Fundamental Plan for National Resilience

- For Building a Strong and Flexible Country -

December 14, 2018

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Introduction

Five years has passed since the Basic Act for National Resilience Contributing to Preventing and Mitigating Disasters for Developing Resilience in the Lives of the Citizenry (Act No. 95 of 2013, hereinafter referred to as the "Basic Act") was promulgated and put into force on December 11, 2013.

The whole government has worked together to promote the initiative according to the Fundamental Plan for National Resilience (Cabinet decision on June 3, 2014, hereinafter referred to as "this Fundamental Plan") with the aim of "building national land and regions highly resilient to large-scale natural disasters, and at the same to increase the power of local residents so that they can protect themselves and their lives by themselves," as the preamble of the Basic Act states.

This Fundamental Plan is, so to speak, a prescription for developing national resilience based on vulnerability assessment, which functions as a health checkup of the nation, and was formulated to serve as the guidelines for other related national plans (hereinafter referred to as "other national plans") with the aim to promoting comprehensive and deliberate measures concerning national resilience.

While the initiatives in this Fundamental Plan can be assessed as mostly progressed as planned, initiatives for developing national resilience in Japan will continue to be an urgent issue, reflecting the fact of increasing probability of the occurrence of large-scale earthquakes, and more frequent occurrence of extreme weather and their catastrophic impact.

Based on the valuable lessons learned from the recent disasters and changes in socio-economic situations in Japan, this Fundamental Plan is reviewed here with the aim to accelerate and deepen its steps forward.

In addition, the whole government will promote systematic development of a resilient nation by revising relevant national plans in line with this Fundamental Plan, and formulating and promoting required measures to enable Japan to exercise its resilience to the full extent in a situation of a national crisis caused by disasters such as Nankai Trough earthquakes or capital inland earthquakes.

Chapter 1: Basic Concept concerning National Resilience

1. Principles of National Resilience

Japan has repeatedly been hit by a number of large-scale disasters due to its geographical, geomorphic and meteorological features. Large-scale disasters have happened when people least expected them and have caused tremendous loss of human life as well as enormous economic, social and cultural damages every time they occurred. However, damage due to disasters varies significantly depending on the preparedness of society. Rather than repeating ex post facto measures – such as implementing long-term recovery and reconstruction measures in response to tremendous damages from each large-scale earthquake or other disasters - it is important to make preparations for large-scale disasters in advance from normal times, squarely facing the possibility of large-scale natural disasters and various other risks with fresh eyes. In light of the lessons we learned from the Great East Japan Earthquake, we need to prepare comprehensive measures against large-scale natural disasters that incorporate national land policy and industry policy, while keeping the possibility of the worst cases in mind without preconceptions and beyond the scope of narrowly-defined disaster management. This has to be done as a far-sighted national policy with an eye on the distant future. Through such initiatives for building a resilient nation, we must overcome risks instead of merely being at the mercy of them, to achieve sustainable growth and develop an environment where young people leading subsequent generations can have bright hopes for the future.

For that purpose, we are committed to promoting initiatives for building national resilience with the aim of creating safe and secure national lands, regions, and economic society that have strength and flexibility, even in the event of any disasters. Basic principles therefore are as follows:

i. Prevent loss of human life by any means.
ii. Avoid fatal damage and maintain important functions of the state and society
iii. Minimize damage to property of the citizenry and public facilities
iv. Achieve swift recovery and reconstruction

Proactively promoting public (the national and local governments) – private (residents and private business operators, etc.) initiatives for building national resilience to secure important systems of the state and society, which never become dysfunctional in any event, will lead not only to protect the lives and property of local residents, industrial competitiveness and economic growth, but also to enhance the capacity to address changes in circumstances and increase the productivity and efficiency of both the national and local governments as well as the private sector. Such initiatives for building national resilience will also contribute to the national government's growth strategy by cultivating new markets and expanding investments, thereby playing a part in Japan's economic growth, in enhancing its international competitiveness, and winning the trust of the international community.

To this end, the national government is committed to promoting cross-sectoral and government-wide actions for building national resilience comprehensively in collaboration with local governments and the private sector.

2. Basic Policies for Promoting Initiatives for Building National Resilience

Based on the principles of national resilience, Japan will promote initiatives for making the entirety of the nation's' land more resilient to large-scale natural disasters, which will contribute to disaster management and mitigation, swift recovery and reconstruction from disasters and enhancement of Japan's international competitiveness, while making the maximum use of its experience obtained through the Great East Japan Earthquake, the 2016 Kumamoto Earthquake, wind and flood damages recently occurred nationwide, and other previous disasters. These initiatives will be implemented in line with the following policies (1) – (4).

Anticipated risks that may affect the lives of the citizenry and the national economy include large-scale accidents, such as nuclear disasters and terror attacks, in addition to natural disasters. However, due to the increase in the probability of the future occurrence of Nankai Trough earthquakes and capital inland earthquakes as well as the frequency of the occurrence of water-related disasters and sediment disasters, and also due to the fact that a wide area of national

land will be damaged significantly once such large-scale natural disasters happen, this Fundamental Plan has its initial focus on large-scale natural disasters.

(1) Approach for Building National Resilience

i. Implement measures, while closely examining all aspects of essential factors that may damage Japan's robustness.

ii. Implement measures in a planned manner based on a long-term perspective, while having both the concept of time management, which focuses on the extent of damage due to a delay in ensuring resilience, and the concept of Evidence-based Policymaking (EBPM), not from a short-term perspective.

iii. Enhance regional vitality by rebuilding diversity in regions, strengthening regional collaboration, and promoting the creation of the entire nation more resilient to disasters, with the aim of preventing the still-ongoing excess concentration in the Tokyo Metropolitan area and encouraging the realization of an "autonomous, decentralized and coordinated" national land structure.

iv. Enhance the latent strength, resistance, resilience, and adaptability held by social and economic systems of all levels in Japan.

v. Implement measures based on the capabilities of the market, administration, and society in a comprehensive manner, while having a broad and systematic perspective as well as focusing on the ideal systems and regulations to be achieved.

(2) Ideal Combination of Measures

vi. Promote measures effectively by appropriately combining structural measures, such as developing disaster management facilities, enhancing the earthquake resistance of facilities and securing replacement facilities, with non-structural measures concerning emergency drills and disaster management education, depending on disaster risks and regional circumstances, and develop a system for these measures at an early stage.

vii. Implement measures in an appropriate combination of self-help efforts, mutual assistance, and public help, with the public sector and the private sector properly

cooperating with each other and sharing roles, with a central role being played by the national government in particularly serious, urgent or dangerous situations.

viii. Devise measures that are not only effective in disaster management and mitigation in an emergency but also utilized effectively even at normal times.

(3) Promotion of Measures in an Efficient Manner

ix. Prioritize measures to be implemented intensively in light of expected changes in citizens' demands as a result of a decrease in population, changes in the weather caused by climate change, and the aging of social capital, etc., while giving due consideration to the concept of time management, which focuses on the extent of damage due to a delay in ensuring resilience, and the implementation of relevant measures on an ongoing basis through an effective use of financial funds.

x. Promote measures effectively, while reducing cost through an effective use of the existing social capital.

xi. Actively utilize private funding through PPP and PFI in order to make the most of limited funds.

xii. Contribute to effective and efficient maintenance and management of facilities.

xiii. Promote reasonable use of land from the viewpoint of protecting human lives, while seeking consensus among interested parties.

xiv. Promote research and development based on scientific knowledge and make efforts for disseminating the outcomes thereof.

(4) Promotion of Measures in Accordance with Regional Characteristics

xv. Strengthen bonds between people and enhance the functions of the communities, while making efforts to develop an environment where actors who promote initiatives for building resilient communities can carry out their activities properly in each region.

xvi. Implement measures with due consideration to women, elderly people, children, people with disabilities, and foreign people, etc.

xvii. Give due consideration to harmony with the environment and preservation of the landscape in accordance with the characteristics of each region, and work to realize symbiosis with nature by utilizing various functions found in the natural environment.

3. Basic Means for Promoting Initiatives – Thorough Implementation of the PDCA Cycle

Initiatives for building national resilience represent national risk management and aim to promote the resilience of the entire country by repeating the following PDCA cycle and constantly returning to the prior process and reviewing it.

i. Upon clarifying the final goals of building national resilience, identify and analyze major risks involved.
ii. Analyze and assess risk scenarios and their effects, and identify vulnerabilities in light of the goals.
iii. Analyze and assess vulnerabilities, and consider countermeasures against problems and risks involved in overcoming the relevant vulnerabilities.
iv. Review policies necessary for solving problems, select countermeasures to focus on, and prioritize and implement them in a planned manner.
v. Properly evaluate the results, and review and improve the initiatives as a whole.

In this process, when engaging in the analysis and assessment of vulnerabilities and the establishment of countermeasures against risks, “the worst events that should never happen,” which are deemed to cause fatal damages to the nation if they occur, are anticipated. Then, from the perspective of what we lack at present and what preparations we should make to avoid such events, an approach to examine cross-sectoral and government-wide programs (policy packages for achieving goals) will be adopted. Through this approach, the government will promote organic collaboration among sectors and gradually improve the administrative initiatives currently taken in each sector to allow them to explicitly incorporate various types of risks.

Through the practice of the PDCA cycle in this way, continuous review will be conducted on the selection of necessary policies and programs for solving issues to focus on and the

prioritization of them. To this end, initiatives for building national resilience will be stepped up in sequence and the utmost efforts will be made to visualize the details and processes of such initiatives. These initiatives include improving vulnerability assessment methods, enhancing methods of evaluating effects of measures (introduction and review of quantitative indicators for progress management, etc.), setting up goals for each program, and carrying out progress management through preparing roadmaps, and introducing mechanisms to respond to crucial issues.

4. Matters Requiring Particular Consideration

(1) Building of Social and Economic System from a Comprehensive Point of View

Under objective circumstances involving various risks, pursuing excessive economic efficiency that only envisages normal times may result in damaging the national land and the economic and social system in Japan, which may lead to an unintended consequence of increasing risks of losing economic efficiency.

For this reason, when implementing the construction, modification, and improvement of the national land and the economic and social system in Japan, it is important to work on the initiatives by utilizing regulations and guidance to correct market failure in normal times, based not only on the perspective of ensuring efficiency and rationality in normal times but also on a comprehensive perspective with an intention to enhance the disaster response capacity with a focus on the presence of various risks, and to ensure prolonged efficiency and rationality. Taking the example of the excess concentration in the Tokyo Metropolitan area, the national government will discuss effective measures for promoting the realization of the “autonomous, decentralized and coordinated” national land structure in coordination with the regional revitalization initiatives, in order to decentralize the risk of excessively concentrated national land structure from the view point of efficiency.

(2) Promotion of Public-Private Collaboration and the Environmental Improvement to Activate

the Private-led Initiatives

Proactive efforts by private business operators, as well as initiatives by the national and local governments, are indispensable for achieving substantial progress in building national resilience. The public and private sectors, therefore, need to collaborate with each other and share roles in a proper manner. As part of these efforts, the national government will advance the activation of self-help and mutual assistance of the private sector, and the use of the private sector's capability in public assistance. In particular, support will be given to practical training and education, initiatives for visualizing risks, and maintenance of community's vitality (community's resilience), so that the initiatives for self-help and mutual assistance conducted by each entity of local residents, communities, and NPOs, in addition to companies and organizations, will become effective and sustainable. At the same time, utilization of the skills, expertise, and facilities/equipment of the private sector, which are essential in disaster response, will also be promoted.

Furthermore, amid the financial tightness with the national and local governments, investment of fund from private business operators, human resources, technologies, and expertise (hereinafter referred to as the "private investment") for the initiative to build national resilience will be promoted.

Comprehensive initiatives to build national resilience from both the non-structural and structural aspects will create diverse needs in various sectors and bring about new innovation and expansion of private investment, leading to increasing Japan's competitiveness through the improvement of the disaster response capacity of private business operators such as enhanced resilience in productivity. Such initiatives themselves are expected to contribute to the sustainable economic growth of Japan.

For this purpose, voluntary capital investment, etc. that will contribute to building national resilience (such as the development of backup facilities and systems, enhancement of the earthquake resistance, etc.) will be encouraged by way of thorough provision and sharing of information and collaboration with private business operators (PR and awareness raising activities containing specific damage prediction and holding of relevant councils' meeting, etc.). At the same time, infrastructure development and countermeasures for aging infrastructure will

be promoted by utilizing PPP and PFI, and the embodiment of mechanisms that further induce private investment (such as regulatory reviews, use of tax systems, and designing promoting measures to be paired with matters with high management priority, etc.) will be advanced steadily. Relevant information will be given and awareness raising of the public will be carried out with the aim to ensure active bi-directional communications between local governments and local private business operators.

Additionally, for ensuring the feasibility of swift recovery and reconstruction while maintaining the country's economic activities after the occurrence of a large-scale natural disaster, small and medium-sized enterprises (SMEs) and other entities should further promote efforts for the business continuity of private enterprises through the spread of practical business continuation efforts based on the corporate structure of each company, as well as promoting business continuation efforts based on the business cooperation model and reginal cooperation model.

