	—	●	●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for the District of Miyake-mura, Tokyo Prefecture Due to Volcanic Phenomena from 2000 to 2010	Miyake Island Volcanic Phenomena	Tokyo	●	●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Aki City, Kochi Prefecture Due to Rainstorms from July 17 to 20, 2011	Typhoon 6	Mie, Wakayama and Kochi Pref.	●	●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Torrential Rains from July 24 to August 1, 2011	July 2011 Niigata/ Fukushima Torrential Rains	Niigata and Fukushima Pref.	○	○			●	○		○	○	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Rainstorms and Torrential Rains from August 29 to September 7, 2011	Typhoon 12	Mie, Nara and Wakayama Pref.	○	○	○		●	○	○	○	○	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Rainstorms and Torrential Rains from September 15 to 23, 2011	Typhoon 15	Fukushima, Gifu and Hyogo Pref.		○	○						○	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Specified Regions in 2011	2011 Regional Disasters	—	●	●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Torrential Rains and Rainstorms from June 8 to July 23, 2011	Seasonal Rain Front/Typhoon 4	Fukuoka, Kumamoto and Oita Pref.	○	○	○		●	○	○	○	○	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Specified Regions in 2012	2012 Regional Disasters	—	●	●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Torrential Rains and Rainstorms from June 8 to August 9, 2013	Seasonal Rain Front/ Typhoon 4/ Typhoon 7	Iwate, Yamagata, Shimane and Yamaguchi Pref.	●	○	○						○ *1	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for the Districts of Gotsu City and Onan-cho, Ochigun, Shimane Prefecture Due to Heavy Rains from August 23 to 25, 2013	Torrential Rains	Shimane Pref.	●	●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Rainstorms and Torrential Rains from September 15 to 17, 2013	Typhoon 18	Fukui, Shiga and Kyoto Pref.		○	○						○	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for the District of Oshima-machi, Tokyo Prefecture Due to Rainstorms on October 15 and 16, 2013	Typhoon 26	Tokyo	●	●			●				●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Specified Regions in 2013	2013 Regional Disasters	—	●	●	●						●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for the Districts of Nagiso-machi, Kiso-gun, Nagano Prefecture, and Shiiba-son, Higashi Usuki-gun, Miyazaki Prefecture Due to Rainstorms and Torrential Rains on July 9 and 10, 2014	Seasonal Rain Front/Typhoon 8	Nagano and Miyazaki Pref.		●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Rainstorms and Heavy Rains from July 30 to August 25, 2014	Torrential Rains Caused by Typhoon 11/ Typhoon 12/ Seasonal Rain Front	Hokkaido, Kyoto, Hyogo, Osaka, Nara, Hiroshima, Tokushima, Ehime, and Kochi Pref.	○	○	○			○	○	○	○	

Title of Legislation	Disaster Name	Main Disaster-Affected Regions	Main Applicable Measures								Other Applicable Measures
			Art. 3, 4	Art. 5	Art. 6	Art. 7	Art. 12	Art. 16	Art. 17	Art. 19	Art. 24	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for the Districts of Sumoto City and Awaji City, Hyogo Prefecture Due to Rainstorms on October 13 and 14, 2014	Typhoon 19	Hyogo Pref.		●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for the Districts of Ikeda-cho and Otari-mura, Kitaazumi-gun, Nagano Prefecture Due to the Earthquake of November 22, 2014.	Earthquake of Nov. 22, 2014	Nagano Pref	●	●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Specified Regions in 2014	2014 Regional Disasters	—	●	●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Torrential Rains and Rainstorms from June 2 to July 26, 2015	Seasonal Rain Front/Typhoon 9/ Typhoon 11/ Typhoon 12	Kumamoto Pref.	●	○							○ *1	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for the Districts of Odai Town, Taki-gun and Kihoku Town, Kitamuro-gun, Mie Prefecture Due to Rainstorms on August 24 and 26, 2015	Typhoon 15	Mie Pref.		●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Rainstorms and Torrential Rains from September 7 to 11, 2015	Typhoon 18, etc.	Miyagi, Fukushima, Ibaraki, and Tochigi Pref.	●	○	○		●				○ *1	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Specified Regions in 2015	2015 Regional Disasters	—	●	●							●	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for the 2016 Kumamoto Earthquake	2016 Kumamoto Earthquake	Kumamoto Pref., etc.	○	○	○		○	○	○	○	○	○
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Torrential Rains from June 6 to July 15, 2016	Seasonal Rain Front	Kumamoto and Miyazaki Pref.	●	○							○ *1	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Rainstorms and Torrential Rains from August 16 to September 1, 2016	Typhoon 7/ Typhoon 9/ Typhoon 10/ Typhoon 11, etc.	Hokkaido and Iwate Pref.	○	○	○	○ *2	●	○	○	○	○	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Rainstorms and Torrential Rains from September 17 to 21, 2016	Typhoon 16	Miyazaki and Kagoshima Pref.	●	○	○						○ *1	
Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for Specified Regions in 2016	2016 Regional Disasters	—		●							●	

*1 Public works facilities were considered as regional disaster

*2 Limited to portions concerning item 3

[Legend]

○: Indicates a national disaster (Region is not specified, the disaster itself is specified).

●: Indicates a regional disaster (Disaster is specified at the municipal level.).

The applicable measures are the measures listed below prescribed in the Act on Special Financial Support to Deal with Extremely Severe Disasters.

[Main applicable measures]

Art. 3, 4: Special financial support for disaster recovery projects for public works facilities

Art. 5: Special measures on subsidies for disaster recovery projects for agricultural land

Art. 6: Special cases of subsidies for disaster recovery projects for agricultural, forestry, and fisheries shared-used facilities

Art. 7 (iii): Special financial support for disaster recovery projects for plant and animal aquaculture facilities

Art. 12: Special provision concerning disaster-related credit guarantees under the Small and Medium-sized Enterprise Credit Insurance Act

Art 16.: Subsidies for disaster recovery projects for public social and educational facilities

Art. 17: Subsidies for disaster recovery projects for private school facilities

Art. 19: Special cases of cost coverage for projects implemented by municipalities to prevent infectious diseases

Art. 24: Inclusion of funds for the redemption of principal and interest related to small disaster bonds in the standard budget request

[Other applicable measures]

Art. 8: Application of interim measures related to financing for agricultural, forestry, and fishery operators who are victims of natural disasters

Art. 9: Subsidies for projects to remove deposited earth and sand conducted by forestry associations

Art. 10: Subsidies for projects to remove floodwater conducted by land improvement districts

Art. 11: Subsidies for construction expenses for shared-use small fishing boats

Art. 11-2: Subsidies for disaster recovery projects for forests

Art. 14: Subsidies for disaster reconstruction projects for facilities including business cooperatives

Art. 20: Special cases of government loans based on the Act for the Welfare of Fatherless Families, motherless families and Widows

Art. 22: Special cases of subsidies for public housing construction projects for victims

Art. 25: Special cases of paying job seeker benefits based on the Employment Insurance Act

Fig. A-15 Response of Government Ministries and Agencies to Major Disasters Since 2016

15-1 2016 Kumamoto Earthquake [Maximum seismic intensity of 7]

(1) Damage

At 21:26 on April 14, 2016, a magnitude 6.5 earthquake struck the Kumamoto region of Kumamoto Prefecture (latitude 32° 44.5 north, longitude 130° 48.5 east) at a depth of 11 km, with a seismic intensity of 7 observed in Mashiki Town, Kumamoto Prefecture. 28 hours later, at 01:25 on April 16, a magnitude 7.3 earthquake with a hypocenter in the same region (latitude 32° 45.2 north, longitude 130° 45.7 east) struck at a depth of 12 km, with a seismic intensity of 7 observed in Mashiki Town and Nishihara Village, and strong tremors observed in other prefectures in the Kyushu area.

The human casualties of this earthquake amounted to 228 fatalities and 2,753 injured, while the damage to homes encompassed 8,697 homes that were completely destroyed, 34,037 half-destroyed, and 155,902 partially destroyed. A total of 1,166 evacuation centers were opened in the affected areas, with the number of evacuees peaking at approximately 196,000 (of whom approximately 180,000 were within Kumamoto Prefecture). (As of April 13, 2017)

In addition, a total of 190 slope failures and other sediment disasters occurred. In terms of impacts on lifeline utilities, up to around 477,000 households in the area served by Kyushu Electric Power Company suffered power outages; up to around 105,000 households experienced gas outages (excluding vacant dwellings and the like, up to around 101,000 were households with consumer gas supply contracts); and up to around 445,857 households experienced interruptions to the water supply. Furthermore, transport infrastructure including the airport, roads, and railways suffered immense damage and the earthquake had a major impact both on the daily lives of local citizens and on the economic activities of SMEs, enterprises in the agriculture, forestry and fishery industries, and tourism industry businesses.

(2) Response from Government Ministries and Agencies

At 21:36 on April 14, after the earthquake, the Prime Minister issued the following instructions to relevant ministries and agencies.

1. Ascertain the extent of the damage without delay.
2. Work closely with local governments as an integrated government team, sparing no effort in taking emergency disaster control measures.
3. Ensure timely and accurate provision of information to the public regarding evacuation and the extent of the damage.

In response to the Prime Minister's instructions, the Emergency Response Team met and confirmed that they would spare no effort in implementing emergency disaster control measures. At 22:10 that day, the government established the Emergency Response Headquarters for the Earthquake Centered in the Kumamoto Region of Kumamoto Prefecture 2016, headed by the Minister of State for Disaster Management. At 23:21 the same day, the first meeting of the Major Disaster Management Headquarters was held with the Prime Minister in attendance.

At 23:25 that day, the government deployed a Cabinet Office advance information-gathering team to Kumamoto Prefecture, and at 06:40 on April 15, a government investigation team led by the State Minister of the Cabinet Office for Disaster Management was deployed there as well.

At 08:08 on April 15, the second meeting of the Major Disaster Management Headquarters was held, attended by the Prime Minister, during which participants held a videoconference with the Kumamoto Prefectural Office and confirmed that the government would continue to work as an integrated team, sparing no effort in implementing emergency disaster control measures.

At 10:40 the same day, the government established the On-site Disaster Management Headquarters for the Earthquake Centered in the Kumamoto Region of Kumamoto Prefecture 2016 and held a joint meeting with the Kumamoto Prefecture Disaster Response Headquarters at 13:00 that day, during which participants shared information on such matters as the extent of the damage and the status of activities by relevant organizations (a total of 44 joint meetings with the Kumamoto Prefecture Disaster Response Headquarters were held thereafter).

At 16:07 that day, the third meeting of the Major Disaster Management Headquarters was held, attended by the Prime Minister, during which participants confirmed the extent of the damage and information concerning the response by each ministry and agency.

Following the earthquake at 01:25 on April 16, the Prime Minister issued the following instructions to relevant ministries and agencies at 02:38 that day.

1. Ascertain the extent of the damage without delay, as the damage is spread over a wide area and there is a risk that it could expand further.
2. Work closely with local governments as an integrated government team, sparing no effort in taking emergency disaster control measures, including the rescue and relief of affected people.
3. Ensure timely and accurate provision of information to the public regarding evacuation and the extent of the damage.

In response to the Prime Minister's instructions, the Emergency Response Team met and confirmed that they would spare no effort in implementing emergency disaster control measures. At 05:10 that day, the fourth meeting of the Major Disaster Management Headquarters was held, attended by the Prime Minister. (A total of 31 meetings of the Major Disaster Management Headquarters were held thereafter, 20 of which were attended by the Prime Minister)
At 05:00 on April 16, the government set up a supplies procurement and transport team within the Major Disaster Management Headquarters and decided to provide supplies via push-mode support, which involves procuring and shipping relief supplies without waiting for requests from the affected areas. A total of approximately 2.78 million meals were supplied between April 17 and May 6; those supplied through April 22 took the form of push-mode support, while those from April 23 were supplied as pull-type support, in response to requests from affected areas.
At 17:00 on April 17, the Team to Support the Daily Lives of Disaster Victims for the 2016 Kumamoto Earthquake, headed by the Deputy Chief Cabinet Secretary (administrative duties), was established to provide powerful support for the swift rebuilding of the daily lives of people affected by the disaster. The first meeting of this body was then held, attended by the Prime Minister.
The SDF carried out the following disaster relief operations in the areas concerned, in response to requests from the governors of Kumamoto and Oita prefectures.

A. Overview of Disaster Relief Operations
- At 22:40 on Thursday, April 14, the Governor of Kumamoto Prefecture contacted the Commander of the GSDF 8th Division (Kita Kumamoto) to request a disaster relief deployment for the purpose of saving lives (request for withdrawal: 09:00 on Monday, May 30)
- At 02:36 on Saturday, April 16, the Governor of Oita Prefecture contacted the Commander of the GSDF Western Army Artillery Unit (Yufuin) to request a disaster relief deployment for the purpose of saving lives (request for withdrawal: 09:00 on Thursday, April 28)

B. Scale of Deployment
- Personnel: Approximately 814,200 people in total (with approximately 26,000 deployed simultaneously at its peak); aircraft: 2,618 in total (peaking at 132); naval vessels: 300 in total (peaking at 15)

In addition, police organizations deployed 27,936 personnel to the area and firefighting organizations deployed 15,613 to conduct rescue operations. The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) TEC-FORCE deployed a total of 10,912 people/day in the areas affected, where they surveyed the extent of the damage, inspected Sediment Disaster Risk Areas, and cleared transport routes.
The Geospatial Information Authority of Japan (GSI) used unmanned aerial vehicles (UAVs) to capture video footage and analyze crustal movement, which they provided to relevant organizations as needed and also published on the GSI website.
On April 23, the Prime Minister visited Kumamoto Prefecture to inspect the extent of the damage; after doing so, he exchanged views with the leaders of affected local governments and visited evacuation centers.
On April 29, the Prime Minister visited both Oita Prefecture and Kumamoto Prefecture to inspect the extent of the damage; after doing so, he exchanged views with the leaders of affected local governments and representatives of local shopping arcades, and visited evacuation centers.
On May 5, the head of the Major Disaster Management Headquarters (the Minister of State for Disaster Management) visited Kumamoto Prefecture, where he exchanged views with the leaders of affected local governments and conducted a survey of evacuation centers and disaster sites.
On June 4, the Prime Minister visited Oita Prefecture and Kumamoto Prefecture to inspect progress with recovery and reconstruction. In addition, he exchanged views with representatives from the tourism industry and visited evacuation centers.
On June 15 and August 17, the head of the Major Disaster Management Headquarters (the Minister of State for Disaster Management) visited Kumamoto Prefecture, where he exchanged views with the leaders of affected local governments and conducted a survey of evacuation centers, temporary housing, and disaster sites.

Due to the 2016 Kumamoto Earthquake, the Disaster Relief Act was invoked in respect of 45 municipalities in Kumamoto Prefecture, while the Act on Support for Reconstructing Livelihoods of Disaster Victims was invoked in respect of 46 municipalities in 2 prefectures.

[Invocation of the Disaster Relief Act]
Kumamoto Prefecture: All 45 municipalities (Kumamoto City, Yatsushiro City, Hitotoshi City, Arao City, Minamata City, Tamana City, Yamaga City, Kikuchi City, Uto City, Kamiamakusa City, Uki City, Aso City, Amakusa City, Koshi City, Misato Town, Gyokuto Town, Nankan Town, Magasu Town, Nagomi Town, Ozu Town, Kikuyo Town, Minamioguni Town, Oguni Town, Ubuyama Village, Takamori Town, Nishihara Village, Minamiazo Village, Mifune Town, Kashima Town, Masiki Town, Kosa Town, Yamato Town, Hikawa Town, Ashikita Town, Tsunagi Town, Nishiki Town, Taragi Town, Yunomae Town, Mizukami Village, Sagara Village, Itsuki Village, Yamae Village, Kuma Village, Asagiri Town, Reihoku Town) (Date of invocation: April 14)

[Invocation of the Act on Support for Reconstructing Livelihoods of Disaster Victims]
Kumamoto Prefecture: All areas (Date of invocation: April 14)
Oita Prefecture: Yufu City (Date of invocation: April 16)

In addition, the government issued the Cabinet Order on the Extremely Severe Disaster Designation and Identification of Essential Response Measures for the 2016 Kumamoto Earthquake, which designated the earthquake as a Disaster of Extreme Severity affecting the entire nation and specified the measures to be applied in respect of the disaster (including special financial support for disaster recovery projects focused on public civil engineering facilities; special financial aid for disaster recovery projects focused on agricultural land; special provisions on financial assistance for disaster recovery projects for facilities for the joint use of the agriculture, forestry, and fisheries industries; a special provision concerning disaster-related credit guarantees under the Small and Medium-sized Enterprise Credit Insurance Act; subsidies for disaster reconstruction projects for facilities including business cooperatives; subsidies for disaster recovery projects for public social and educational facilities; subsidies for disaster recovery projects for private school facilities; special cases of cost coverage for projects implemented by municipalities to prevent infectious diseases; special cases of government loans based on the Act for the Welfare of Fatherless Families, Motherless Families and Widows; special cases of subsidies for public housing construction projects for victims; inclusion of funds for the redemption of principal and interest on small disaster bonds in the standard budget request; and special cases of paying job seeker benefits based on the Employment Insurance Act) (promulgated and entered into force on April 26).
The Cabinet Order on the Specified Disaster Designation and Identification of Essential Response Measures for the 2016 Kumamoto Earthquake designated the disaster caused by the 2016 Kumamoto Earthquake as a specified disaster and stipulated the measures to be applied in respect of it (including measures relating to extending the deadlines for administrative rights and interests; measures relating to exemptions associated with obligations not carried out within the required period; measures relating to the special provisions on decisions concerning the start of corporate bankruptcy proceedings on the grounds of insolvency; and measures relating to the special provisions on the period for acceptance or renunciation of inheritance) (promulgated and entered into force on May 2).
Subsequently, the Cabinet Order on the Specified Disaster Designation and Identification of Essential Response Measures for the 2016 Kumamoto Earthquake was partially revised, with the addition of measures to be applied in respect of the disaster (measures relating to the special provision on fees for the filing of a petition for conciliation under the Civil Conciliation Act) (promulgated and entered into force on June 24).
The Cabinet Order on the Major Disaster Designation for the 2016 Kumamoto Earthquake designated the disaster caused by the 2016 Kumamoto Earthquake as a major disaster (promulgated and entered into force on May 13). Under this ordinance, if so requested by a local government that has been affected by a disaster, the national government or a prefectural government is able to carry out disaster recovery projects that would normally be carried out by the affected local government, insofar as doing so does not impede the administrative duties of the national government or the prefectural government concerned. This was the first time that a disaster had been designated as a major disaster under the Act on Reconstruction from Large-Scale Disasters.

15-2 Typhoons in August 2016 (2016 Typhoons 7, 11, 9, and 10)

(1) Damage
Typhoons 7, 11, 9, and 10 occurred in quick succession in August, causing river flooding, sediment disasters, and other floods and damage, primarily in Hokkaido and Iwate Prefecture.

The human casualties of this series of typhoons amounted to 29 fatalities and missing persons, and 106 injured, while the damage to homes encompassed 519 homes that were completely destroyed, 2,306 half-destroyed, 1,010 with above-floor flooding and 4,538 with below-floor flooding.

2016 Typhoon 7 originated over the sea to the west of the Northern Mariana Islands at 03:00 on August 14, 2016 and moved north, progressing from the sea to the east of the Kanto region to the waters off the Sanriku Coast. It made landfall near Cape Erimo, Hokkaido around 17:30 on the 17th and continued up through Hokkaido, turning into an extra-tropical cyclone near Sakhalin at 03:00 on the 18th.
This typhoon and weather front caused heavy rain centered on northern Japan. Between 00:00 on August 16 and 06:00 on the 18th, there was 234.0 mm of rainfall at Morino in Shiraoi Town, Hokkaido and 228.0 mm at Washikura in Fukushima City, Fukushima Prefecture.
Some parts of Hokkaido also experienced severe gales, with a maximum peak wind of 31.8 m and a maximum instantaneous wind speed of 43.2 m observed in at Kushiro in Kushiro City, Hokkaido.
The human casualties of Typhoon 7 amounted to 5 injured, while the damage to homes encompassed 9 homes that were half-destroyed, 67 with above-floor flooding and 173 with below-floor flooding. A total of 6 slope failures and other sediment disasters occurred, while up to approximately 2,260 households in the area served by Tohoku Electric Power Company, Inc. suffered power outages.

2016 Typhoon 11 originated over the sea to the east of Japan at 09:00 on August 20, 2016 and moved northwest, approaching the Tohoku region before moving north off the Sanriku Coast. It made landfall near Kushiro City, Hokkaido after 23:00 on the 21st and continued up through Hokkaido before turning into an extra-tropical cyclone in the Sea of Okhotsk at 03:00 on the 22nd.
2016 Typhoon 9 originated over the sea to the west of the Northern Mariana Islands at 15:00 on August 19, 2016 and continued to develop as it moved north, nearing the Izu Islands in the early hours of the 22nd, accompanied by a storm area. It subsequently made landfall near Tateyama City, Chiba Prefecture at around 12:30 on the 22nd and continued up through the Kanto and Tohoku regions, making landfall once more in the central Hidaka region of Hokkaido before 06:00 on the 23rd. It then continued up through Hokkaido before turning into an extra-tropical cyclone in the Sea of Okhotsk at 12:00 on the 23rd.
These typhoons and weather fronts caused heavy rain in eastern and northern Japan. Between 00:00 on August 20 and 24:00 on the 23rd, there was 448.5 mm of rainfall at Mt. Amagi in Izu City, Shizuoka Prefecture; 297.5 mm at Ome in Ome City, Tokyo; and 296.0 mm at Itokushibetsu in Shibetsu Town, Hokkaido. Hokkaido experienced particularly heavy rain, receiving double the average rainfall for August. In addition, various areas experienced severe gales, with a maximum instantaneous wind speed of 50.9 m observed at Yaemigahara in Hachijo Town, Tokyo; 45.5 m at Katsuura in Katsuura City, Chiba Prefecture; and 34.3 m at Onahama in Iwaki City, Fukushima Prefecture.
The human casualties of Typhoon 11 and Typhoon 9 amounted to 2 fatalities and 87 injured, while the damage to homes encompassed 6 homes that were completely destroyed, 17 half-destroyed, 665 with above-floor flooding and 2,581 with below-floor flooding. A total of 65 slope failures and other sediment disasters occurred, while up to approximately 104,200 households in the area served by Tokyo Electric Power Company experienced power outages, along with up to approximately 710 households in the area served by Hokkaido Electric Power Company. In addition, up to 16,714 households in Hokkaido and Ibaraki Prefecture suffered interruptions to the water supply.

2016 Typhoon 10 originated over the sea south of Shikoku on August 21, 2016 and continued to develop as it moved north on the 26th, nearing the Kanto region in the morning of the 30th. It made landfall near Ofunato City, Iwate Prefecture at around 17:30 on the 30th, accompanied by a storm area, and gathered speed as it passed through the Tohoku region before exiting onto the Sea of Japan, where it turned into an extra-tropical cyclone on the 31st. This was the first time that a typhoon had made landfall on the northeastern Pacific coast since the Japan Meteorological Agency began recording statistics in 1951.
As a result of Typhoon 10, heavy rain fell over a wide area from western to northern Japan, primarily in the Tohoku and Hokkaido regions. Miyako City and Kuji City, Iwate Prefecture experienced driving rains, with 80 mm of rain falling in an hour. In addition, between 00:00 on the 28th and 06:00 on the 31st, Kamishihoro Town received record-breaking rainfall of 329 mm, which is more than it usually receives for the entire month of August in an average year. Areas from eastern to northern Japan experienced windstorms, with a maximum instantaneous wind speed of 37.7 m observed in Miyako City, Iwate Prefecture and 36.5 m in Setana City, Hokkaido. In addition, some areas saw stormy seas.
The human casualties of Typhoon 10 amounted to 27 fatalities and missing persons, and 14 injured, while the damage to homes encompassed 513 homes that were completely destroyed, 2,280 half-destroyed, 278 with above-floor flooding and 1,784 with below-floor flooding. A total of 177 slope failures and other sediment disasters occurred, with up to 1,093 people from 535 households in Iwate Prefecture being cut off due to river flooding or sediment collapse. Up to approximately 40,380 households in the area served by Hokkaido Electric Power Company and up to

approximately 36,500 households in the area served by Tohoku Electric Power Company suffered power outages, while up to approximately 17,000 households in Hokkaido and Iwate Prefecture experienced interruptions to the water supply.

(2) Response from Government Ministries and Agencies

At 13:30 on August 13, before Typhoon 7 made landfall, the government held an Inter-Agency Disaster Measures Alert Meeting, during which participants shared information about the weather outlook and the steps being taken by ministries and agencies in response, confirming that they would take appropriate response measures.

At 17:00 on August 20, before Typhoons 11 and 9 made landfall, the government held an Inter-Agency Disaster Alert Meeting, during which participants shared information about the weather outlook and the steps being taken by ministries and agencies in response, confirming that they would take appropriate response measures.

At 16:00 on August 26, the government held an Inter-Agency Disaster Alert Meeting concerning Typhoons 11 and 9 and an Inter-Agency Disaster Alert Meeting concerning Typhoon 10, attended by the Minister of State for Disaster Management, the State Minister of the Cabinet Office for Disaster Management, and the Parliamentary Vice-Minister for Disaster Management. During this meeting, participants shared information about the weather outlook, the extent of the damage, and the steps being taken by ministries and agencies in response, confirming that they would take appropriate response measures.

The same day, the Minister of State for Disaster Management made the following appeal to the public via the website and social media, concerning the response to Typhoon 10.

1. The large and very powerful Typhoon 10 seems likely to approach North Japan and the Kanto region and make landfall tomorrow, the 30th, accompanied by a storm area. Localized driving rains centered on North Japan and severe gales centered on marine areas are expected, with stormy seas in some areas. In particular, there is a risk of record-breaking heavy rains in the Tohoku region, so please be particularly vigilant about sediment disasters and river flooding with the potential to threaten human lives.
2. We ask all members of the public to comply with advisories, etc. issued by municipalities and take the initiative in evacuating at an early stage in order to protect your life. Even if your municipality has not issued an advisory, etc., please pay attention to weather information and do not hesitate to evacuate if you judge that it might be wise to evacuate. If you feel that it is too dangerous to get to an evacuation site, please evacuate to a nearby place of safety; if you feel that it is already too dangerous to venture outside, please evacuate to a safer place, such as the second or third floor of the building where you are. Please refrain from going outside unless essential and urgent, and do not, under any circumstances, go near any waterways or the coast.
3. We also ask all members of the public to take the initiative in taking evacuation actions or any other actions necessary to keep themselves safe, without fearing that it might be a wasted effort.

In light of the landfall of the typhoon and its progress thereafter, at 13:30 on August 29, the government held a second Inter-Agency Disaster Alert Meeting, attended by the Minister of State for Disaster Management, the State Minister of the Cabinet Office for Disaster Management, and the Parliamentary Vice-Minister for Disaster Management. During this meeting, participants shared information about the weather outlook, the extent of the damage, and the steps being taken by ministries and agencies in response, confirming that they would continue to take appropriate response measures.

At 08:50 on August 31, the Prime Minister issued the following instructions to relevant ministries and agencies.

1. Ascertain the extent of the damage without delay.
2. Work closely with local governments as an integrated government team, making human life the top priority and sparing no effort in taking emergency disaster control measures, including the rescue and relief of affected people. In addition, fully implement measures to prevent further harm by such means as providing support for the evacuation of local citizens.
3. Ensure timely and accurate provision of information to the public regarding evacuation and the status of the rain, rivers, and floods, etc.

At 08:57 the same day, a meeting of the directors-general of relevant ministries and agencies was held, at which participants confirmed that they would spare no effort to ascertain the full extent of the damage and to undertake rescue and relief activities, in response to the Prime Minister's instructions. At 13:00 that day, an Inter-Agency Disaster Management Meeting was held, attended by the Minister of State for Disaster Management, the State Minister of the Cabinet Office for Disaster Management, and the Parliamentary Vice-Minister for Disaster Management. During this meeting, participants shared information about the weather outlook, the extent of the damage, and the steps being taken by ministries and agencies in response, confirming that they would continue to

work as one, sparing no effort in taking emergency disaster control measures, such as ascertaining the extent of the damage and undertaking rescue and relief activities. (A total of 7 Inter-Agency Disaster Management Meetings were held thereafter)
The SDF carried out the following disaster relief operations in relation to Typhoon 10, in response to requests from the governors of Iwate and Hokkaido prefectures.

A. Overview of Disaster Relief Operations
- At 19:55 on Tuesday, August 30, the Governor of Iwate Prefecture contacted the Commander of the GSDF 9th Artillery Regiment (Iwate) to request a disaster relief deployment for the purpose of rescuing stranded people, providing support for the supply of water, road clearance, transporting personnel and supplies, providing support for the supply of food, and bathing support (request for withdrawal: 21:00 on Friday, September 16)
- At 04:00 on Wednesday, August 31, the Governor of Hokkaido (Director General, Tokachi General Subprefectural Bureau) contacted the Commander of the GSDF 5th Brigade (Obihiro) to request a disaster relief deployment for the purpose of rescuing stranded people, searching for missing persons, providing support for the supply of water, bathing support, and flood prevention activities (request for withdrawal: 17:00 on Sunday, September 18)
- At 04:15 on Wednesday, August 31, the Governor of Hokkaido (Director General, Kamikawa General Subprefectural Bureau) contacted the Commander of the GSDF 4th Artillery Group (Kamifurano) to request a disaster relief deployment for the purpose of rescuing stranded people, providing support for the supply of water and food, and transporting supplies (request for withdrawal: 19:00 on Tuesday, September 6)

B. Scale of Deployment
- Iwate Prefecture Personnel: approx. 2,090 in total; vehicles: approx. 690 in total; aircraft: approx. 77 in total
- Hokkaido Personnel: approx. 1,705 in total; vehicles: approx. 790 in total; aircraft: approx. 19 in total; reconnaissance boats: 5 in total

In addition, police organizations deployed a total of 1,217 personnel to the area to conduct rescue operations.
Having deployed a Cabinet Office advance information-gathering team on August 31 to Iwate Prefecture (August 31 – September 2) and Hokkaido (August 31 – September 5), the government established a Government Local Liaison and Coordination Office at Iwate Prefectural Office on September 2.
From August 31 to September 1, to ascertain the extent of the damage and the status of the local response, a government investigation team led by the Parliamentary Vice-Minister for Disaster Management was deployed to Iwate Prefecture, where it conducted a survey of the affected area, as well as exchanging views with the leaders of local governments affected by the disaster.
In addition, on September 5, to ascertain the extent of the damage and the status of the local response, a government investigation team led by the Minister of State for Disaster Management was deployed to Hokkaido, where it conducted surveys of the affected areas, as as exchanging views with the leaders of local governments affected by the disaster.
On September 14, the Prime Minister visited Hokkaido and conducted an aerial inspection of the extent of the damage in Obihiro City from a helicopter, after which he exchanged views with local farming representatives and the leaders of local governments affected by the disaster. (His originally scheduled visit to Iwate Prefecture was cancelled due to poor weather)
On October 8, the Prime Minister visited Iwate Prefecture, where he inspected a group home for elderly people with dementia and a dairy factory in Iwaizumi Town, which suffered damage as a result of the typhoon. He also visited an evacuation center, after which he exchanged views with the leaders of local governments affected by the disaster.
Due to Typhoon 10, the Disaster Relief Act was invoked in respect of 20 municipalities in Hokkaido and 12 municipalities in Iwate Prefecture, and the Act on Support for Reconstructing Livelihoods of Disaster Victims was also invoked.