(3) Building of Systems by Local Governments, etc.

In order to promote initiatives for building national resilience, information sharing and collaboration should be ensured among local governments and between the national government and local governments. The national government will support and promote local governments' efforts to strengthen their organizational structure, such as the enhancement of their supervisory and adjustment functions and the development of human resources in charge of resilience-building activities, as well as the acceleration of regional efforts to establish a regional plan for building regional resilience (hereinafter referred to as the "regional plan") and strengthening of support for the implementation of the plan.

Furthermore, the national government will provide proper assistance to municipalities so that they can take appropriate measures for residents at the right time, depending on risks of disasters, on a timely basis.

(4) Risk Communication and Fostering of Human Resources, etc.

Each citizen is supposed to play a major role in initiatives for building national resilience,

and for the initiative, the points below are considered important: the citizens and the administration carry out bi-directional communication; the citizens proactively consider the importance of building national resilience, learn the ways to respond to disaster-caused stress, and enhance their resilience; the government fosters and ensures leaders in regional societies, administrative bodies, companies and organizations, as well as experts and researchers specialized in the disaster management area with diverse academic backgrounds. The national government will promote, as a national campaign, the activities to foster and ensure the said human resources and to disseminate and implement lessons and knowledge obtained from previous disasters, while also taking into account the perspective of gender equality.

(5) Innovation for Building National Resilience

The Government of Japan will aim to realize a super smart society in the era of Society 5.0 in the areas of infrastructure, disaster management and the mitigation of disasters, and resolve social issues utilizing advanced technology, in order to support the promotion of building national resilience.

Specifically, progress and innovation in both technology and service aspects of ICT, such as AI technology, IoT, cloud computing technology, and SNS, will be actively used. Along with this, research and development concerning responses to system failure and the loss of storage media, and element technology and system for information collection, analysis, and transmission will be advanced.

Among these advancements, ICT will be used in various scenes related to infrastructure, disaster management, and disaster mitigation, such as the prediction of the scale of heavy rain, earthquakes, and tsunami and the provision of relevant information, estimation of damage situation and information collection, information sharing and analysis between disaster management organizations, and provision of disaster management information to victims and evacuees. At the same time, satellites for observation, navigation and communication will also be used to further enhance the functions such as real time-ness/immediacy, bi-directionality, and the concatenation with geospatial information.

In doing so, the government will promote the industry-government-academia partnership

such as the use of SNS and various other information services operated and provided by the private sector, in addition to the information held by the government and academia, and advance the disclosure of such data owned by the government and other relevant organizations.

Through these efforts, communications with no digital divide, familiarity, immediacy, smart and easy-to-understand features will be realized nationwide, regardless of the locations in urban or rural areas, leading to a society in which every citizen can live safely and securely. Along with the promotion of the innovation for building national resilience through the promotion of advanced technology, we should pay attention to the perspective of overseas expansion of exporting the advanced technology that suits Japan's experiences from disasters to make contributions.

(6) Leading the building of resilience in the world through the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030

Japan, which has experienced natural disasters numerous times, is one of the countries that are leading the promotion of building of national resilience from the international point of view, and it is important to contribute to the international communities in various areas regarding the building of national resilience.

Japan is leading the action to build resilience around the world by taking an initiative in implementing the priorities of action such as "Prior investment in disaster risk prevention" and "Build Back Better" stated in the Sendai Framework for Disaster Risk Reduction 2015-2030 (hereinafter referred to as the "Sendai Framework for Disaster Risk Reduction"), which was adopted at the Third UN World Conference on Disaster Risk Reduction in March 2015.

Specifically, in response to the UN General Assembly Resolution to designated November 5 as World Tsunami Awareness Day unanimously adopted in December 2015, Japan will exercise its initiatives through educational activities for raising awareness of tsunami and activities to enhance tsunami countermeasures in various places worldwide. Japan is also required to take the role to lead the world, utilizing the Economic Research Institute for ASEAN and East Asia (ERIA), which has signed a cooperation agreement concerning risk assessment, etc. with the Organization for Economic Co-operation and Development (OECD).

Based on these ideas, Japan, in various areas with respect to the building of national resilience, will further promote the initiatives for building national resilience, while deepening and developing mutual understanding between foreign countries through creating a place of information exchange and human resources exchange, and will contribute to the international communities by actively disseminating the information about the results of its initiatives of national resilience.

The relationship between the Sendai Framework for Disaster Risk Reduction and this Fundamental Plan is shown in Attachment 1.

(7) Measures for the 2020 Olympic and Paralympic Games

Initiatives for building national resilience represent part of our hospitality to foreign visitors. The government will take the necessary measures for the realization of a safe and secure Olympic and Paralympic Games in Tokyo in 2020 enabled by national resilience, and for foreign tourists etc. who will be put in a weaker position at the event of a disaster in a comprehensive and systematic manner to enhance the resilience of Tokyo in close collaboration with the Tokyo Metropolitan government and other relevant local governments.

(8) Measures based on the lessons learnt from the disaster occurred after June 2018

While the vulnerability assessment conducted when establishing this Fundamental Plan was underway and after the completion of the assessment, Japan was hit by successive disasters including the earthquake with epicenter in the northern part of Osaka prefecture, heavy rain in July 2018, Typhoon Jebi (No.21) in 2018, and the 2018 Hokkaido Eastern Iburi Earthquake. From the “Emergency Inspection of Critical Infrastructure” carried out in response to these disasters, in addition to the protection of lives and assets, many lessons such as the following specific cases were leant regarding the necessity to maintain the critical infrastructure that supports the lives of citizenry and economic activities at the time of disaster.

- It is necessary to respond to the sections with a danger of severe damage to human life etc. in the case of flooding depth becoming very deep.
- Regarding disaster base hospitals, it is necessary to enhance and expand their equipment

to have the capabilities to maintain medical treatment function for approximately three days.

- Regarding the non-structural measures for sediment disaster, it is necessary to develop the disaster risk information and improve information concerning sediment disaster at local governments.
- Regarding the power infrastructure nationwide, even in the case of a failure at the largest power station in each area, it was confirmed that the recurrence of large blackout due to frequency drop can be prevented in general, on the premise that operational measures are taken in part, but further building of resilience in power supply is necessary.
- Regarding livestock production-related facilities that are important for steady supply of livestock products, it is necessary to deal with the issues of no response plan for cases of power failure established, etc.
- Regarding the terminal buildings of the airport that are important for air transportation, it is necessary to respond to inundation into emergency power supply/electric equipment.
- Regarding the artificial slopes and embankments on main roads, it is necessary to implement measures for road slopes and embankments compatible to sediment disasters in places with a major social impact such as the proximity to railway and wide area detour.
- It is necessary to deal with railway and river bridges, which are at risk of being destroyed or inclining by heavy rain.
- Regarding the major foreign trade container terminals, it is necessary to respond to the issues such as container outflow risk, power supply inundation risk, and earthquake risk.
- Regarding mobile phone base stations, it is necessary to respond to the issues such as initial responses to emergency restoration based on the understanding of damage situation.

Furthermore, various lessons such as the following were obtained from verification works based on disasters.

- It is necessary to deal with the issues related to the collapse of block walls etc. and frequently occurred destruction of small-scale reservoirs.
- It is necessary to surely link disaster management information, such as weather information and evacuation information, with residents' evacuation actions.

In light of these lessons, Japan will develop policies for promoting the initiatives for building national resilience set in Chapter 3 into individual measures, and will work on to materialize the three-year emergency measures and promotion policies of each program set in Chapter 4.

Chapter 2: Vulnerability Assessment

1. Framework and Procedures for Assessment

Based on the Guidelines for Assessment of Vulnerability decided by the National Resilience Promotion Headquarters (hereinafter referred to as the "Headquarters") on June 5, 2018, a vulnerability assessment was conducted under the following framework in the following procedures.

(1) Anticipated Risks

Anticipated risks that may affect the lives of the citizenry and the national economy include large-scale accidents, such as nuclear disasters, terror attacks, and various types of events, in addition to natural disasters. Given this fact, the assessment anticipating large-scale natural disasters was conducted under this Fundamental Plan for the time being, for the reasons that Nankai Trough earthquakes and capital inland earthquakes are predicted to occur in the near future and a wide area of national land will be damaged significantly once such large-scale natural disasters happen.

(2) Sectors of Measures

Vulnerability assessment is to be conducted for each sector of measures concerning national resilience (Article 17, paragraph (4) of the Basic Act). Sectors of measures have been identified as 12 sectors for individual measures (Administrative functions/Police and fire services/Disaster management education, etc.; Housing and cities; Healthcare and welfare; Energy; Finance; Information and communications; Industrial structures; Transportation and

logistics; Agriculture, Forestry and fisheries; National land conservation; Environment; and Land use (national land use)), while cross-cutting sectors are categorized into five areas (Risk communication, Human resources development, Public-private collaboration, Countermeasures for aging infrastructure, and Research and development).

(3) Goals and the Worst Events that Should Never Happen

Vulnerability assessment is to be conducted while anticipating the worst events that should never happen (Article 17, paragraph (3) of the Basic Act). Regarding such worst events, eight goals of preparation in advance were set up and 45 worst events that would hinder the achievement thereof were specified as follows.

The Worst Events that Should Never Happen

Fundamental goals	Goals of preparation in advance			Worst events that should never happen
I. Prevent loss of human life by any means II. Avoid fatal damage and maintain important functions of the state and society III. Minimize damage to property of the citizenry and public facilities IV. Achieve swift recovery and reconstruction	1	Prevent direct death to the utmost extent	1-1	Occurrence of a large number of casualties due to large-scale and multiple collapse of houses, buildings, transportation facilities, etc. or collapse of buildings at facilities used by the general public
			1-2	Mass casualties caused by a large-scale fire in crowded urban areas and at facilities, etc. used by the general public
			1-3	Occurrence of extensive number of casualties due to a large-scale tsunami, etc. affecting a wide area
			1-4	Mass casualties caused by sudden or prolonged and wide-area flooding in urban areas
			1-5	Mass casualties due to a large-scale volcanic eruption or sediment disasters (deep-seated landslide), etc.
			1-6	Occurrence of a large number of casualties due to blizzards, heavy snow, etc.
	2	Ensure prompt rescue/emergency and medical activities as well as the victims' health and their evacuation living environment of their evacuation life	2-1	Suspension of supply of goods and energy relating sustaining life including food, drinking water, electric power, fuel, etc. at disaster-affected areas
			2-2	Simultaneous occurrence of a large number of isolated communities, etc. for a long time
			2-3	Severe lack of rescue/emergency and medical activities, etc. due to damage to the Self-Defense Forces, the police services, fire services, the Japan Coast Guard, etc.
			2-4	Post-disaster disorder and unexpectedly high numbers of stranded persons
			2-5	Paralysis of medical services due to damage to and/or severe lack of medical facilities and personnel, disruption of routes for offering support, and disruption of energy supply
			2-6	Outbreak of plagues or infectious diseases on a large scale in disaster-affected areas
			2-7	Deterioration of the health condition of many victims or the occurrence of death due to poor living conditions during evacuation and inadequate health care.
	3	Secure indispensable administrative functions	3-1	A decline in public safety and confusion of society due to significant deterioration of judicial functions and police functions due to disasters
			3-2	Dysfunction of central government in the metropolitan area
			3-3	Significant deterioration of the functions of local governments due to damage to personnel and facilities
	4	Secure indispensable information and communication functions	4-1	Paralysis and suspension of communication infrastructure needed for disaster management and disaster responses
			4-2	Circumstances in which disaster information cannot be delivered to people who need it due to suspension of TV and radio broadcasting
			4-3	Circumstances in which information services to be used in the event of a disaster become dysfunctional, making the collection and transmission of information unfeasible, and causing a delay in evacuation actions and rescue/support
	5	Prevent economic dysfunction	5-1	Deterioration of international competitiveness due to a decline in companies' productivity caused by disruption of supply chains, etc.
			5-2	Serious impact on the sustainability of socioeconomic activities and supply chains due to suspension of energy supply
			5-3	Damages, fires, explosions, etc. at complexes and other important industrial facilities

			5-4	Tremendous influence on overseas trade due to suspension of maritime transport functions
			5-5	Tremendous influence on logistics and human flow due to dysfunction of the core road/marine transport networks, such as disruption of arteries in the Pacific Belt Zone
			5-6	Tremendous influence on international air transportation due to concurrent damage to multiple airports
			5-7	Serious impact on citizenry, commercial transactions, etc. due to dysfunction of financial services, postal services, etc.
			5-8	Stagnation of stable supply of food, etc.
			5-9	Tremendous influence on production activities associated with disruption of water supply for specific uses due to drought, etc.
	6	Minimize damage to lifelines, fuel supply related facilities, transport networks, etc., and seek early recovery of these infrastructures	6-1	Prolonged suspension of functions of power supply networks (power generating/transforming stations, transmission/distribution equipment), city gas supply, and oil/LP gas supply chains
			6-2	Prolonged suspension of water supply, etc.
			6-3	Prolonged suspension of functions of sewage treatment facilities, etc.
			6-4	Prolonged suspension of functions of land/sea/air transport infrastructure from Shinkansen and other core infrastructure to regional transport networks
			6-5	Significant deterioration of the functions of disaster management infrastructure for a prolonged period
	7	Uncontrollable complex disasters and secondary disasters should be avoided	7-1	Mass casualties caused by the occurrence of a large-scale fire in an urban area accompanying earthquakes
			7-2	Occurrence of an extensive complex disaster on the sea or in coastal areas
			7-3	Blocked conditions accompanying collapse of buildings along railroads and roads, and traffic paralysis due to depression accompanying the collapse of underground structures etc.
			7-4	Occurrence of a large number of casualties due to damage to and functional failure of reservoirs, disaster management infrastructure, and natural dams, etc., and due to deposited earth and sand as well as flowing volcanic ejecta
			7-5	Expansion of damage caused by large-scale diffusion and outflow of toxic substances
			7-6	Devastation of national land due to damage to farmland and forests
	8	Develop conditions for swift reconstruction of society and economy with improved resilience	8-1	Circumstances where reconstruction is delayed significantly due to stagnation in treatment of a large amount of disaster waste generated
			8-2	Circumstances where reconstruction becomes not feasible to achieve due to shortage of personnel in charge of supporting reconstruction-related activities (experts, coordinators, workers, engineers well versed in respective regions, etc.), and lack of visions for a better reconstruction
			8-3	Circumstances where reconstruction is delayed significantly due to extensive and prolonged flood damage caused by ground subsidence in broad areas, etc.
			8-4	Loss of precious cultural assets and environmental assets, and decline or loss of tangible and intangible cultures due to collapse of regional communities
			8-5	Circumstances where reconstruction is delayed significantly due to sluggish progress in ensuring commercial land and developing temporary housing, temporary stores, and temporary work places
			8-6	Tremendous influence on the national economy etc., due to damage by international harmful rumor, credit uncertainty, delay in recovery of productivity, and a large number of people unemployment/bankruptcy

(4) Procedures for Assessment

With regard to the measures being conducted to avoid the worst events that should never happen (hereinafter referred to as “the worst events”), topics such as the progress status of measures, effects on the avoidance of the worst events, the validity of the level of measures achievement for avoiding the worst events, and the issues taking into consideration the disasters occurred after the establishment of this Fundamental Plan were organized after utmost efforts had been made to add quantitative analysis to them, and evaluations on future responses were carried out.

In doing so, a flow chart showing the results of an analysis of possible processes in which the worst events occur was created. At the same time, based on the progress status of the measures and the status of the mutual combination between the measures, the government, to avoid the worst events, analyzed and organized the issues as to what problems existed to improve the current condition and what measures to be implemented going forward.

Each measure to avoid the worst events was then organized into cross-sectoral and government-wide programs, and the vulnerability of the current national land and economic and social systems, and the vulnerability of the measures to deal with it were comprehensively analyzed and evaluated by each program and measure sector.

2. Key Points of Assessment Results

The assessment results are as shown in Attachments 2 and 3. The key points of the results of vulnerability assessment based on the assessment results are as follows.

(1) Responses to national land use and the vulnerability of industrial structure are necessary

With respect to the current status of national land use and industrial structure, which are regarded as a precondition when considering disaster management, it is necessary to work on them while examining their ideal conditions based on the risk hedge when deliberating long-term stable growth of the economy and effective measures to promote an “autonomous,

decentralized and coordinated" national land structure. For example, amid the concern over capital inland earthquakes, the following points need to be verified and appropriate responses should be taken: due to the excessive concentration of the population, headquarters, and the capital functions in Tokyo, whether the current situation holds potential risks that may generate enormous human and economic damages and the loss of the state function in an emergency; whether a large number of population in particular areas is concentrated in high-disaster risk areas related to tsunami and flooding; meanwhile, in rural areas, whether declining regional vitality has created a condition in which necessary human resources for reconstruction cannot be secured within the affected areas in an emergency.

(2) Investigation and research on the frequency of the occurrence of disasters and the seriousness of the damages are necessary

Based on the analysis of logical structure from the occurrence of a large-scale natural disaster leading to the worst events, the method that assesses vulnerability by quantitatively simulating the probability of occurrence and magnitude of damage of events, and the method that prioritizes logical structures based on the fact that there are common parts in many of these structures, are still in their developing phase. It is necessary that the government and academia conduct investigation and research in collaboration, disseminate the results, and enlighten people using the results.

(3) Appropriate combination of structural development with non-structural measures is necessary

It is necessary to find an appropriate combination between the structural development, which suppresses the arrival of earthquakes and typhoons leading to the initial disaster and the non-structural measures covering the process from evacuation to reconstruction when the arrival of an earthquake and a typhoon goes beyond the assumption of structural development, to prevent the initial disaster from developing and expanding to become the worst events.

(4) Securing redundancy, and establishing and securing the effectiveness of Business Continuity

Plan (BCP) are necessary

Along with the enhancement of disaster resistance of each facility, the following actions are indispensable in continuing business operations in non-affected areas when disasters occur and for the purpose of preventing economic stagnation of the entire Japan from occurring: securing of substitutions of the base of energy supply network, communication network, redundancy of transport network, the administration, finance, logistics, and information services; formulation and continuous review of BCP for the industries viable on these social infrastructures; and securing of effectiveness through implementing training etc. Additionally, in order to make progress in the restoration of damaged facilities, it is necessary to secure the total amount of personnel, materials, and equipment from normal times and advance the preparation for support readiness nationwide in an emergency.

(5) Preparation with the idea of “Build Back Better” in mind is necessary

While swift recovery and reconstruction at the time of a disaster is important, it is necessary not only to aim for simple restoration but also to have the preparation of vision formation in which the generation bearing the future of each region in place from normal times. This will enable the country to practice the building of more resilient towns and communities on the occasion of recovery and reconstruction, looking ahead with an ideal way of the future social capital and adding of perspectives of the tradition of cultures and life styles unique to each region.

Chapter 3: Policies for Promoting Initiatives for Building National Resilience

1. Sectors of Measures concerning National Resilience

Sectors of measures concerning national resilience covered under this Fundamental Plan are the following twelve respective individual sectors and five cross-cutting sectors as set up upon conducting vulnerability assessment.

(Individual sectors of measures)

(i) Administrative functions/Police and fire services/Disaster management education, etc.; (ii) Housing and cities; (iii) Healthcare and welfare; (iv) Energy; (v) Finance; (vi) Information and communications; (vii) Industrial structures; (viii) Transportation and logistics; (ix) Agriculture, forestry and fisheries; (x) National land conservation; (xi) Environment; and (xii) Land use (national land use)

(Cross-cutting sectors)

(i) Risk communication; (ii) Human resources development; (iii) Public-private collaboration; (iv) Countermeasures for aging infrastructure; and (v) Research and development

2. Promotion Policies for Respective Sectors of Measures

Promotion policies for each of the 17 sectors of measures (basic guidelines for establishing measures) set forth in 1. above are as follows.

These 17 policies were compiled by categorizing necessary measures in light of the eight goals, but they are all interdependent between the sectors. Therefore, in promoting the measures in each sector, due consideration should be given to ensure effectiveness and efficiency of the respective measures such as building a promotion system at relevant ministries and agencies, local governments, etc. to share data and jointly conduct progress management, after clarifying the responsible ministries and agencies (departments, etc.).

(Promotion Policies for Individual Sectors of Measures)

(1) Administrative Functions/Police and Fire Services/Disaster Management Education, etc.

(Administrative Function)

○ With the aim of maintaining key functions of the national government even in the event of capital inland earthquakes or other large-scale natural disasters, drills and evaluation for enhancing the effectiveness of the business continuity plan for each ministry and agency will be conducted based on that for the entirety of the national government and should be reviewed constantly. In addition, enhancement of earthquake resistance of government office buildings etc., securing energy such as electricity and gas, securing the redundancy of information and communication system, stockpiling of goods, securing of alternative government office buildings, regional relocation of government agencies to will also be promoted. [Cabinet Secretariat; Cabinet Office (Disaster Management); and other relevant ministries and agencies]

○ Local governments will establish and review their own business continuity plans based on initiatives taken by the national government and relevant ministries and agencies, and strengthen their business continuity systems through initiatives to improve effectiveness. They will also enhance earthquake resistance of government office buildings, etc., secure energy such as electricity and gas, secure the redundancy of information and communication system, stockpile goods, and secure alternative government office buildings. Utilizing skills and expertise, facilities and equipment, and organizational system held by private business operators and experts, education with an assumption of various events and joint exercises with clear purpose and goal will continue to be conducted. Disaster response capacity will be further enhanced by accepting external support such as broad-area collaboration and mutual aid agreement among local governments, to improve their business continuity systems. [Cabinet Secretariat, Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications; and other relevant ministries and agencies]

○ Relevant ministries and agencies will work on the strengthening of the local governments' system and its support system from normal times by making efforts in the following areas: swift collection and sharing of necessary information for disaster responses; effective

collaboration among the relevant organizations including the national and local governments and organizations in the private sector; capacity against large-scale natural disasters through research and development by making optimal use of satellites, IoT, big data, and other latest science and technology and their social implementation, as well as implementation of broad-area and practical exercises; expansion and enhancement of the system and functions of the Technical Emergency Control Force (TEC-FORCE). [Cabinet Office (Science, Technology and Innovation); Cabinet Secretariat, Cabinet Office (Disaster Management); Ministry of Education, Culture, Sports, Science and Technology; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

(Police and Fire Services)

○ Disaster resistance of base facilities and routes will be improved through the enhancement of earthquake resistance of base facilities for activities of the police, fire services, Self-Defense Forces, the Japan Coast Guard, and correctional institutions, and securing of energy such as electricity and gas. Regarding the equipment and materials, such as airplanes, ships, vehicles and communication materials and equipment, necessary for rescue/emergency activities and ensuring access routes will be developed and advanced, together with disaster management information, while giving due consideration to the development of common communication means and utilization of information possessed by the private sector. [Cabinet Secretariat, Cabinet Office (Disaster Management); National Police Agency; Ministry of Internal Affairs and Communications; Ministry of Justice; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Defense]

○ Enhancement of the equipment and materials as well as the enhancement and strengthening of systems and functions of the Police Disaster Dispatch Unit, National Fire Service Team for Disaster Response, TEC-FORCE, National Strike Team, and the FAST-Force will be carried out. At the same time, various drills including emergency drills will be conducted as joint drills as well as systematic and staged training exercises in the environment more suited to disaster sites, while cooperating with related organizations from the planning phase. Furthermore, along with the enhancement of collaboration with private business operators, in addition to the

enhancement of the system, equipment, and exercises of Volunteer Firefighters that are at the core of regional disaster management activities, enhancement and strengthening of regional disaster management activities will be promoted by improving and strengthening flood control companies, development and educational training of disaster management volunteer groups, and the promotion of securing human resources in the construction industry that are responsible for road clearing and other related works. [Cabinet Secretariat, Cabinet Office (Disaster Management); National Police Agency; Ministry of Internal Affairs and Communications; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Defense]

○ The central government offices, local governments, the police, fire services, Self-Defense Forces, and the Japan Coast Guard, etc. will strengthen their respective response capacity and develop a system for collaboration and adjustment under which comprehensive and broad-area disaster response measures are taken as a whole country. At the same time, they will discuss how instruction and supervision should be provided based on basic principles of responses at the time when a declaration of a disaster emergency is issued. Furthermore, procedures to be followed in the collaboration with the US army should be clarified between the US and Japan sides, while coordination methods for receiving disaster relief units from overseas and collaboration activities will be widely disseminated and operated. [Cabinet Secretariat; Cabinet Office (Disaster Management); National Police Agency; Ministry of Internal Affairs and Communications; Ministry of Justice; Ministry of Foreign Affairs; Ministry of Health, Labour and Welfare; Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Defense]

○ For ensuring good living environment at designated shelters, etc., initiatives with due consideration to households and women with infants, and elderly people will be promoted. [Cabinet Office (Disaster Management)]

(Disaster Management Education, etc.)