[Invocation of the Disaster Relief Act]
[Hokkaido Prefecture] (Date of invocation: August 30)
Obihiro City, Minamifurano Town, Otofuke Town, Shihoro Town, Kamishihoro Town, Shikaoi Town, ShintokuTown, Shimizu Town, Memuro Town, Nakasatsunai Village, Sarabetsu Village, Taiki Town, Hiroo Town, Makubetsu Town, Ikeda Town, Toyokoro Town, Honbetsu Town, Ashoro Town, Rikubetsu Town, Urahoro Town

[Iwate Prefecture] (Date of invocation: August 30)
Morioka City, Miyako City, Kuji Citym, Tono City, Kamaishi City, Otsuchi Town, Iwaizumi Town, Tanohata Village, Fudai Village, Karumai Town, Noda Village, Ichonohe Town

[Invocation of the Act on Support for Reconstructing Livelihoods of Disaster Victims]
[Hokkaido Prefecture] (Date of invocation: August 30)
Muroran City, Minamifurano Town, Shiraoi Town, Toyako Town, Shintoku Town, Shimizu Town, Makubetsu Town
[Iwate Prefecture] (Date of invocation: August 30)
All areas

Since Typhoons 7, 11, 9, and 10 had caused immense damage to various parts of the country, the weather events between August 16 and September 1, 2016 were grouped together in the Ordinance Designating the Disaster Due to Rainstorms and Torrential Rains between August 16 and September 1, 2016 as a Disaster of Extreme Severity and Specifying the Measures to be Applied. As well as designating the group of events as a Disaster of Extreme Severity affecting the entire nation and specified the measures to be applied in respect of the disaster (including special financial support for disaster recovery projects focused on public civil engineering facilities; special financial aid for disaster recovery projects focused on agricultural land; special provisions on financial assistance for disaster recovery projects for facilities for the joint use of the agriculture, forestry, and fisheries industries; subsidies for disaster recovery projects for public social and educational facilities; subsidies for disaster recovery projects for private school facilities; special cases of cost coverage for projects implemented by municipalities to prevent infectious diseases; and inclusion of funds for the redemption of principal and interest on small disaster bonds in the standard budget request). In addition, a measure to be applied in respect of the disaster (a special provision concerning disaster-related credit guarantees under the Small and Medium-sized Enterprise Credit Insurance Act) was specified in regard to Minamifurano Town in Hokkaido and Miyako City, Kuji City, and Iwaizumi Town in Iwate Prefecture (promulgated and entered into force on September 23).
Subsequently, the Ordinance Designating the Disaster Due to Rainstorms and Torrential Rains between August 16 and September 1, 2016 as a Disaster of Extreme Severity and Specifying the Measures to be Applied was partially revised, with the addition of special financial support for disaster recovery projects for plant and animal aquaculture facilities as a measure to be applied in respect of the disaster for the whole country (promulgated and entered into force on October 13).

15-3 2016 Typhoon 16

(1) Damage
2016 Typhoon 16 originated over the sea to the west of the Northern Mariana Islands at 03:00 on September 13, 2016 and passed close to Yonaguni Island, Okinawa Prefecture at about 12:00 on the 17th, heading north. Having progressed northeast over the East China Sea, it made landfall on the Osumi Peninsula, Kagoshima Prefecture with powerful momentum after 00:00 on September 20 and then headed northeast across the waters off Shikoku before making landfall once more near Tanabe City, Wakayama Prefecture at around 13:30 the same day. After making landfall yet again just after 17:00 that day near Tokoname City, Aichi Prefecture, it turned into an extra-tropical cyclone at 21:00 the same day over the waters off the Tokaido coast.
As a result of this typhoon and weather front, driving rains were observed in many areas, with 115 mm of rain falling in Makurazaki City, Kagoshima Prefecture in the hour to 00:19 on the 20th. Between the 16th and the 20th, heavy rain in excess of 200 mm fell over extensive swathes of eastern and western Japan, with 607 mm observed in Hyuga City, Miyazaki Prefecture during that period. In particular, some parts of West Japan received 1.5 times their usual average rainfall for September.
In addition, severe gales buffeted areas from the Ryukyu Islands to West Japan, with maximum instantaneous wind speeds of 66.8 m observed at 10:06 on the 17th in Yonaguni Town, Okinawa Prefecture and 44.5 m observed at 00:08 on the 20th in Makurazaki City, Kagoshima Prefecture, while offshore areas saw rough seas.
The human casualties of Typhoon 16 amounted to 1 fatality and 47 injured, while the damage to homes encompassed 8 homes that were completely destroyed, 65 half-destroyed, 489 with above-floor flooding and 1,941 with below-floor flooding. A total of 233 slope failures and other sediment disasters occurred, while approximately 182,560 households suffered power outages, including around 181,900 households in the area served by Kyushu Electric Power Company. In addition, up to 3,249 households, mainly in the Kyushu area, experienced interruptions to the water supply.

(2) Response from Government Ministries and Agencies
On September 16, before the typhoon made landfall, the government held an Inter-Agency Disaster Alert Meeting, during which participants shared information about the weather outlook and the steps being taken by ministries and agencies in response, confirming that they would take appropriate response measures. At 13:00 on September 20, an Inter-Agency Disaster Management Meeting was held, attended by the State Minister of the Cabinet Office for Disaster Management and the Parliamentary Vice-Minister for Disaster Management, during which participants confirmed that the government would continue to work as an integrated team, sparing no effort in implementing emergency disaster control measures.
Due to the damage caused by Typhoon 16, the government issued the Ordinance Designating the Disaster Due to Rainstorms and Torrential Rains between September 17 and 21, 2016 as a Disaster of Extreme Severity and Specifying the Measures to be Applied, which designated the typhoon as a Disaster of Extreme Severity affecting the entire nation and specified the measures to be applied (including special provisions on financial assistance for disaster recovery projects for agricultural land; special provisions on financial assistance for disaster recovery projects for facilities for the joint use of the agriculture, forestry, and fisheries industries; and the inclusion of funds for the redemption of principal and interest on small disaster bonds in the standard budget request). This also specified the measures to be applied in respect of the disaster in Tarumizu City, Kagoshima Prefecture (special financial support for projects to recover public civil engineering works damaged by disaster and the inclusion of funds for the redemption of principal and interest on small disaster bonds in the standard budget request; promulgated and entered into force on October 26).
Subsequently, the Ordinance Designating the Disaster Due to Rainstorms and Torrential Rains between September 17 and 21, 2016 as a Disaster of Extreme Severity and Specifying the Measures to be Applied was partially revised, adding Mihara Village, Kochi Prefecture to the areas to which the measures (special financial support for projects to recover public civil engineering works damaged by disaster and the inclusion of funds for the redemption of principal and interest on small disaster bonds in the standard budget request) were to be applied (promulgated and entered into force on March 10).

15-4 2016 Central Tottori Earthquake [Maximum Seismic Intensity: 6-Lower]

(1) Damage
At 14:07 on October 21, 2016, a magnitude 6.6 earthquake with the hypocenter located in central Tottori Prefecture occurred. The seismic intensity observed in the Tottori Prefecture municipalities of Kurayoshi City, Yurihama Town, and Hokuei Town was 6-lower, with an intensity of 5-upper observed in the Tottori Prefecture municipalities of Tottori City and Misasa Town, and the Okayama Prefecture municipalities of Kagamino Town and Maniwa City. In addition, the seismic intensity observed from the Kanto to the Kyushu regions, centering on the Chugoku region, ranged between 5-lower and 1.
The human casualties of this earthquake amounted to 32 injured, while the damage to homes encompassed 18 homes that were completely destroyed and 290 homes that were half-destroyed. In terms of impacts on lifeline utilities, a total of around 77,100 homes in the area served by Chubu Electric Power Company suffered power outages, while up to 16,187 homes in Tottori and Okayama prefectures suffered interruptions to their water supply.

(2) Response from Government Ministries and Agencies
At 14:10 on October 21, 2016, immediately after the earthquake, the Prime Minister issued the following instructions to relevant ministries and agencies.

1. Ascertain the extent of the damage without delay.
2. Work closely with local governments as an integrated government team, sparing no effort in taking emergency disaster control measures, including the rescue and relief of affected people.
3. Ensure timely and accurate provision of information to the public regarding evacuation and the extent of the damage.

In response to the Prime Minister's instructions, the Emergency Response Team met and confirmed that they would spare no effort in implementing emergency disaster control measures.
At 18:00 that day, an Inter-Agency Disaster Management Meeting was held, during which participants confirmed the extent of the damage, and the steps being taken by ministries and agencies in response.
The SDF carried out the following disaster relief operations in the areas concerned, in response to a request from the

Governor of Tottori Prefecture.

A. Overview of Disaster Relief Operations
・At 19:22 on Friday, October 21, the Governor of Tottori Prefecture contacted the Commander of the GSDF 8th Infantry Regiment (Yonago) to request a disaster relief deployment for the purpose of providing support for the supply of water (request for withdrawal: 17:00 on Friday, October 28)
B. Scale of Deployment
Personnel: approx. 620 in total; vehicles: approx. 140 in total; aircraft: approx. 13 in total

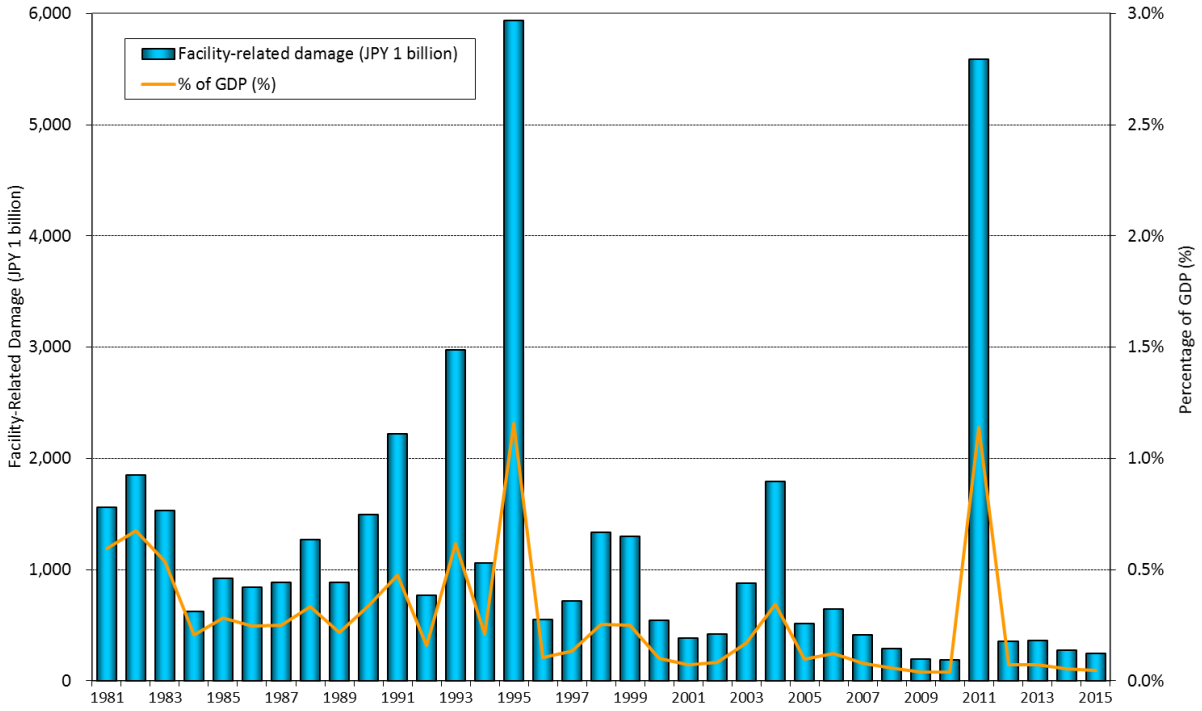
In addition, police organizations deployed a total of 226 personnel to the area to stand guard and carry out other activities.
At 14:00 on October 22, the government held a second Inter-Agency Disaster Management Meeting, during which participants shared information about seismic activity forecasts, the extent of the damage, and the steps being taken by ministries and agencies in response, confirming that they would continue to take appropriate response measures.
At 16:00 on October 26, the government held a third Inter-Agency Disaster Measure Meeting, attended by the Minister of State for Disaster Management, the State Minister of the Cabinet Office for Disaster Management, and the Parliamentary Vice-Minister for Disaster Management. During this meeting, participants shared information about seismic activity forecasts, the extent of the damage, and the steps being taken by ministries and agencies in response, confirming that they would take appropriate measures to ensure a satisfactory living environment in evacuation centers.
On October 29, to ascertain the extent of the damage and the status of the local response, a government investigation team led by the State Minister of the Cabinet Office for Disaster Management was deployed to Tottori Prefecture, where it conducted a survey of disaster sites and evacuation centers, as well as exchanging views with the leaders of local governments affected by the disaster.
Due to the damage caused by this earthquake, the Disaster Relief Act was invoked (effective October 21) to Kurayoshi City, Misasa Town, Yurihama Town, and Hokuei Town in Tottori Prefecture, while the Act on Support for Reconstructing Livelihoods of Disaster Victims was invoked (effective October 21) to Kurayoshi City and Hokuei Town in Tottori Prefecture.

15-5 2016 Conflagration in Itoigawa City, Niigata Prefecture

(1) Damage
At around 10:20 on December 22, 2016, a major fire broke out in the Omachi district of Itoigawa City, Niigata Prefecture. Strong winds caused the conflagration to spread over an area of approximately 40,000 square meters; 120 buildings were completely destroyed by the fire, 5 half destroyed, and 22 partly destroyed.
It was the biggest urban fire for 40 years, since the 1976 Sakata Fire.
In terms of human casualties of the fire, 2 local citizens suffered minor injuries, while 15 fire corps volunteers sustained minor injuries in the course of their efforts to extinguish the fire.

(2) Response from Government Ministries and Agencies
On December 28, to ascertain the extent of the damage and the status of the local response, a government investigation team led by the State Minister of the Cabinet Office for Disaster Management was deployed to Itoigawa City, Niigata Prefecture, where it conducted a survey of disaster sites and evacuation centers, as well as exchanging views with the leaders of local governments affected by the disaster.
On December 30, the Disaster Relief Act and the Act on Support for Reconstructing Livelihoods of Disaster were invoked (effective December 22) to Itoigawa City, Niigata Prefecture, as the fire was deemed to be a natural disaster resulting from strong winds.
On January 11, 2017, the Prime Minister inspected the area and exchanged views with affected people, the Governor of Niigata Prefecture, and the Mayor of Itoigawa City, among others. The decision was then taken to set up the Itoigawa Community Development Promotion Council, a body bringing together the national, prefectural, and city governments.

Fig. A-16 Trends in Facility-Related Damage, Actual and as a Percentage of Gross Domestic Product (GDP)



Source: Created by the Cabinet Office using materials from various ministries and agencies.
Note: Gross domestic product (GDP) figures up to 1993 are based on the 2000 standard (SNA 1993), while those for 1994 onward are based on the 2011 standard (SNA 2008)

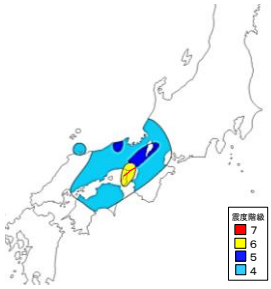
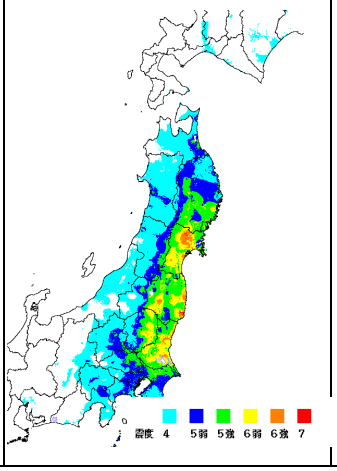
Fig. A-17 Facility-Related Damage by Disaster Type for Disasters Occurring in 2015

(Unit: JPY 1 million)

Facility type	Typhoon	Torrential rain	Earthquake	Heavy snowfall	Other	Total	Notes
Public works	91,981	21,306	38	0	26,181	139,505	Rivers, forestry conservation facilities, ports, etc.
Agriculture, forest, and fisheries industry	39,350	37,390	90	146	13,019	89,995	Farmland, agricultural facilities, forestry roads, fishing facilities, etc.
Educational facilities	797	1,763	3	0	81	2,643	School facilities, cultural heritages, etc.
Public welfare facilities	2,278	6,341	1,128	0	14	9,760	Social welfare facilities, waterworks facilities, etc.
Other facilities	1,811	1,166	0	0	3	2,980	Nature parks, telegraph/telephone, urban facilities, etc.
Total	136,217	67,965	1,259	146	39,298	244,884	

Note: Totals may not agree due to rounding.
Source: Created by the Cabinet Office using materials from various ministries and agencies.

Fig. A-18 Comparison of the Great Hanshin-Awaji Earthquake, the Great East Japan Earthquake, and the Sumatra Earthquake

	Great Hanshin-Awaji Earthquake (Japan)	Great East Japan Earthquake (Japan)	Sumatra Earthquake (Indonesia)
Date & time	5:46 a.m., Jan. 17, 1995	2:46 p.m., March 11, 2011	9:58 a.m., Dec. 26, 2004
Magnitude	7.3	9.0	9.1
Earthquake type	Inland	Oceanic trench	Oceanic trench
Affected area	City center	Mainly agricultural, forestry, and fishery regions	
No. of prefectures with seismic intensity of Lower 6 or higher	1 (Hyogo)	8 (Miyagi, Fukushima, Ibaraki, Tochigi, Iwate, Gunma, Saitama, Chiba)	
Tsunami	Reports of tsunami measuring tens of centimeters, no damage	Large tsunami observed in various regions (max. wave height of more than 9.3 m in Soma, more than 8.5 m in Miyako, more than 8.0 m in Ofunato)	Large tsunami observed in Indonesia as well as other countries with coastline along the Indian Ocean
Damage characteristics	Structures destroyed, large fires erupted mainly in Nagata-ku	Large tsunami caused massive damage in coastal areas, destruction across many districts	Large tsunami caused damage to countries with coastline along the Indian Ocean, with Indonesia suffering particularly massive damage
Fatalities Missing persons	Fatalities: 6,437 Missing persons: 3 (May 19, 2006)	Fatalities: 19,418 Missing persons: 2,592 (as of March 1, 2016)	Fatalities: 126,732 Missing persons: 93,662 (as of March 30, 2005)
Homes damaged (totally destroyed)	104,906	121,809 (as of March 1, 2016)	Unknown*
Invocation of the Disaster Relief Act	25 municipalities (2 prefectures)	241 municipalities (10 prefectures) *Including 4 municipalities (2 prefectures) that invoked the Act for an earthquake centered in northern Nagano prefecture	
Seismic intensity distribution map (showing seismic intensity of 4 and above)			

Note: The seismic intensity levels were revised in 1996 to newly add Lower 5, Upper 5, Lower 6, and Upper 6.
Source: Created by the Cabinet Office from Cabinet Office materials, Fire and Disaster Management Agency materials, and UNOCHA materials.

Fig. A-19 Damage Estimate for the Great East Japan Earthquake

June 24, 2011

Category	Damage (Approx. Value)
Structures (Homes/housing sites, stores/offices, factories, machines, etc.)	JPY 10.4 trillion
Lifeline facilities (Water, gas, electricity, communications/broadcasting facilities)	JPY 1.3 trillion
Infrastructure facilities (Rivers, roads, ports, sewers, airports, etc.)	JPY 2.2 trillion
Agriculture, forest, and fisheries-related facilities (Farmland/agricultural facilities, forests and fields, fisheries-related facilities, etc.)	JPY 1.9 trillion
Other (Educational facilities, healthcare/social welfare facilities, waste treatment facilities, other public facilities)	JPY 1.1 trillion
Total	JPY 16.9 trillion

Note: This information has been compiled by Disaster Management Bureau of the Cabinet Office based on information provided by individual prefectures and relevant ministries and agencies regarding damage to property (including buildings, lifeline facilities, and infrastructure facilities). Information is subject to change as the details become clear. In addition, the total and breakdown may not agree due to rounding.

Source: Cabinet Office

Fig. A-20 Main Volcanic Eruptions and Eruption Disasters in Japan

Year of Eruption	Name of Volcano	No. of Victims	Eruption and Damage Characteristics
1640	Hokkaido-Komagatake*	At least 700	Sector collapse, debris flow, tsunami, large amount of falling ash, pyroclastic flow
1663	Usuzan*	5	Nearby homes disappeared or were buried
1664	Unzendake	At least 30	Lava flow, flood of water from crater
1667	Tarumaesan*		Pyroclastic flow, large amount of falling ash/pumice
1694	Hokkaido-Komagatake		Eruption with earthquake/volcanic thunder, falling pumice stone, pyroclastic flow
1707	Fujisan *		"Great Hoei eruption," large amount of falling ash, landslide disaster after eruption
1721	Asamayama	15	Cinders
1739	Tarumaesan *		Pyroclastic flow, large amount of falling ash/pumice
1741	Oshima-Oshima	1,467	Sector collapse, large tsunami occurred due to debris avalanche
1769	Usuzan		Large amount of falling ash/pumice, pyroclastic flow
1777	Izu-Oshima		"Great Anei eruption," lava flow, scoria fall
1779	Sakurajima*	At least 150	"Great Anei eruption," cinders, lava flow
1781	Sakurajima	15	Eruption on an island off of Komen, tsunami
1783	Asamayama	1,151	"Great Tenmei eruption," pyroclastic flow, lava flow, flooding of Agatsuma River and Tone River
1785	Aogashima	130–140	Cinders, mud, more than one-third of islanders became victims. Uninhabited island for more than 50 years thereafter
1792	Unzendake	15,000	"Shimabara taihen, Higo meiwaku," tsunami on opposing shore due to collapse of Mt. Mayuyama
1822	Usuzan	50–103	Pyroclastic flow, former Abuta village totally destroyed
1853	Usuzan		Large amount of volcanic ash/pumice, formation of lava dome, pyroclastic flow
1856	Hokkaido-Komagatake	21–29	Falling pumice, pyroclastic flow
1888	Bandaisan*	461–477	5 towns and 11 villages buried in debris avalanche, debris flow (volcanic mud flow)
1900	Adatarayama	72	Cinders, sulfur mine at crater totally destroyed
1902	Izu-Torishima	125	All islanders became victims
1914	Sakurajima*	58	"Great Taisho eruption," volcanic thunder, lava flow, earthquake, air wave, villages buried, large amount of falling ash
1926	Tokachidake	144	Larger mudflow, towns of Kamifurano and Biei buried
1929	Hokkaido-Komagatake	2	Large amount of falling ash/pumice, pyroclastic flow, volcanic gas damage
1940	Miyakejima	11	Large amount of volcanic ash/volcanic bombs, lava flow
1952	Beyonesu (Bayonnaise) Rocks (Myojin-sho)	31	Pyroclastic surge
1943–45	Usuzan	1	Large amount of volcanic ash, cinders, formation of Showa-shinzan (new mountain)
1958	Asosan	12	Cinders
1991	Unzendake	43	Pyroclastic flow, debris flow
2014	Ontakesan	58	Cinders

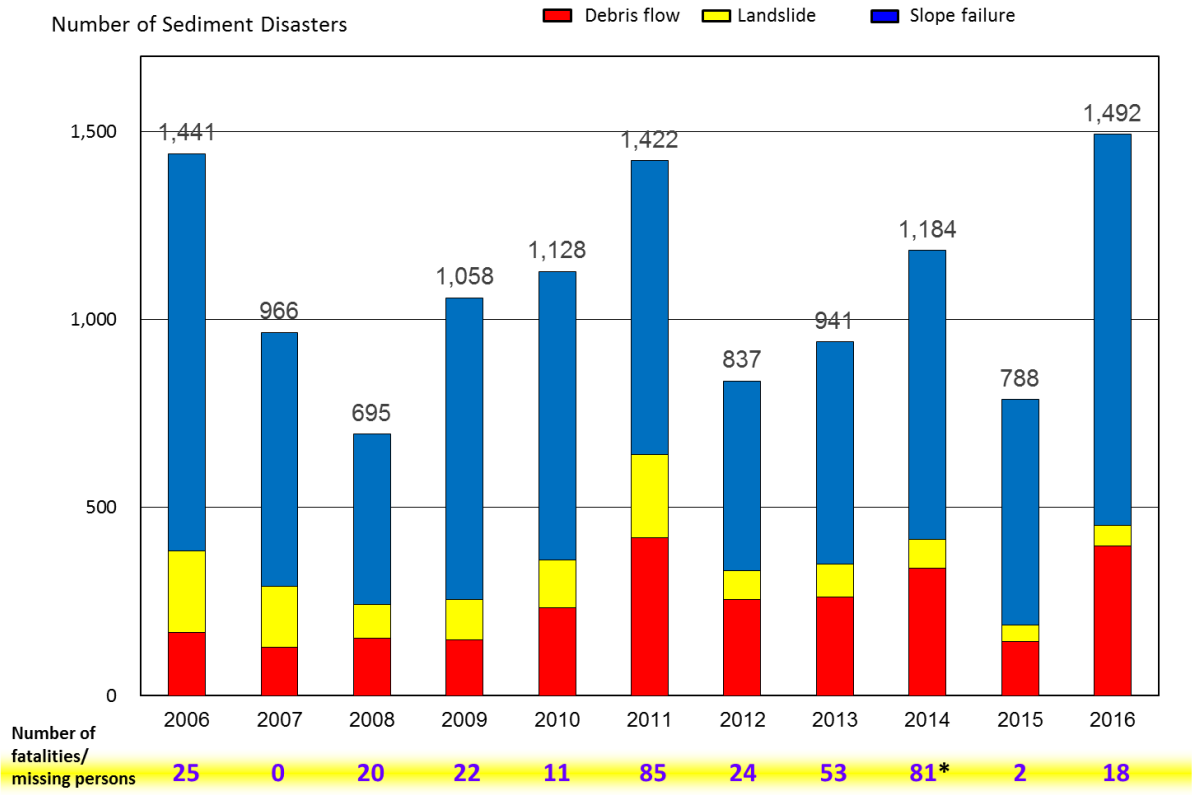
Note: Lists "Eruption disasters with 10 or more fatalities and/or missing persons" and "Large eruptions with an apparent volume of ejecta of 0.1 km^3 or more"

*Indicates eruptions with apparent volume of ejecta of more than 1 km^3

Source: Created by the Cabinet Office based on the National Catalogue of the Active Volcanoes in Japan (4th Edition) (edited by the Japan Meteorological Agency, 2013).

Fig. A-21 Number of Sediment Disasters

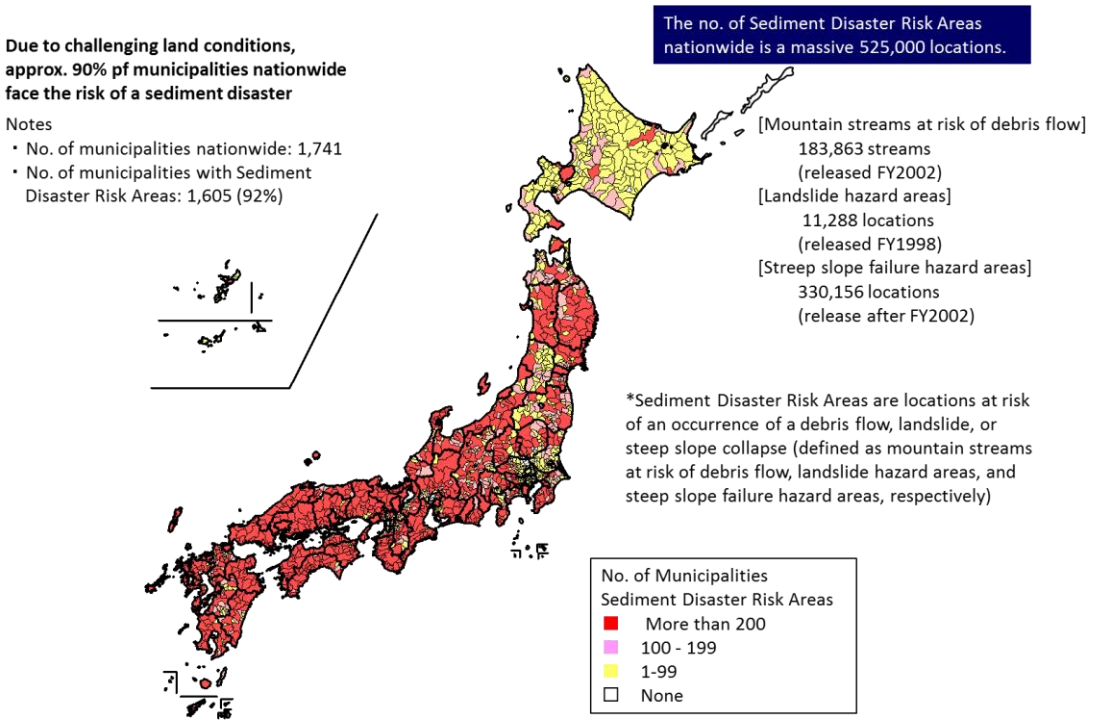
As of December 31, 2016



*In addition, there were 3 disaster-related deaths due to the Hiroshima Sediment Disaster

Source: Ministry of Land, Infrastructure, Transport and Tourism

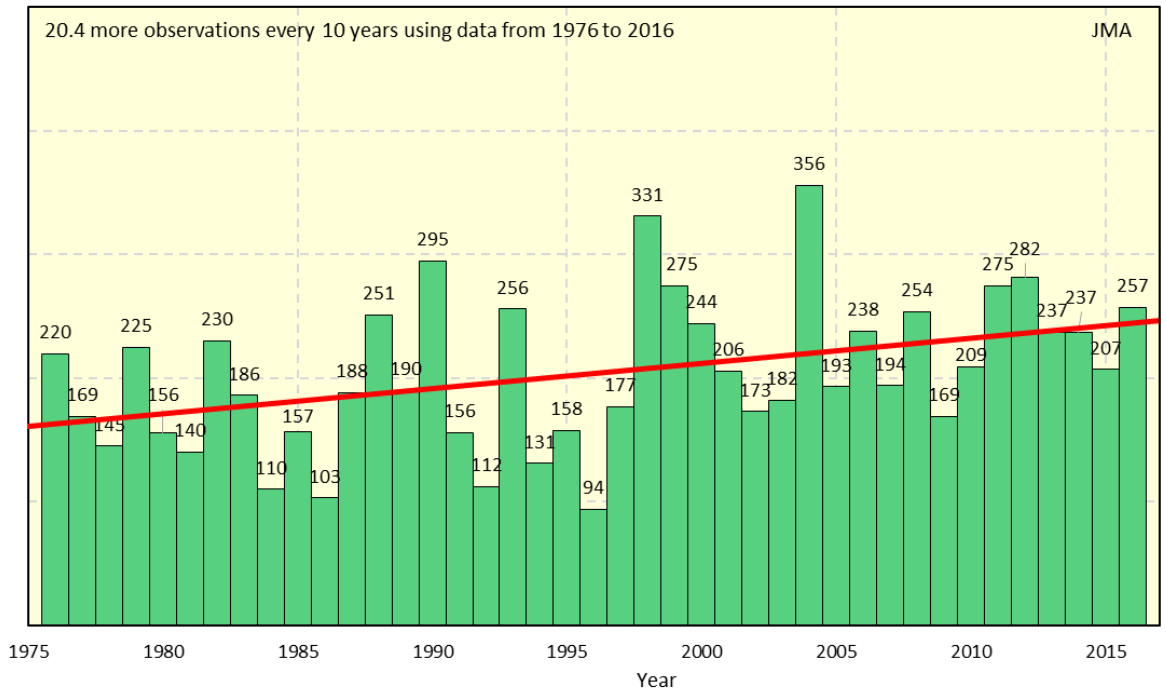
Fig. A-22 Sediment Disaster Risk Areas by Municipalities