○ Continuous reviews will be conducted on the way to take evacuation procedures to protect oneself, enabling them be conscious about their responsibility to protect their own life, and to

take evacuation behavior on their own judgement. At the same time, disaster prevention exercises and disaster prevention education will be promoted continuously through schools, workplaces, local autonomous organizations, and other relevant organizations. In addition, voluntary formulation of an action plan by local residents will be encouraged by widely disseminating and making awareness of the Community Disaster Management Plan. [Cabinet Office (Disaster Management); Ministry of Education, Culture, Sports, Science and Technology; Ministry of Land, Infrastructure, Transport and Tourism]

○ Relevant ministries and agencies will make efforts to widely disseminate and establish the Sendai Framework for Disaster Risk Reduction 2015-2030 both in and outside of Japan, while promoting strategic international cooperation on disaster management disaster management cooperation, utilizing the experience, knowledge and technology gained from disasters occurred in the country. They will also use the World Tsunami Awareness Day as a platform to encourage international discussions on tsunami disaster management and find better solutions from a broader perspective. [Cabinet Secretariat, Cabinet Office (Disaster Management); Ministry of Foreign Affairs]

(2) Housing and Cities

○ In order to ensure that the goals of countermeasures against large-scale fires, such as prevention of spread of fire in crowded urban areas, and of enhancement of earthquake resistance at houses, buildings and schools, etc. are steadily achieved, initiatives including the development of shelters and evacuation routes using parks and city streets, rebuilding old condominiums, renovation of buildings for enhancing earthquake resistance will be promoted. Along with these initiatives, safety measures for block walls etc. and other initiatives to ensure the safety of schools and evacuation routes will be implemented. Meanwhile, promotion of renovation of used houses reflecting the guideline to improve the evaluation methods for those buildings and construction of wooden houses highly resistant earthquakes will be carried out. These initiatives will be promoted by appropriately combining the structural and non-structural measures, such as the use of support measures and tax systems targeting local governments, utilization of regulatory methods, research and development of new construction methods

such as those using Cross-Laminated-Timber (CLT) and of traditional construction methods, establishment and dissemination of standards thereof, and implementation of joint training exercises. Moreover, public relations activities and awareness-raising activities targeting the general public will be proactively carried out in an easy-to-understand manner, thereby promoting effective initiatives inducing reconstruction and renovation of houses and buildings, and measures for preventing furniture from falling. [Ministry of Education, Culture, Sports, Science and Technology; Ministry of Land, Infrastructure, Transport and Tourism]

○ Regarding disaster management bases, school facilities, social education facilities, sports halls, medical/social welfare facilities, correctional institutions, and other similar buildings, relevant ministries and agencies will promote earthquake resistance measures, which will also cover ceiling and other materials for non-structural elements, and countermeasures for aging buildings. In addition, the responsible agencies and organizations will work to ensure, in the case of the occurrence of a large number of casualties, that they will be admitted in an appropriate environment within the affected area, or to secure places to which the casualties are transported outside the affected area. [Cabinet Secretariat, Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications; Ministry of Justice; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Health, Labour and Welfare; Ministry of Land, Infrastructure, Transport and Tourism]

○ Based on lessons from the Great East Japan Earthquake, safety measures against long-period ground motions will be taken for high-rise buildings, while disaster management measures for underground space will be promoted from both structural and non-structural aspects. The disaster response capacity of multipurpose facilities will also be enhanced through proper evacuation guidance given by general fire/disaster management supervisors and implementation of joint drills, etc. Furthermore, initiatives to mitigate damage from collision of flying objects caused by strong wind, such as measures against flying objects around the opening of houses and buildings, will be promoted. [Ministry of Internal Affairs and Communications; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Land, Infrastructure, Transport and Tourism]

○ With the aim to prevent damage to residential land such as sliding and collapse of prepared

residential land due to a large-scale earthquake, research on risks of liquefaction damage to a large-scale developed land with embankment and residential land nationwide will be conducted, and relevant maps will be published with greater sophistication and enhancement of earthquake resistance will be promoted to advance the visualization of the safety in residential land and proactive measures. [Ministry of Land, Infrastructure, Transport and Tourism]

○ Efforts should be made for promoting the enhancement of the earthquake resistance, enhancement of the water resistance, and countermeasures for aging routes and facilities for essential utilities (electricity, gas, water supply and sewerage, and communication systems). Disaster resistance should be strengthened by such means as introducing a system to automatically stop power supply for preventing electrical fires. Each household and local government will store drinking water and other types of water necessary for daily life water using groundwater, rainwater, and reclaimed water, and for medical activities and fire services, and alternate functions will be secured. In carrying out such actions, relevant areas should be divided into unified blocks. Alternate functions of essential utilities at each facility in an emergency will be secured through diversifying and decentralizing energy supply sources by introducing independent distributed energy. In doing so, attention should be paid to the manner in which it is carried out with unified blocks as a basic unit. Additionally, by encouraging business operators to establish their own BCP and BCM structures and the development of human resources and expertise through the collaboration of related organizations, disaster mitigation measures contributing to swift reconstruction should be promoted. Furthermore, the following measures will be promoted: subsurface cavity detection, enhancement of the earthquake resistance of underground structure and inspection, repair, and back-filling of water leak, etc., measures for preventing roads from becoming depressed involving collecting and sharing, and using ground information. [Cabinet Secretariat, Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications; Ministry of Health, Labour and Welfare; Ministry of Agriculture, Forestry and Fisheries; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism]

○ The public sector and the private sector should cooperate with each other to provide accurate

information in the event of a disaster, make efforts to continue their business in relevant business or commercial zones as a whole, and ensure safety of evacuees and stranded persons around major stations in metropolitan areas by carrying out initiatives such as mitigating a simultaneous return home. Measures for stranded persons should be promoted and disseminated around major stations, while measures should be enhanced through drills and prior information sharing regarding the possibility of using public and private buildings as temporary shelters. With regard to facilities to be designated shelters, enhancement of the disaster management functions countermeasures for aging facilities will be carried out by measures to enhance earthquake resistance including non-structural elements, In-house power generation equipment, maintenance of reserve warehouses, securing alternate water source/energy/sanitary environment, and barrier-free access to the facilities, while the disaster management functions of temporary shelters will also be enhanced and promoted. Furthermore, the government will advance the development of conditions to confirm the safety of family members, while endeavoring to steadily enhance the disaster resistance of traffic facilities to ensure a smooth evacuation and return home.【Cabinet Secretariat, Cabinet Office (Disaster Management); Cabinet Office (Regional Revitalization); Ministry of Education, Culture, Sports, Science and Technology; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

○ The national government will implement measures to preserve cultural properties, such as conducting inspections on the display and collection methods at museums and establishing an archive for recording tangible/intangible cultures nationwide in a video format, to advance the enhancement of the earthquake resistance of cultural property and minimize damage to exhibits and collections. [Ministry of Education, Culture, Sports, Science and Technology]

○ Relevant organizations will cooperate with each other to create communities resilient to tsunamis, while trying to make towns more compact, in light of population aging in urban areas, so that elderly people can have access to important facilities within walking distance and live independently even in the event of a disaster. With regard to making towns more compact, the concept of “compact + network” to connect compact towns with networks will be promoted, and by generating convection of movements, the excess concentration in the

Tokyo Metropolitan area, a cause of generating many victims and stranded persons, will be corrected. [Ministry of Land, Infrastructure, Transport and Tourism]

○ Operational improvement to speed up the damage assessment of residences and matters to be dealt with by local governments when a disaster occurs should be widely and accurately disseminated. At the same time, the supervising agencies and organizations will examine measures to provide emergency temporary housing smoothly and swiftly, promotion measures for emergency repair of housing, and diverse supply options for residence, which are collaborating with reconstruction projects for towns, and advance necessary initiatives, such as showing local governments directions to take. [Cabinet Secretariat, Cabinet Office (Disaster Management); Ministry of Land, Infrastructure, Transport and Tourism]

(3) Healthcare and Welfare

○ Due to a risk that an extensive and large-scale disaster may cause a tremendous number of people to be injured, exceeding the capacity of emergency treatment and transportation, the public and private sectors will discuss in cooperation any systems in which those with minor injury are given emergency treatment through mutual assistance within respective regions. [Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications]

○ Efforts should be made to enhance the earthquake resistance of medical and welfare facilities, promote relocation from areas expected to be submerged in water in the event of Nankai Trough earthquakes. At the same time, utilization of information and communications, ensuring sewerage function and emergency power supply equipment, stockpiling of water, food and fuel, etc., various water and energy sources such as groundwater, rain water and recycled water will be advanced to support medical and welfare functions in the event of a disaster. Disaster management and mitigation functions will be strengthened to ensure business continuity by building a cooperation system through which water and fuel will be preferentially allocated in cooperation with relevant organizations and formulating Business Continuity Plan (BCP). Furthermore, disaster-resistant healthcare and welfare functions will be strengthened in order to ensure that a large number of disaster victims expected to be generated in wide areas can all receive necessary and appropriate services with the creation of

frameworks for wide-area coordination through appropriate allocation of medical resources, including materials, equipment, and human resources, and through utilization of medical information. [Ministry of Education, Culture, Sports, Science and Technology; Ministry of Health, Labour and Welfare; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of the Environment]

○ In order to avoid an absolute lack of medical resources in the event of a large-scale natural disaster, cross-sectoral and government-wide examination of concrete cases including the capacity, speed and transportation access of the means of transport will be conducted to establish a supply system for medical resources. The Disaster Medical Assistance Team (DMAT), which is responsible for medical aid, will be developed in a systematic manner, considering the number of necessary teams based on anticipated damage, while their capability will be maintained and enhanced through exercises. Furthermore, a nation-wide structure will be developed to enable appropriate allocation and adjustments of medical resources by identifying the medical needs of the affected area. [Cabinet Office (Disaster Management); Ministry of Health, Labour and Welfare; Ministry of Land, Infrastructure, Transport and Tourism]

○ In addition to DMAT, relevant ministries and agencies will develop the Disaster Psychiatric Assistance Team (DPAT) and disaster medical coordinators, who assist prefectures and public health centers in conducting comprehensive coordination of health and medical activities properly and smoothly, and human resources who are crossing occupations required for medical support activities in an emergency, as well as fostering Japan Self-Defense Forces' major personnel for disaster medical activities. Enhancement of a system to develop human resources that are specialized in effective disaster relief dispatch and logistics such as provision of relief supplies, and that carry out dispatch coordination and command coordination at the headquarters, etc., will be promoted to advance disaster response functions. [Ministry of Education, Culture, Sports, Science and Technology; Ministry of Health, Labour and Welfare; Ministry of Defense]

○ In order to ensure that medical facilities, which serve as comprehensive disaster centers in each prefecture, can accept patients, including critically ill patients, the use of medical treatment

units (medical modules) both in an emergency and at normal times will be considered. Necessary materials and equipment will be allocated to local medical organizations, such as disaster base hospitals and municipalities in charge of establishing first-aid centers, while at the same time initiatives to avoid an absolute shortage of medical functions and personnel will also be promoted by enhancing various types of medical training courses. Furthermore, collaboration between medical organizations and transport/logistics business operators will be strengthened to ensure higher disaster resistance of transport routes for patients and medicines, and early opening of the access routes and prompt resumption of distribution of medical materials. [Cabinet Office (Disaster Management); Ministry of Health, Labour and Welfare; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Defense]

○ For the enhancement of bases and facilities to be used to provide treatment for critically ill patients who cannot be treated within disaster affected areas, relevant ministries and agencies will review required equipment, functions, and materials along with a measure for the use of these equipment in normal times and proceed with their materialization. [Cabinet Office (Disaster Management); Ministry of Health, Labour and Welfare]

○ In order to ensure that infectious disease is not spread among evacuees, promote appropriate medical checkups and vaccinations from normal times. At the same time, local governments will plan measures for widely disseminating information regarding health management such as correct infection disease management. The relevant ministries and agencies will maintain the preparedness for carrying out sterilization and pest control based on the Act on Prevention of Infectious Diseases and Medical Care for Patients with Infectious Diseases (Act No.114 of 1998), while a system for accurately securing medicine and equipment will be built for the facilities to be a designated shelter in order to maintain their hygienic environment in good condition in the event of a disaster. [Cabinet Office (Disaster Management); Ministry of Health, Labour and Welfare]

○ Public health centers, administration, medical personnel, NPOs, and community residents will build, in cooperation, a system in which medium- and long-term care and health management are performed to ensure that people do not damage their health due to stress-related illness and mental issues caused by disasters [Ministry of Health, Labour and Welfare]

○ Through promoting collaboration between the health and medical care sector and the nursing care sector from normal times, the responsible ministry will proceed with building the integrated community care system, thereby developing an environment that encourages elderly people to participate in community activities and enhance disaster response capacity of respective communities. [Ministry of Health, Labour and Welfare]

○ Promotion of designating welfare shelters with established system, which enables vulnerable people to disasters in the event of a disaster such as elderly people and people with disabilities who will encounter difficulties in living at general shelters to receive special consideration depending on their situation and live in peace will be implemented. For providing emergency assistance to vulnerable people to disasters, a broad-based welfare support network among private bodies and business operators will be built. [Cabinet Office (Disaster Management); Ministry of Health, Labour and Welfare]

(4) Energy

○ Due to the locations of large-scale energy supply bases in Japan being concentrated on the Pacific side, there is a risk that Nankai Trough earthquakes or capital inland earthquakes may damage their supply capacity significantly. Therefore, relevant ministries and agencies will mitigate the concentration of energy supply bases in those areas with high disaster risks and consider measures that promote an “autonomous, decentralized and coordinated” national land structure and national land use, while the disaster response capacity of each facility should be strengthened, and self-sufficiency within each region and the capacity to mutually accommodate energy between regions should be enhanced. At the same time, the supply side and the demand side of energy will take comprehensive measures from both the structural and non-structural aspects based on their complementarity and integrity, thereby enhancing resilience of power infrastructure to build energy supply system resilient to disasters. [Relevant ministries and agencies]