Source: Ministry of Land, Infrastructure, Transport and Tourism, as of March 31, 2015

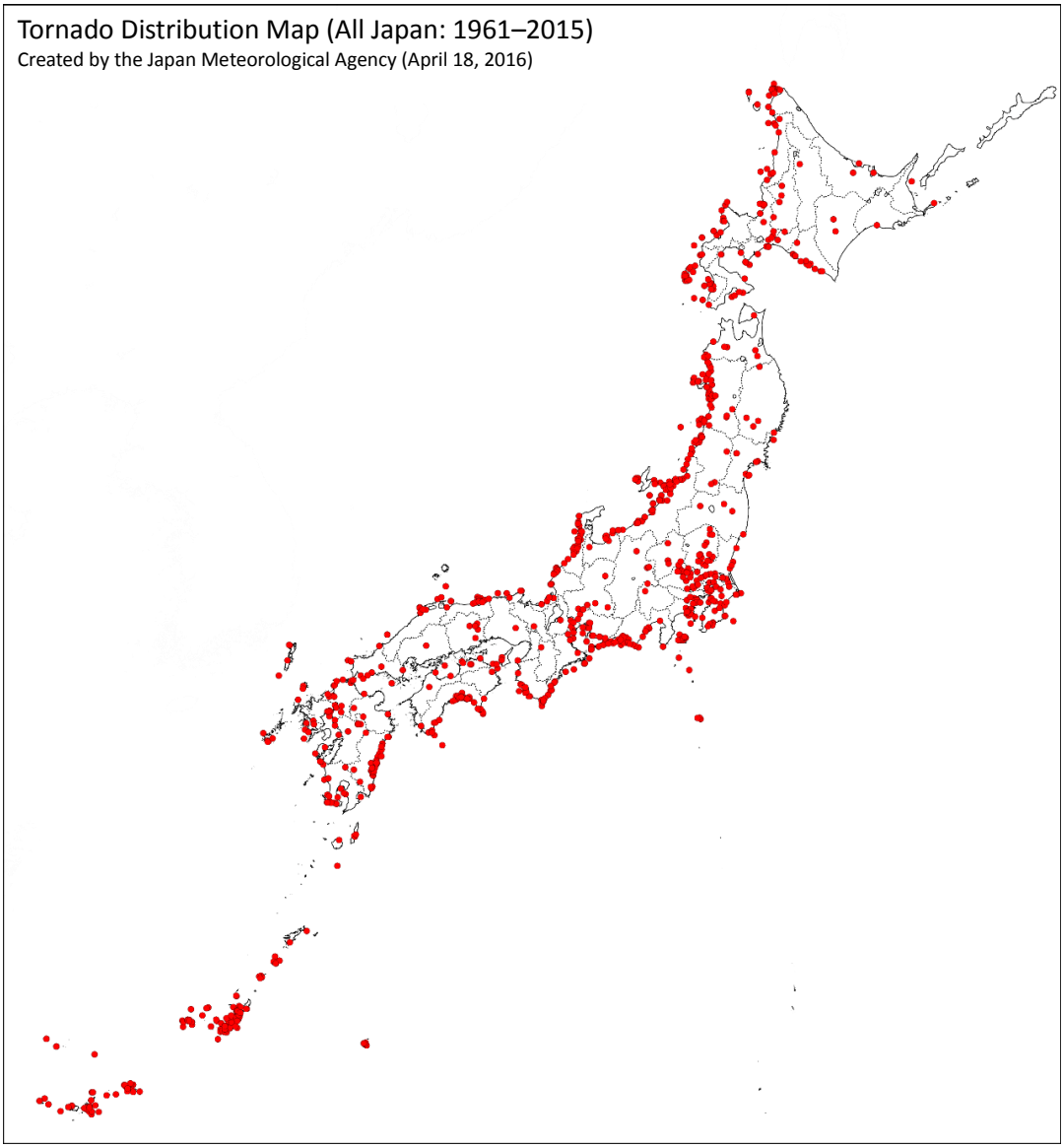
Fig. A-23 Increase in Torrential Rain During Short Periods

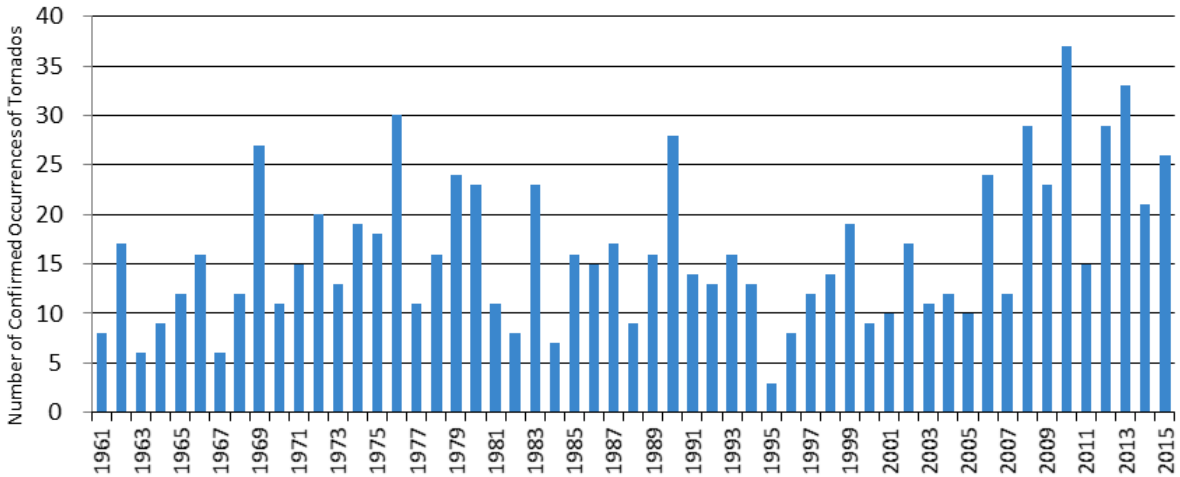
[AMEDAS] Annual Frequency of Observation of 50 mm or More of Rainfall Per Hour



Source: Japan Meteorological Agency (website)

Fig. A-24 Number of Confirmed Occurrences of Tornados





Source: (Upper) Japan Meteorological Agency.
(Lower) Created by the Cabinet Office based on the document, "Number of Confirmed Occurrences by Year (1961–2015)" on the Japan Meteorological Agency website.

Fig. A-25 Major Natural Disasters in the World Since 1900

Year	Disaster Type	Country (Areas)	Fatalities/Missing Persons (approx.)
1900	Hurricane Galveston	Texas, USA	6,000
1902	Volcanic Eruption	Martinique (West Indies, Mt. Pelée)	29,000
1902	Volcanic Eruption	Santa Maria Volcano, Guatemala	6,000
1905	Earthquake	Northern India	20,000
1906	Earthquake (Chiayi earthquake)	Taiwan	6,000
1906	Earthquake/Fire	San Francisco, USA	1,500
1906	Earthquake	Chile	20,000
1906	Typhoon	Hong Kong	10,000
1907	Earthquake	Tianshan, China	12,000
1907	Earthquake	Uzbekistan (former Soviet Union)	12,000
1908	Earthquake (Messina earthquake)	Sicily, Italy	75,000
1911	Flood	China	100,000
1911	Volcanic Eruption	Taal Volcano, Philippines	1,300
1912	Typhoon	Wenzhou, China	50,000
1915	Earthquake	Central Italy	30,000
1916	Landslide	Italy, Austria	10,000
1917	Earthquake	Bali, Indonesia	15,000
1918	Earthquake	Guangdong, China	10,000
1919	Volcanic Eruption	Kelut Volcano, Indonesia	5,200
1920	Earthquake/Landslide (Haiyuan earthquake)	Gansu, China	180,000
1922	Typhoon	Shantou, China	100,000
1923	Earthquake/Fire (Great Kanto earthquake)	Southeast Kanto region, Japan	143,000
1927	Earthquake (Kitatango earthquake)	Northern Kyoto, Japan	2,930
1927	Earthquake	Nanchang, China	200,000
1928	Hurricane/Flood	Florida, USA	2,000
1930	Volcanic Eruption	Merapi volcano, Indonesia	1,400
1931	Flood	Coastal areas of the Yangtze River and other rivers in China	3,700,000
1932	Earthquake (Gansu earthquake)	Gansu, China	70,000
1933	Flood	Henan, China	18,000
1933	Tsunami (Showa Sanriku Tsunami)	Sanriku, Japan	3,000
1933	Earthquake	China	10,000
1935	Flood	China	142,000
1935	Earthquake (Quetta Earthquake)	Baltistan, Pakistan	60,000
1939	Earthquake/Tsunami	Chile	30,000
1939	Flood	Hunan, China	500,000
1939	Earthquake	Eastern Turkey	32,962
1942	Cyclone	Bangladesh	61,000
1942	Cyclone	Orissa, India	40,000
1943	Earthquake	Tottori, Japan	1,083
1944	Earthquake (Showa Tonankai Earthquake)	Tonankai, Japan	1,200
1944	Earthquake	Midwestern Argentina	10,000
1945	Earthquake (Mikawa Earthquake)	Aichi, Japan	2,300
1945	Typhoon (Typhoon Makurazaki)	Western Japan	3,700
1946	Earthquake/Tsunami (Showa Nankai Earthquake)	Nankai, Japan	1,400
1947	Typhoon (Typhoon Kathleen)	North of Tohoku, Japan	1,900
1948	Earthquake (Fukui Earthquake)	Fukui, Japan	3,900
1948	Earthquake (Ashgabat Earthquake)	Turkmenistan (former Soviet Union)	110,000
1949	Earthquake/Landslide	Tajikistan (former Soviet Union)	12,000
1949	Flood	China	57,000
1949	Flood	Guatemala	40,000
1951	Volcanic Eruption	Mt. Lamington, Papua New Guinea	2,900
1953	Flood	Coastal areas of the North Sea	1,800
1953	Flood	Kyushu, Japan	1,000
1953	Flood	Honshu, Japan	1,100
1954	Flood	China	40,000
1954	Typhoon (Typhoon Toyamaru)	Japan	1,700
1959	Flood	China	2,000,000
1959	Typhoon (Typhoon Ise-wan)	Japan	5,100
1960	Flood	Bangladesh	10,000
1960	Earthquake	Southwestern Morocco	12,000
1960	Earthquake/Tsunami	Chile	6,000
1961	Cyclone	Bangladesh	11,000

Year	Disaster Type	Country (Areas)	Fatalities/Missing Persons (approx.)
1962	Earthquake	Northwestern Iran	12,000
1963	Cyclone	Bangladesh	22,000
1965	Cyclone	Bangladesh	36,000
1965	Cyclone	Southern Pakistan	10,000
1968	Earthquake	Northwestern Iran	12,000
1970	Earthquake	Yunnan, China	10,000
1970	Earthquake/Landslide	Northern Peru	70,000
1970	Cyclone Bhola	Bangladesh	300,000
1971	Cyclone	Orissa, India	10,000
1972	Earthquake (Managua earthquake)	Nicaragua	10,000
1974	Earthquake	Yunnan and Sichuan, China	20,000
1974	Flood	Bangladesh	28,700
1975	Earthquake	Liaoning, China	10,000
1976	Earthquake (Guatemala earthquake)	Guatemala	24,000
1976	Earthquake (Tangshan earthquake)	Tianjin, China	242,000
1977	Cyclone	Andhra Pradesh, India	20,000
1978	Earthquake	Northeastern Iran	25,000
1982	Volcanic Eruption	El Chichon Volcano, Mexico	17,000
1985	Cyclone	Bangladesh	10,000
1985	Earthquake	Mexico City, Mexico	10,000
1985	Volcanic Eruption	Nevado del Ruiz Volcano, Colombia	22,000
1986	Toxic gas	Lake Nyos, Western Cameroon	1,700
1986	Earthquake	San Salvador, El Salvador	1,000
1987	Earthquake	Northwestern Ecuador	5,000
1987	Flood	Bangladesh	1,000
1988	Earthquake	India, Nepal	1,000
1988	Flood	Bangladesh	2,000
1988	Earthquake (Spitak Earthquake)	Armenia (former Soviet Union)	25,000
1988	Earthquake	Yunnan, China	1,000
1989	Flood	India	1,000
1989	Flood/Landslide	Sichuan, China	2,000
1990	Earthquake (Manjil Earthquake)	Northern Iran	41,000
1990	Earthquake	Philippines	2,000
1991	Cyclone/Storm Surge	Chittagong, Bangladesh	137,000
1991	Flood	Jiangsu, China	1,900
1991	Typhoon Thelma	Philippines	6,000
1992	Flood	Pakistan	1,300
1992	Earthquake/Tsunami	Indonesia	2,100
1993	Flood	Nepal	1,800
1993	Earthquake (Maharashtra Earthquake)	India	9,800
1993	Flood	India	1,200
1994	Torrential Rain, Flood	India	2,000
1994	Typhoon, Flood	Six Southern Provinces of China	1,000
1994	Tropical Storm	Haiti	1,100
1995	Earthquake (Great Hanshin-Awaji Earthquake)	Japan	6,300
1995	Earthquake	Russia	1,800
1995	Flood	China	1,200
1996	Flood/Typhoon	Seven southern and five northern and northwestern provinces of China	2,800
1996	Typhoon/Flood	Viet Nam	1,000
1997	Earthquake	Eastern Iran	1,600
1997	Flood	India	1,400
1997	Flood	Southern Somalia	2,000
1997	Typhoon Linda	Southern Viet Nam	3,700
1998	Earthquake	Northern Afghanistan	2,300
1998	Earthquake	Northern Afghanistan	4,700
1998	Flood/Landslide	Assam state, India	3,000
1998	Cyclone	India	2,900
1998	Flood	Bangladesh	1,000
1998	Flood	Coastal areas of the Yangtze River and other rivers in China	3,700
1998	Tsunami (Aitape Tsunami)	Papua New Guinea	2,600
1998	Hurricane Mitch	Honduras, Nicaragua	17,000
1999	Earthquake (Quindio Earthquake)	Mid-western Colombia	1,200
1999	Earthquake (Izmit Earthquake)	Western Turkey	15,500
1999	Earthquake (Chi-Chi earthquake)	Taiwan	2,300
1999	Cyclone	India	9,500

Year	Disaster Type	Country (Areas)	Fatalities/Missing Persons (approx.)
2000	Flood	Venezuela	30,000
2001	Earthquake (Gujarat earthquake)	India	20,000
2001	Earthquake	El Salvador	1,200
2003	Earthquake	Northern Algeria	2,300
2003	Earthquake (Bam earthquake)	Iran	26,800
2004	Flood	Haiti	2,700
2004	Hurricane	USA, Jamaica, Puerto Rico, Haiti	3,000
2004	Earthquake, Tsunami (2004 Indian Ocean Earthquake and Tsunami)	Sri Lanka, Indonesia, Maldives, India, Thailand, Malaysia, Myanmar, Seychelles, Somalia, Tanzania, Bangladesh, Kenya	Over 226,000
2005	Flood/Landslide	India	1,200
2005	Hurricane Katrina	USA	1,800
2005	Rainstorm	India, Bangladesh	1,300
2005	Hurricane Stan/Flood	Guatemala, El Salvador, Mexico	1,500
2005	Earthquake (Pakistan earthquake)	Northern Pakistan and India	75,000
2006	Landslide	Philippines	1,100
2006	Earthquake/Volcanic Eruption	Merapi volcano, Indonesia	5,800
2006	Typhoon Xangsane	Luzon, Philippines	1,400
2007	Heavy Rain, Flood	India	1,100
2007	Cyclone Sidr	Bangladesh	4,200
2008	Earthquake (Great Sichuan Earthquake)	China	87,500
2008	Cyclone Nargis	Myanmar	138,400
2008	Flood	North-eastern India	1,100
2009	Earthquake (2009 Sumatra Earthquake)	Indonesia	1,200
2009	Flood	Southern India	1,200
2010	Earthquake (Haiti Earthquake)	Haiti	222,600
2010	Earthquake (Yushu Earthquake)	Qinghai, China	3,000
2010	Flood	North-western Pakistan	2,000
2010	Torrential Rain, Debris Flow	Yangtze River Basin, China	1,800
2011	Earthquake, Tsunami (Great East Japan Earthquake)	Tohoku and Kanto regions, Japan	19,000
2011	Typhoon Washi	Mindanao, Philippines	1,400
2012	Typhoon Bopha	Mindanao, Philippines	1,900
2013	Flood	Northern India	1,500
2013	Typhoon Haiyan	Leyte, Philippines	6,200
2015	Earthquake (Nepal Earthquake)	Nepal	9,000

Source: Prepared by the Cabinet Office based on materials from EM-DAT: The International Disaster Database (Centre for Research on the Epidemiology of Disasters (CRED), Université Catholique de Louvain).

Fig. A-26 Top 10 Largest Earthquakes Since 1900

(As of March 31, 2017)

Ranking	Date (Japan Time)	Location	Magnitude (Mw)
1	May 23, 1960	Chile	9.5
2	March 28, 1964	Gulf of Alaska	9.2
3	December 26, 2004	Off the West Coast of Northern Sumatra, Indonesia	9.1
4	March 11, 2011	Off the Sanriku Coast, Japan (Great East Japan Earthquake)	9.0
	November 5, 1952	Kamchatka Peninsula	9.0
6	February 27, 2010	Offshore Maule, Chile	8.8
	February 1, 1906	Offshore Ecuador	8.8
8	February 4, 1965	Aleutian Islands, Alaska	8.7
9	April 11, 2012	Off the West Coast of Northern Sumatra, Indonesia	8.6
	March 29, 2005	Northern Sumatra, Indonesia	8.6
	March 10, 1957	Aleutian Islands, Alaska	8.6
	August 16, 1950	Tibet, Assam	8.6
	April 1, 1946	Aleutian Islands, Alaska	8.6

Mw: Moment magnitude

Source: US Geological Survey

*The figure for the magnitude (Mw) of the Great East Japan Earthquake is from the Japan Meteorological Agency.

Fig. A-27 Major Natural Disasters Since 2016

Date	Country	Disaster Type	Fatalities	Affected People	Direct Damages (USD 1,000)
Jan.-May 2016	India	Drought	—	330,000,000	—
Jan.-Mar. 2016	Haiti	Drought	—	3,600,000	—
Jan.-Nov. 2016	Mozambique	Drought	—	2,000,000	—
Jan.4-8, 2016	USA	Rainstorms	—	—	125,000
Jan.9-15, 2016	Brazil	Flood	5	50,500	100,000
Jan.20-26, 2016	China	Cold wave	5	—	1,600,000
Jan.20-26, 2016	Republic of Korea	Cold wave	6	—	127,000
Jan.23-26, 2016	USA	Rainstorms	58	12	2,000,000
Feb.-Nov. 2016	South Sudan	Drought	—	3,600,000	—
Feb. 6, 2016	Taiwan	Earthquake	117	525	—
Feb. 20-21, 2016	Fiji	Tropical cyclone	44	350,000	470,000
Mar.-May 2016	Ethiopia	Flash flood	100	20,000	—
Mar. 6-7, 2016	Serbia	Flash flood	—	7,000	100,000
Mar. 10-11, 2016	Brazil	Flash flood	30	—	100,000
Mar. 19-22, 2016	China	Flash flood	5	219,300	170,000
Apr. 1-May 20, 2016	India	Heat wave	300	—	—
Apr. 2-8, 2016	Pakistan	Flood	121	2,400	—
Apr. 4-Oct. 1, 2016	Argentina	Flood	—	72,119	1,300,000
Apr. 10-13, 2016	USA	Rainstorms	—	—	3,500,000
Apr. 15-18, 2016	Chile	River flooding	12	100	100,000
Apr. 14 and 16, 2016	Japan	Earthquake	49	298,432	20,000,000
Apr. 16, 2016	Ecuador	Earthquake	683	1,230,000	3,300,000
Apr. 22-25, 2016	India	Flood	18	100,000	150,000
May 2016	Cambodia	Drought	—	2,500,000	—
May 1-9, 2016	Canada	Forest fire	—	7,200	3,900,000
May 4-11, 2016	China	Landslide	66	237,600	820,000
May 7-10, 2016	USA	Rainstorms	2	12	575,000
May 14-15, 2016	Sri Lanka	Flood	203	301,602	2,000,000
May 18-21, 2016	China	River flooding	12	44,100	447,000
May 21, 2016	Bangladesh	Tropical cyclone	27	1,300,000	—
May 31-Jun. 5, 2016	France	Flood	4	24	1,000,000
Jun.-Aug. 2016	China	Drought	—	10,000,000	1,600,000
Jun.-Nov. 2016	Kenya	Drought	—	1,254,600	—
Jun. 2-8, 2016	China	Rainstorms	12	150,000	768,000
Jun. 9-16, 2016	China	Flood	25	254,400	664,000
Jun. 16-23, 2016	China	Rainstorms	102	46,000	302,000
Jun. 18-20, 2016	China	Flood	42	197,000	410,000
Jun. 18-23, 2016	China	Flood	68	165,000	2,300,000
Jun. 23-30, 2016	China	Flood	34	150,000	675,000
Jun. 24, 2016	China	Rainstorms	102	46,000	302,000
Jun. 25-26, 2016	USA	Forest fire	2	891	100,000
Jun. 28-Jul. 6, 2016	China	Flood	128	160,000	5,729,590
Jul. 9, 2016	China	Tropical cyclone	75	24,900	1,511,160
Jul. 15-Aug. 3, 2016	India	Flood	127	377,097	—
Jul. 18-25, 2016	China	Flood	289	900,000	—
Jul. 19-Aug. 6, 2016	Bangladesh	River flooding	106	1,900,000	—

Date	Country	Disaster Type	Fatalities	Affected People	Direct Damages (USD 1,000)
Jul. 25-27, 2016	Nepal	Flood	138	10,551	—
Jul. 28-30, 2016	India	Flood	134	700,000	—
Jul. 28, 2016	Viet Nam	Tropical cyclone	1	191,750	191,000
Aug. 2, 2016	China	Rainstorms	—	18,000	123,000
Aug. 2, 2016	Viet Nam	Rainstorms	25	182,500	144,000
Aug. 5-10, 2016	China	Flood	23	36,900	123,000
Aug. 6-7, 2016	Macedonia	Flash flood	22	33,582	100,000
Aug. 6-7, 2016	Macedonia	Flash flood	22	33,582	100,000
Aug. 8-16, 2016	Philippines	Flood	26	1,263,098	9,320
Aug. 9-16, 2016	USA	Flood	13	330,000	8,733,000
Aug. 19-22, 2016	India	River flooding	40	—	312,000
Aug. 24, 2016	Italy	Earthquake	241	4,854	—
Aug. 29-Sep. 6, 2016	North Korea	River flooding	538	600,000	—
Sep. 1-6, 2016	USA	Tropical cyclone	3	2,250	800,000
Sep. 10, 2016	Tanzania	Earthquake	17	139,601	458,000
Sep. 15, 2016	China	Tropical cyclone	—	205,500	2,300,000
Sep. 19-23, 2016	USA	River flooding	2	—	100,000
Sep. 21-Oct. 16, 2016	India	Flood	17	3,000	479,000
Sep. 27, 2016	Taiwan	Tropical cyclone	7	160	110,000
Sep. 28, 2016	China	Tropical cyclone	35	36,000	830,000
Sep. 28-Oct. 10, 2016	Bahamas	Rainstorms	—	—	600,000
Sep. 28-Oct. 7, 2016	Cuba	Rainstorms	—	190,000	2,600,000
Sep. 28-Oct. 7, 2016	Haiti	Rainstorms	674	2,100,438	2,000,000
Oct. 5-12, 2016	Republic of Korea	Rainstorms	10	1,500	126,000
Oct. 7-9, 2016	USA	Rainstorms	49	—	10,000,000
Oct. 16-19, 2016	China	Tropical cyclone	—	—	890,000
Nov. 13, 2016	New Zealand	Earthquake	2	50	3,900,000
Nov. 18-26, 2016	Israel	Forest fire	—	60,137	520,000
Nov. 23-25, 2016	Italy	River flooding	2	400	100,000
Nov. 28-Dec. 2, 2016	USA	Forest fire	14	2,234	100,000
Dec. 7, 2016	Indonesia	Earthquake	100	152,138	—

Source: Prepared by the Cabinet Office based on materials including relevant information from countries, UN Office for the Coordination of Humanitarian Affairs (UNOCHA) and EM-DAT: The International Disaster Database (Centre for Research on the Epidemiology of Disasters (CRED), Université Catholique de Louvain).

(1) Ecuador Earthquake

On April 16, 2016 at 18:58 local time (08:58 on the 17th in Japan), Ecuador was struck by a magnitude 7.8 earthquake centered near the towns of Pedernales and Muisne, on the country's Pacific coast. This earthquake caused immense damage, resulting in damage to around 20,000 buildings, with at least 661 people killed and 12 missing. The focal depth was about 20 km and the Pacific Tsunami Warning Center called on people to be alert to the risk of tsunami on the Ecuadorean coast, but this alert was lifted around three hours later. About a month after the earthquake, on May 18, earthquakes with a magnitude of 6.8 and 6.9 struck Esmeraldas Canton, adjacent to Muisne Canton, resulting in two fatalities.

The Government of Japan provided emergency support in the areas of water and hygiene, shelter, and emergency grant aid for prompt repairs via through the United Nations Children's Fund (UNICEF), the International Organization for Migration (IOM), and the United Nations Development Programme (UNDP), and also provided disaster relief supplies (tents, etc.)

(2) Italy Earthquake

On August 24, 2016 at 03:36 local time (10:36 in Japan), Central Italy was struck by a magnitude 6.2 earthquake centered on the province of Rieti, in the region of Lazio. The earthquake caused many buildings to collapse in five provinces across four regions, mainly in Lazio, and resulted in 241 fatalities and more than 400 people injured, while more than 1,000 people had to evacuate. A total of 460 earthquakes were observed between 03:00, when the first quake occurred, and 07:00 that morning, two of which had a magnitude in excess of 5. Many historic buildings in areas such as Amatrice, in Lazio's Rieti Province, were also damaged.

Due to fears of secondary damage due to landslides and the collapse of buildings weakened by the earthquake, the Government of Japan issued a warning to Japanese nationals living in or planning to travel to or stay in Lazio's Rieti Province, Umbria's Terni Province, Marche's Ascoli Piceno and Fermo provinces, and Abruzzo's Teramo Province.

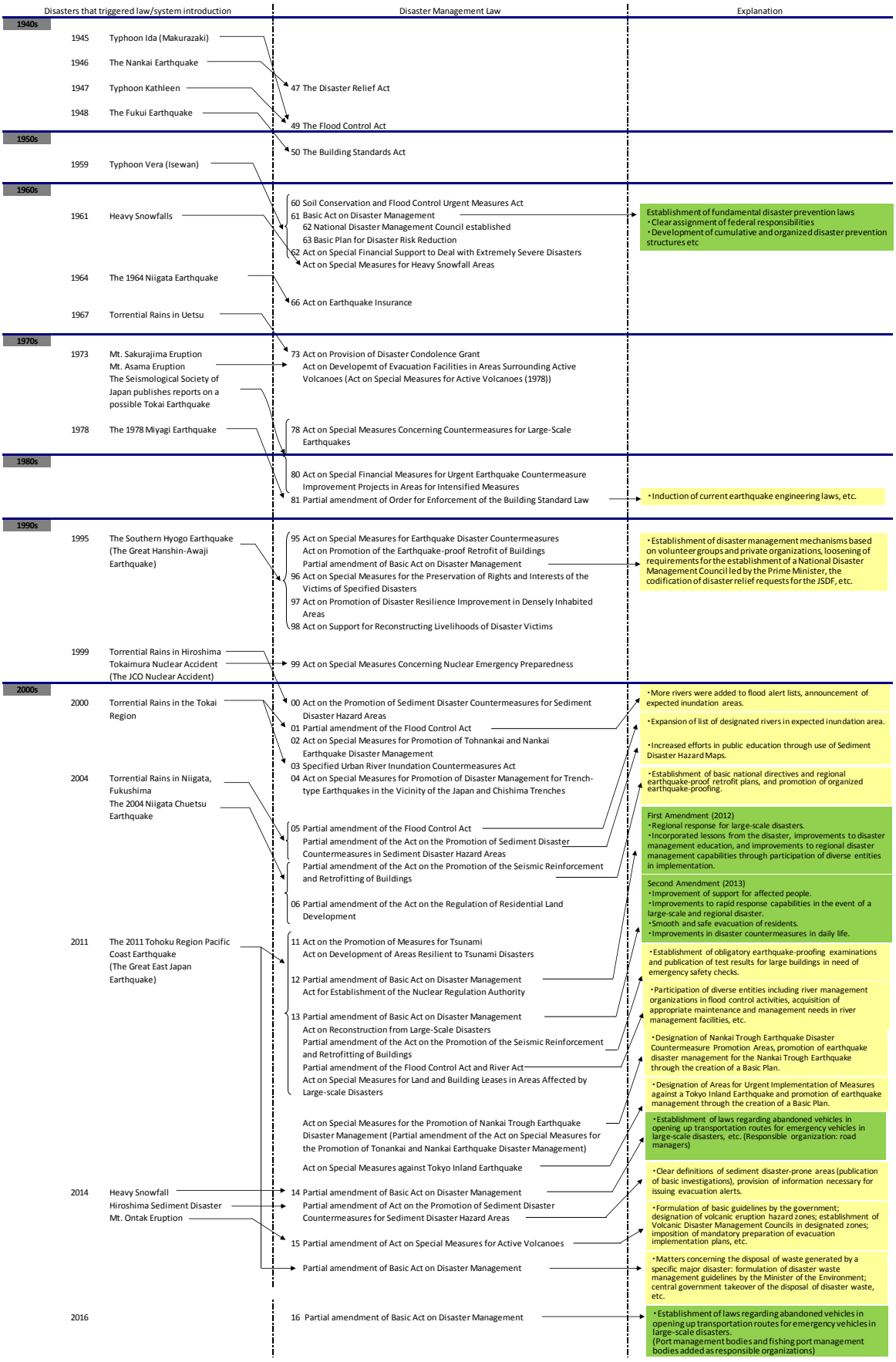
(3) Hurricane in Haiti

On October 4, 2016, Hurricane Matthew struck southern Haiti's Tiburon Peninsula, with winds of up to approximately 64 m (230 km/h) recorded. The hurricane caused 546 fatalities, with 128 people missing and 432 injured. Floods and landslides destroyed approximately 500 homes, with a further 25,160 or so sustaining serious damage and around 2,380 suffering flooding. Roads, schools, and other structures also sustained major damage, with interruptions to power and water supplies, and more than 170,000 people were forced to evacuate. Medical facilities in the affected area are vulnerable, so there were concerns about outbreaks of cholera and other infectious diseases in the immediate aftermath of the hurricane.