○ Relevant ministries and agencies will make efforts to enhance the disaster response capacity of fuel supply infrastructure so that they can ensure the necessary energy supply even in the event of large-scale damage through promoting efforts for strengthening the emergency

receiving and shipping capacity of refineries and oil terminals, ensuring the mobility in releasing national stockpiles of crude oil and petroleum products, and securing and maintaining the amount of national stockpiles of LP gas. On the premise that there will be a limit to the supply amount after a disaster, the idea of prioritizing supply destinations should be discussed in advance. Efforts will also be made to maintain and strengthen declining supply capacity of terminals (service stations, LP gas filling stations, etc.), introduce non-utility generation facilities to individual households and important facilities such as public facilities to be used as shelters in the event of a disaster, schools, disaster base hospitals, and correctional institutions, as well as stockpiling of fuel such light oils and LP gas. [Ministry of Justice; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Health, Labour and Welfare; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

○ As damage to energy supply facilities such as a complex and high-pressure gas facilities may not only cause disruption of energy supply but also lead to a large-scale fire and environmental pollution, their disaster resistance will be enhanced and disaster management systems will be strengthened. [Ministry of Internal Affairs and Communications; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

○ Introduction of self-reliant and decentralized energy, such as cogeneration, fuel cells, renewable energy, hydrogen energy, and LP gas will be promoted locally, while creation of smart communities will be aimed for. Introduction of renewable energy using biomass, water, land and other resources in rural areas will also be promoted. [Ministry of Agriculture, Forestry and Fisheries; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of the Environment; and other relevant ministries and agencies]

○ The land and maritime traffic infrastructure for energy transport will be improved and the disaster response capacity of the transport system will be strengthened. Furthermore, relevant organizations should cooperate with each other to develop a system necessary for ensuring early opening of transportation routes in an emergency, and discuss information sharing,

cooperation in transportation, and improvement of various procedures for smooth transportation of fuel. [Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

○ Relevant ministries and agencies will work on the sustainable promotion of building a corporate collaboration type BCP and BCM structures for the supply side, while conducting joint drills with relevant organizations with the securing of supply chains, in order to enhance the effectiveness of their BCP and BCM structures such as prompt securing of materials and equipment, fuel, and personnel necessary for emergency reconstruction work. Further enhancement of the functions of the BCP and BCM structures and technological development will be made through the use of the PDCA cycle. [National Police Agency; Ministry of Internal Affairs and Communications; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Defense; and other relevant ministries and agencies]

○ With the aim for making the entirety of the energy supply-demand structure more resilient, the responsible ministry will work to multi-lateralize and diversify domestic and overseas supply sources. This includes intensive measures concerning the national energy infrastructure and distribution networks that enable mutual accommodation of electricity and natural gas, etc. between regions, promotion of regionally dispersed power sources, promotion of research and development for commercialization of methane hydrate, and ensuring of domestically produced energy through the use of thermal energy, in light of medium- to long-term trends of energy supply and demand, domestic and overseas circumstances, and disaster risks in coastal areas. [Ministry of Economy, Trade and Industry]

(5) Finance

○ Financial institutions, etc. are required to reliably maintain their functions of making settlement and supplying cash even in the event of various natural disasters, including large-scale complex natural disasters. The national government and the Central Bank will quickly collect accurate information and disseminate correct information both within and outside of Japan to maintain financial orders, thereby mitigating credit uncertainty over financial settlement

functions in Japan and avoiding systemic risk or other financial crises. [Financial Services Agency; Ministry of Finance; and other relevant ministries and agencies]

○ In order to ensure that financial services are reliably provided, relevant ministries and agencies will improve the disaster resistance of the buildings of all of the major financial institutions, etc. ensure the backup functions of their systems, and secure power sources and information communication functions in an emergency in collaboration with relevant organizations, and promote and enhance their BCP and BCM structures. In particular, as significant settlement functions are concentrated in the Tokyo Metropolitan area, a focus in place on the initiative to minimize possible influence due to capital inland earthquakes, such as securing alternate bases, will be promoted. Furthermore, they need to intensively promote efforts. The Central Bank must proceed with its measures in consideration of its significant role in maintaining financial order from a macro perspective. [Financial Services Agency; Ministry of Finance; and other relevant ministries and agencies]

○ Relevant organizations, including the national government and the Central Bank will carry out cross-sectoral joint drills and reflect the results in their countermeasures to further enhance the effectiveness of their BCP and BCM structures, accumulate expertise, develop human resources, and promote collaboration among related financial institutions. In that process, various circumstances, such as concurrent damage to multiple bases with financial functions, shortage of personnel (major staff), and long-term disruption of the power supply and transport infrastructure, will be envisaged in order to identify vulnerability across the entire financial system. [Financial Services Agency; Ministry of Finance]

(6) Information and Communications

○ With regard to disaster-related information, relevant ministries and agencies will secure various collection means from the public and private sectors through advanced technology such as Quasi-Zenith Satellite System (QZSS), geospatial information (G-space information), Monitoring of Waves on Land and Seafloor (MOWLAS), use of SNS, and the building of a cooperation system with each business operator in normal times and in the event of a disaster. Furthermore, various provisions mean taking into account tourists, elderly people, people with

disabilities, and foreign people will be secured to ensure every citizen can surely obtain accurate information by promoting the digitalization of disaster prevention administration radio , promotion of prompt and accurate transmission of L-Alert(Disaster Information Sharing System) and its enhancement, multiplexing of information transmission means collaborating with J-Alert, and Public wireless LAN (Wi-Fi). Promotion of disaster measures such as development of Terrestrial Broadcasting Network, promotion of measures against hearing loss, and cable television services via fiber optics telecommunications networks will also be carried out. [Cabinet Office (Disaster Management); Cabinet Office (Space); National Police Agency; Ministry of Internal Affairs and Communications; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Agriculture, Forestry and Fisheries; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Defense]

○ Regional disaster countermeasures will be promoted steadily, and the disaster resistance of power and communication facilities/networks themselves will be enhanced. Information and communications facilities and equipment will also be improved by developing emergency power supply equipment, fuel supply equipment, and stockpile equipment, etc. [Cabinet Office (Disaster Management); National Police Agency; Financial Services Agency; Ministry of Internal Affairs and Communications; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Agriculture, Forestry and Fisheries; Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Defense]

○ Business operators will conduct self-confirmation of conformity to technical standard concerning damage or malfunction of telecommunication equipment, etc., while ministries and agencies will continue working on the vulnerability measures for information and communication systems. [Cabinet Office (Disaster Management); National Police Agency; Financial Services Agency; Ministry of Internal Affairs and Communications; Ministry of Agriculture, Forestry and Fisheries; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Defense]

(7) Industrial Structures

○ Relevant ministries will enhance disaster resistance of industrial equipment, including internal equipment such as a production line, etc. Energy supply, industrial water works, and infrastructure of logistics, which support the industry and supply chains as a whole, will also be made more disaster-resistant. Furthermore, from the perspective of ensuring the business continuity of respective companies, relevant ministries and agencies will discuss measures to ensure substitutability, such as creating multiple supply chains, ensuring substitutability of components, and dispersing or relocating factories and business establishments in light of the areas with high disaster risks, to build disaster-resistant industrial structures. [Cabinet Office (Disaster Management); Ministry of Education, Culture, Sports, Science and Technology; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism]

○ Relevant ministries and agencies will encourage companies to make efforts to ensure emergency power supply facilities necessary for continuing their industrial activities, and promote building of a mechanism to accommodate non-utility generation facilities, fuel stockpiling and procurement, etc. among affiliated companies and within regions by large companies and SMEs in cooperation with each other. In building such a mechanism, attention should be paid to business types and processes that require constant energization for achieving swift recovery and reconstruction of relevant regions. [Ministry of Economy, Trade and Industry]

○ Considering the circumstances in which the international division of labor has further progressed and supply chains have become more globalized, relevant ministries and agencies will promote, in addition to the establishment of separate BCP and BCM structures by individual companies, establishment of group BCP and BCM structures and industrial BCP and BCM structures through the collaboration between private companies and economic organizations, with global supply chains, including overseas production bases, and activities outside disaster-affected areas in mind, and research and studies for developing disaster-resistant infrastructure, etc. [Cabinet Office (Disaster Management); Ministry of Economy, Trade and Industry; and other relevant ministries and agencies]

○ Establishment of BCP and BCM structures at each company will be encouraged. With SMEs, awareness of disaster management and disaster mitigation measures in advance will be further enhanced, mainly with companies taking the core role in regional economy and those serving as a leader for the regional supply chain. In addition, development of an environment for encouraging private companies' voluntary initiatives such as the spread and promotion of a system to certify organizations with active engagement in establishing BCP and BCM structures will be discussed. [Cabinet Office (Disaster Management); Ministry of Economy, Trade and Industry; and other relevant ministries and agencies]

○ In tandem with structural measures, with the aim of ensuring the effectiveness and further encouraging the establishment of the BCP and BCM structures, efforts will be made to create a framework to properly evaluate companies' systems and capabilities to continue business, secure and develop in-house human resources through continuing education and training, familiarize and enlighten management in particular, and improve their BCP and BCM structures by implementing the PDCA cycle. Relevant ministries and agencies will also work on initiatives for securing and developing human resource and creating a better environment in light of the problem of labor shortage such as the advancing aging condition of skilled workers in the construction industry engaging in recovery and reconstruction work. [Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

○ In order to further enhance the effectiveness of individual companies' BCP and BCM structures, cooperation among relevant ministries and agencies, their regional branches, local governments and economic organizations will be advanced in each regional block. [Cabinet Office (Disaster Management); Financial Services Agency; Ministry of Agriculture, Forestry and Fisheries; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

○ Regional relocation and expansion of the headquarter function of companies will be actively supported, and the development of a business environment will be comprehensively promoted to ensure that the relocation and expansion proceed smoothly. [Cabinet Office; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism]

(8) Transportation and Logistics

○ Disaster resistance of transportation/logistics facilities including measures against flooding and power failure will be enhanced depending on regional characteristics of disasters, while countermeasures for aging facilities, measures against obstructions due to the surrounding buildings and appropriate management of roadside areas will also be advanced. In particular, with regard to transportation networks in metropolitan areas where main arteries and hubs for the flows of people and goods and central administrative functions are concentrated, disaster preparedness will be ensured promptly in accordance with the characteristics of each region regarding earthquakes, tsunamis, floods, volcanic eruptions, sediment disasters, heavy snow, and other disasters, and decentralization of transport network from high disaster risk areas will be conducted. Such efforts will not be limited to the development of facilities (structural measures), but will include non-structural measures, such as the advancement of land/maritime/air traffic control, strengthening of training, and promotion of research and development. Furthermore, the progress in efforts to enhance disaster resistance of facilities will be published to serve as an incentive to facility managers. [National Police Agency; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Land, Infrastructure, Transport and Tourism]

○ With regard to main arteries and hubs for the flows of people and goods that support the economy of Japan, alternate transportation routes based on the cooperation among land/maritime/air transportation modes will be ensured from the perspectives focusing on both broad and narrow areas be ensured. This will be carried out on the premise that the arteries may be disrupted or the hubs may become dysfunctional due to any large-scale natural disaster, and transportation capacity at normal times will also be improved. In particular, concerning the Linear Chuo Shinkansen, which will bring about innovation in the national land structure due to its ultrahigh speed, JR Tokai, the responsible entity, will promote its development in collaboration and cooperation with the national and local governments. Meanwhile, the relevant ministries and agencies will also work on the following areas regarding the Shinkansen network, which functions as an alternative transport route in the event of a disaster

due to its resilience to disasters such as snow and heavy rain, and the highway network such as the ring roads in metropolitan areas: steady development to both networks based on comprehensive assessments such as business evaluations; enhancement of highway functions such as making temporary two-lane sections four lanes; improvement in the accessibility to high-standard highways. In doing so, these developments will also be promoted from the perspective that contributes to the realization of an "autonomous, decentralized and coordinated" national land structure. [Ministry of Land, Infrastructure, Transport and Tourism]

○ In order to ensure stable transportation in both normal times and the event of a disaster, important road networks for logistics will be designated as an "important logistics road" to which function enhancement will be carried out and priority support will be provided. At the same time, the national government will serve as an acting agent in clearing roads and promoting recovery from disasters so that functions will be ensured quickly. In addition, disaster management measures such as reinforcing the earthquake resistance of emergency transportation roads and preventing sliding collapse of roads, and safety measures for traffic safety facilities including additional power supply equipment for traffic signals will be implemented. Furthermore, elimination of power poles will be promoted to prevent road closure, interruption of power supply, and damage to houses and buildings. [National Police Agency; Ministry of Land, Infrastructure, Transport and Tourism]