The Government of Japan provided support in the areas of food, transport of humanitarian relief supplies, and prompt repairs through the United Nations Children's Fund (UNICEF), the World Food Programme (WFP), the International Federation of Red Cross and Red Crescent Societies (IFRC), and the United Nations Development Programme (UNDP). In addition, it provided support in the areas of water and hygiene, and health and medical care to address infectious diseases, and provided disaster relief supplies (tents, etc.)

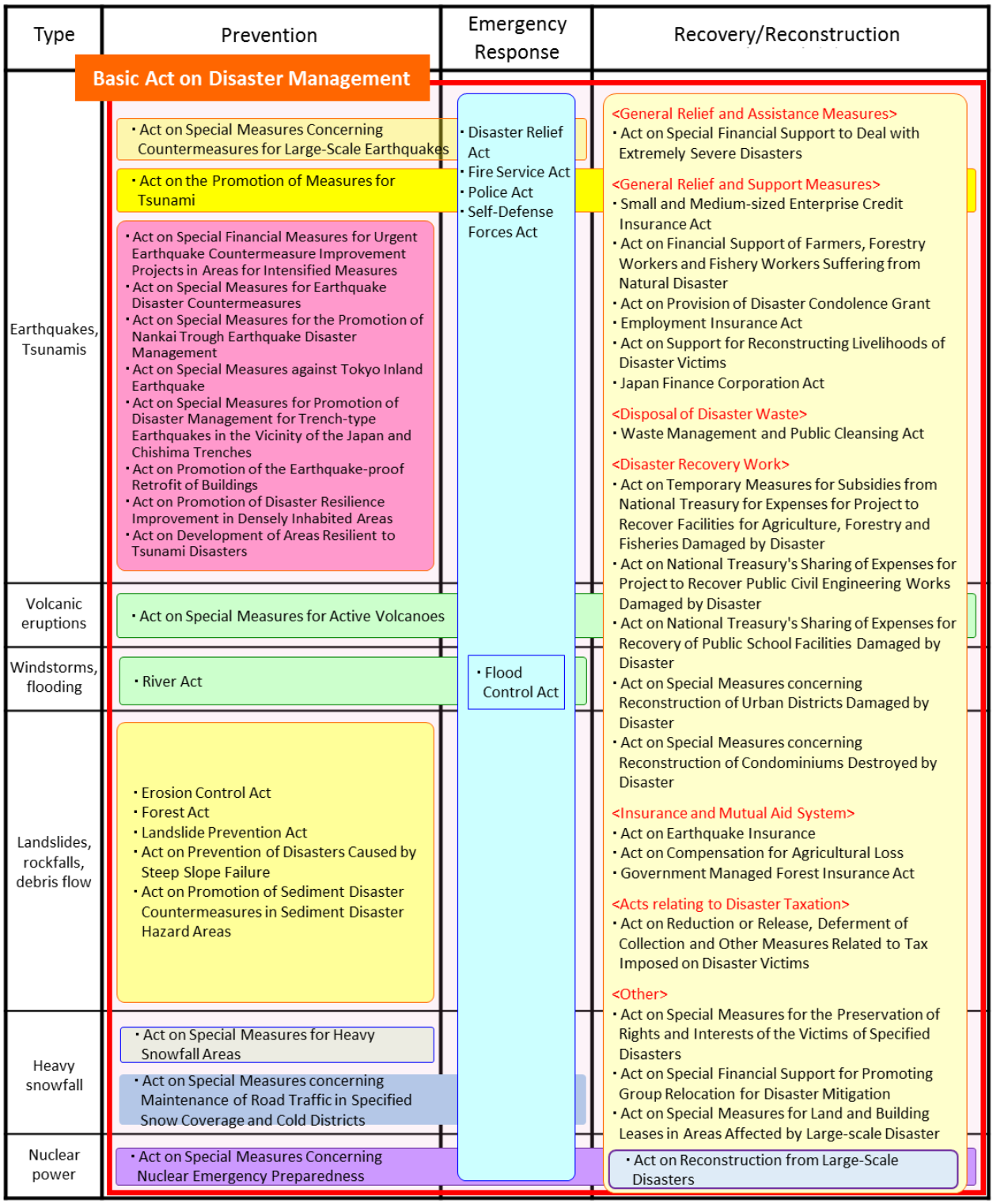
3. Laws and Systems

Fig. A-28 Progress on Disaster Management Laws and Systems Since 1945



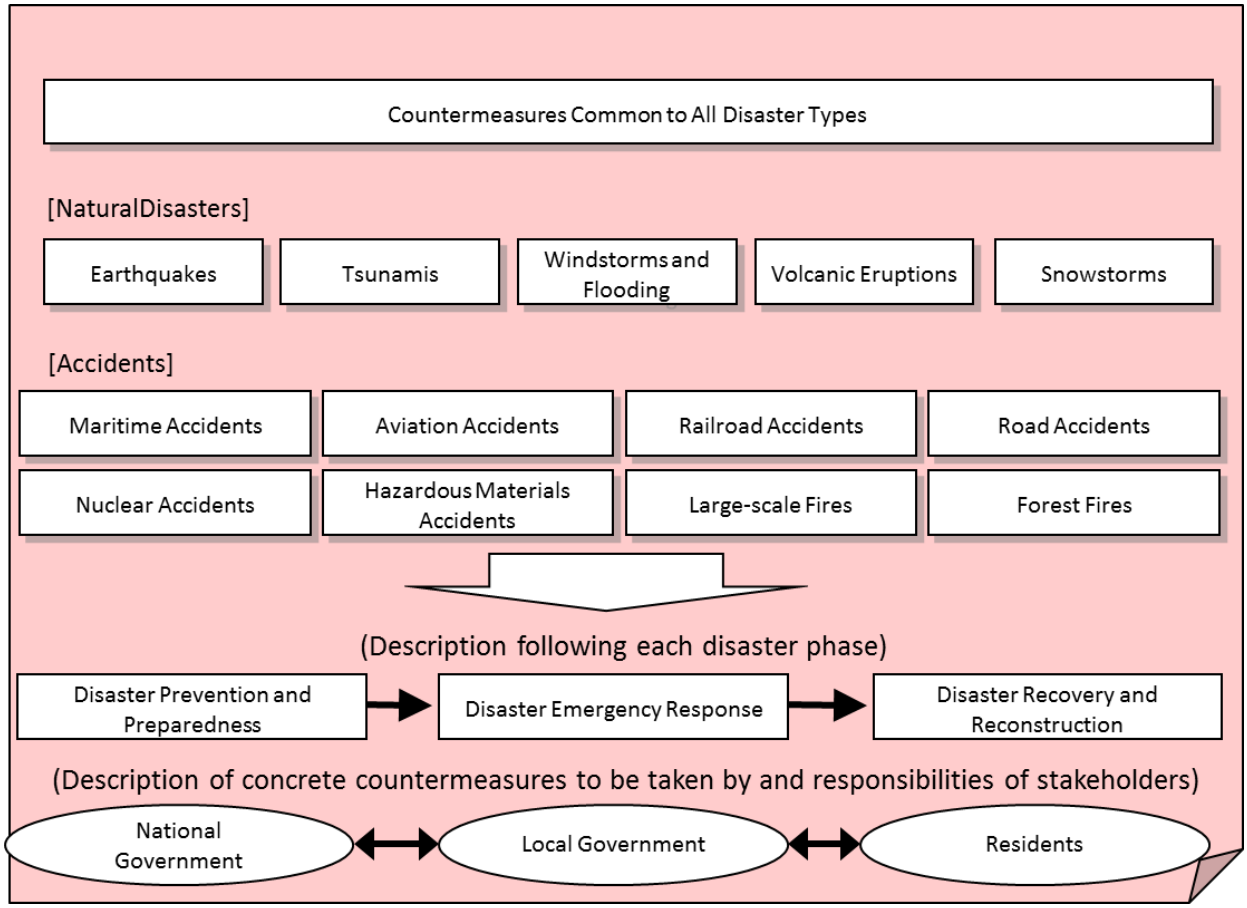
Source: Cabinet Office

Fig. A-29 Major Disaster Management Laws by Type of Disaster



Source: Cabinet Office

Fig. A-30 Structure and System of the Basic Plan for Disaster Risk Reduction



Source: Cabinet Office

Fig. A-31 History of Revisions to the Basic Plan for Disaster Risk Reduction

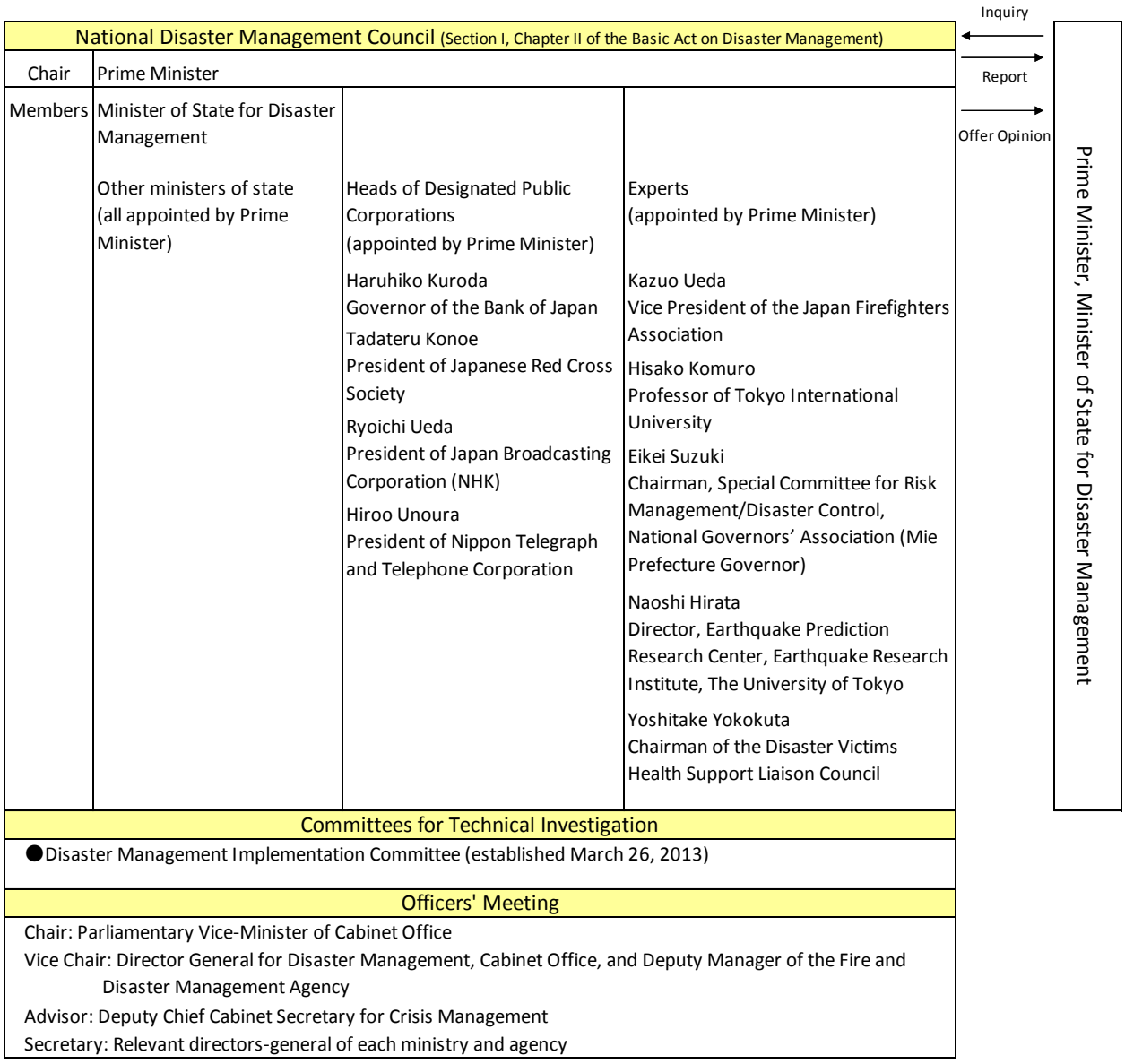
Revision Date	Outline of Revision	Background
June 1963	- The Basic Plan for Disaster Risk Reduction formulated based on the Basic Act on Disaster Management - Stipulations regarding various measures to prevent natural disasters, mitigate damage, and promote disaster reconstruction	Sep. 26, 1959: Typhoon Ise-wan Nov. 15, 1961: Enactment of the Basic Act on Disaster Management
May 1971	Partial revision - Enhancement of earthquake countermeasures (facilities for earthquake prediction, preparation of fire fighting helicopters) - Renewed positioning of countermeasures to tackle hazardous materials, petrochemical complexes, and wildfires	Sep. 6, 1967 Recommendation concerning Disaster Prevention Measures (recommending revisions in response to a modern socioeconomy)
July 1995	Complete revision - Structured this version by disaster type, and included stipulations in the following order: prevention, emergency response, recovery/reconstruction - Clearly defined the stakeholders, such as national governments, public agencies, local governments, and businesses, and specified countermeasures - Stipulated that changes in social structure such as the aging of society should be taken into account	Jan. 17, 1995: Great Hanshin-Awaji Earthquake
June 1997	Partial revision - Addition of section on countermeasures to address disasters caused by accidents (structural improvements such as the establishment of an emergency countermeasures headquarters) - Addition of a section on snowstorm countermeasures	Jan. 2, 1997: Nakhodka Oil Spill Accident
May 2000	Partial revision - Revision of the section on countermeasures to tackle nuclear power disasters, following the enactment of the Act on Special Measures Concerning Nuclear Emergency Preparedness	Sep. 30, 1999: Criticality accident at uranium fabrication plant in Tokai-mura, Ibaraki prefecture
December 2000	Partial revision - Revisions resulting from the national government reformation	National government reformation
April 2002	Partial revision - Enhancement of descriptions relating to information transmission to residents and evacuation measures regarding countermeasures against flooding, sediment disasters, and storm surges - New positioning of nuclear power disasters related to nuclear vessels	Jun. 29, 1999: Torrential rain disaster in Hiroshima Prefecture Sep. 24, 1999: Storm surge disaster in Kumamoto Prefecture
March 2004	Partial revision - Revisions based on the creation of the Basic Plan for the Promotion of Tonankai and Nankai Earthquake Countermeasures (seismic retrofitting of public buildings, etc.) - Revisions based on the development of policies such as the development of an earthquake early warning system	Mar. 31, 2004: Creation of a Basic Plan for the Promotion of Tohnankai and Nankai Earthquake Countermeasures
July 2005	Partial revision - Revisions based on developments in policy, such as the promotion of a nationwide movement to practice disaster preparedness, the promotion of corporate disaster risk reduction efforts, the formulation and implementation of an earthquake DRR strategy, tsunami DRR measures such as the development of tsunami evacuation buildings, information transmission during torrential rains, evacuation support for the elderly, etc.	July 28, 2004: Creation of an Earthquake Disaster Risk Reduction Strategy Dec. 26, 2004: Indian Ocean Tsunami (Sumatra/Andaman Earthquake)
March 2007	Partial revision - Revisions resulting from the transition from Defense Agency to Ministry of Defense	Transition from Defense Agency to Ministry of Defense
February 2008	Partial revision - Implementation of follow-up actions on key issues regarding the Basic Plan for Disaster Risk Reduction, development of strategic national movements, establishment of conditions for the promotion of corporate disaster risk reduction, full-scale introduction of earthquake early warning system, strengthening of nuclear power disaster countermeasures in light of lessons learned from the Niigataken Chuetsu-oki Earthquake	July 16, 2007:The Niigataken Chuetsu-oki Earthquake
December 2011	Partial revision - Radical strengthening of earthquake/tsunami countermeasures in light of the Great East Japan Earthquake (addition of tsunami disaster countermeasure section)	Mar. 11, 2011 The Great East Japan Earthquake
September 2012	Partial revision - Strengthening of countermeasures against large-scale regional disasters in light of revisions to the Basic Act on Disaster Management (First Revision), and the final report of the National Disaster Management Council's Committee for Policy Planning on Disaster Management (each section) - Strengthening of nuclear power disaster countermeasures in light of the enactment of the Act for Establishment of the Nuclear Regulation Authority (nuclear power disaster countermeasures section)	Mar. 11, 2011 The Great East Japan Earthquake Jun. 27, 2012 Partial revisions to the Basic Act on Disaster Management Sep. 19, 2012 Inauguration of the Nuclear Regulatory Authority
January 2014	Partial revision - Strengthening of countermeasures against large-scale disasters in light of revisions to the Basic Act on Disaster Management (Second Revision) and the enactment of the Act on Reconstruction from Large-Scale Disasters (each section) - Strengthening of nuclear disaster countermeasures in light of investigations by the Nuclear Regulation Authority	Mar. 11, 2011 The Great East Japan Earthquake Jun. 21, 2013 Partial revisions to the Basic Act on Disaster Management, enactment of the Act on Reconstruction from Large-Scale Disasters

Revision Date	Outline of Revision	Background
November 2014	Partial revision - Strengthening of countermeasures against abandoned and stranded vehicles following revision of the Basic Act on Disaster Management - Addition of descriptions in light of lessons learned from heavy snowfall of February 2014, such as the diversification of information transmission methods such as warnings of heavy snow	Feb. 2014: Heavy snowfall Nov. 21, 2014: Partial revisions to the Basic Act on Disaster Management
March 2015	Partial revision - Improvement and strengthening of nuclear disaster risk reduction systems e.g., through the establishment of local nuclear disaster management committees and national support for the enhancement of local plans for disaster risk reduction/evacuation plans (nuclear disaster countermeasures section)	Mar. 5, 2015: Cabinet Secretariat Three-Year Revision and Investigation Team "Improvement and Strengthening of the Nuclear Disaster Management System (Second Report)"
July 2015	Partial revision -Revisions resulting from the strengthening of measures in light of lessons learned from the Hiroshima Sediment Disaster and the Mt. Ontake Eruption (each section)	Jan. 18, 2015: Partial revisions to the Act on the Promotion of Sediment Disaster Countermeasures in Sediment Disaster Hazard Areas Mar. 26, 2015: Working Group for the Promotion of Volcano Disaster Prevention report Jun. 4, 2015: Working Group for Studying Comprehensive Countermeasures against Sediment Disasters report
February 2016	Partial revision -Revisions resulting from the strengthening of measures in light of the revision of laws, including the Act on Special Measures for Active Volcanoes, the Flood Control Act, the Sewerage Act, the Waste Management and Public Cleansing Act, and the Basic Act on Disaster Management (each section)	Dec. 10, 2015: Partial revisions to the Act on Special Measures for Active Volcanoes
May 2016	Partial revision -Revisions resulting from the strengthening of measures in light of lessons learned from the Torrential Rain of September 2015 in the Kanto and Tohoku Regions (each section)	Mar. 31, 2016: Working Group on Study on Evacuation and Emergency Response Measures for Flood Disasters report
April 2017	Partial revision -Revisions resulting from the strengthening of measures in light of lessons learned from the 2016 Kumamoto Earthquake and 2016 Typhoon 10 disaster (each section)	Dec. 20, 2016: Report of the Working Group for Studying Emergency Response and Livelihood Support Measures in Light of the Kumamoto Earthquake Dec. 26, 2016: Report of the Study Group on Guidelines for Producing a Handbook on Decision and Dissemination for Evacuation Recommendations

Source: Cabinet Office

4. Organizations

Fig. A-32 Organization of the National Disaster Management Council



[Role]

- ○ Formulate a Basic Plan for Disaster Risk Reduction and Earthquake Disaster Management Plan and promote their implementation
- ○ Discuss important issues related to disaster management in response to inquiries from the Prime Minister or the Minister of State for Disaster Management (e.g., basic approaches to disaster management, comprehensive coordination of disaster management policies, and the declaration of states of emergency)
- ○ Offer opinions on important issues related to disaster management to the Prime Minister or the Minister of State for Disaster Management

Source: Cabinet Office

Fig. A-33 Recent Meetings of the National Disaster Management Council (Since 2009)

FY2009	
Apr. 21, 2009	• FY2009 Comprehensive Disaster Management Drill Framework • Framework for Chubu and Kinki Region Inland Earthquake Countermeasures • New Promotion of Earthquake Research • Volcanic eruption possibilities and DRR measures
Jan. 15, 2010	• Establishment of the Committee for the Technical Investigation of Best Practices for Earthquake Disaster Management in Regional Cities • Revisions to the General Framework for Tokyo Inland Earthquake Countermeasures • Report of the Committee for the Technical Investigation of the Dissemination of Lessons Learned from Disasters • Earthquake DRR measures in Japan
FY2010	
Apr. 21, 2010	• FY2010 Comprehensive Disaster Management Drill Framework • Establishment of the Committee for the Technical Investigation of Disaster Evacuation • Report of the Committee for the Technical Investigation of Large-Scale Flood Measures • Tsunamis caused by earthquakes centered along the coast of Chile • Tokyo Metropolitan Area Flooding: Measures Needed for Damage Mitigation
FY2011	
Apr. 27, 2011	• Great East Japan Earthquake: Characteristics and Challenges • Conventional earthquake and tsunami policies
Oct. 11, 2011	• Report of the Committee for the Technical Investigation of Earthquake and Tsunami Measures Based on Lessons Learned from the Great East Japan Earthquake • Government ministry and agency efforts related to future DRR efforts • Establishment of the Committee for Policy Planning on Disaster Management
Dec. 27, 2011	• Revisions to the Basic Plan for Disaster Risk Reduction • Revisions to the National Disaster Management Council Operation Guidelines • Report of the Committee for the Technical Investigation of the Dissemination of Lessons Learned from Disasters • Status of the investigations by the Committee for Policy Planning on Disaster Management
Mar. 29, 2012	• Interim Report of the Committee for Policy Planning on Disaster Management • Current efforts aimed at bolstering and reinforcing DRR measures • FY2012 Comprehensive Disaster Management Drill Framework
FY2012	
Sep. 6, 2012	• Revisions to the Basic Plan for Disaster Risk Reduction • Framework for Large-Scale Flood Measures in the Capital Region • New Promotion of Earthquake Research • Final Report of the Committee for Policy Planning on Disaster Management • Report of the Committee for the Technical Investigation of Best Practices for Earthquake Disaster Management in Regional Cities • Report of the Committee for the Technical Investigation of Disaster Evacuation • Report on Tsunami Heights and Inundation Areas Resulting from Nankai Trough Megaquake (Secondary Report) and Damage Estimates (Primary Report)
Mar. 26, 2013	• Review of the legal systems for disaster management; status of investigations into Nankai Trough Megaquake Measures and Tokyo Inland Earthquake Measures • Establishment of the Disaster Management Implementation Committee • FY2013 Comprehensive Disaster Management Drill Framework
FY2013	
Jan. 17, 2014	• Designation of Areas for the Promotion of Nankai Trough Earthquake DRR Measures and Areas for the Special Reinforcement of Nankai Trough Earthquake Tsunami Evacuation Measures • Designation of Tokyo Inland Earthquake Emergency Management Zones • Revisions to the Basic Plan for Disaster Risk Reduction • Final Report of the Working Group to Investigate Tokyo Inland Earthquake Measures and a National Government Business Continuity Plan Proposal
Mar. 28, 2014	• Act on Special Measures for the Promotion of Nankai Trough Earthquake Disaster Management • Act on Special Measures against Tokyo Inland Earthquake • Framework for Large-Scale Earthquake Disaster Management and Reduction • FY2014 Comprehensive Disaster Management Drill Framework
FY2014	
Nov. 28, 2014	• Revisions to the Basic Plan for Disaster Risk Reduction
Mar. 31, 2015	• Revisions to the Basic Plan for Disaster Risk Reduction • FY2015 Comprehensive Disaster Management Drill Framework • Earthquake Disaster Risk Reduction Strategy for a Tokyo Inland Earthquake
FY2015	
Jul. 7, 2015	• Revisions to the Basic Plan for Disaster Risk Reduction
Feb. 16, 2016	• Basic Guidelines on the Comprehensive Promotion of Measures for Active Volcanoes • Designation of volcanic eruption hazard areas • Revisions to the Basic Plan for Disaster Risk Reduction
FY2016	
May 31, 2016	• FY2016 Comprehensive Disaster Management Drill Framework • Revisions to the Basic Plan for Disaster Risk Reduction
FY2017	
Apr. 11, 2017	• FY2017 Comprehensive Disaster Management Drill Framework • Revisions to the Basic Plan for Disaster Risk Reduction

Source: Cabinet Office

Fig. A-34 Status of the Establishment of National Disaster Management Council Committees for Technical Investigation

Source: Cabinet Office

5. Budget

Fig. A-35 Disaster Management Budgets by Year

Fiscal Year	Science and Technology Research		Disaster Prevention		Land Conservation		Disaster Reconstruction		Total
	(JPY million)	Share (%)	(JPY million)	Share (%)	(JPY million)	Share (%)	(JPY million)	Share (%)	(JPY million)
1962	751	0.4	8,864	4.3	97,929	47.1	100,642	48.3	208,006
1963	1,021	0.4	8,906	3.7	116,131	47.7	117,473	48.2	243,522
1964	1,776	0.7	13,724	5.4	122,409	48.3	115,393	45.6	253,302
1965	1,605	0.5	17,143	5.6	147,858	48.3	139,424	45.6	306,030
1966	1,773	0.5	20,436	5.9	170,650	49.0	155,715	44.7	348,574
1967	2,115	0.6	23,152	6.1	197,833	52.3	154,855	41.0	377,955
1968	2,730	0.7	25,514	6.8	207,600	55.4	138,815	37.1	374,659
1969	2,747	0.7	30,177	7.5	236,209	59.0	131,270	32.8	400,403
1970	2,756	0.6	36,027	8.2	269,159	60.9	133,998	30.3	441,940
1971	3,078	0.5	50,464	8.6	352,686	60.3	178,209	30.5	584,437
1972	3,700	0.4	93,425	10.3	488,818	54.1	316,895	35.1	902,838
1973	6,287	0.7	111,321	12.4	493,580	54.9	287,082	32.0	898,270
1974	14,569	1.5	118,596	12.1	505,208	51.5	342,556	34.9	980,929
1975	17,795	1.5	159,595	13.3	615,457	51.3	405,771	33.9	1,198,618
1976	21,143	1.3	186,297	11.5	711,159	43.9	700,688	43.3	1,619,287
1977	22,836	1.4	234,409	13.9	904,302	53.6	525,886	31.2	1,687,433
1978	29,642	1.7	307,170	17.3	1,093,847	61.6	345,603	19.5	1,776,262
1979	35,145	1.6	435,963	20.4	1,229,401	57.6	432,759	20.3	2,133,268
1980	29,929	1.2	456,575	18.9	1,229,615	50.8	705,168	29.1	2,421,287
1981	29,621	1.2	474,926	18.9	1,240,788	49.5	761,950	30.4	2,507,285
1982	28,945	1.1	469,443	17.2	1,261,326	46.3	963,984	35.4	2,723,698
1983	29,825	1.1	489,918	18.4	1,268,712	47.6	875,851	32.9	2,664,306
1984	28,215	1.2	485,219	20.7	1,350,592	57.7	475,878	20.3	2,339,904
1985	27,680	1.1	512,837	20.2	1,355,917	53.5	640,225	25.2	2,536,659
1986	28,646	1.2	482,889	19.7	1,354,397	55.3	581,462	23.8	2,447,394
1987	38,296	1.4	612,505	21.9	1,603,599	57.2	548,337	19.6	2,802,737
1988	31,051	1.1	587,073	20.8	1,550,132	54.9	657,681	23.3	2,825,937
1989	34,542	1.2	588,354	20.7	1,638,104	57.5	587,819	20.6	2,848,819
1990	35,382	1.1	625,239	20.0	1,669,336	53.4	796,231	25.5	3,126,188
1991	35,791	1.1	628,596	19.8	1,729,332	54.3	788,603	24.8	3,182,322
1992	36,302	1.1	745,405	22.8	2,017,898	61.6	475,411	14.5	3,275,015
1993	43,152	0.9	866,170	18.6	2,462,800	52.9	1,280,569	27.5	4,652,691
1994	40,460	1.0	747,223	18.9	1,945,295	49.1	1,230,072	31.0	3,963,050
1995	105,845	1.4	1,208,134	16.0	2,529,386	33.5	3,696,010	49.0	7,539,375
1996	52,385	1.2	1,029,658	24.5	2,156,714	51.3	968,182	23.0	4,206,938
1997	49,128	1.2	1,147,102	28.2	2,014,695	49.4	864,370	21.2	4,075,295
1998	62,435	1.1	1,228,539	22.3	2,905,921	52.8	1,310,515	23.8	5,507,411
1999	78,134	1.7	1,142,199	25.0	2,400,534	52.6	941,886	20.6	4,562,752
2000	73,502	1.8	1,011,535	24.4	2,376,083	57.3	689,225	16.6	4,150,346
2001	49,310	1.2	1,060,445	26.7	2,238,816	56.4	618,427	15.6	3,966,998
2002	48,164	1.3	1,202,984	31.9	1,981,686	52.5	543,949	14.4	3,776,783
2003	35,133	1.1	814,101	25.7	1,625,670	51.4	689,255	21.8	3,164,159
2004	30,478	0.7	815,059	19.3	1,753,418	41.5	1,622,112	38.4	4,221,067
2005	11,097	0.4	866,290	28.6	1,426,745	47.0	728,606	24.0	3,032,738

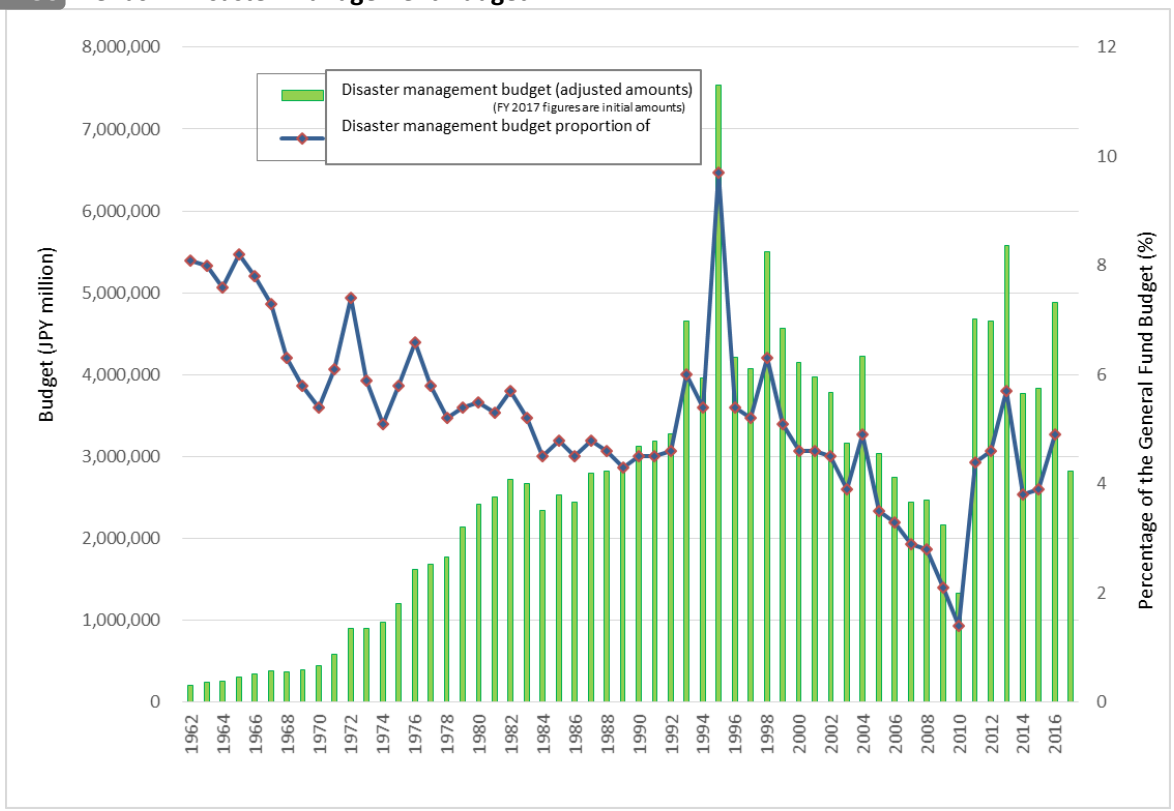
Fiscal Year	Science and Technology Research		Disaster Prevention		Land Conservation		Disaster Reconstruction		Total
	(JPY million)	Share (%)	(JPY million)	Share (%)	(JPY million)	Share (%)	(JPY million)	Share (%)	(JPY million)
2006	11,627	0.4	689,505	25.1	1,439,129	52.3	610,302	22.2	2,750,563
2007	9,687	0.4	706,853	29.0	1,332,222	54.6	391,637	16.0	2,440,399
2008	8,921	0.4	819,359	33.2	1,275,135	51.7	363,471	14.7	2,466,886
2009	8,761	0.4	498,397	23.0	1,383,254	63.7	279,789	12.9	2,170,201
2010	7,695	0.6	224,841	16.9	813,359	61.1	285,038	21.4	1,330,933
2011	28,072	0.6	376,169	8.0	743,936	15.9	3,536,475	75.5	4,684,652
2012	29,422	0.6	561,021	12.0	790,422	17.0	3,129,561	67.2	4,656,656
2013	15,339	0.3	788,576	14.1	879,932	15.8	3,883,911	69.6	5,578,036
2014	16,688	0.4	639,966	13.9	836,580	18.2	3,101,555	67.5	4,594,789
2015	14,961	0.4	713,477	18.6	155,475	4.1	2,954,355	77.0	3,838,268
2016	14,023	0.3	696,399	14.3	318,320	6.5	3,855,516	78.9	4,884,258
2017	9,136	0.3	524,874	18.6	100,332	3.5	2,192,077	77.6	2,826,419

Notes:

1. These are adjusted budget (national expenditures) amounts. However, the FY2017 figures are preliminary figures reflecting the initial budget.
2. The reduced amount allocated to science and technology research in FY2007 is largely due to the structural conversion of national lab and research institutions into independent administrative agencies (the budgets of independent administrative agencies are not included in this table).
3. The amount allocated to disaster prevention in FY2009 is reduced because a portion of the revenue sources set aside for road construction were converted to general fund sources making it impossible to allocate certain portions to the disaster management budget.
4. The reduced amount allocated to disaster prevention and land conservation in FY2010 is due to the fact that, following the creation of the General Grant for Social Capital Development, some disaster prevention policies and many subsidy programs in land conservation were established using those grants.
5. The reduced amount allocated to land conservation in FY2011 is a result of the fact that relevant personnel expenses were accounted for separately.

Source: Created by the Cabinet Office using materials from various ministries and agencies.

Fig. A-36 Trends in Disaster Management Budget



Source: Created by the Cabinet Office using materials from various ministries and agencies.

Fig. A-37 Earthquake Emergency Development Project Plans

(As of the end of FY2015; Unit: JPY million)

Category	FY1980 - FY2019		
	Planned Amount (a)	Actual Amount (b)	Rate of Progress (b)/(a)
1 Evacuation sites	177,539	157,244	88.6%
2 Evacuation roads	93,983	80,117	85.2%
3 Firefighting facilities	140,658	123,780	88.0%
4 Emergency transport routes	936,037	785,519	83.9%
4-1 Emergency transport routes	825,601	690,944	83.7%
4-2 Emergency transport ports	59,631	52,774	88.5%
4-3 Emergency transport fishing ports	50,805	41,801	82.3%
5 Telecommunications facilities	17,240	16,714	96.9%
6 Public medical institutions	54,012	50,900	94.2%
7 Social welfare facilities	55,586	55,586	100.0%
8 Public elementary and junior high schools	441,934	422,459	95.6%
9 Tsunami countermeasures	270,660	172,243	63.6%
9-1 River management facilities	104,233	58,116	55.8%
9-2 Coastal preservation facilities	166,427	114,127	68.6%
10 Landslide prevention	540,087	484,814	89.8%
10-1 Erosion control facilities	102,887	91,798	89.2%
10-2 Security facilities	171,243	151,220	88.3%
10-3 Landslide facilities	84,527	77,040	91.1%
10-4 Steep slope facilities	159,800	149,838	93.8%
10-5 Ponds	21,630	14,918	69.0%
Total	2,727,736	2,349,376	86.1%

Notes:

1. The content of Earthquake Emergency Development Project Plans (FY1980-2019) is as of the end of FY2015.
2. Project expenses include expenses for projects that may not be solely designed for earthquake disaster management, but that, while having other policy objectives, also are intended to have an overall effect on earthquake disaster management. Project expenses are not comprised solely of expenses used entirely for disaster management.

Source: Cabinet Office

Based on lessons learned from the Great Hanshin-Awaji Earthquake, the Act on Special Measures for Earthquake Disaster Countermeasures was enacted in July 1995 to protect citizens' lives, heath, and assets from earthquake-related damage. This law allows prefectural governors to create a Five-Year Plan for Emergency Earthquake Disaster Management Projects for communities where there are concerns about the occurrence of a severe earthquake disaster and a portion of the projects to be implemented based on this plan are eligible for an increased rate of financial support from the national government.
Thus far, these plans have been created by the prefectural governors over four terms, and earthquake disaster projects have begun to be implemented.
These plans are five-year plans created for 29 facilities that need to be urgently developed from the perspective of achieving earthquake disaster reduction. When a prefecture wants to create a plan, hearings are held to listen to the opinions of the municipalities involved, and the consent of the Prime Minister must be obtained.
Project budgets for these plans over four terms are shown in the table below.

(All prefectures, as of FY 2015. Unit: JPY 1,000,000)

Category	First Five-Year Plan (FY 1996-2000)			Second Five-Year Plan (FY 2001-2005)				Third Five-Year Plan (FY 2006-2010)				Fourth Five-Year Plan (FY 2011-2015)			
	Planned Amt. (a)	Actual Amt. (b)	% Complete (b)/(a)	Project Scope (Unit) (c)	Planned Amt. (d)	Actual Amt. (e)	% Complete (e)/(d)	Project Scope (Unit) (f)	Planned Amt. (g)	Actual Amt. (h)	% Complete (h)/(g)	Project Scope (Unit) (i)	Planned Amt. (j)	Actual Amt. (k)	% Complete (k)/(j)
1. Evacuation sites	1,462,542	959,276	65.6%	3,168 ha	931,413	543,233	58.3%	2,515 ha	488,257	400,283	82.0%	1,456 ha	305,490	255,401	83.6%
2. Evacuation routes	1,481,509	1,105,639	74.6%	2,601 km	1,188,051	900,446	75.8%	1,405 km	952,865	625,957	65.7%	897 km	1,336,465	779,815	58.3%
3. Firefighting facilities	917,213	697,067	76.0%	28,153 sites	540,784	297,301	55.0%	21,039 sites	448,460	246,745	55.0%	20,052 sites	677,209	468,951	69.2%
4. Roads for firefighting activities	168,387	128,163	76.1%	161 km	119,329	92,958	77.9%	102 km	46,719	49,136	105.2%	56 km	23,506	19,998	85.1%
5. Emergency transport roads, etc.	6,067,258	5,719,897	94.3%		5,267,908	4,242,139	80.5%		3,813,169	3,291,461	86.3%		2,773,563	2,420,121	87.3%
5-1. Emergency transport roads	5,555,626	5,355,365	96.4%	3,920 km	4,998,577	4,067,023	81.4%	2,552 km	3,557,657	3,106,165	87.3%	2,191 km	2,584,039	2,256,510	87.3%
5-2. Emergency transport/traffic control facilities	23,900	21,017	87.9%	3,448 facilities	16,855	8,473	50.3%	2,439 facilities	9,242	6,844	74.0%	4,837 sites	15,464	12,081	78.1%
5-3. Emergency transport heliports	6,327	2,094	33.1%	1 sites	550	387	70.4%	0 sites	0	0	—	2 sites	117	78	66.7%
5-4. Emergency transport port facilities	359,671	237,940	66.2%	113 sites	181,503	119,869	66.0%	100 sites	198,676	136,895	68.9%	77 sites	153,101	133,801	87.4%
5-5. Emergency transport fishing port facilities	121,734	103,481	85.0%	73 sites	70,423	46,387	65.9%	43 sites	47,594	41,558	87.3%	26 sites	20,843	17,652	84.7%
6. Multipurpose underground utility conduits	261,385	275,928	105.6%	844 km	394,948	257,890	65.3%	591 km	259,420	175,571	67.7%	471 km	255,017	207,556	81.4%
7. Medical institutions	784,899	526,548	67.1%	115 facilities	391,016	277,721	71.0%	93 facilities	239,424	150,877	63.0%	219 facilities	689,917	506,681	73.4%
8. Social welfare facilities	482,317	219,490	45.5%	857 facilities	280,028	176,408	63.0%	521 facilities	114,756	56,400	49.1%	681 facilities	126,275	96,578	76.5%
8-2. Public kindergartens	-	-	-	-	-	-	-	995 schools	35,198	7,074	20.1%	1,159 schools	54,480	27,203	49.9%
9. Public elementary and jr. high schools	1,359,672	765,344	56.3%	5,840 schools	1,078,849	594,777	55.1%	16,256 schools	3,077,544	1,399,624	45.5%	13,612 schools	2,322,605	1,626,867	70.0%
10. Public special education schools	84,577	29,685	35.1%	114 schools	32,094	12,070	37.6%	264 schools	56,834	23,262	40.9%	199 schools	43,173	29,955	69.4%
11. Public buildings	24,169	5,267	21.8%	29 facilities	2,662	1,199	45.0%	670 facilities	62,975	24,429	38.8%	1,737 facilities	369,417	209,039	56.6%
12. Coast and river facilities	235,686	187,310	79.5%	334 sites	272,744	225,598	82.7%	491 sites	237,787	182,911	76.9%	687 sites	345,184	302,195	87.5%
12-1. Coastal preservation facilities	140,865	109,501	77.7%	215 sites	196,496	146,699	74.7%	423 sites	187,407	146,044	77.9%	525 sites	229,583	184,601	80.4%
12-2. River management facilities	94,821	77,809	82.1%	119 sites	76,248	78,899	103.5%	68 sites	50,380	36,867	73.2%	162 sites	115,601	117,594	101.7%
13. Erosion control facilities, etc.	1,729,574	1,702,042	98.4%	14,332 sites	1,622,048	1,339,438	82.6%	10,504 sites	1,069,686	976,742	91.3%	9,327 sites	845,288	783,594	92.7%
13-1. Erosion control facilities	268,151	247,050	92.1%	2,278 sites	436,635	409,636	93.8%	2,033 sites	354,972	325,910	91.8%	2,063 sites	303,286	256,274	84.5%
13-2. Security facilities	409,216	469,126	114.6%	5,583 sites	330,719	263,907	79.8%	3,673 sites	210,861	202,299	95.9%	2,683 sites	146,012	172,801	118.3%
13-3. Landslide prevention facilities	359,433	356,531	99.2%	1,651 sites	275,558	219,200	79.5%	1,151 sites	158,479	160,883	101.5%	849 sites	119,025	108,748	91.4%
13-4. Steep slope failure prevention facilities	522,261	497,690	95.3%	3,568 sites	446,098	356,530	79.9%	2,500 sites	244,461	220,779	90.3%	2,629 sites	193,936	185,609	95.7%
13-5. Reservoirs	170,513	131,645	77.2%	1,252 sites	133,038	90,165	67.8%	1,147 sites	100,913	66,870	66.3%	1,103 sites	83,029	60,162	72.5%
14. Community DRR base facilities	162,319	102,857	63.4%	121 sites	81,642	40,342	49.4%	78 sites	60,905	34,277	56.3%	161 sites	90,683	68,591	75.6%
15. Disaster management radio communications system	224,276	126,236	56.3%	1,702 sites	126,944	38,693	30.5%	5,844 sites	239,525	78,112	32.6%	8,777 sites	190,612	101,183	53.1%
16. Potable water facilities/power generation systems	221,622	126,320	57.0%	444 sites	89,822	55,599	61.9%	405 sites	142,958	72,142	50.5%	517 sites	121,728	93,437	76.8%
17. Storage warehouses	17,763	8,028	45.2%	437 sites	10,338	5,292	51.2%	296 sites	4,081	838	20.5%	650 sites	7,053	3,870	54.9%
18. Response and relief systems	3,595	659	18.3%	610 groups	1,133	687	60.6%	515 groups	314	262	83.4%	304 groups	891	161	18.0%
19. Downtown areas with high density dilapidated housing	2,814,605	1,431,714	50.9%	6,960 ha	1,725,532	916,981	53.1%	7,839 ha	846,197	563,811	66.6%	12,156 ha	501,836	340,080	67.8%
	18,503,368	14,117,470	76.3%		14,157,285	10,018,773	70.8%		12,197,074	8,359,916	68.5%		11,080,391	8,341,276	75.3%

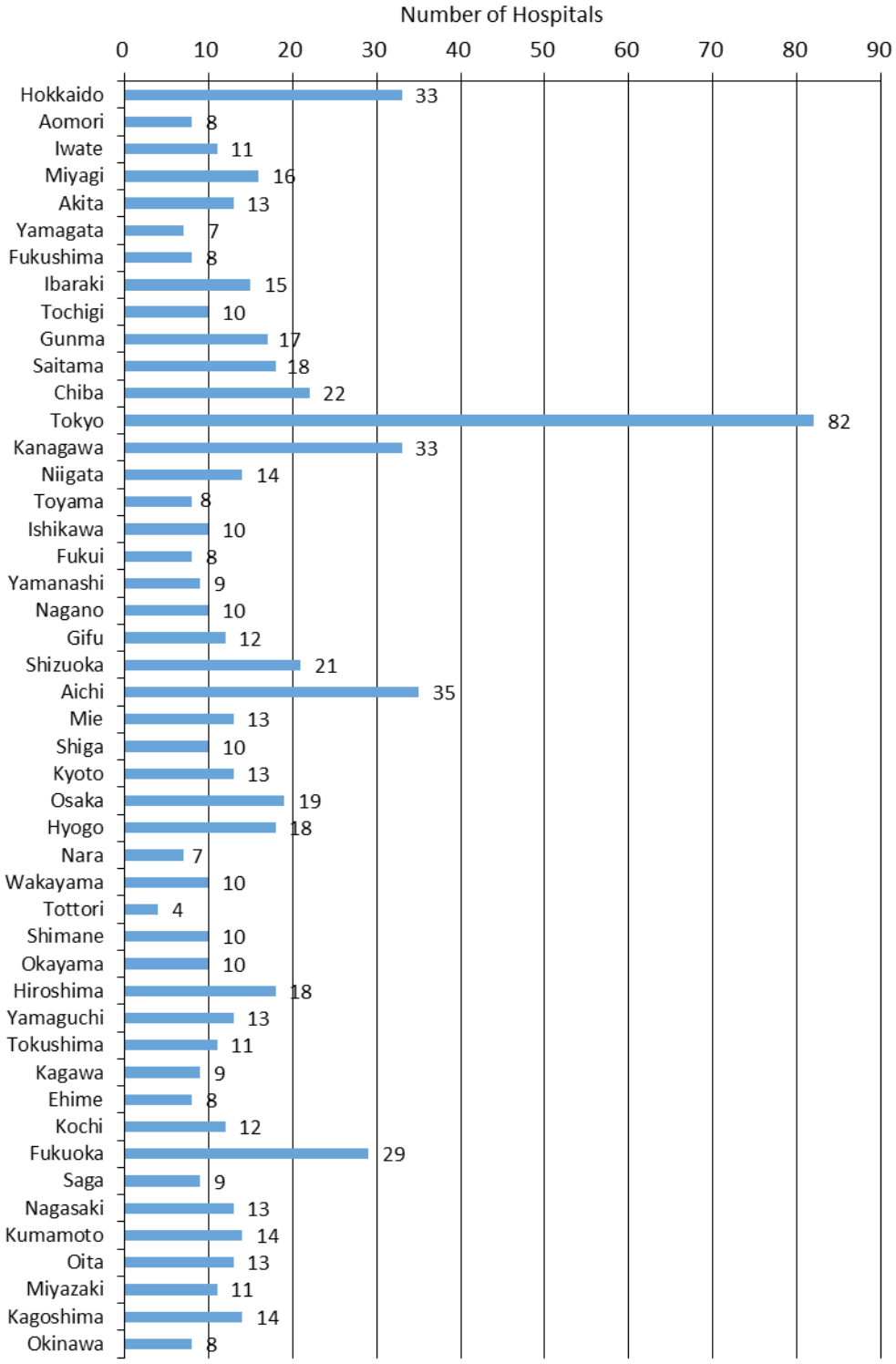
Notes:

1. The content of the Fourth Five-Year Plan (FY2011-2015) is current as of the end of FY2015. However, details for Saga Prefecture are current as of the end of FY2014.
2. The expenses for each project are not limited to projects aimed at achieving earthquake DRR; they include expenses for projects that have other policy purposes, such as those related to urban infrastructure development, but that also are effective in terms of earthquake DRR.
3. Public special education schools include schools known as schools for the blind, schools for the deaf, and schools for the physically or mentally/physically handicapped prior to FY 2006.

Source: Cabinet Office materials.

6. Status of Disaster Management Facilities and Equipment

Fig. A-39 Number of Medical Facilities for Disasters by Prefecture



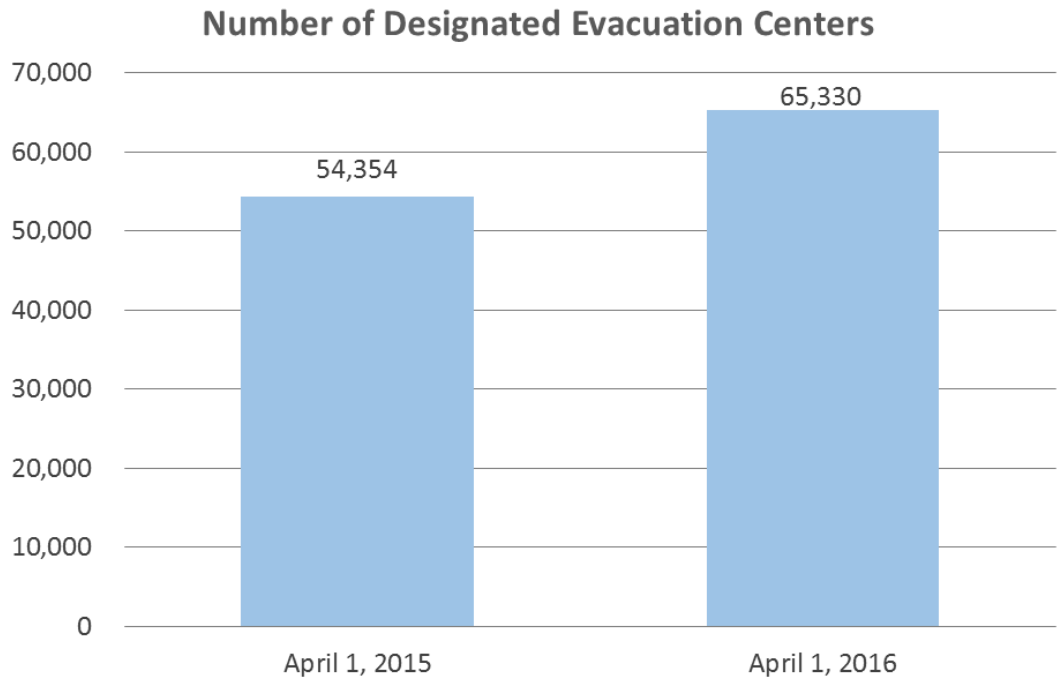
Source: Prepared by the Cabinet Office based on the website of the Emergency Medical Information System

Fig. A-40 Number of Red Cross Hospitals, Emergency Medical Centers, and DMAT-Designated Medical Facilities

	Red Cross Hospital	Emergency Medical Center	DMAT-Designated Facility		Red Cross Hospital	Emergency Medical Center	DMAT-Designated Facility
Hokkaido	10	11	34	Shiga	3	4	10
Aomori	1	2	10	Kyoto	3	6	14
Iwate	1	3	11	Osaka	2	14	19
Miyagi	2	6	16	Hyogo	4	10	20
Akita	2	1	14	Nara	0	3	9
Yamagata	0	3	8	Wakayama	1	3	11
Fukushima	1	4	9	Tottori	1	2	4
Ibaraki	2	6	20	Shimane	2	3	11
Tochigi	3	5	11	Okayama	2	5	10
Gunma	2	4	18	Hiroshima	3	5	18
Saitama	3	9	19	Yamaguchi	2	5	18
Chiba	1	11	24	Tokushima	1	3	15
Tokyo	4	23	80	Kagawa	1	2	9
Kanagawa	6	16	33	Ehime	1	3	8
Niigata	1	6	14	Kochi	1	3	18
Toyama	1	2	8	Fukuoka	3	9	29
Ishikawa	1	2	12	Saga	1	5	9
Fukui	1	2	10	Nagasaki	2	3	15
Yamanashi	1	1	12	Kumamoto	2	3	15
Nagano	6	7	11	Oita	1	4	21
Gifu	2	6	13	Miyazaki	0	3	13
Shizuoka	5	9	21	Kagoshima	1	2	15
Aichi	2	22	35	Okinawa	1	3	16
Mie	1	4	13	Total	97	268	783

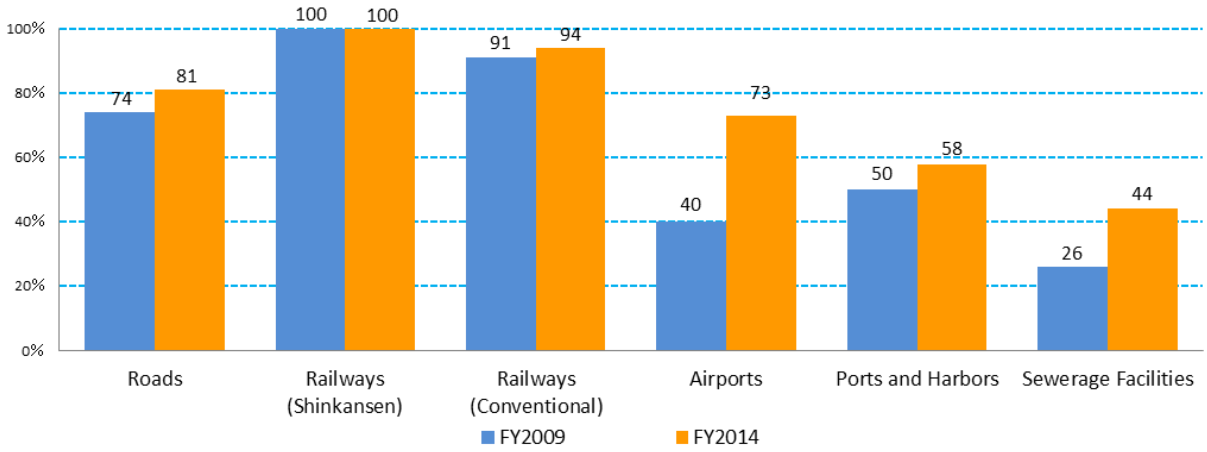
Source: Red Cross Hospital information was prepared by the Cabinet Office based on the website of the Japanese Red Cross Society.
Information on Emergency Medical Centers and DMAT-Designated Facilities was prepared by the Cabinet Office based on the website of the Emergency Medical Information System.

Fig. A-41 Designation of Designated Evacuation Centers



Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report "Status of Regional Disaster Management Administration"

Fig. A-42 Seismic Reinforcement of Public Infrastructure



Notes

Roads: Rate of seismic reinforcement of bridges of emergency transport roads (important roads that have to be secured for the passage of emergency vehicles to facilitate evacuation and rescue as well as relief supply delivery activities starting immediately after the earthquake; national expressways, national highways, and the arterial roads that connect them.) (As of end of FY2013)

Railway (Shinkansen): Elevated bridges.

Railway (Conventional): Elevated bridges of major railway lines in regions where a seismic intensity of 6 Upper or greater would be expected to occur in the case of a Tokyo Inland Earthquake or Nankai Trough Earthquake. (Left: As of end of FY2012. Right: As of end of FY2013.)

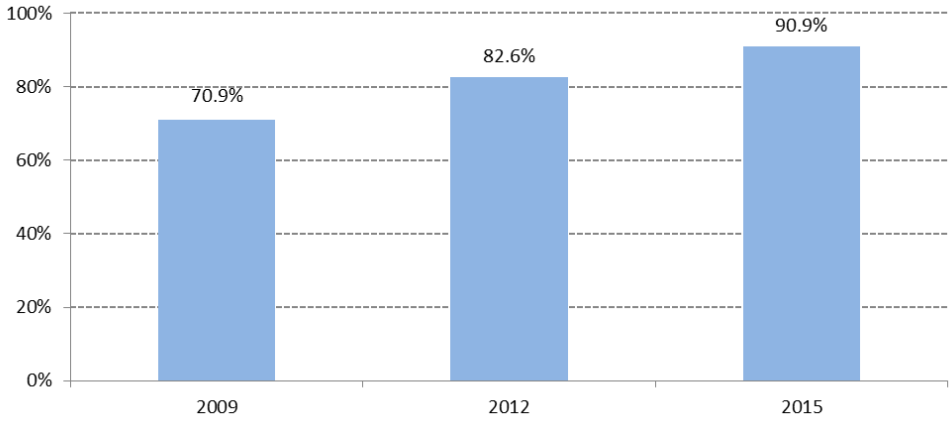
Airports: Percentage of population in a 100 km area around an airport that could be used for emergency transport.

Ports and Harbors: Seismically reinforced piers (number completed as a proportion of those detailed in plans for seismic retrofit of piers to facilitate the transportation of emergency supplies (those classed as major ports or higher)).

Sewerage Facilities: Important main lines (pipes that can accommodate drainage from river basin lines, DRR bases, and evacuation sites, main pipes connected to pump stations and disposal stations, pipes buried beneath emergency transport roads and railroad tracks. (Left: As of end of FY2010. Right: As of end of FY2012.)

Source: Prepared by the Cabinet Office using materials from the Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

Fig. A-43 Trends in the Seismic Reinforcement Rate of Public Facilities That Serve as Disaster Management Bases

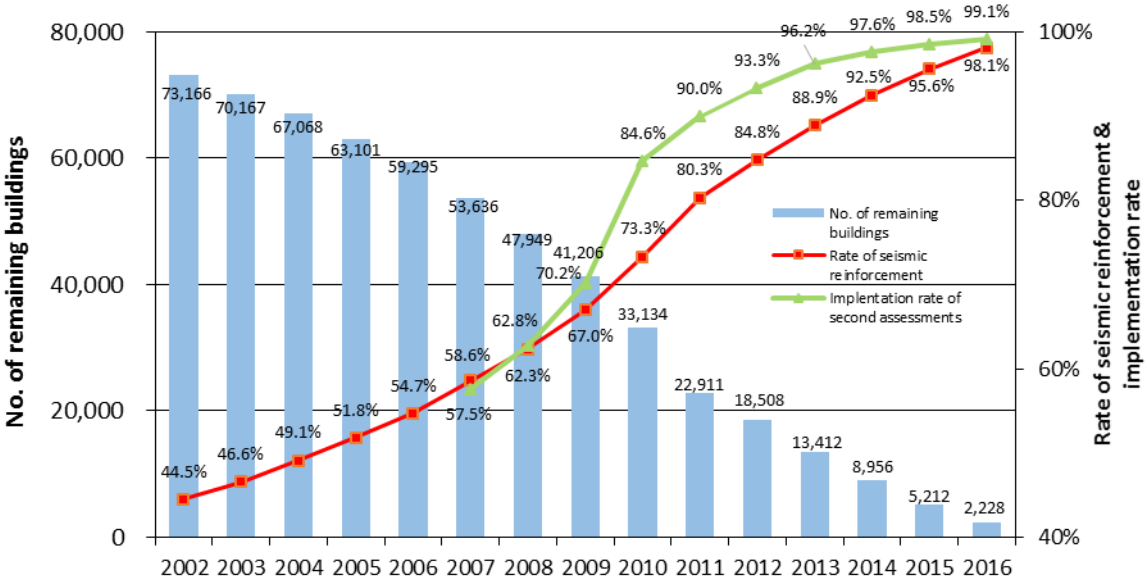


*Public facilities owned or managed by local governments (buildings for public or public-private use: non-wooden structures built two stories or taller or buildings with a floor area of 200 m² or more) that could serve as disaster management bases for implementing disaster response measures

<Classification criteria of public facilities that serve as disaster management bases>	
(1) Social welfare facilities	All facilities
(2) Education facilities (classrooms, gymnasiums)	Facilities designated as designated emergency evacuation site or designated evacuation center
(3) Government buildings	Facilities that will be used for the implementation of disaster response measures
(4) Prefectural civic halls, civic centers	Facilities designated as designated emergency evacuation site or designated evacuation center
(5) Gymnasiums	Facilities designated as designated emergency evacuation site or designated evacuation center
(6) Health care facilities	Facilities positioned in local plans for disaster risk reduction as medical care facilities
(7) Police headquarters and police stations	All facilities
(8) Fire headquarters and fire stations	All facilities
(9) Public housing	None
(10) Employee dorms	None
(11) Other	Facilities designated as designated emergency evacuation site or designated evacuation center

Source: Produced by the Cabinet Office based on "Results of the Survey on the Seismic Reinforcement Rate of Public Facilities That Serve as Disaster Management Bases," Fire and Disaster Management Agency

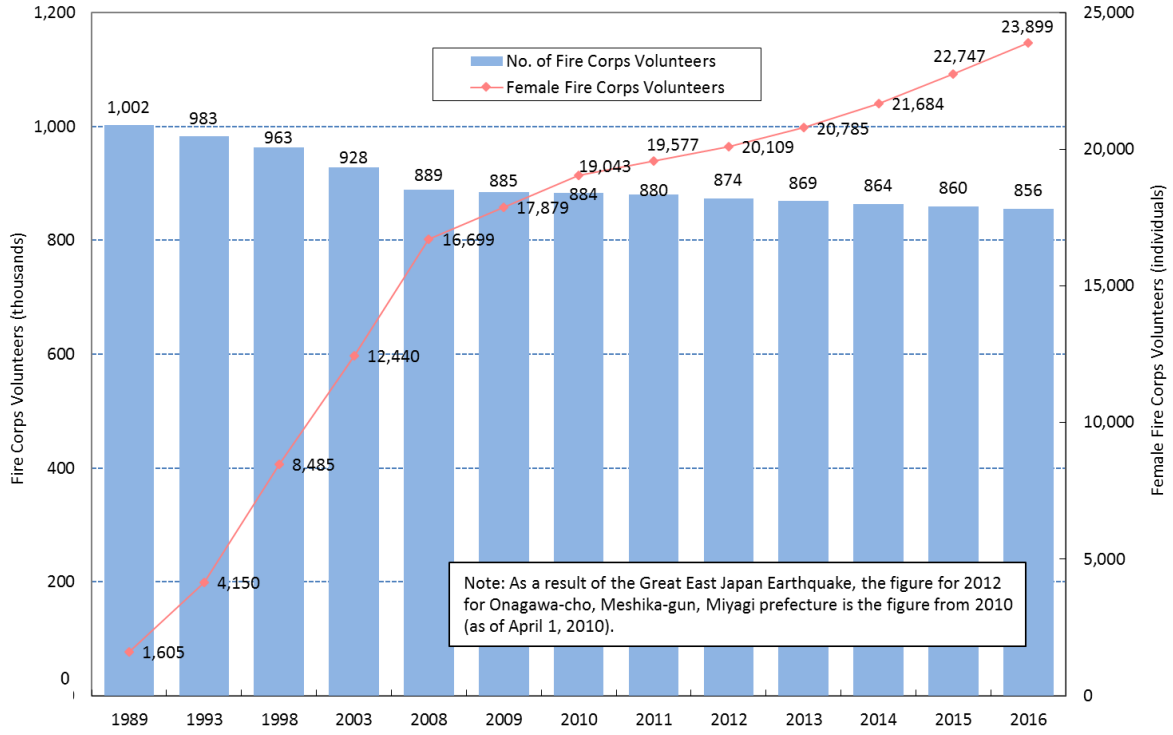
Fig. A-44 Seismic Reinforcement Status of Public Elementary and Junior High Schools