○ When developing alternate transportation routes, transportation/logistics business operators will determine the required capacity and functions, and develop necessary structural measures to ensure stable transportation in both normal times and an emergency. Transportation/logistics business operators will also prepare sufficient non-structural measures, such as the strengthening of collaboration with other business operators, enhancement of their BCP and BCM structures including the establishment of a corporate collaboration-type BCP, and provision of training, so that alternate transportation can be commenced promptly after the occurrence of a disaster. Furthermore, a system for time adjustment of logistics in advance will be built, assuming a situation in which a transportation network cannot be used due to typhoons etc. [Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism]

○ Relevant ministries and agencies will develop evacuation routes, evacuation areas, and accepting bases for wide area support to prepare for a large-scale tsunami, earthquake, flood, storm surge, volcanic eruption, and sediment disaster, etc. while at the same time promoting structural measures to protect evacuation routes and evacuation areas. While limiting those who can use vehicles in advance, evacuation routes and methods by foot and bicycle, taking into account the impact of traffic jam and nighttime blackout, and evacuation methods with an assumption of various situations such as on a ship at a port and on an airplane at an airport will be discussed. Furthermore, a measure to prevent floating objects will be promoted to prevent severe secondary disaster due to the outflow of containers, vehicles, ships, and oil tanks. [Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications; Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism]

○ In order to secure transportation of roads and railways, etc. at the event of intensive heavy snow, spot measures such as collaboration among road managers and pull-off areas, and development of snow removal system from both non-structural and structural aspects will be advanced. At the same time, aiming to avoid the situation in which many users become stranded, right decisions on road closure and stopping operation of transportation will be made and information provision to the users will be carried out. [Ministry of Land, Infrastructure, Transport and Tourism]

○ For reliable and swift provision of traffic information as a measure for people having difficulty returning home in case of traffic is cut off, multiplexing and diversifying means will be promoted, while securing routes, which enable people to return home safely and smoothly by foot or bicycle through sharing disaster risk information among the relevant organizations. Cooperation system among relevant business operators will be strengthened to ensure smooth implementation of alternative transport and mutual cooperation when resuming operation in order to prevent confusion when the railway is interrupted or when the operation is resumed. Furthermore, in addition to the utilization of traffic surveillance cameras and road management cameras, use of vehicle probe information by the public and private sectors and use of bicycles in field research will be planned. Measures for swiftly grasping situations about the opening

or closure of roads using optical beacon and ETC2.0 will be promoted to make sure that road users will surely receive information regarding road closure and traffic conditions. [National Police Agency; Ministry of Land, Infrastructure, Transport and Tourism]

○ Disaster response capacity will be strengthened, and this will include fostering personnel and improving materials and equipment, and developing technology, so that access to each transport infrastructure and transportation agency can be ensured, and they can recover a resume operation at an early stage. A system to procure personnel and goods required for the events such as Nankai Trough earthquakes will be established. At the same time, in order to ensure smooth supply to disaster-affected areas including the last mile, relevant ministries and agencies will implement assistance using ships and enhance a system for information sharing and collaboration among the private business operators and managers of facilities for ensuring access routes, recovery, and transport. They will also develop a system to effectively utilize the existing logistics functions. Furthermore, disaster waster transport system will be built, making use of the mass transport feature of freight rail and maritime transport. [Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications; try of Health, Labour and Welfare; Ministry of Agriculture, Forestry and Fisheries; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Defense]

○ In preparation for shortages of gasoline etc., relevant ministries will work on diversification/decentralization of fuel type for transportation such as electric vehicles, CNG-powered vehicles, LPG vehicles and ships, and LNG vehicles and ships. [Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

(9) Agriculture, Forestry and Fisheries

○ In the event of a large-scale natural disaster that affects broad areas, it is necessary not only to ensure supply of emergency food, etc. to disaster-affected areas immediately after the disaster, but also to secure production, processing and distribution of food, etc. nationwide thereafter and maintain the function of stably supplying such necessities as a system. To that end,

relevant ministries and agencies will enhance the disaster response capacity of a series of supply chain by conducting structural measures such as the development of production infrastructure for the agriculture, forestry and fisheries industry, and non-structural measures, such as the establishment of BCP /BCM in the distribution and processing stages, and the establishment of a collaboration and cooperation system among business operators in the food industry, business operators in relevant industries (transportation and warehouse businesses, etc.), and local governments. [Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism]

○ As initiatives from normal times, relevant ministries and agencies will conduct appropriate and efficient stockpile operations and secure stable import. In an emergency, utilization of stockpiles and securing of imports should be steadily implemented. [Ministry of Agriculture, Forestry and Fisheries]

○ In order to protect human life and property, and to prevent and mitigate secondary damage in rural areas, relevant organizations will collaboratively enhance disaster management and mitigation measures that combine structural and non-structural measures such as: promotion of the longer life of agricultural irrigation facilities; development and conservation of forests; measures for hillside collapse and megaliths in vulnerable geological zones; promotion of a comprehensive driftwood measure; enhancement of the disaster management function of fishing ports and fishing villages; promotion of a comprehensive reservoir management including its abolition; creation and dissemination of a hazard map; and establishment of BCP for facility managers. These initiatives will be conducted while considering the effect of the natural environment for “green infrastructure” to be shown. With regard to drought, information sharing among relevant parties, along with a comprehensive measure, will be promoted. [Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism]

○ While seeking collaboration with local communities and giving due consideration to vegetation unique to relevant regions from the perspective of ensuring symbiosis with nature, relevant ministries and agencies will make efforts to maintain production activities of agriculture and forestry in rural areas, utilize local resources by developing agriculture into the sixth industry,

and prevent devastation of farmland and forests through implementing appropriate conservation management of farmland and forests, thereby ensuring the function to preserve national land to be demonstrated properly. In the process of this initiative, regarding the works with forest, development of diverse and healthy forest through the works of thinning and reforestation, and the development of road network and wildlife management necessary for the said works will be promoted, while also working on the accumulation and consolidation of forest management. Efforts will also be made for development and popularization of construction methods for actively using locally produced wood and those for using wood such CLT in the area of civil engineering and construction. [Ministry of Agriculture, Forestry and Fisheries; Ministry of the Environment; and other relevant ministries and agencies]

○ Agricultural land, such as farmland, agricultural irrigation facilities, and forests, has been conserved and managed based on local collaboration and other activities. Due to the declining population, aging and other factors, this has become difficult to continue. This situation has generated concern over decreasing regional disaster management capacity and activities. Thus, a structure will be developed to fully enable autonomous disaster management and recovery activities at the time of disaster, while helping the regional community conserve and manage local assets based on autonomous collaboration. In addition, interactions between urban and agricultural areas based on local assets should help maintain and reinvigorate local communities. [Cabinet Office (Regional Revitalization); Ministry of Agriculture, Forestry and Fisheries]

(10) National Land Conservation

○ As responses to earthquakes, tsunamis, floods, tidal waves, volcanic eruptions, sediment disasters, sediment and flood damage, and other natural disasters, relevant ministries and agencies will take comprehensive measures by effectively and efficiently combining structural and non-structural measures. Structural measures include the installation of erosion control equipment at river management facilities, rainwater storage and infiltration facilities, sewer facilities, and shore protection facilities in areas with high risks of sediment disasters, and the development of forest conservation facilities and protection forests. Non-structural measures

include disaster mitigation measures incorporating effective land use, collection and utilization of research and observation data, accurate understanding of the areas with disaster risks, preparation and dissemination of hazard maps, awareness raising for disaster management prevention to enhance the effectiveness of evacuation, enhancement of the disaster monitoring system, accurate and easy-to-understand information transmission and communication before and after the occurrence of a disaster, and development of warning and evacuation systems. These measures will be implemented with strong determination with proper support given to local governments. In addition, measures effectively utilizing existing stock will also be promoted. In particular, to minimize damage due to water related disaster that exceeds the anticipated scale of existing plans or flood disasters that occurs while such measures are still in preparatory stages, initiatives to rebuild "Flood-Conscious Societies" and ones to avoid disastrous damage to the social economy such as constructing high-standard levees, while at the same time advancing flood control measures taking into consideration the impact of climate change etc. [Cabinet Office (Disaster Management); Ministry of Education, Culture, Sports, Science and Technology; Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism]

○ With regard to facility management, more efficient inspection and diagnosis will be carried out to advance effective long-life measures for the facilities by actively using ICT such as sensors, image information, and unmanned aerial vehicles, while a preventive maintenance type asset management system based on respective regional characteristics will be introduced to local governments. In doing so, the following points need to be taken into consideration: automation and remote controlling function of flood gates etc. and their effective management and operation, effective use of hydro energy, collaboration with local communities, symbiosis with nature and harmony with the environment. [Cabinet Office (Science, Technology and Innovation); Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism]

○ It is assumed that the occurrence of droughts exceeding the current water supply maintenance level will become more frequent with more severity going forward due to the impact of climate change. Therefore, relevant parties will ensure close information sharing, and promote

initiatives such as functional enhancement of water source-related facilities, effective use of water resources utilizing existing stock, use of groundwater, rainwater, and reclaimed water as alternative water source in a time of crisis. [Ministry of Land, Infrastructure, Transport and Tourism]

○ Relevant ministries and agencies will work on disaster management weather information in terms of its advancement and promotion of use as well as the ensuring of the continuity of infrastructure for the information, development of observation network in the western area of the Nankai Trough and other areas. They will also provide observation data obtained through the Global Navigation Satellite System (GNSS) such as the Global Positioning System (GPS) and the Quasi-Zenith Satellite System (QZSS), and geospatial information (G-space information), that contribute to disaster management and mitigation responses and disaster responses, and national land monitoring using these data, centralization of various disaster risk information, and enhancement of research and development as well as scientific knowledge of new technologies for social infrastructure. Furthermore, development of a shared platform for disaster-related information, enhancement of systems, equipment, and materials contributing to swift recovery, and utilization of advanced technology will also be promoted. [Cabinet Office (Science, Technology and Innovation); Cabinet Office (Disaster Management); Cabinet Office (Space); Ministry of Internal Affairs and Communications; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Agriculture, Forestry and Fisheries; Ministry of Economy, Trade. And Industry; Ministry of Land, Infrastructure, Transport and Tourism]

○ Development of systems for securing and fostering personnel and communities that play central roles in the conservation of national land will be promoted, and at the same time, efforts will be made to build a social and economic structure that enables such systems. [Ministry of Education, Culture, Sports, Science and Technology; Ministry of Land, Infrastructure, Transport and Tourism]

(11) Environment

○ Relevant ministries and agencies will contribute to enhance the regional resilience through the

use of regional resources by promoting the creation of Regional Circulating and Ecological Spheres, and through utilizing self-reliant and decentralized energy as well as diverse functions possessed by the natural environment. [Ministry of the Environment; and other relevant ministries and agencies]

○ Recognizing the disaster prevention and mitigation function possessed by the natural environment such as coastal forest and wetland, disaster management and mitigation measurements utilizing this function of "green infrastructure" will be promoted according to the characteristics of each region. At the same time, handling of marine debris will be promoted from the perspective of preventing the second disaster caused by marine debris, etc. Furthermore, with the aim to prevent the expansion of forest devastation etc., wildlife management as well as measures for developing natural parks and making the life of the parks longer will be promoted. [Ministry of Agriculture, Forestry and Fisheries; Ministry of the Environment]

○ Relevant ministries and agencies will conduct the following initiatives : formulation and review of the disaster waste management plan by prefectures and municipalities; development of waste treatment facilities resilient to disasters including the introduction of incineration facilities capable of autonomous operation even in the event of a disaster; securing wide-area treatment systems; securing sufficient temporary storage sites to accommodate the estimated amount of disaster waste to be generated; securing useful equipment and stools in the event of a disaster; promotion of recycling of disaster waste; human resources development through educational training to enhance the effectiveness of the initiatives mentioned above. Through these initiatives conducted at different levels of the local governments, the regional blocks, and the national government from normal times, a wide-area cooperation system for disaster waste management will be built and the resilience of the waste management system will be increased. [Ministry of the Environment]

○ Maintenance of equipment and materials, relevant drills and training will be conducted to prevent large-scale diffusion or leakage of hazardous materials in the event of a disaster along with the swift implementation of measures for mining areas. Relevant ministries and agencies, in cooperation, will also build and maintain the system that enables them to take proper

responses to the sharing of information on storage status of hazardous materials, and monitoring and preventing the spread of discharged or leaked hazardous materials. [Ministry of the Environment; Ministry of Economy, Trade. And Industry; and other relevant ministries and agencies]

○ Regarding “Johkasou”, decentralized domestic wastewater treatment system, we are promoting conversion of single treatment Johkasou (for black water only) to combined treatment Johkasou (for black water and gray water), while ensuring execution of legal inspections thoroughly. In this way, we will build, decentralized domestic wastewater treatment system, which is disaster resilient to and quickly deals with disasters. In addition to the above measures, together with preparation of Johkasou Inventory (data base system), disaster response capabilities of the entire Johkasou system should be reinforced. [Ministry of the Environment]

(12) Land Use (National Land Use)