Source: "Results of the Survey on the Seismic Reinforcement Status of Public School Facilities," Ministry of Education, Culture, Sports, Science and Technology (MEXT) (April 2016)

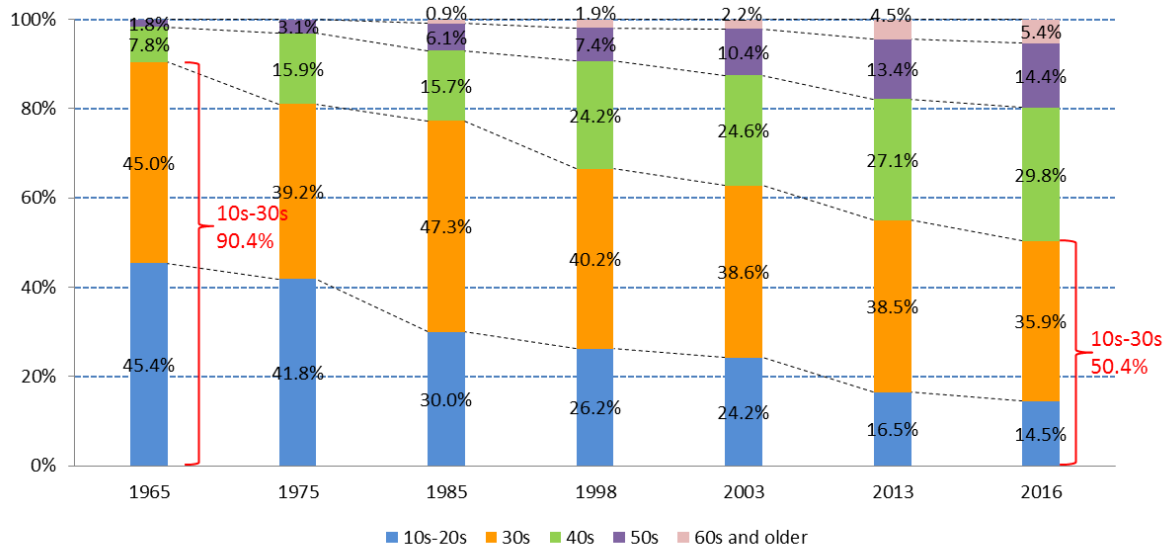
7. Trends in Numbers of Workers in Disaster Management

Fig. A-45 Trends in Numbers of Fire Corps Volunteers



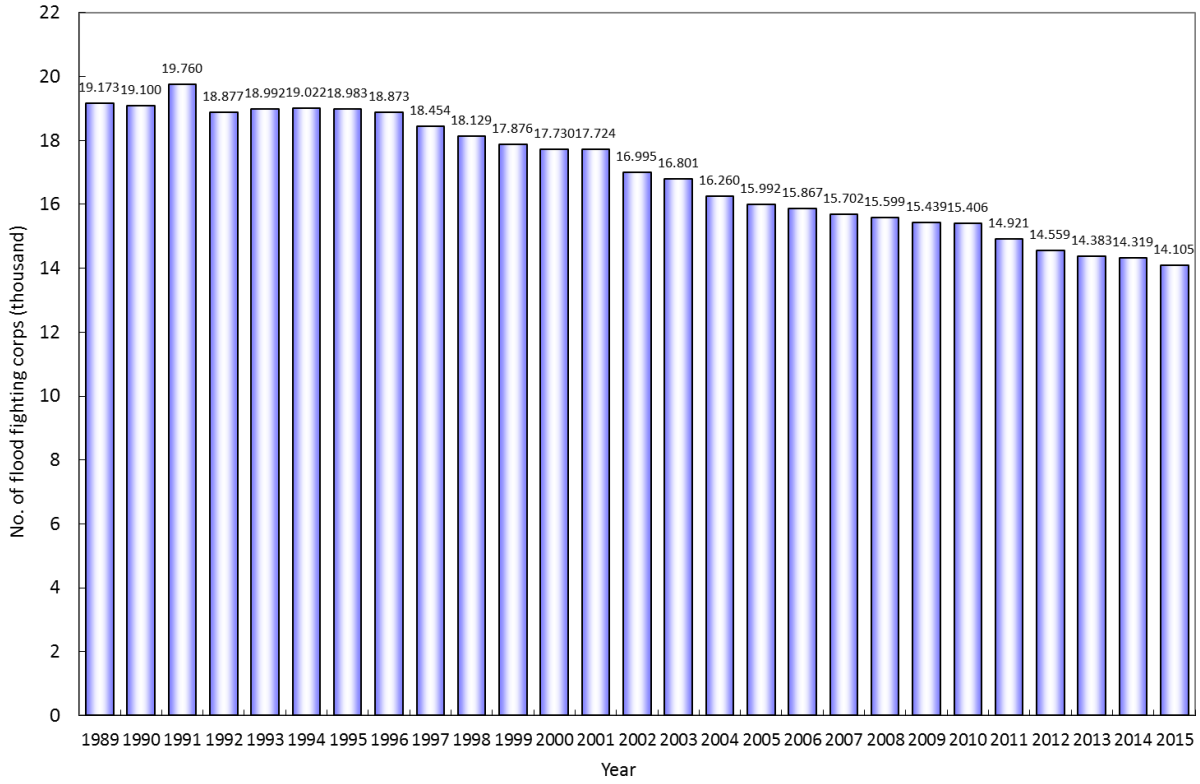
Source: Produced by the Cabinet Office based on the Survey on the Current Status of Fire and Earthquake Disaster Management Measures of the Fire and Disaster Management Agency

Fig. A-46 Trends in Age Composition Ratios among Fire Corps Volunteers



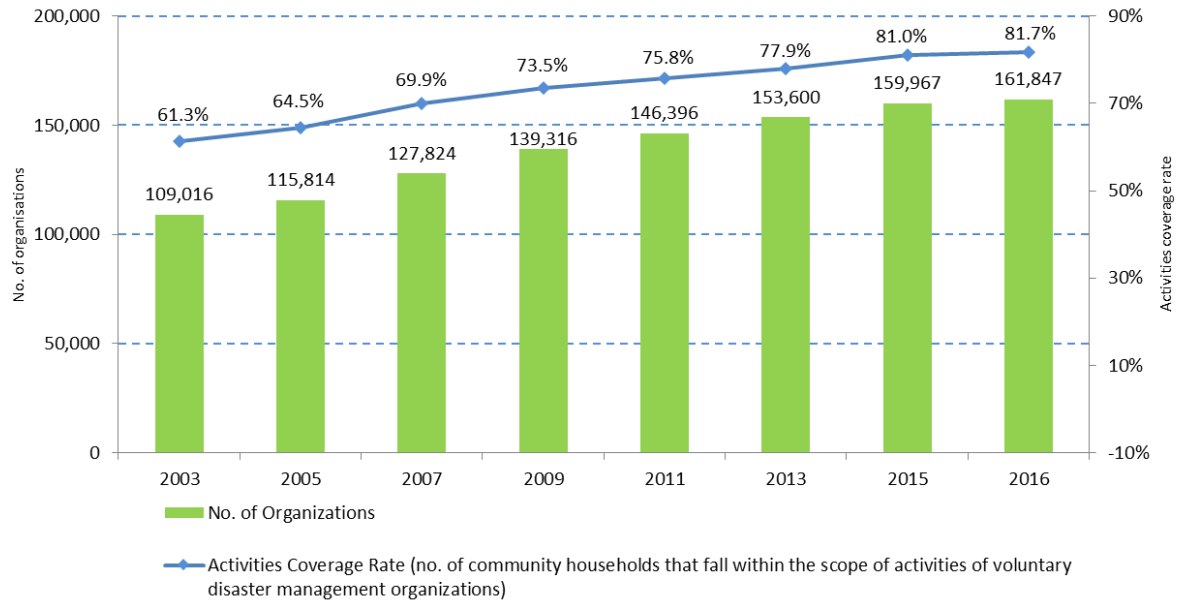
Source: Produced by the Cabinet Office based on the Survey on the Current Status of Fire and Earthquake Disaster Management Measures of the Fire and Disaster Management Agency

Fig. A-47 Trends in Numbers of Flood Fighting Corps Personnel



*Number of full-time flood fighting corps personnel
Source: Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

Fig. A-48 Trends in Voluntary Disaster Management Organizations



Source: Produced by the Cabinet Office based on the Survey on the Current Status of Fire and Earthquake Disaster Management Measures of the Fire and Disaster Management Agency. Figures as of April 1 each year.

Fig. A-49 Female Representation on Local Disaster Management Councils (by Prefecture, 2016)

	Prefectural Disaster Management Council			Municipal Disaster Management Council		
	Total Members	Of which, Female Members	Proportion of Women (%)	Total Members	Of which, Female Members	Proportion of Women (%)
Hokkaido	66	5	7.6	3879	146	3.8
Aomori	44	9	20.5	662	24	3.6
Iwate	73	11	15.1	1035	72	7.0
Miyagi	53	5	9.4	936	63	6.7
Akita	60	7	11.7	707	82	11.6
Yamagata	59	10	16.9	955	57	6.0
Fukushima	51	6	11.8	1095	50	4.6
Ibaraki	51	6	11.8	1282	76	5.9
Tochigi	52	8	15.4	689	62	9.0
Gunma	47	5	10.6	816	59	7.2
Saitama	69	7	10.1	2148	212	9.9
Chiba	61	8	13.1	1505	152	10.1
Tokyo	66	2	3.0	2283	267	11.7
Kanagawa	55	8	14.5	1018	99	9.7
Niigata	72	18	25.0	866	52	6.0
Toyama	65	9	13.8	519	24	4.6
Ishikawa	70	7	10.0	422	25	5.9
Fukui	56	2	3.6	453	38	8.4
Yamanashi	61	4	6.6	617	54	8.8
Nagano	64	6	9.4	2024	144	7.1
Gifu	61	11	18.0	969	74	7.6
Shizuoka	55	4	7.3	1002	79	7.9
Aichi	75	2	2.7	1502	140	9.3
Mie	55	6	10.9	892	80	9.0
Shiga	56	9	16.1	550	54	9.8
Kyoto	65	10	15.4	729	60	8.2
Osaka	59	6	10.2	1433	158	11.0
Hyogo	55	6	10.9	1307	122	9.3
Nara	59	7	11.9	881	84	9.5
Wakayama	51	2	3.9	597	42	7.0
Tottori	67	29	43.3	369	55	14.9
Shimane	71	25	35.2	617	44	7.1
Okayama	56	7	12.5	499	76	15.2
Hiroshima	58	2	3.4	798	59	7.4
Yamaguchi	56	7	12.5	583	63	10.8
Tokushima	79	39	49.4	560	35	6.3
Kagawa	59	8	13.6	395	37	9.4
Ehime	61	5	8.2	478	32	6.7
Kochi	57	6	10.5	731	65	8.9
Fukuoka	58	3	5.2	1308	187	14.3
Saga	68	22	32.4	460	46	10.0
Nagasaki	66	7	10.6	654	39	6.0
Kumamoto	56	6	10.7	1721	113	6.6
Oita	50	5	10.0	553	40	7.2
Miyazaki	53	4	7.5	760	42	5.5
Kagoshima	60	5	8.3	1051	53	5.0
Okinawa	54	7	13.0	679	55	8.1
Total	2,815	393	14.0	45,989	3,692	8.0

Notes

1. Compiled from Cabinet Office, Progress of Local Government Measures Focused on Women or the Promotion of a Gender-Equal Society (FY2016)
2. Figures for April 1, in principle.

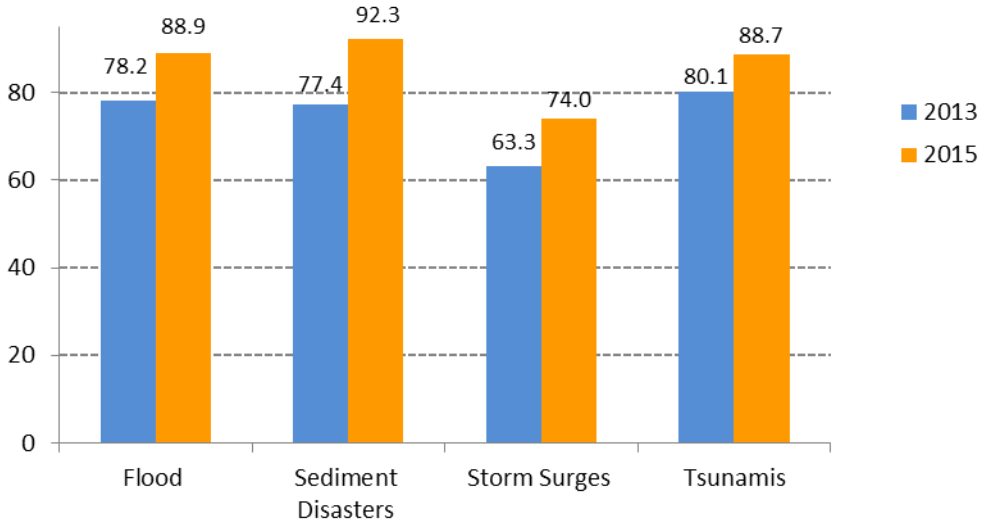
Source: Cabinet Office

8. Various Policies and Measures

Fig. A-50 Hazard Map Development

Source: Produced by the Cabinet Office based on materials of the Ministry of Land, Infrastructure, Transport and Tourism (excluding Volcano Hazard Map)

Fig. A-51 Formulation Status of Official Announcement Criteria for Evacuation Recommendations in Municipalities where Natural Disasters are Anticipated



*The disasters anticipated vary from one municipality to another, so the formulation rate is calculated using different denominators, according to the type of disaster.

Source: Produced by the Cabinet Office based on the "Results of a Survey into the Formulation Status of Specific Official Announcement Criteria for Evacuation Recommendations" from the Fire and Disaster Management Agency.

Fig. A-52 Methods of Communicating Evacuation Instructions to Residents in Municipalities

Year	Disaster management radio communications system		Using the communication facilities of agricultural/ fishery cooperatives (including wired systems)	Patrols by loudspeaker vans	Siren	Bell ringing	News media	Through voluntary disaster management organizations	Other
	Individual Home Receivers System	Simultaneous Broadcasting System							
2003	1,748 54%	2,126 66%	591 18%	2,942 92%	2,537 79%	698 22%	675 21%	1,065 33%	1,106 34%
2004	1,731 55%	2,095 67%	559 18%	2,864 92%	2,463 79%	659 21%	663 21%	1,064 34%	1,106 35%
2005	1,365 56%	1,670 69%	449 19%	2,254 93%	1,927 80%	525 22%	642 27%	942 39%	925 38%
2006	1,118 61%	1,349 73%	362 20%	1,739 94%	1,487 81%	414 22%	666 36%	887 48%	781 42%
2007	1,125 62%	1,350 74%	343 19%	1,722 94%	1,462 80%	383 21%	718 39%	939 51%	800 44%
2008	1,117 62%	1,348 74%	323 18%	1,713 95%	1,455 80%	358 20%	750 41%	987 55%	829 46%
2009	1,118 62%	1,361 76%	311 17%	1,702 95%	1,440 80%	345 19%	782 43%	1,015 56%	830 46%
2010	1,096 63%	1,333 76%	289 17%	1,647 94%	1,383 79%	324 19%	811 46%	1,033 59%	830 47%
2011	1,006 62%	1,240 77%	248 15%	1,530 95%	1,271 79%	270 17%	787 49%	1,002 62%	806 50%
2012	1,086 62%	1,340 77%	245 14%	1,644 94%	1,357 78%	285 16%	848 49%	1,129 65%	955 55%
2013	1,097 63%	1,377 79%	219 13%	1,648 95%	1,347 77%	276 16%	878 50%	1,154 66%	998 57%
2014	1,112 64%	1,398 80%	206 12%	1,651 95%	1,334 77%	256 15%	925 50%	1,169 67%	1,049 60%
2015	1,128 65%	1,412 81%	192 11%	1,659 95%	1,317 76%	238 14%	975 56%	1,193 69%	1,093 63%
2016	1,145 66%	1,426 82%	178 10%	1,654 95%	1,282 74%	219 13%	993 57%	1,204 69%	1,078 62%

Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report “Status of Regional Disaster Management Administration”

Fig. A-53 Instances of Assistance based on Mutual Support Agreements between Prefectures and Support Agreements with Private-Sector Institutions in Recent Years

Year	Instances of Support Based on Mutual Support Agreements Between Prefectures		Status of Support Agreements with Private-Sector Institutions													
			Broadcasting Agreements (agmts.)		Reporting Agreements		Emergency Relief Agreements		Transportation Agreements		Disaster Recovery Agreements		Resources Agreements		Other	
	Total no.	No. of orgs.	Total no. of concluded agmts.	No. of orgs.	Total no. of concluded agmts.	No. of orgs.	Total no. of concluded agmts.	No. of orgs.	Total no. of concluded agmts.	No. of orgs.	Total no. of concluded agmts.	No. of orgs.	Total no. of concluded agmts.	No. of orgs.	Total no. of concluded agmts.	No. of orgs.
2003	23	6	288	47	347	31	191	37	148	39	400	37	711	34	124	19
2004	4	2	288	47	359	33	218	39	165	41	474	39	828	36	134	23
2005	13	8	304	47	362	32	221	43	178	42	504	40	873	40	182	31
2006	5	2	301	46	370	33	241	44	201	40	587	43	992	42	212	37
2007	0	0	304	46	337	34	272	43	211	41	778	43	1,196	44	317	36
2008	12	1	306	46	400	36	316	45	239	43	818	45	1,294	46	461	39
2009	5	1	314	46	399	36	339	44	247	43	857	45	1,364	46	546	41
2010	24	5	329	47	393	36	420	45	254	43	1,590	46	1,431	45	676	42
2011	18	4	318	44	373	33	472	43	235	41	1,568	43	1,357	44	676	39
2012	25	6	334	47	395	36	495	46	291	44	1,825	46	1,461	47	931	46
2013	29	8	360	47	419	38	575	47	317	46	1,913	47	1,558	47	1,178	46
2014	28	6	351	47	445	40	703	47	374	46	2,360	47	1,672	47	1,299	46
2015	24	6	343	47	454	39	893	47	382	46	2,397	47	1,694	47	1,515	46
2016	19	5	352	47	461	40	970	47	438	46	2,626	47	1,795	47	1,751	47

Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report “Status of Regional Disaster Management Administration”

Fig. A-54 Status of Mutual Support Agreements in Municipalities

Year	No. of Municipalities	No. of mutual support agreements to which municipalities belong within the prefecture	No. of municipalities that have concluded mutual support agreements with other municipalities
2003	3,213	1,459	2,363 74%
2004	3,123	1,527	2,306 74%
2005	2,418	1,502	1,771 73%
2006	1,843	1,408	1,457 79%
2007	1,827	1,512	1,471 81%
2008	1,811	1,625	1,656 91%
2009	1,800	1,725	1,646 91%
2010	1,750	1,778	1,571 90%
2011	1,619	1,738	1,476 91%
2012	1,742	2,254	1,645 94%
2013	1,742	2,920	1,650 95%
2014	1,742	3,419	1,697 97%
2015	1,741	3,642	1,705 98%
2016	1,741	4,013	1,699 98%

Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report “Status of Regional Disaster Management Administration”

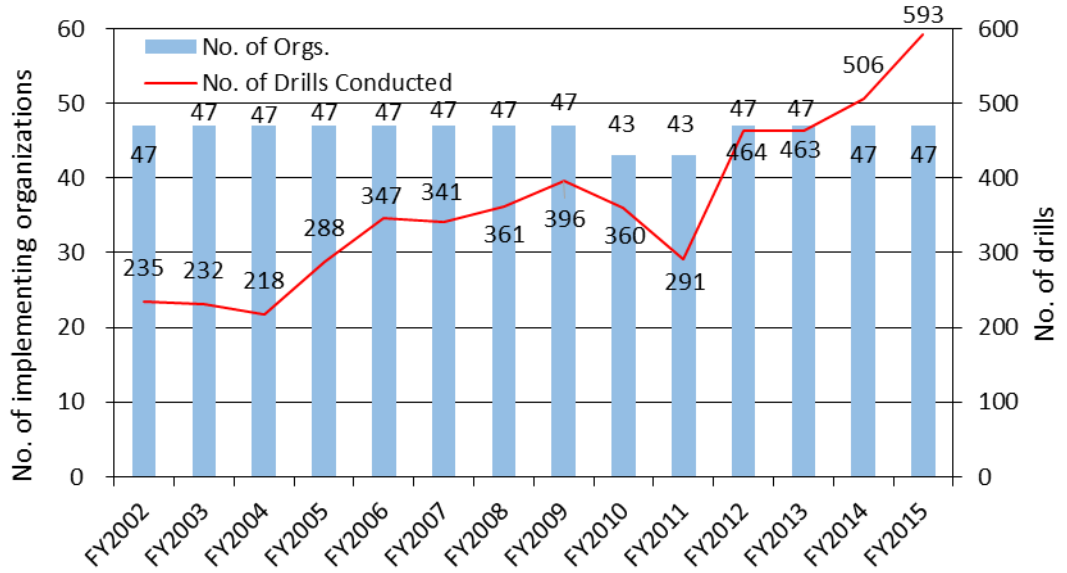
Fig. A-55 Status of Municipalities' Support Agreements with Private-Sector Institutions

Year	Broadcast Agreements		Reporting Agreements		Emergency Relief Agreements		Transportation Agreement		Disaster Recovery Agreements		Resources Agreements		Other	
	No. of orgs.	No. of support instances	No. of orgs.	No. of support instances	No. of orgs.	No. of support instances	No. of orgs.	No. of support instances	No. of orgs.	No. of support instances	No. of orgs.	No. of support instances	No. of orgs.	No. of support instances
2003	150	10	22	2	726	4	253	2	392	21	562	7	334	6
2004	171	20	20	2	713	4	260	2	445	18	589	5	361	5
2005	191	50	27	2	647	6	271	15	445	39	583	17	376	9
2006	225	38	18	2	574	10	267	3	451	24	619	8	401	2
2007	275	35	24		596	7	292	2	662	23	794	6	484	9
2008	315	62	33		619	2	319	5	813	35	936	17	510	5
2009	362	48	33		658	3	355	2	979	35	1,060	33	559	11
2010	378	35	35		683	6	376	3	1,052	42	1,125	22	580	8
2011	376	107	36	2	645	17	386	109	1,066	548	1,118	226	579	57
2012	437	59	41	3	719	19	462	48	1,242	167	1,309	123	684	54
2013	495	81	58		778	3	519	9	1,318	42	1,412	20	743	6
2014	554	59	66		827	2	602	3	1,360	131	1,466	40	800	17
2015	609	50	83	1	869	34	719	3	1,408	62	1,500	31	809	15
2016	636	48	101	1	921	43	811	6	1,451	41	1,526	44	810	25

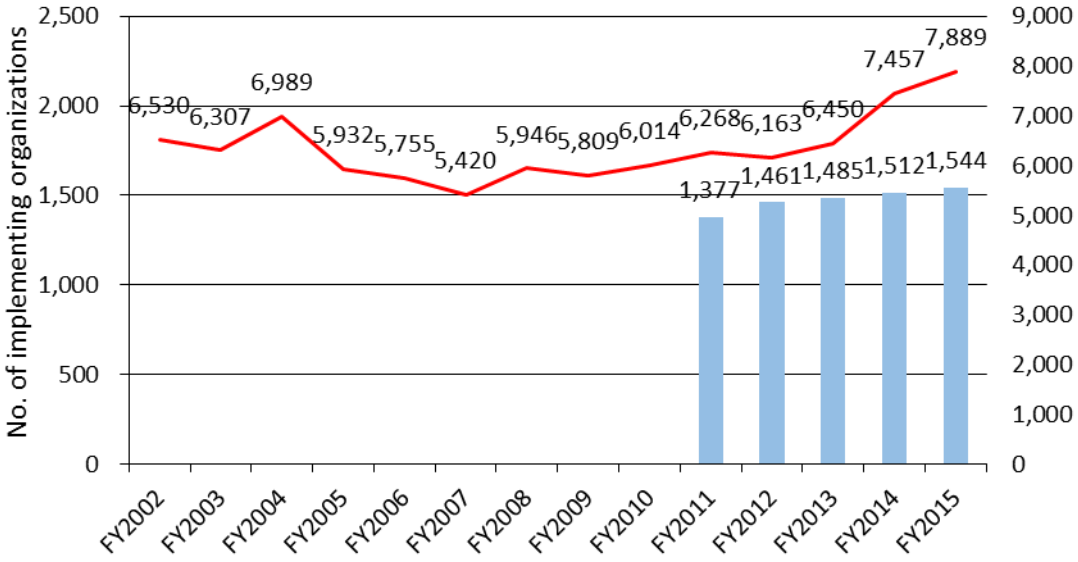
Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report "Status of Regional Disaster Management Administration"

Fig. A-56 Status of Disaster Management Drill Implementation

Trends in the No. of Prefectural Organizations Conducting Disaster Management Drills and the No. of Drills Conducted



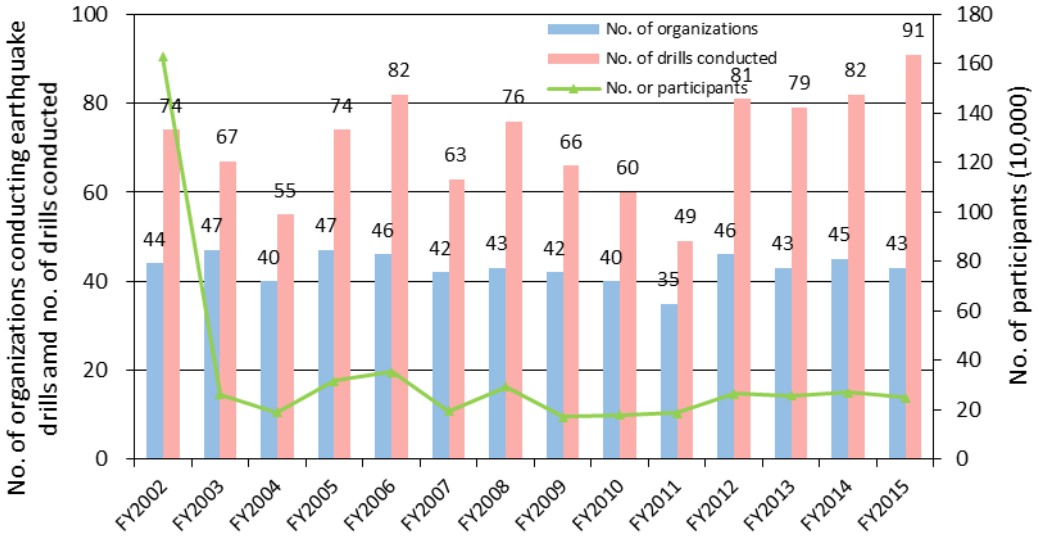
Trends in the No. of Municipal Organizations Conducting Disaster Management Drills and the No. of Drills Conducted



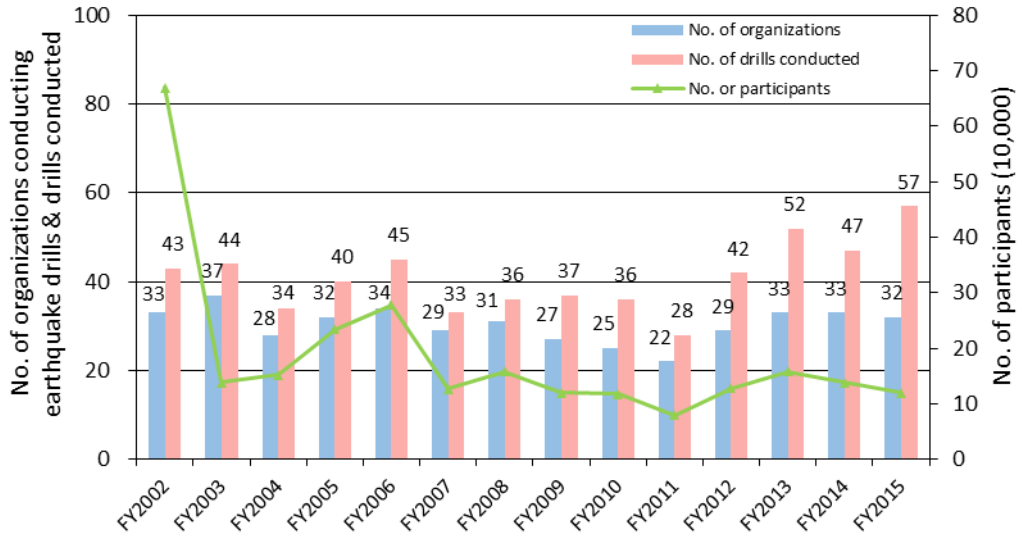
Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report "Status of Regional Disaster Management Administration"

Fig. A-57 Status of Earthquake Disaster Management Drill Implementation

Trends in the No. of Prefectural Organizations Conducting Earthquake Disaster Management Drills, No. of Drills Conducted, and the No. of Participants (Comprehensive Drills)



Trends in the No. of Prefectural Organizations Conducting Earthquake Disaster Management Drills, No. of Drills Conducted, and the No. of Participants (Including Region-Wide Drills)



Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report “Status of Regional Disaster Management Administration”

Fig. A-58 Implementation Status of Tsunami Countermeasures

Year	No. of govts.	Along the Coast?		Designated as likely tsunami inundation areas	Recorded in local plan for disaster risk reduction	Evacuation Routes		Evacuation Sites		Tsunami Breakwaters	
		Yes	No			No. of routes	No. of govts.	No. of facilities	No. of govts.	Extended distance (km)	No. of govts.
2003	3,213	1,014	2,199	401	812	1,700	108	5,355	311	1,631	204
2004	3,123	984	2,139	420	799	1,817	104	5,609	306	1,535	204
2005	2,418	806	1,612	374	465	2,099	111	6,442	316	1,472	180
2006	1,843	666	1,177	367	299	3,066	107	6,830	286	1,233	149
2007	1,827	667	1,160	374	384	2,297	108	7,307	292	1,231	143
2008	1,811	659	1,152	417	393	2,593	118	7,647	297	1,105	133
2009	1,800	655	1,145	424	353	2,674	118	7,919	307	1,042	125
2010	1,750	648	1,102	439	385	2,757	118	8,396	304	1,025	123
2011	1,619	609	1,010	425	357	2,448	106	7,448	276	787	93
2012	1,742	646	1,096	492	379	4,058	130	12,110	323	886	107
2013	1,742	646	1,096	539	383	5,054	139	16,238	361	905	104
2014	1,742	646	1,096	576	403	5,591	155	19,405	380	848	96
2015	1,741	646	1,095	603	431	6,176	166	22,589	410	841	97
2016	1,741	646	1,095	612	444	6,086	174	23,263	418	913	93