○ Relevant ministries and agencies will discuss measures for promoting the “autonomous, decentralized and coordinated” national land structure and national land use, and will work on them as soon as possible to achieve the following objectives: to rebuild diversity in respective regions through having them exercise their independence and to strengthen regional collaboration; to ease the population concentration in the areas with high-disaster risks and diversify risks; to avoid the condition in which regional vitality decreases to the extent that cannot maintain medical services from normal times, and the condition in which reconstruction is not feasible in the case of emergency, leading to the loss the culture of life style and folk culture. [Relevant ministries and agencies]

○ Focus will be placed on the Japan Sea side, as well as on the Pacific side, where various functions are currently concentrated, to enhance substitutability and redundancy by linking the both sides in creating a more resilient nation. Furthermore, in order to ensure that each region can properly maintain and secure various national and social functions, in accordance with the types and frequencies of the natural disasters to which it is vulnerable, and according to the significance of respective functions, mutual cooperation will be strengthened among regions

and companies, and better sharing of necessary functions and provision of backup will be pursued. While conducting these initiatives, relevant ministries and agencies will also work on the correction of the excess concentration in the Tokyo Metropolitan area by quantitatively grasping the effects of each measure that is deemed to bring decentralization of functions to other regions. [Relevant ministries and agencies]

○ Considering types and frequencies of natural disasters and geographical and geological conditions of respective regions, efforts will be made for making safe communities, while discussing various measures flexibly combining those for preventing damage to facilities and those for regulating and guiding land use, with an eye on the recovery and reconstruction stage in advance. In doing so, relevant ministries and agencies will distribute the ideas of avoiding the use of vulnerable land and of the "Ecosystem-based Disaster Risk Reduction (Eco-DRR)" and "green infrastructure," which enhance the regional resilience by utilizing the functions of the natural environment, and advance the initiatives to enhance the regional resilience including a review of the approach to national land use and management. In addition, controlling of location in areas with high disaster risk and relocation to outside of the high-risk areas will be encouraged by visualizing disaster risks and using regulations regarding the locations of buildings. [Cabinet Office (Disaster Management); Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of the Environment]

○ Local governments should endeavor to secure sites to be used for shelters or bases for rescue activities and sites for building temporary housing necessary in the event of a large-scale natural disaster in advance, while seeking cooperation of the national government and the private sector. Cadastral surveys in urban areas will be promoted and maps stored at registries will be created to carry out initiatives to ensure systematic implementation of disaster management-related projects such as the development of emergency transportation routes for assisting emergency response/life-saving activities and recovery activities in the event of a large-scale disaster, and the prevention of slope collapse of road, as well as conducting smooth recovery and reconstruction work after a disaster. Furthermore, systems for enabling land with unknown owners, which is expected to increase going forward, to be used for public projects

and a mechanism to streamline the owner search will be made widespread. [Cabinet Office (Disaster Management); Ministry of Justice; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

○ Relevant ministries and agencies will establish BCP of the businesses that constitute local industries including agriculture, forestry and fishery and foster personnel leading to those businesses, and conduct initiatives to improve the capability of regional communities. Regional reconstruction visions based on disaster risks in respective regions, future images of the industrial structure, ideal approaches to the region-specific resources such as the history of the region and landscape will be discussed from normal times, in order to ensure the respective region to attain a better condition through reconstruction in the case of an emergency. Along with these initiatives, they will also promote initiatives in which the systems and procedures with respect to reconstruction are examined and reconstruction issues when a disaster occurs are grasped beforehand from a broad perspective, and will continue awareness raising regarding preparation for community reconstruction planning, while developing an environment that enables local governments to engage in the preparation for community reconstruction planning in advance. Effort should be made to build risk communication among the administration, local residents, and researchers, connection between people, bond, and communities. [Relevant ministries and agencies]

○ In rural villages with deteriorating functions due to depopulation and population aging, relevant ministries and agencies will endeavor to enhance and maintain regional functions through the implementation of relocating or reorganizing villages, based on full consideration to the opinions and intentions of local people. For villages with risks of becoming isolated in the event of a disaster, they are, depending on the size of each village, encouraged to increase the stockpile of necessities to be able to respond to the situation even without support from other regions. [Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications; Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism]

○ Relevant ministries and agencies will develop basic geospatial information (G-space information) and promote the utilization of the data in disaster management/mitigation and

disaster response scenes from normal times [Cabinet Office (Disaster Management); Ministry of Education, Culture, Sports, Science and Technology; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

(Promotion Policies for Cross-cutting Sectors)

(A) Risk Communication

○ Voluntary efforts will be promoted through bi-directional communications in which all stakeholders, including the national and local governments, citizens, and private business operators, based on the principle of self-help efforts, mutual assistance and public help. With regard to the ways of taking evacuation actions to protect oneself, continuous reviews will be conducted to ensure that people have awareness to protect their own life and are able to take evacuation actions their own accord. At the same time, all citizens will receive education and training for, and awareness raising of national resilience throughout their lives from the promotion of continuous disaster drills and disaster education through schools, work places, local autonomous organizations, etc., and the promotion of planning concerning voluntary disaster prevention activities by local residents, thereby building risk-resilient economic society and mitigating damage. [Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Agriculture, Forestry and Fisheries; Ministry of Economy, Trade. And Industry; Ministry of Land, Infrastructure, Transport and Tourism]

○ In local communities, which are the basis for promoting risk communication, making efforts to increase residents' social involvement and strengthen regional capacity will lead to the enhancement of disaster response capacity and healing of the post-disaster mental scars through mutual aid and collaboration among residents, with due consideration given to women, elderly people, children, people with disabilities, and foreign people, etc. Considering the significance of such effects, necessary measures will be promoted, while reconstruction visions should be discussed from normal times and the development of the environment in which reconstruction projects can be conducted smoothly in the event of an emergency, including consensus building towards reconstruction plans, will be advanced. Additionally,

independent regional activities will also be promoted, including logistic support for organizations and bodies working to protect regions through disaster management volunteering activities and other activities. [Cabinet Office (Disaster Management); Ministry of Health, Labour and Welfare; Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism]

○ Self-help and mutual assistance initiatives will be further expanded in cooperation with public help by the administration, and initiatives for awareness-raining and collaboration to enhance disaster resilience will be rolled out, while the development of contents for raising citizen's awareness of national resilience and the integration of information such as creating a risk information database will be promoted. [Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

○ Relevant ministries and agencies will conduct diffusion and education to promote the investment and initiatives on building national resilience with individuals and in households, communities, companies and organizations, work on the establishment of BCP to advance information provision, etc. and its enhancement, enhancing the earthquake resistance of houses and buildings, measures for preventing furniture from falling, utilization of diverse water and energy sources, and stockpiling. In doing so, necessary measures for diffusion and education will be promoted so that the citizens can identify products and services, etc. contributing to building national resilience. [Relevant ministries and agencies]

○ Relevant ministries and agencies will work on the familiarization and establishment of the Sendai Framework for Disaster Risk Reduction and educational activities for raising awareness of disaster management and mitigation, which started from the World Tsunami Awareness Day, etc. both in and outside of Japan. [Cabinet Office (Disaster Management); Ministry of Foreign Affairs; and other relevant ministries and agencies]

(B) Human Resources Development

○ In order to enhance the response capacity for life saving and other activities in the event of a disaster, human resources development will be promoted at the organizations for disaster

through various types of practical drills assuming a variety of situations including wide-area support and night-time responses. At the same time, cross-occupational human resources training and system development involving occupations involved in medical care activities in the event of a disaster will be carried out. Meanwhile, operational management of designated shelters, and fostering of administrative personnel with capabilities to deal with diverse disaster response tasks such as issuing disaster victim certificates in a smooth manner. will be promoted to achieve swift recovery of the lives of affected people. Furthermore, support will also be provided to human resources development at local governments. [Relevant ministries and agencies]

○ Human resources at private business operators such as skilled workers in the construction industry who are familiar with respective regions and will be responsible for road clearing and channel clearing, snow removal work, swift recovery and reconstruction, and maintenance work for infrastructure in normal times. [Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

○ With the aim of enhancing self-help and public assistance initiatives, the private sector will work on human resources development in private businesses by fostering expert personnel who will play the leading role in improving the resilience among the private business operators, in addition to those who will be responsible for realizing BCP within the private business operators. [Cabinet Office (Disaster Management); Ministry of Economy, Trade. And Industry; and other relevant ministries and agencies]

○ Human resources including leaders will be fostered in regional communities etc., in order to promote activities for protecting their respective regions such as logistic support for disaster management volunteering activities. In particular, from the perspective of reconstruction, relevant ministries and agencies will make effort to foster young people who are responsible for the next generation and have a good understanding of the mechanisms related to town planning and community development. [Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications; and other relevant ministries and agencies]

○ Based on the fact that Japan, as an advanced country in terms of disaster management, is expected by overseas countries to provide support and contributions in this field, relevant

ministries and agencies will conduct the fostering of disaster experts in sediment disasters and volcanology, human resources that will make use of their experiences of a large-scale disaster, lessons learnt from the experiences, and research outcomes in the disaster-affected sites, while also working to foster engineers and other experts who possess good knowledge of diverse academic disciplines in different regions [Relevant ministries and agencies]

(C) Public-Private Collaboration

○ Public-private collaboration will be promoted to utilize skills and expertise of private business operators and experts in respective regions, as well as utilizing facilities, equipment, and organizational system of private business operators in various disaster responses such as road and channel clearance, emergency recovery construction, operational management and livelihood support at designated shelters, and procurement and transport of emergency relief supplies. In order to make this collaboration effective, conclusion of agreement between the national and local governments and private business operators and industry groups, establishment of individual plans and collaborative regional plans reflecting the collaboration, and implementation of practical joint exercises will also be promoted. Furthermore, private business operators will maintain and secure personnel with familiarity with respective regions and equipment/materials, and enhance the robustness of facilities, while advancing the enhancement and enhancing of disaster prevention volunteer groups. [Cabinet Office (Disaster Management); Ministry of Internal Affairs and Communications; Ministry of Economy, Trade. And Industry; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

○ Relevant ministries and agencies will promote various initiatives such as introduction of new technologies, research and development for the collection and development of big data and its use, unified provision of information, and utilization of SNS in order to collect, provide, and share damage information and other necessary information for disaster management response and rebuilding of regional economy and society. [Cabinet Office (Disaster Management); National Police Agency; Ministry of Education, Culture, Sports, Science and Technology; Ministry of Economy, Trade. And Industry; Ministry of Land, Infrastructure, Transport and

Tourism; and other relevant ministries and agencies]

○ Relevant ministries and agencies will build a cooperation system among the local governments, Japan Red Cross Society, Social Welfare Council, volunteering groups, NPOs and coordinating organization to ensure smooth and effective implementation of disaster prevention volunteering activities at the event of a disaster. In addition, discussions will be held regarding a system to accept experts from the private sector to the disaster response headquarters to be established at local governments. [Cabinet Office (Disaster Management); Ministry of Health, Labour and Welfare; and other relevant ministries and agencies]

○ Initiatives based on a view that policies involving cooperation between regional industries and the respective region from normal times will demonstrate disaster management effects at the event of a disaster will be promoted. Furthermore, local governments and private business operators in the area of infrastructure and lifeline will provide, in cooperation, specific damage prediction of the region, while local governments and economic organizations will cooperate to set up a system such as a general consultation desk, thereby supporting private business operators establishing BCP and other initiatives for responding to disasters. [Cabinet Office (Disaster Management); Ministry of Economy, Trade. And Industry; Ministry of Land, Infrastructure, Transport and Tourism; and other relevant ministries and agencies]

(D) Countermeasures for Aging Infrastructure

○ In light of an expected acceleration of aging of the existing infrastructure, which was intensively developed in and after the high-growth period, and from the perspective of protecting human life and preventing social and economic systems from becoming dysfunctional, relevant ministries and agencies will steadily carry out maintenance and renewal of the infrastructure, while seeking reduction and leveling of the total cost in the medium- and long-term. [Relevant ministries and agencies]

○ Formulation of basic plan for prolonging lifetimes of infrastructure (action plan) by managers of each infrastructure will be promoted, while relevant ministries and agencies will, based on the action plan, establish a maintenance cycle for checking, diagnosis, repair, renewal and compilation of information for essential infrastructures and implement required measures so

that the established maintenance cycle will function smoothly. [Relevant ministries and agencies]

○ Development and dissemination of new technologies and cross-sectoral use and sharing thereof will be promoted. New technologies include those for checking and diagnosis, such as non-destructive testing technique, and those for prolonging lifetimes upon new construction or renewal of facilities, such as research on new materials, and repair and reinforcement techniques. [Relevant ministries and agencies]

○ Through public-private collaboration and support, the national government and local governments will respectively build a system to support initiatives for building national resilience, such as for fostering and deploying engineers who will engage in management and renewal of the infrastructure, establishing qualification systems concerning checking and diagnosis, and reinforcing research systems [Relevant ministries and agencies]

(E) Research and Development

○ Education/research organizations and private business operators will endeavor to foster excellent human resources, while relevant ministries and agencies will introduce incentives for research and development to promote the introduction of advanced technology and promote innovation for building national resilience. Relevant ministries and agencies will leverage superior technology and the latest science and technology to enhance the disaster response capability of relevant organizations such as the national and local governments, and those is the private sector to deal with large-scale natural disasters, thereby promoting disaster management and mitigation as well as research and development, dissemination, and social implementation in conducting countermeasures for aging infrastructure. [Cabinet Office (Science, Technology and Innovation); and other relevant ministries and agencies]

○ Research and development by research organizations and private business operators will be promoted to achieve the social implementation of basic technology to applied technology, such as the realization of Society 5.0 and initiatives for achieving the Sustainable Development Goals (SDGs), in wide-ranging national resilience-related fields with respect to the security and safety of the citizenry. In that process, effort should be made to ensure effective and

efficient research and development by promoting the utilization of the results of research and development for other purposes in various national resilience-related fields such as diversion of research and development related to the building of national resilience to other purposes. [Cabinet Office (Science, Technology and Innovation); and other relevant ministries and agencies]

Chapter 4: Promotion and Constant Review of the Plans

1. Necessary Review of Other National Plans

As specified in the Basic Act, this Fundamental Plan serves as the guidelines for other national plans for building national resilience and is a so-called umbrella plan to be positioned superior to those other plans.