Source: Created by the Cabinet Office based on the Fire and Disaster Management Agency report “Status of Regional Disaster Management Administration”

9. Japan's International Cooperation

Fig. A-59 List of Cooperation Projects Conducted by Ministries and Agencies

Ministry/ Agency	Project	Partner/ Target Country (Target Institution)	Description	Budget for FY2016 (in JPY million; if applicable)	Department Responsible
Cabinet Office (CAO)	Partnership between the Cabinet Office and FEMA	US	Based on the Memorandum of Cooperation signed by the Cabinet Office and FEMA in December 2014, an annual meeting was held in September 2016 at FEMA's Washington, D.C. headquarters. During this meeting, the FEMA and the Cabinet Office representatives signed the FY2016-17 Work Plan as an annex to their Memorandum of Cooperation.	—	Disaster Preparedness, Public Relations and International Cooperation Division, Disaster Management Bureau, CAO
	Partnership between the Cabinet Office and the Republic of Korea's Ministry of Public Safety and Security	Republic of Korea	In December 2016, the Cabinet Office and the Republic of Korea's Ministry of Public Safety and Security concluded the Operational Arrangement on Cooperation in the Field of Disaster Management, based on the working-level exchanges that the two countries had undertaken in the field of disaster management to date.	—	Disaster Preparedness, Public Relations and International Cooperation Division, Disaster Management Bureau, CAO
	Japan-China-Republic of Korea Trilateral Tabletop Exercise on Disaster Management	China, Republic of Korea	Based on the matters agreed upon in the Leaders' Declaration at the 4th Japan-China-Republic of Korea Summit Meeting held in Tokyo in March 2011, the 5th Japan-China-Republic of Korea Trilateral Table Top Exercise on Disaster Management took place in Republic of Korea in June 2016, with related institutions from Japan, China, and Republic of Korea participating.	—	Disaster Preparedness, Public Relations and International Cooperation Division, Disaster Management Bureau, CAO
	Japan-U.S. Emergency Management Working Group	US	Partnerships in the field of nuclear emergency prevention systems were deepened through regular exchanges of opinions and information, and reciprocal invitations to exercises, which took place within the framework of the Emergency Management Working Group (EMWG) under the U.S.-Japan Bilateral Commission on Civil Nuclear Cooperation.	—	Director General for Nuclear Disaster Management, CAO
	Cooperation between the Cabinet Office of Japan and the Ministry of the Interior of France on emergency management related to nuclear accidents	France	Along with regular exchanges of opinions and information between the relevant bodies in both countries, reciprocal invitations to exercises were issued within the framework of the memorandum of cooperation on nuclear emergency preparedness signed in May 2015.	—	Director General for Nuclear Disaster Management, CAO
	International Nuclear Emergency Exercise (INEX)	OECD/NEA	Japan participates in the International Nuclear Emergency Exercise (INEX) held by the OECD/NEA, with the aim of improving working-level efforts to address nuclear accidents and disaster countermeasures. This exercise was conducted in Japan in November 2016.	—	Director General for Nuclear Disaster Management, CAO
	Hosting observers of a nuclear emergency response exercise	OECD/NEA, IAEA, US, France, Canada, Republic of Korea	With the objective of sharing information and exchanging views concerning nuclear emergency preparedness in each country, Japan hosted relevant parties from international organizations such as the IAEA and OECD/NEA, as well as the US, France, Canada, and the Republic of Korea as observers at the Comprehensive Nuclear Emergency Response Exercise held at Tomari Power Station in November 2016 and held an exchange of opinions with them.	—	Director General for Nuclear Disaster Management, CAO/ International Affairs Office, Policy Planning and Coordination Division, Secretary-General's Secretariat, the Secretariat of the Nuclear Regulation Authority
	International workshop on post-accident food safety science	OECD/NEA	In November 2016, OECD/NEA and the Cabinet Office co-hosted an international workshop on "Post-accident Food Safety Science" in Fukushima Prefecture. This workshop was an opportunity to tell the world not only about the current situation in Fukushima and initiatives by producers, but also about the valuable experiences of people from the area, including the management of food within the prefecture and the views of local consumers. Scientists from around the world compared the situation in Fukushima with international standards and responses in the wake of Chernobyl and affirmed once again that Fukushima producers, local governments, and the national government are acting rationally from a scientific viewpoint.	—	Director General for Nuclear Disaster Management, CAO

Ministry/ Agency	Project	Partner/ Target Country (Target Institution)	Description	Budget for FY2016 (in JPY million; if applicable)	Department Responsible
Ministry of Internal Affairs and Communications (MIC)	Promotion of Overseas Development of ICT Systems for Disaster Management	ASEAN, Latin America and Caribbean and others	Through this project, MIC will test disaster management ICT systems, which have been cultivated based on Japan's many years of experience and expertise, in countries in the ASEAN region that are prone to natural disasters, taking the needs of each country into account. It will also approach other governments in cooperation with private enterprises and will promote the overseas development of Japan's ICT systems for disaster management.	Included as a part of packaged assistance projects for strengthening international competitiveness in the field of ICT, 2016 (JPY 772m)	International Cooperation Division, Global ICT Strategy Bureau (GISB), MIC
	ICT Phase 3 for the support to AHA Center (ASEAN Coordinating Centre for Humanitarian Assistance on disaster management)	AHA Center (ASEAN)	Since FY2011, MIC and MOFA have been utilizing the Japan-ASEAN Integration Fund (JAIF) to support the development of the ICT system of the AHA Center, which is the disaster management information hub for the ASEAN region. From FY2015, they conduct to support ICT development and human resource development to help improve the AHA Center's emergency response capacity as ICT Phase 3.	—	International Cooperation Division, Global ICT Strategy Bureau (GISB), MIC/ Regional Policy Division, Asian and Oceanian Affairs Bureau, MOFA
Fire and Disaster Management Agency (FDMA)	International Forum on Fire and Disaster Management	Mainly Asian countries	The International Forum on Fire and Disaster Management has been held since 2007 to enable the countries of Asia, first and foremost, to enhance their firefighting and disaster management capacity, and to introduce Japan's firefighting technologies and systems.	3	(Counselor of) Civil Protection and Disaster Management Department, FDMA
	Japan-Republic of Korea Firefighting Administration Seminar	Republic of Korea	During the Year of Japan-Republic of Korea National Exchange, which was held to coincide with the joint hosting of the 2002 FIFA World Cup by Japan and the Republic of Korea, a Japan-Republic of Korea Firefighting Administration Seminar was held in both countries to promote Japanese-Republic of Korean exchange, partnership, and cooperation, through the sharing of information and the exchange of ideas regarding firefighting and disaster management in both countries.	2	(Counselor of) Civil Protection and Disaster Management Department, FDMA
Ministry of Foreign Affairs (MOFA)	Provision of International Emergency Relief Goods		In May 2016, following torrential rain in Sri Lanka, and in October 2016, following the hurricane in Haiti, MOFA contributed international emergency relief goods to support the immediate needs of the affected people through the Japan International Cooperation Agency (JICA) (10th occasion).	219.2	Humanitarian Assistance and Emergency Relief Division, International Cooperation Bureau, MOFA
	Emergency Grant Aid		MOFA provided emergency humanitarian assistance following disasters such as earthquakes and droughts, most notably the October 2016 hurricane in Haiti, and provided emergency grant aid to facilitate recovery and mitigate the damage arising from those disasters.	11,612	Humanitarian Assistance and Emergency Relief Division, International Cooperation Bureau, MOFA
	Disaster Risk Reduction Collaboration/ Disaster Restoration Support in Cooperation with Japan's International Cooperation NGOs	Countries affected by natural disasters	This project promotes (1) DRR cooperation in developing countries through the Grant Aid for Japanese NGO's Projects, emergency humanitarian relief and disaster recovery support through the Japan Platform,[1] and (2) by establishing an international DRR network in the Asia Pacific region and carrying out emergency humanitarian relief through the Asia Pacific Alliance (PAD).[2] 1: A framework by which Japanese NGOs, the business community, and the government work together to provide emergency humanitarian support following the occurrence of a natural disaster or conflict either in Japan or overseas. 2: A framework that aims to develop an international DRR network for NGOs, the business community, and the governments of the APAD member states to tackle large-scale natural disasters in the Asia Pacific region, under the leadership of Japanese NGOs. The Japanese government contributed approx. JPY 100 million in FY2013 and plans to contribute JPY 200 million in FY2015 and JPY 100 million in FY2016.	(1) Included in the JPY 162,904m of grant aid (2) Included in the JPY 28,437m of voluntary financial contributions to international organizations, etc.	Non-Governmental Organizations Cooperation Division, International Cooperation Bureau, MOFA
	Financial Contributions to International Organizations in Response to the Establishment of World Tsunami Awareness Day	UNISDR, UNITAR, ESCAP	In response to the establishment of World Tsunami Awareness Day, Japan worked with international organizations on activities to raise awareness of tsunami (symposiums and seminars, etc.) in various parts of the world, primarily in Asian countries that are most vulnerable to tsunami damage. In addition, Japan held Technical Training in Japan on the topic of tsunami preparedness.	393	Global Issues Cooperation Division, International Cooperation Bureau, MOFA
	Operation of IAEA RANET Capacity Building Centre (CBC)	IAEA member countries (IAEA)	In December 2012, the "Practical Arrangements Between the Ministry of Foreign Affairs of Japan and the International Atomic Energy Agency on Cooperation in the Area of Emergency Preparedness and Response" was signed by MOFA and the IAEA. Given this, in May 2013, the IAEA RANET Capacity Building Centre (CBC) was designated in Fukushima Prefecture. IAEA staff are permanently stationed there. As well as being used to store materials and equipment required for dealing with emergencies involving radiation and to undertake various tasks in an emergency, the CBC serves as the venue for training courses for officials from foreign and Japanese local governments several times a year.		International Nuclear Energy Cooperation Division, Disarmament, Non-proliferation and Science Department, MOFA

Ministry/ Agency	Project	Partner/ Target Country (Target Institution)	Description	Budget for FY2016 (in JPY million; if applicable)	Department Responsible
Ministry of Education, Culture, Sports, Science and Technology (MEXT)	Promotion of "Sentinel Asia" Project to Share Information on Natural Disasters Between Asia - Pacific Countries	27 countries and regions of the Asia Pacific Region/ 15 international organizations	This project is led and implemented by Japan to contribute to disaster management efforts in the Asia-Pacific Region. It uses satellites to share information relating to natural disasters. Participants consist of 27 countries and regions, 89 institutions, and 15 international institutions (as of February 2017).	Included in JAXA Management Expenses Grant	Office for Space Utilization Promotion, Space Development and Utilization Division, Research and Development Bureau, MEXT
	Science and Technology Research Partnership for Sustainable Development (SATREPS) Program	135 countries that are the object of ODA	MEXT and the Japan Science and Technology Agency (JST) together with MOFA and the Japan International Cooperation Agency (JICA), through leading science and technology and Official Development Assistance (ODA), have set up SATREPS in order to promote joint international research on solutions to global issues that occur in developing countries, including DRR.	(MOFA) Included in JICA Management Expenses Grant (MEXT) Included in JST Management Expenses Grant	International Science and Technology Affairs Division, Science and Technology Policy Bureau, MEXT
Ministry of Agriculture, Forestry and Fisheries (MAFF)	Investigative Project into Global Environment Issues for Overseas Agricultural and Rural Development (Survey to consider agricultural disaster management plans)	Targeted widely, particularly in Asian countries	Between 2013 and 2016 this project will work in the rural areas of developing countries to disseminate education to raise residents' awareness of DRR, to develop system to prevent and reduce damage from natural disasters through resident participation under the leadership and support of local governments, and to investigate methods for creating rural disaster management plans.	26	Overseas Technical Team, Overseas Land Improvement Cooperation Office, Design Division, Rural Infrastructure Department, Rural Development Bureau, MAFF
Ministry of Land, Infrastructure Transport and Tourism (MLIT)	ASEAN-Japan Port Technology Group (Formulation of Port DRR Guidelines)	ASEAN nations	Under a three-year program launched in FY2014, Japan has been sharing the lessons learned from the Great East Japan Earthquake with the ASEAN nations and preparing Port DRR Guidelines to which all of the ASEAN nations can refer when implementing initiatives relating to port DRR. A substantive agreement on the guidelines was reached at a meeting of port engineers in Phnom Penh, Cambodia in February 2017 and the guidelines are due to be approved at the ASEAN and Japan Transport Ministers Meeting, which is scheduled to take place in the autumn of 2017.	15	International Policy Planning Office, Industrial Port Policy Division, Ports and Harbors Bureau/ Risk Management Office, Coastal Administration and Disaster Management Division, Ports and Harbors Bureau, MLIT
	Joint Tsunami Evacuation Drill With Chile	Chile	On November 4, 2016, in partnership with Chile's National Office of Emergency of the Interior Ministry, joint tsunami evacuation drills were held at Hososhima Port (Hyuga City, Miyazaki Prefecture) and in Chile (Valparaiso), to facilitate a swift response to tsunami.	—	Risk Management Office, Coastal Administration and Disaster Management Division, Ports and Harbors Bureau, MLIT
	Raising Awareness of World Tsunami Awareness Day (Hamaguchi Award)	All relevant countries	Taking advantage of the opportunity presented by the establishment of World Tsunami Awareness Day, Japan founded the Hamaguchi Award (awarded by the Minister of Land, Infrastructure and Transport) for individuals and/or organizations within Japan or overseas that have made significant contributions in the field of technologies for coastal disaster risk reduction, especially tsunami preparedness. Two individuals and one organization were recognized at the award ceremony held on October 31, 2016: Prof. Nobuo Shuto, Emeritus Professor, Tohoku University; Dr. Eddie Bernard, Former Director, Pacific Marine Environmental Laboratory of the U.S. National Oceanic and Atmospheric Administration; and the National Office of Emergency of the Interior Ministry, Chile.	—	Port and Airport Research Institute, National Institute of Maritime, Port and Aviation Technology,
	Disaster Management Collaboration Dialogues	Vietnam, Thailand, Myanmar, Indonesia, Turkey, South Africa	Held since 2013, these dialogues aim to enhance the DRR functions of developing nations principally in Asia, while also expanding Japan's DRR technology overseas. They also aim to develop a lasting structure for cooperation in each individual country through collaborations between industry, government, and academia.	30	River Planning Division, Water and Disaster Management Bureau/ Overseas Projects Division, Policy Bureau, MLIT
	Collaboration between MLIT and the European Commission's Humanitarian Aid and Civil Protection Department (ECHO)	ECHO	Following the exchange of correspondence between Japan's MLIT and EU's ECHO in March 2013, an information exchange has been conducted every year to share DRR knowledge and experience through the reciprocal exchange of experts and practitioners, with the objective of enhancing disaster management systems on both sides.	—	River Planning Division, Water and Disaster Management Bureau, MLIT
	Discussion with India on DRR Technology Through a Bilateral Conference	Ministry of Road Transport and Highways in India	In accordance with the cooperation framework concluded in September 2014, the 3rd meeting of the Japan–India Joint Working Group on Roads and Road Transport was held in India. At the meeting, the Japanese side confirmed that it would provide India with support in creating standards for slope disaster prevention technology suited to India, with reference to Japanese standards and technologies, to facilitate the development of mountain roads in areas such as India's northeastern states. The 4th meeting is due to be held in Tokyo in FY2017.	—	International Affairs Office, Planning Division, Road Bureau, MLIT

Ministry/ Agency	Project	Partner/ Target Country (Target Institution)	Description	Budget for FY2015 (in JPY million; if applicable)	Department Responsible
Ministry of Land, Infrastructure Transport and Tourism (MLIT)	International Centre for Water Hazard and Risk Management (ICHARM)	UNESCO, etc.	As a UNESCO Category 2 center, the International Centre for Water Hazard and Risk Management (ICHARM) actively undertook research, training, and information networking activities aimed at mitigating damage due to water hazards worldwide. Specifically, it developed the Integrated Flood Analysis System and the Rainfall-Runoff-Inundation model, and put them into practice in the field; conducted research and development on risk management; and offered master's and doctoral courses in disaster mitigation studies. In addition, it undertook technical assistance and international support initiatives funded by organizations including UNESCO and the Asian Development Bank.	Included in PWRI Management Expenses Grant (8,665 million yen)	Public Works Research Institute
	US-Japan Cooperative Program in Natural Resources (UJNR) Panel on Earthquake Research	US	Established to share scientific knowledge concerning the mitigation of earthquake damage and promote collaboration with the US, this panel brings together earthquake research organizations in Japan and the US. A meeting of the panel was held in November 2016 in the US (held alternately in the US and Japan every two years) to exchange information and engage in discussion concerning the latest research output and future plans relating to earthquake research and observation. The coordinating office for the Japanese side is the Geospatial Information Authority of Japan, while that for the US side is the United States Geological Survey (USGS). A resolution summarizing the research on which Japan and the US should cooperate in future to mitigate the damage caused by earthquakes was adopted at the meeting.	—	Research Management Division, Geography and Crustal Dynamics Research Center, Geospatial Information Authority of Japan, MLIT
	6th Plenary Meeting of UN Global Geospatial Information Management for Asia and the Pacific (UN-GGIM-AP)	Member countries in the Asia-Pacific region	The 6th Plenary Meeting of UN Global Geospatial Information Management for Asia and the Pacific (UN-GGIM-AP), in which the geospatial information authorities of each country participate, is due to be held in Japan in October 2017. As chair of this committee and also as a country that will be represented by experts in the use of geospatial information in disaster management, Japan will seek to build capacity among the member countries.	—	International Affairs Division, Planning Department, Geospatial Information Authority of Japan, MLIT
Japan Metrological Agency (JMA)	International Cooperation through WMO	WMO member countries	The JMA, as a constituent member of the WMO (one of the specialized institutions of the UN which functions to collect and promote the distribution of observations and data on weather around the world, and to improve information relating to the weather and the climate), sends experts to international conferences, and is responsible for international centers.	—	Office of Disaster Management and Planning, Planning Division, Administration Department, JMA
	International Cooperation through UNESCO	UNESCO member countries, etc.	The JMA provides technological contributions relating to the field of oceans and tsunami, within the framework of the UNESCO Intergovernmental Oceanographic Commission (IOC). - It collects, analyzes, and provides data on oceans and maritime meteorology for the northeast Asian region, in cooperation with other related countries (China, Republic of Korea, and Russia). - It provides each country with information on tsunamis caused by earthquakes that occur in the northwest Pacific region.	—	Office of Disaster Management and Planning, Planning Division, Administration Department, JMA
	International Cooperation through International Civil Aviation Organization (ICAO)	ICAO member countries	The JMA participates in meetings relating to aeronautical meteorology organized by the ICAO, as well as investigations into adopting and improving standard international criteria for aviation weather services. It has also been appointed by the ICAO to operate international centers such as the Tokyo Volcanic Ash Information Center, and the Tropical Cyclone Information Center, thus contributing to the safe operation of global aircraft.	—	Office of Disaster Mitigation, Planning Division, Administration Department, JMA
	Collaboration on International Research Plans	All relevant countries	The JMA promotes various international research projects in cooperation with other countries. On climate change, it has been involved in writing evaluation reports on the activities of the Intergovernmental Panel on Climate Change (IPCC) since the panel was established in 1988.	—	Office of Disaster Management and Planning, Planning Division, Administration Department, JMA
	Human Resource Development Aid and Technological Cooperation to Developing Countries	All relevant countries	Together with the Japan International Cooperation Agency (JICA), the JMA has spent more than 40 years conducting trainings designed for the staff of the national meteorological institutions of developing countries, in order to improve their meteorological services. Also, in response to demands from the WMO and individual countries, the JMA dispatches staff who are experts in observations using meteorological radar, weather analysis, and weather forecasting, and receives trainees from the national meteorological institutions.	—	Office of Disaster Management and Planning, Planning Division, Administration Department, JMA

Ministry/ Agency	Project	Partner/ Target Country (Target Institution)	Description	Budget for FY2015 (in JPY million; if applicable)	Department Responsible
Japan Coast Guard (JCG)	Participation in the projects of the Northwest Pacific Action Plan (NOWPAP) Marine Environmental Emergency Preparedness and Response Regional Activity Centre (MERRAC)	Republic of Korea, China, Russia	The JCG participates in the projects of the NOWPAP MERRAC, which is a center responsible for preparing for and responding to marine environmental emergencies. As well as undertaking a marine environmental conservation initiative focused on the Sea of Japan and the Yellow Sea, etc. in partnership with neighboring countries, the JCG takes part in joint oil spill clean-up drills organized by relevant organizations and attends meetings held each year. Through these activities, it promotes international cooperation by striving to build systems that will enable relevant countries to work together in the event of an accident.	—	Protection of Marine Environment Division, Guard & Rescue Department, JCG
The Secretariat of the Nuclear Regulation Authority (NRA)	IAEA Safety Measure Contributions for Nuclear Power Plants (Emergency Measures Project)	IAEA	Japan also participates in IAEA projects to promote the publication and sharing of information relating to accidents and issues that are reported to the IAEA by member countries regarding their nuclear facilities.	41	International Affairs Office, Policy Planning and Coordination Division, Secretary-General's Secretariat, the Secretariat of the Nuclear Regulation Authority
	Japan, China, and Republic of Korea Trilateral Top Regulators Meeting (TRM) on Nuclear Safety and Working Group on Emergency Preparedness and Response (WGEPR)	China, Republic of Korea	The TRM is a meeting held by the regulatory bodies of Japan, China, and the Republic of Korea to promote the exchange of information on regulatory issues concerning nuclear energy and the improvement of technology. Its other objectives are to increase nuclear safety and strengthen regional cooperation. Established under its auspices, the WGEPR is a forum for the exchange of information concerning emergency prepareness and response.	—	International Affairs Office, Policy Planning and Coordination Division, Secretary-General's Secretariat, the Secretariat of the Nuclear Regulation Authority
Ministry of Defense (MOD)	Multi-National Joint Training Exercise, RIMPAC	Australia, Canada, US, and others	This is a joint training exercise planned by the US Navy and conducted with the involvement of foreign vessels. Japan participates in humanitarian support and disaster relief training.	—	Training Division, Bureau of Defense Policy, MOD
	Multinational Joint Training on Humanitarian Aid and Disaster Relief "Southern Cross" organized by French military based in New Caledonia	France, Australia, Tonga, Vanuatu, UK, US, and others	Following the press release issued in May 2014, at the time of the Prime Minister's visit to France, personnel were dispatched to this training in November 2016, and field training was conducted in connection with relief activities for disasters on islands.	—	Training Division, Bureau of Defense Policy, MOD
	Multinational Joint Training "Cobra Gold"	Indonesia, Republic of Korea, Malaysia, Singapore, Thailand, US, and others	In addition to the existing bilateral training drills conducted between the US and Thailand, this training has been implemented in recent years as a multinational training program focusing on peace operations in areas of conflict, UN peace-keeping activities, and humanitarian and public welfare support activities. Japan participated in medical activity drills.	—	Training Division, Bureau of Defense Policy, MOD
	Japan-U.S.-Australia Joint Training for Humanitarian Assistance and Disaster Relief	Australia and US	This is a training program that aims to improve interoperability with the US and Australian air forces with respect to humanitarian aid and disaster relief activities. The participating countries conduct air transport training, supply-drop training, soft-field take-off and landing training, and search training.	—	Training Division, Bureau of Defense Policy, MOD
	Japan-U.S.-Australia Joint Training for Humanitarian Assistance and Disaster Relief in the Federated States of Micronesia and other Countries	Australia and US	Aimed at improving interoperability with the US Air Force and Royal Australian Air Force in humanitarian aid and disaster relief activities, this training includes exercises in which the participating countries undertake air transport, pack supplies, and deliver them by air drop.	—	Training Division, Bureau of Defense Policy, MOD
	ADMM-Plus Exercise in Humanitarian Aid, Disaster Relief and Defense Medicine	Every ADMM-Plus country	This training exercise aims to enhance the capacity for providing regional disaster relief, and consists of field training conducted within the framework of the extended ASEAN Defense Ministers' Meeting (ADMM-Plus). Japan participated in medical activity drills.	—	Training Division, Bureau of Defense Policy, MOD
	Komodo 2016 Multilateral Joint Training Exercise Hosted by the Indonesian Navy	Indonesia, US, Australia, China, Russia and others	Japan sent a destroyer to participate in this exercise, which includes search and rescue drills.	—	Training Division, Bureau of Defense Policy, MOD

Source: Created by the Cabinet Office using materials from various ministries and agencies.

Fig. A-60 Examples of Technical Cooperation Projects in Disaster Risk Reduction (FY2016)

Country	Cooperation Period	Project Name	Description
Asia	2013-2016	Use of Disaster Management Satellite Information Assistance for Capacity-building Project in the ASEAN Region	To improve the practical use of satellite information in DRR in the ASEAN countries, this project conducts research using satellite information acquisition, image analysis, flood run-off analysis, and flooding analysis.
Indonesia	2013-2017	Project for Assessing and Integrating Climate Change Impacts into the Water Resources Management Plans for Brantas and Musi River Basins	Supports the implementation by Indonesia of water resources management that takes into account the effects of climate change, by providing advice on the formulation of water resource management plans in Indonesia's Brantas and Musi River Basins that take such effects into consideration, and by drafting guidelines that can also be applied to other river basins.
Indonesia	2013-2018	Project for Integrated Study on the Mitigation of Multimodal Disasters Caused by the Ejection of Volcanic Products (SATREPS)	Aims to comprehensively reduce disaster risks caused by the ejection of volcanic products through the development of a "Multimodal Sediment Disaster Countermeasures Decision-Making Support System" composed of a "Volcanic Eruption Early Warning System", an "Integrated GIS Multimodal Sediment Disaster Simulator", and a "Floating Volcanic Ash Warning System", all addressing the six volcanoes within Indonesia (Merapi, Semeru, Kelud, Galunggung, Guntur and Sinabung), and through the practical use of such system by the institutions related to DRR.
Indonesia	2014-2018	Project on Capacity Development for River Basin Organizations (RBOs) in Integrated Water Resources Management in the Republic of Indonesia (Phase II)	In the field of integrated water resources management in Indonesia (operation and maintenance of river facilities, coordination of water use and allocation, preservation of aquatic environments, flood management, etc.), supports the improvement of the structure and capacity of the RBOs and the continuous strengthening of efforts relating to integrated water resources management, by means of (1) site confirmations using field practice, (2) development and management of organizational structures and systems for strengthening the capacity of the RBOs, and (3) improving access to reliable guidelines and manuals.
Thailand	2016-2019	Project for Strengthening the ASEAN Regional Capacity on Disaster Health Management (ARCH Project)	Thailand's National Institute for Emergency Medicine (NIEM) serves as the implementing agency for this project, which aims to strengthen collaborative frameworks for disaster health management in the ASEAN region through collaborative intraregional disaster health management drills, the development of collaboration tools, and training courses, thereby enhancing disaster response capabilities within the region. ASEAN has endorsed this project as an official ASEAN project.
Philippines	2014-2017	Project for Enhancing Capacity on Weather Observations, Forecasting and Warnings	Enhances weather observation, forecasting, and warning capacity in the Philippines through capacity development for weather observations, weather data analysis and forecasting, establishment of warning criteria for Southern Luzon, and improvements in communication methods for and details of weather information, as well as awareness-raising activities relating to weather information in Southern Luzon.
Philippines	2016-2019	Project for Strengthening Capacity of Integrated Data Management of Flood Forecasting and Warning	This project seeks to strengthen capacity to prepare flood forecasting and warning plans and strengthen hydro-meteorological data quality control and storage capabilities within the Hydro-Meteorological Division (HMD) of the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA); standardize organizational systems and draft standards for enhancing equipment and facilities within River Centers (RCs); strengthen flood forecasting and warning systems in the Cagayan de Oro and Tagoloan basins; and cultivate the data management capabilities required for flood forecasting and warning at the Cagayan de Oro and Tagoloan RCs. Through this, it aims to strengthen integrated data management and utilization capabilities in respect of flood forecasting and warning at PAGASA HMD and the RCs in question, and thereby contribute to improving integrated data management and utilization capabilities in respect of flood forecasting and warning throughout PAGASA.
Vietnam	2011-2016	Development of Landslide Risk Assessment Technology along Transport Arterials in Vietnam (SATREPS)	In the mountainous area of Vietnam, landslides are a frequent occurrence due to soft ground and increasingly strong tropical winds and tropical monsoons. This project therefore aims to develop landslide disaster risk assessment technologies for the protection of trunk roads that connect the north and the south of the country and to ensure the safety of the residents of mountainous areas, as well as to develop landslide disaster risk reduction technologies that include early warning systems and human resources development.
Vietnam	2013-2016	Project for Building Disaster Resilient Societies in the Central Region of Vietnam (Phase II)	Project aims to strengthen the implementation capacity and integrated flood control plans of the national government and the four ministries of Central region, by strengthening collaboration systems with respect to integrating the national government's flood risk management efforts and strengthening its capacity to develop integrated flood risk management plans, enhancing capacity for flood risk analysis, and implementing structural and non-structural flood countermeasures in the target ministries.
Malaysia	2011-2016	Research and Development for Reducing Geo-Hazard Damage in Malaysia caused by Landslides and Floods (SATREPS)	Observes the environment around the surface of the earth using remote sensing and conducts research into the production of the trial version of a high level disaster risk management system including an integrated database relating to sediment and flood disasters, in order to implement and promote a disaster management program in Malaysia.
Myanmar	2012-2016	Project on Establishment of an End-to-End Early Warning System for Natural Disasters	In order to assist in the eventual development of a natural disaster early warning system in Myanmar, this project aims to establish an improved model of a system for transmitting early warnings swiftly and appropriately to residents at the pilot project site, and also to implement human resources development for national and local government institutions and awareness-raising activities for residents such as evacuation activities. It also develops a plan for expansion into other regions.
Myanmar	2015-2020	Project for Development of a Comprehensive Disaster Resilience System and Collaboration Platform in Myanmar (SATREPS)	Yangon Technological University, which falls under the jurisdiction of Myanmar's Ministry of Science and Technology, is planning to develop and build a scenario analysis system that forecasts changes in disaster vulnerability as needed, and an integrated disaster response system based on this to enhance disaster resilience. In addition, it is planning to establish a consortium to promote collaboration between industry, academia and government, to promote widespread adoption of these systems by governmental organizations and industry. Japan will provide support for R&D of these systems, human resource development required for this R&D, and the establishment of the consortium, thereby helping to enhance disaster resilience in Myanmar.
Tuvalu	2011-2017	Project on Pilot Gravel Beach Replenishment against Coastal Disasters on Fongafale Island, Tuvalu	In Tuvalu, measures to address coastal erosion are urgently required since marine pollution has worsened due to storm surges and domestic wastewater. In this project, gravel beach replenishment is proposed as a measure to preserve the coast, following the natural beach formation mechanism of reef islands. Through this pilot study, the project will verify suitability and collate points to note when the pilot is disseminated to other areas.

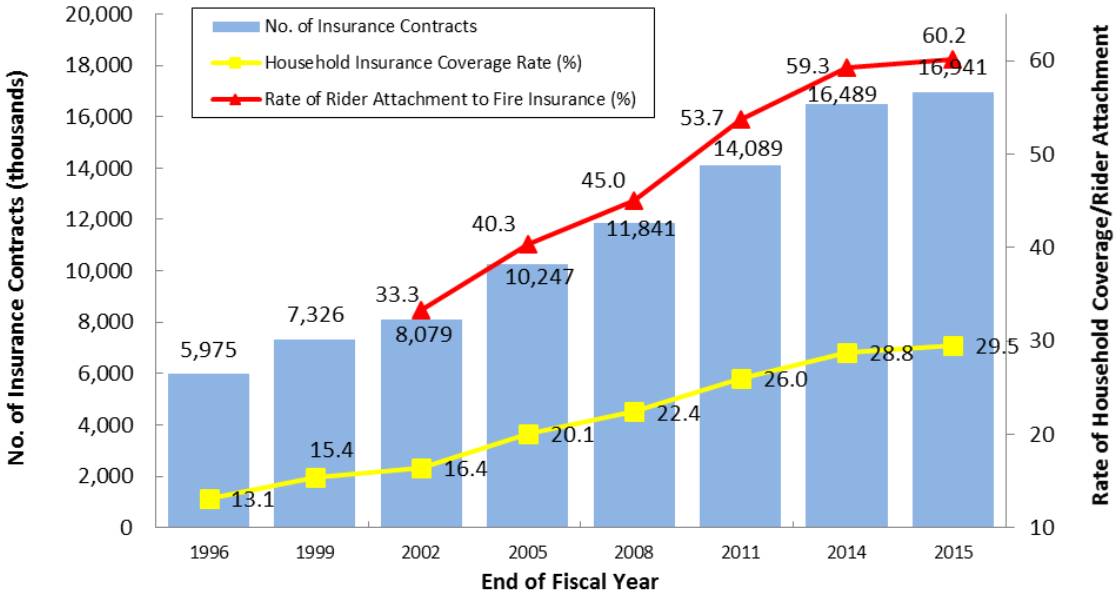
Country	Cooperation Period	Project Name	Description
Fiji	2014-2016	Project for the Planning of the Nadi River Flood Control Structures	Nadi, Fiji's third largest city, is important to Fiji as a tourist center, but since no basic flood control plan has been formulated, and no flood countermeasures program has been implemented, it is vulnerable to flooding. There has been immense damage even in recent years and the area continues to be exposed to flood risk. For this reason, this project is working towards the formulation of a comprehensive flood countermeasures master plan for the river basin of the Nadi River, which flows through Nadi, the performance of feasibility studies with respect to priority projects based thereon, and the implementation of technology transfers to project counterparts.
Fiji	2014-2018	Project for Reinforcing Meteorological Training Function of FMS	Improves the capacity to assess the human resources development needs of Oceania for the Fiji Meteorological Service (FMS), performs maintenance on human resources development tools (including curriculum and textbooks), and by enhancing the leadership capacity of the FMS through the improvement of its observation and prediction services, works towards the improvement of the human resources development function of the FMS with respect to Oceania, and contributes to the independent future continuation of human resources development work in Oceania by the FMS.
China	2015-2018	The Project for Promotion and Capacity Development of Disaster Mitigation Education in Sichuan Province	As part of this project, which encompasses 100 or so model schools for disaster mitigation education, model schools in the city of Ya'an will carry out model lessons, to facilitate research into drills and activities that involve teaching materials, curricula, and communities, as well as research into the development of government policy. The objective of this initiative is to build models for ongoing disaster mitigation education and to improve awareness of disaster preparedness and disaster response capabilities at every level, including boards of education, school managers, teachers, and the students themselves.
Kyrgyzstan	2016-2019	Project for Capacity Development for Road Disaster Prevention Management	This road disaster prevention project involving Kyrgyzstan's Ministry of Transport and Roads seeks to (1) summarize the roles of relevant departments; (2) improve road disaster prevention inspection and analysis capabilities; (3) build and operate a road disaster prevention database management system; and (4) promote cooperation in improving capabilities in the area of preparing road disaster prevention management plans. Through this, it aims to develop capacity for road disaster prevention management within the Ministry of Transport and Roads, and thereby increase the safety of road traffic against slope or snow disasters in the area under the jurisdiction of the road maintenance management office targeted by the project.
Mongolia	2016-2019	Project for Strengthening the National Capacity of Earthquake Disaster Protection and Prevention in Mongolia	This project seeks to strengthen capacity at the Mongolian national government's disaster prevention body (National Emergency Management Agency: NEMA) by strengthening preventive measures in respect of earthquake-related disaster preparedness. In addition to increasing NEMA's capacity to formulate its own disaster prevention plans, this project will promote initiatives such as the formulation and updating of regional government disaster prevention plans by NEMA, earthquake-resistant construction by other ministries and agencies, and disaster preparedness education.
Armenia	2014-2017	Landslide Disaster Management Project	In Armenia, this project works towards enhancing the capacity to manage and respond to landslide disasters of the Landslide Disaster Management Working Group, by improving the technology and capacity relating to sediment disaster management, developing plans, guidelines, and legislation, and strengthening implementation systems.
Sri Lanka	2014-2017	Technical Cooperation for Landslide Mitigation Project	Supports the enhancement of sediment disaster management capacity in Sri Lanka through conducting surveys and assessments of sediment disaster countermeasures, development of designs to prevent landslide, slope failures and rocks fall, construction supervision and monitoring, and accumulation of knowledge and know-how on sediment disasters mitigation measures.
Sri Lanka	2014-2017	Project for Improving of Meteorological Observations, Weather Forecasting and Dissemination	Conducts maintenance and inspection as well as calibration capacity improvements on meteorological observation equipment, enhances the capacity to send and receive meteorological data, improves weather forecasting capacity, refines warning criteria, improves transmission methods for and contents of weather information, and works towards improving capacity for meteorological observations, forecasting, warnings, and dissemination in Sri Lanka.
Nepal	2016-2021	Integrated Research on Great Earthquakes and Disaster Mitigation in Nepal Himalaya (SATREPS)	The goal of this project is to strengthen remote monitoring systems and develop human resources in the earthquake field by estimating future earthquakes that could occur in the Himalayan seismic gap, thoroughly examining the ground properties of the Kathmandu basin, and enhancing the seismographic network.
Pakistan	2016-2019	Project for Capacity Development of Disaster Management	Via the National Institute of Disaster Management (NIDM), a public training institution established in 2007 to develop capacity at the National Disaster Management Authority (NDMA), this project will support efforts to strengthen human resource development implementation systems in the field of disaster management and contribute to increasing the knowledge concerning disaster management held by personnel belonging to the country's disaster management administration bodies.
Bangladesh	2013-2017	Project for Capacity Development of Management for Sustainable Water-Related Infrastructure	To reduce flood damage in Bangladesh, this project provides support for investigations and inspections into the causes of damage at existing levees, and support for levee design, construction, and maintenance manuals through demonstrations to verify levee construction.
Bangladesh	2014-2018	Research Project on Disaster Prevention/Mitigation Measures against Floods and Storm Surges (SATREPS)	Proposes prevention and mitigation measures for storm surge and flood damage including the creation of flood risk maps and storm surge risk maps, measures to address river bank erosion and river levee collapse, and measures to prevent toxic substance diffusion at times of flooding, and experimentally conducts such measures.
Bangladesh	2015-2019	Building Safety Promotion Project For Disaster Risk Reduction (BSPP)	Mainly targeting staff at the Public Works Department under the Ministry of Housing and Public Works, this project seeks to increase the safety of buildings in Bangladesh and reduce the risk of disaster in urban areas by supporting efforts to strengthen human resource development systems aimed at increasing building safety; increase capacity to evaluate seismic capacity, undertake seismic design, and supervise construction; and strengthen systems aimed at making buildings sounder.
Bangladesh	2016-2021	Technical Development to Upgrade Structural Integrity of Buildings in Densely Populated Urban Areas and its Strategic Implementation towards Resilient Cities (SATREPS)	Focusing on buildings in Dhaka that are primarily built from reinforced concrete, this project involves research into diagnostic techniques and reinforcement methods suitable to local components and structural styles, and the presentation of recommendations for a strategies for applyin them. Through this, it aims to increase the structural resilience of buildings, and encourage technology development and its effective implementation, thereby contributing to reducing the structural vulnerability of buildings in Bangladesh, and increasing safety against urban earthquakes.
Bhutan	2013-2016	Study on Glacial Lake Outburst Floods (GLOFs) in the Bhutan Himalayas	Supports the strengthening of emergency response capacity at the national and regional levels through the development and pilot implementation of an early warning system to respond to flooding including Glacial Lake Outburst Floods (GLOFs), as well as the development of a system for incorporating disaster risk assessment into development plans.

Country	Cooperation Period	Project Name	Description
Central America	2015-2020	Project on Capacity Development for Disaster Risk Management in Central America, Phase 2	The Project on Capacity Development for Disaster Risk Management in Central America was conducted to build disaster-resilient societies by improving the disaster risk reduction capabilities of six countries in Central America (El Salvador, Honduras, Guatemala, Nicaragua, Costa Rica, and Panama), which face similar risks in terms of natural disasters, including earthquakes, floods, and volcanic disasters. Based on the results of that project, Phase 2 supports the strengthening of capacity among administrative organizations with a view to nationwide rollout, and the strengthening of frameworks for sustained efforts to popularize systematic community disaster preparedness, as well as supporting the construction of frameworks for sharing each country's experiences with others in Central America, with the aim of developing disaster risk management capacity throughout the region.
Mexico	2016-2021	Hazard Assessment of Large Earthquakes and Tsunamis in the Mexican Pacific Coast for Disaster Mitigation (SATREPS)	This project involves installing measuring instruments on the earth's surface and sea floor in the coastal region of Guerrero state in southern Mexico, and gathering and analyzing earthquake data. This will be used to develop scenarios for major earthquake and tsunami hazards that could occur in future and to prepare a hazard map, and tsunami evacuation signs will also be created. In addition, the project will develop and disseminate a disaster mitigation education program that takes local sociocultural attributes into account.
Nicaragua	2016-2019	Project for Strengthening of Capacity of the Central American Tsunami Advisory Center (CATAC)	Focusing on the Central American Tsunami Advisory Center (CATAC) in Nicaragua, the goal of this project is to improve the quantitative tsunami forecasting capabilities required for CATAC's tsunami advisory information so that the information can be used in the tsunami warnings of Central American countries. It will involve increasing CATAC's ability to analyze earthquake parameters and forecast tsunami using observation data from Central American countries; putting in place facilities and infrastructure for conducting human resource development in Central American countries; and conducting human resource development among core personnel.
Ecuador	2013-2016	Project for the Enhancement of Tsunami-induced Earthquake Monitoring Capability	Conducts facility maintenance and core personnel development to ensure swift judgement regarding the parameters of earthquakes that accompany tsunamis in Ecuador, the issuing of tsunami warnings, the improvement of tsunami observation, warning, and cancellation technologies, the adoption of criteria, and the improvement of tsunami warning procedures. As a result, it is strengthening earthquake and tsunami monitoring capacity and working towards the development of a tsunami warning system.
Colombia	2015-2018	Project for Strengthening Flood Risk Management Capacity	This project will seek to strengthen flood risk management capabilities among relevant organizations in Colombia by strengthening capacity in the areas of flood risk assessment, flood forecast and warning, and the communication of forecasts and warnings, as well as by clarifying the roles and responsibilities of national and local governments, and enhancing flood risk management planning capabilities.
Colombia	2015-2020	Project for Application of State of the Art Technologies to Strengthen Research and Response to Seismic, Volcanic and Tsunami Events, and Enhance Risk Management (SATREPS)	Colombia experiences frequent disasters due to earthquakes, tsunami, and volcanic eruptions. This project involves promoting partnerships between research institutes and relevant disaster management organizations, along with research and practical activities aimed at strengthening measures to mitigate the damage due to disaster through capacity building in such areas as earthquake, tsunami, and volcanic activity monitoring, modeling, damage forecasting, and the transmission of information. In addition, it will contribute to advances in disaster research in South America through collaboration with neighboring countries.
Chile	2014-2019	Disaster Risk Reduction Training Program for Latin America and the Caribbean	With a view to contributing to the improvement of disaster risk reduction measures in Latin America and the Caribbean, this project will support the development of mechanisms to establish Chile as a base for human resource development in the field of disaster risk reduction, focusing primarily on earthquakes and tsunami. These mechanisms will cover such matters as cooperation policy, budget planning, needs surveys in countries receiving assistance, and the coordination and investment of cooperation resources appropriate to those needs.
Brazil	2013-2017	Project for Strengthening the National Strategy of Integrated Natural Disaster Risk Management	Damage from sediment disasters has been escalating in Brazil, with increased habitation of risk areas due to development cited as a contributory factor. With the objective of reducing the risk of sediment disasters, this project aims to identify disaster risks and, based on this, strengthen comprehensive disaster response capabilities, including urban expansion plans, prevention and recovery, monitoring, and the transmission of information.
Turkey	2012-2016	Capacity Development for Effective Disaster Risk Management	This project is for staff members of relevant organizations, such as ministries and agencies responsible for DRR, sector government offices, and local governments, and works towards supporting and strengthening the capacity to adopt disaster management plans based on risk assessments, and to contribute to the improvement of DRR capacity in Turkey.
Turkey	2013-2018	Project on Earthquake and Tsunami Disaster Mitigation in the Marmara Region and Disaster Education in Turkey (SATREPS)	In the Marmara Region, with its high earthquake risk, this project conducts research on earthquake observations and on earthquake and tsunami disaster simulations. By maintaining the results of this research in the form of visual resources (such as images and pamphlets), this project works to improve the general public's awareness and knowledge of DRR.
Mozambique	2014-2017	Project for the Capacity Enhancement of Meteorological Observations, Weather Forecasting and Warnings	This project, which targets the staff of the Mozambique Meteorological Office and regional observation stations, aims to improve the capacity for responding to water-related disasters in Mozambique, a country which is vulnerable to natural disasters and is exposed to cyclones and flooding every year. The project works towards the improvement of forecasts and warnings that use quality controlled weather data by aiming to improve meteorological observation capacity and weather forecasting and warning capacity.

Note: SATREPS: Science and Technology Research Partnership for Sustainable Development
Source: Japan International Cooperation Agency (JICA)

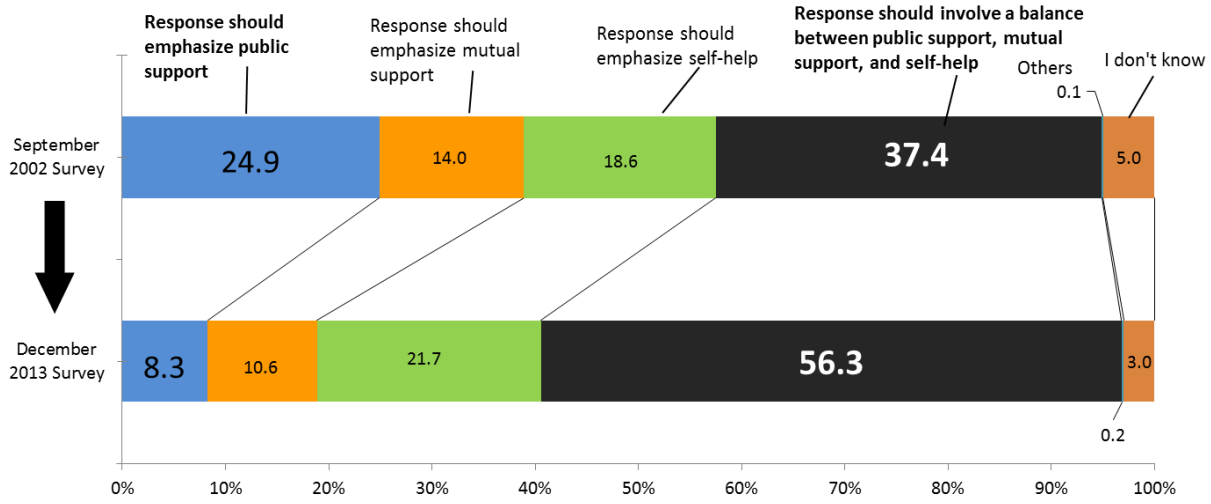
10. Others

Fig. A-61 Trends in the Number of Earthquake Insurance Contracts



Source: Produced by the Cabinet Office based on materials from the General Insurance Rating Organization of Japan

Fig. A-62 Awareness of Self-Help, Mutual Support, and Public Support Measures



Source: Produced by Cabinet Office on basis of "Public Opinion Poll regarding Disaster Risk Reduction" conducted by the Cabinet

Fig. A-63 Explanations Regarding the Japan Meteorological Agency's Seismic Intensity Ratings

Notes:

(1) The seismic intensity values published by the Japan Meteorological Agency (JMA) are generally observed values from seismometers situated on the surface of the earth or on the first floor of low-rise buildings. When a particular seismic intensity is observed, these materials indicate what type of phenomenon or damage has occurred. It is impossible to determine the seismic intensity based on the phenomena described for each seismic intensity level.

(2) Seismic motion is strongly influenced by type of ground and topography. A seismic intensity value is the observed value for the place where the seismometer is situated, and seismic intensity can vary even within a municipality depending on where it is measured. Furthermore, even within the same building, the strength of a tremor will depend on the floor or place where it is felt. For example, a tremor is generally stronger on the upper floor of a middle- or high-rise building than at ground level.

(3) Even with tremors of the same seismic intensity, the damage will differ according to the amplitude of the earthquake vibration (the size of the tremor), the cycle (the length of time taken for one repetition of the tremor), and the duration of the tremor, as well as the condition of the building or structure that is affected and the ground conditions.

(4) In this data, of all the damage that occurs when a particular seismic intensity is observed, that which is seen relatively often has been recorded. However, there are also instances where greater or lesser amounts of damage have been caused. Note also that not all of the phenomena indicated for any particular level of seismic intensity will necessarily occur.

(5) This data is primarily collated from earthquakes that have occurred in recent years. Going forward, the details of these tables will be regularly inspected every five years, new examples will be added, and amendments will be made where the data no longer reflects true conditions due to, for example, improvements in the earthquake-proofing of houses and structures.

(6) In these materials, where the extent of damage is not shown in round numbers, the following adverbs and adjectives have been used as a tentative guide.

Term	Definition
Rarely A few/little Majority Almost all	Extremely limited. Hardly ever. Number/extent is extremely small. Just a little bit. Half or more. Less than "almost all." Not all but close to all.
There are (also), there may be	Used to express something that typically starts to appear at this seismic intensity level, where the quantity is not great, but it is hard to quantify the number/extent.
Increases	It is difficult to specify the quantity, but it is more than would be the case for a lower level of intensity.
Increases further	Same meaning as "increases" above. Used in relation to lower levels of intensity, just like "increases" above.

* The JMA sometimes publishes earthquake intensities obtained from questionnaire surveys, but these are expressed as "corresponding to seismic intensity xx" and are distinguished from seismic intensity levels observed by seismometers.

●Human Sensation/Reaction, Indoor Conditions, Outdoor Conditions

Seismic intensity level	Human sensation/reaction	Indoor conditions	Outdoor conditions
0	A person will not feel the tremor but it will be recorded by seismometers	—	—
1	If people are indoors keeping quiet, some will feel a slight tremor.	—	—
2	If people are indoors keeping quiet, the majority will feel the tremor. If people are asleep, some will be awakened.	Things hanging from the ceiling such as lamps will sway slightly.	—
3	Most people who are indoors will feel the tremor. Of those who are walking, some will feel the tremor. The majority of people who are sleeping will be awakened.	Dishes in cupboards may rattle.	Electric wires will tremble slightly.
4	Most people will be startled. Most of those walking will feel the tremor. Most who are sleeping will be awakened.	Things hanging from the ceiling such as lamps will sway significantly, dishes in cupboards will rattle. Unstable ornaments may fall over.	Electric wires will tremble significantly. Some people who are driving vehicles will notice the tremor.
5 Lower	The majority of people will be frightened and feel as if they want to hold onto something.	Things hanging from the ceiling such as lamps will sway violently. Dishes in cupboards and books on bookshelves may fall down. The majority of unstable ornaments will fall over. Furniture that is not secured may move and unstable items may fall over.	Rarely, windows may break and glass may fall out. People will notice electric poles swaying. Roads may be damaged.
5 Upper	The majority of people will find the tremors an obstacle to movement, and find it hard to walk unless they hold onto something.	More dishes in cupboards and books on bookshelves will fall. TV sets may fall from their stands. Furniture that is not secured may fall over.	Windows may break and glass may fall out. Unreinforced concrete block walls may collapse. Vending machines that are not properly installed may fall over. Driving a vehicle will become difficult and some cars may come to a stop.
6 Lower	It will become difficult to remain standing.	The majority of unsecured furniture will move, and some will fall over. Some doors will become impossible to open.	Tiles on walls and glass in windows may break and fall.
6 Upper	It will become impossible to remain standing or to move without crawling. People may be tossed around, being unable to move, and may even be thrown through the air.	Almost all unsecured furniture will move and more of it will fall over.	More buildings will have broken tiles and glass. Almost all of the unreinforced concrete block walls will collapse.
7		Almost all unsecured furniture will move and fall over, some even being thrown through the air.	Even more buildings will have broken tiles and glass. Even reinforced concrete block walls may be damaged.

●Conditions of Wooden Buildings (Residential)

Seismic intensity level	Wooden Buildings (Residential)	
	High earthquake resistance	Low earthquake resistance
5 Lower	—	Slight crazing or cracks may be seen in walls.
5 Upper	—	Crazing or cracks may be seen in walls.
6 Lower	Slight crazing or cracks may be seen in walls.	Crazing or cracks in walls become more common. Large cracks may form in walls. Tiles may fall and buildings may lean. Some may topple.
6 Upper	Crazing or cracks may be seen in walls.	Large cracks in walls become more common. Buildings that lean or collapse become more common.
7	Crazing or cracks in walls become more common. Rarely, buildings may lean.	Buildings that lean or collapse become even more common.

Notes:

(1) Wooden building (residential) are classified into two types according to their earthquake resistance. Earthquake resistance tends to be better in newer buildings, tending to be lower in structures built prior to 1981 and higher in structures built since 1982. However, there is wide variation in earthquake resistance due to differences in construction methods and the placement of walls. Just because a building is old does not necessarily mean that you can determine its level of earthquake resistance. The earthquake resistance of existing buildings can be ascertained through seismic diagnosis.

(2) The crazing, cracks and damage to the walls in the wooden buildings referred to in this table are deemed to appear in walls made of soil (split bamboo substrate) or mortar (including lath and wire mesh substrate). Where walls have weak foundations, even when the deformation to the building is slight, the mortar readily becomes detached and falls off.

(3) Damage to wooden buildings will differ depending on the cycle and duration of the seismic motion. There are examples of damage to buildings being low in relation to seismic intensity, such as the Iwate-Miyagi Nairiku Earthquake in 2008.

●Conditions of Reinforced Concrete Buildings

Seismic intensity level	Reinforced Concrete Buildings	
	High earthquake resistance	Low earthquake resistance
5 Upper	—	Cracks may form in walls, crossbeams, and pillars.
6 Lower	Cracks may form in walls, crossbeams, and pillars.	Cracks become more common in walls, crossbeams, and pillars.
6 Upper	Cracks become more common in walls, crossbeams, and pillars.	Diagonal and X-shaped cracks may be seen in walls, crossbeams, and pillars. Pillars on the ground floor or middle floors may crumble and some buildings may collapse.
7	Cracks become even more common in walls, crossbeams, and pillars. Ground floor and middle floors may be deformed, and rarely, buildings may lean.	Diagonal and X-shaped cracks become more common in walls, crossbeams, and pillars. Pillars on the ground floor or middle floors crumble and more buildings will collapse.

Notes:

(1) Earthquake resistance tends to be better in newer buildings, tending to be lower in structures built prior to 1981 and higher in structures built since 1982. However, there is wide variation in earthquake resistance, due to differences in structural types, the placement of quake-resistant walls, and whether the walls are planar or vertical. Just because a building is old does not necessarily mean that you can determine its level of earthquake resistance. The earthquake resistance of existing buildings can be ascertained through seismic diagnosis.

(2) In reinforced concrete buildings, slight cracks may be observed even where the core structure of the building is not affected.

●Ground and Slope Conditions

Seismic intensity level	Ground Conditions	Slope Conditions
5 Lower	Cracks*1 and liquefaction*2 may occur.	Rock falls and slope failures may occur.
5 Upper		
6 Lower	Fissures may form.	Slope failures and landslides may occur.
6 Upper	Large fissures may form.	Landslips become more frequent, large-scale landslides and sector collapses may occur.*3
7		

Notes:

*1 A crack is the same phenomenon as a fissure, but the expression is used here to refer to a small fissure or opening in the ground.

*2 Where the groundwater level is high, and the ground is loose and sandy, liquefaction may occur. As liquefaction progresses, muddy water may spout out of the ground, subsidence may occur, embankments and quays may be broken, sewage pipes and manhole covers may float to the surface, and damage may include the leaning or destruction of building foundations.

*3 If a large-scale landslide or a sector collapse occurs, depending on the topography of the area, this may also cause natural dams to be formed. Large volumes of sediment may also cause debris flows.

●Effect on Utilities and Infrastructure

Suspension of gas supply	When the seismic intensity level reaches 5 Lower or greater, gas meters with safety devices (“intelligent gas meters”) will trip, and the gas supply will be shut off. If tremors become even stronger, the gas supply for entire communities may be shut off in the interest of safety.*
Suspension of water supply, power outages	In communities where tremors are recorded at seismic level 5 Lower or greater, the water supply may be suspended and there may be power outages.
Suspension of rail services, expressway regulation	If the seismic intensity level is 4 or greater, in the interest of safety, the implementation of suspensions, speed restrictions, and traffic regulations on railways and expressways will be enacted at the discretion of the relevant operating company (criteria applied to confirm safety will differ by operating company and geographical area).
Disruption to telephone lines and other means of communication	When an earthquake disaster occurs, there is an increase in communications using the telephone and the internet in the areas where the tremors are strong and in the surrounding areas, as people try to confirm the safety of loved ones, offer condolences, and ask about friends and relatives. This can lead to telephone line congestion. To address this, when a natural disaster such as an earthquake with a seismic level of 6 Lower or greater occurs, communication companies provide services such as the Disaster Emergency Message Dial 171 (which allows people in affected areas to record a message about their safety, and allows people outside the area to listen to that message) and the Disaster Emergency Message Board (web171, which allows people in affected areas to record information using text, voice, or images, and allows people anywhere in the world to access that information).
Elevators taken out of service	Elevators equipped with earthquake control devices will automatically stop, in the interest of safety, in the event of a tremor of seismic intensity level 5 Lower or greater. It can take time for operations to resume while safety inspections are conducted.

*When there are tremors with a seismic intensity of 6 Upper or greater, gas, water, and electricity supply services may be widely suspended across large regions of the country.

●Effect on Large-scale Structures

Shaking of skyscrapers due to long-period earthquake ground motion*	Since skyscrapers have a long natural period, they react less violently to earthquakes than ordinary reinforced concrete buildings, which have a short natural period. However, in response to long-period earthquake ground motion, they shake more slowly over a long period of time. If the tremors are strong, then poorly secured office fixtures may move significantly, and people inside may need to hold onto fixed objects in order to remain in one place.
Sloshing inside oil tanks	Sloshing of liquid inside oil tanks may occur as a result of long-period earthquake motion, oil may overflow the tanks, and fires may occur.
Damage to or collapse of ceilings at facilities that occupy large spaces	At facilities such as gymnasiums and indoor swimming pools, which occupy large spaces, even earthquake movements that do not cause significant damage to the structure itself, such as the pillars and walls of the building, may cause ceilings to shake significantly, become damaged, and collapse.

*Large-scale earthquakes can generate long-period seismic waves, which can travel long distances from the epicenter of the quake. Depending on the natural period of the ground, such long-period seismic waves may become amplified as they travel over plains, and the duration of the tremors may be lengthened.

Source: Japan Meteorological Agency

Fig. A-64 Emergency Warning Issuance Criteria

■Criteria for Meteorological Emergency Warnings

<table>
<tr><th>Type of Event</th><th colspan="2">Criteria</th></tr>
<tr><td>Heavy rain</td><td colspan="2">Heavy rainfall with a level of intensity observed only once every few decades is predicted in association with a typhoon or intense heavy rains or
Heavy rainfall is predicted in association with a strong typhoon whose expected level of intensity is observed only once every few decades or an extra-tropical cyclone of comparable intensity.</td></tr>
<tr><td>Storm</td><td>A storm is predicted…</td><td rowspan="3">…in association with a strong typhoon whose expected level of intensity is observed only once every few decades or an extra-tropical cyclone of comparable intensity.</td></tr>
<tr><td>Storm surge</td><td>A storm surge is predicted…</td></tr>
<tr><td>High waves</td><td>High waves are predicted…</td></tr>
<tr><td>Snowstorm</td><td colspan="2">A snowstorm is predicted in association with an extra-tropical cyclone of comparable intensity with a strong typhoon whose expected level of intensity is observed only once every few decades.</td></tr>
<tr><td>Heavy snowfall</td><td colspan="2">Heavy snowfall with accumulations observed only once every few decades is predicted.</td></tr>
</table>

■ Criteria for Tsunami, Volcano, and Earthquake (Seismic Motion) Emergency Warnings

Type of Event	Criteria
Tsunami	A tsunami greater than 3m at its highest is predicted (a major tsunami warning is classed as an Emergency Warning)
Volcanic eruption	A volcanic eruption that will cause serious damage to residential areas is predicted (a Warning (Residential Areas)* is classed as an Emergency Warning)
Earthquake (seismic motion)	Seismic motion with a seismic intensity of 6-lower or more is predicted (an earthquake early warning (seismic intensity of 6-lower or more) is classed as an Emergency Warning)

*In the case of volcanoes to which volcanic alert levels are applied, a Warning (Residential Areas) (volcanic alert level 4 or 5) is classed as an Emergency Warning, while for volcanoes to which volcanic alert levels are not applied, a Warning (Residential Areas) (Keyword: Extreme caution advised in residential areas and non-residential areas nearer the crater) is classed as an Emergency Warning.

Source: Japan Meteorological Agency

Should a disaster occur, we request that you remain calm and take steps to ensure your own safety. In addition, we request your cooperation with regard to the following points, to ensure that emergency disaster control measures can be carried out swiftly and smoothly.

Preparation in advance

- ☑ Talk with your family how to communicate that you are safe.

- ☑ Build stockpile of three days' worth (at least) of water, foods, and essential commodities (a week's worth is highly recommended).
- ☑ Install devises to reduce earthquake risk at home.
  (Stabilization of furniture and installation of a quake-sensitive circuit breaker)

Quake-sensitive circuit breakers

Response in disasters

- ☑ Protect yourself against shaking of an earthquake.
- ☑ Escape from the fire in urban areas.
  "Evacuate before you see the fire."
- ☑ Don't force yourself to travel back home. Don't drive a car.
  "If everyone moves, everyone gets stuck."
- ☑ Don't buy up things in stores.

Hazard Specific Evacuation Guidance Sign System