In other words, in light of the fact that promoting plans in various fields exerts an effect on the resilience of the whole nation, basic policies and measures under various other national plans concerning national resilience should be established and implemented in line with the guidelines specified in this Fundamental Plan to ensure comprehensive and systematic implementation of the initiatives for building national resilience.

For this purpose, based on this Fundamental Plan, other related national plans will be reviewed every year and amended as necessary in accordance with the progress of respective measures and programs, which will lead to the promotion of building national resilience by the whole government working as one.

2. Constant Review of the Fundamental Plan

This Fundamental Plan states that the initiatives for building national resilience should be promoted, while having a long-term perspective, by clarifying medium- to long-term promotion policies and directions for the respective measures and reviewing the details of the plan once around every five years in consideration of the changes in social and economic circumstances surrounding the future national resilience and the progress of the respective measures. Amendment to the content is to be reviewed as necessary even before the fifth-year review, depending on the annual progress of measures and programs, and required amendments are to be made based on such reviews. When conducting a review of the details of plans, initiatives for contributing to building national resilience, which are independently implemented by local

governments and private business operators, will also be included in the items to be considered for the review of the vulnerability assessment. Going forward, the vulnerability assessment is required to be advanced by conducting research on the method to assess the vulnerability through quantitatively simulating the probability of occurrence of events and the severity of damage, and the development of outcome indicators that show comprehensive vulnerability. Therefore, review and required amendments of this Fundamental Plan will follow in tandem with the progress and degree of the advancement made to the assessment.

3. Promotion and Prioritization of Programs

(1) Establishment of an Action Plan for Every Fiscal Year and PDCA Cycle

In relation to the policy of building national resilience, this Fundamental Plan was established with the aim of avoiding the 45 worst events that should never happen as specified through the vulnerability assessment explained in Chapter 2, and various measures will be implemented every year while reviewing other national plans related to national resilience based on this Fundamental Plan, as necessary.

It is extremely important for the national government to decide policies for promoting respective programs based on the results of vulnerability assessment and to have relevant ministries and agencies cooperate with each other and implement measures promptly. Furthermore, the national government must review programs constantly depending on the progress of measures and endeavor to optimize programs by adding new measures as necessary, and then it should make corrections of promotion policies of the programs.

Attachment 4 shows policies for promoting the programs to which the results of vulnerability assessment thereof conducted as explained in Chapter 2 were reflected. The promotion Headquarters will prepare a promotion plan for each program with added quantitative indicators for progress management and major measures for promoting programs. Specific measures are to be implemented based on this promotion plan, while the Headquarters ascertains their progress every fiscal year and reviews the plans for promoting programs. The whole process will thus be

managed by repeating the PDCA cycle. In order to ascertain the progress of programs as quantitatively as possible, concrete numerical indicators shall be set based on the anticipated scale of risks and scope of the programs, and they will be constantly reviewed according to the progress of the programs if necessary.

In the case of the occurrence of a new large-scale natural disaster, inspections of measures based on this will be carried out and reflected in the annual plan to increase the usefulness of the PDCA cycle.

(2) Research and Review for Solving Issues

For the effective promotion of the initiatives for building national resilience, it is necessary to establish specific response measures for resolving the issues to overcome vulnerability in accordance with the promotion policies clarified in this Fundamental Plan.

Among the issues grasped through the vulnerability assessment, those requiring strategic responses will be annually examined in relation to response measures that are needed for resolving the issues. At the same time, for example, research on evaluation methods for the effects of required response measures and indicators for progress management will also be conducted.

(3) Prioritization of Programs

In order to carry out initiatives for building national resilience efficiently and effectively with limited resources, it is necessary to select measures to be prioritized and to implement the ones with high priority intensively. This Fundamental Plan set priorities of measures by program and selected 15 programs based on the progress of the measures and changes in social situations, in addition to the viewpoints of the significance of the national government's role, seriousness of the influence, and degree of urgency. The worst events that should be avoided by the 15 prioritized programs are as shown in the following table.

The Worst Events that Should Never Happen Regarding the Programs to be Prioritized

Fundamental goals	Goals of preparation in advance			Worst events that should never happen
I. Prevent loss of human life by any means II. Avoid fatal damage and maintain important functions of the state and society III. Minimize damage to property of the citizenry and public facilities IV. Achieve swift recovery and reconstruction	1	Prevent direct death to the utmost extent	1-1	Occurrence of a large number of casualties due to large-scale and multiple collapse of houses, buildings, transportation facilities, etc. or collapse of buildings at facilities used by the general public
			1-3	Occurrence of extensive number of casualties due to a large-scale tsunami, etc. affecting a wide area
			1-4	Mass casualties caused by sudden or prolonged and wide-area flooding in urban areas
			1-5	Mass casualties due to a large-scale volcanic eruption or sediment disasters (deep-seated landslide), etc.
	2	Ensure prompt rescue/emergency and medical activities as well as the victims' health and the environment of their evacuation life.	2-1	Suspension of supply of goods and energy relating life including food, drinking water, electric power, fuel, etc. at disaster-affected areas
			2-3	Severe lack of rescue/emergency and medical activities, etc. due to damage to the Self-Defense Forces, the police services, fire services, the Japan Coast Guard, etc.
			2-7	Deterioration of health condition of many victims or the occurrence of death due to poor living condition during evacuation and inadequate health care.
	4	Secure indispensable information and communication functions	4-3	Circumstances in which information services to be used in the event of a disaster become dysfunction, making the collection and transmission of information unfeasible, and causing a delay in evacuation actions and rescue/support
	5	Prevent economic dysfunction	5-1	Deterioration of international competitiveness due to a decline in companies' productivity caused by disruption of supply chains, etc.
			5-5	Tremendous influence on logistics and human flow due to dysfunction of the core road/marine transport networks, such as disruption of arteries in the Pacific Belt Zone
			5-8	Stagnation of stable supply of food, etc.
	6	Minimize damage to lifelines, fuel supply related facilities, transport networks, etc., and seek early recovery of these infrastructures	6-1	Prolonged suspension of functions of power supply networks (power generating/transforming stations, transmission/distribution equipment), city gas supply, and oil/LP gas supply chains
			6-2	Prolonged suspension of water supply, etc.
	7	Uncontrollable complex disasters and secondary disasters should be avoided	7-1	Mass casualties caused by the occurrence of a large-scale fire in an urban area accompanying earthquakes
			7-6	Devastation of national land due to damage to farmland and forests

Regarding these 15 programs, enhanced efforts should be made on the initiatives including further intensive implementation in light of their significance, and in consideration of the progress and the situation of embodying measures by relevant ministries and agencies. In the selection of programs for intensive implementation, programs considered to have strong relevance to the selected programs will also be treated in a similar manner in light of their significance. For the measures to be implemented particularly urgently among the programs to be implemented intensively, an emergency three-year measure explicitly indicating goals to be achieved, implementation content, and project costs will be established and promptly implemented. The worst events that should be avoided by the programs considered to have strong relevance to the programs for intensive implementation are as shown in the following table.

The Worst Events that Should Never Happen Regarding the Programs with Strong Relevance to Programs to be Prioritized

1-2	Mass casualties caused by a large-scale fire in crowded urban areas and at facilities, etc. used by the general public
2-5	Paralysis of medical services due to damage to and/or severe lack of medical facilities and personnel, disruption of routes for offering support, and disruption of energy supply
4-1	Paralysis and suspension of communication infrastructure needed for disaster management and disaster responses
5-2	Serious impact on the sustainability of socioeconomic activities and supply chains due to suspension of energy supply
6-4	Prolonged suspension of functions of land/sea/air transport infrastructure from Shinkansen and other core infrastructure to regional transport networks

4. Establishment and Promotion of Regional Plans

(1) Necessity to Establish Regional Plans

In order to make substantial achievements in initiatives for building national resilience, it is indispensable to mobilize the full potential of all parties including local governments and private business operators, in addition to the national government.

Ascertaining risks of large-scale natural disasters faced by respective regions and promoting measures for building national resilience in a comprehensive and planned manner is an extremely important task for local governments not only for protecting the lives and property of local residents but also for contributing to regional economic growth through building communities where people can engage in economic and social activities safely.

Thus, local governments are currently working to establish a regional plan for national resilience, which serve as the guidelines for other regional plans. Going forward, relevant plans will be established at the municipal level under the active assistance provided by respective prefectures, so it will be necessary to promote regional efforts for building a resilient nation comprehensively through reviewing and promoting such other regional plans.

In order to surely protect the lives and property of local residents and maintain key functions with limited financial and other resources, it is important to clarify what to prioritize and implement intensively in establishing and implementing regional plans for building regional resilience. For that purpose, the top of local governments must take the initiative and provide persuasive explanations based on objective data to the local assembly, heads of relevant local governments, and residents of respective regions.

(2) Assistance by the National Government

Regional plans must be in harmony with the Fundamental Plan, and there may be cases in which local governments need to ascertain the relationships between their own measures and measures taken by the national government in their plans. Therefore, regional plans need to be established in full collaboration and cooperation between the national government and local governments.

For this reason, the national government will offer local governments assistance for establishing and promoting regional plans by preparing enhanced guidelines so that local governments can smoothly establish their regional plans.

Conclusion: Towards the development of a resilient nation

Initiatives for building national resilience represent, in part, works to reorganize various measures that have so far been taken independently by each ministry and agency into unified initiatives under common goals. Relevant ministries and agencies are required to carry out necessary measures in a planned manner under an effective cooperative system beyond their bounds

To that end, it is essential for them to sequentially step up their initiatives for building national resilience through full demonstration of the function as an umbrella plan for this Fundamental Plan, improvement of vulnerability assessment, progress management with set quantitative indicators for thorough PDCA cycle, continuous investigation and examination for resolving issues, and prioritization of programs and measures. Knowledge and lessons are gained through the verification etc., of disasters and used when they are needed next time. Japanese government continues such works and lead them to constant reviews of this Fundamental Plan, which is a major long-range plan for the nation.

Meanwhile, national resilience cannot be achieved solely by the national government. It is indispensable to put together the wisdom of all related parties, including local governments and private business operators, and mobilize the full potential of the whole nation. Each citizen must hand down the spirit of self-help efforts and mutual assistance from generation to generation, trying to protect oneself instead of counting on others, help each other while considering what one can do in the community, and act independently. To develop a culture where all citizens act in this manner will be the basis of the initiatives for building national resilience.

For that purpose, the national government will not only promote and manage the progress of the Fundamental Plan, but will also endeavor to make its details understood properly, disseminated and reflected broadly in the code of conduct of local governments, private business operators and the citizenry as a whole, and implemented appropriately. The national government will accelerate the establishment of regional plans by the prefectures and municipalities nationwide based on this Fundamental Plan, and strengthen support for their

implementation, while making a national approach on problems that cannot be dealt with under regional plans to make some adjustments.

Through the reflection of these approaches to this Fundamental Plan, Japan will make the initiative for building national resilience developed and progressed to steadily realize the building of a resilient country.

(Attachment 1)

Connection between the Sendai Framework for Disaster Risk Reduction and this plan

Sendai Framework for Disaster Risk Reduction (Outline)		Corresponding section in this plan
I. Introduction	Lessons from the Hyogo Framework for Action, the confirmed gap and future problems	Chapter 1: 1, 2,4 (6)
II. Expected outcomes and goals	Decide the aimed-for outcomes, decide the goals that should be achieved for this, and decide the seven indices for evaluation	Chapter 1:3 Chapter 2
III. Guiding principles	Concept toward reducing disaster risks, where responsibilities lie for all people concerned, division of roles, method, etc.	Chapter 2
IV. Priority actions (National level and regional level)	【Priority action 1: Understanding of disaster risks】	
	i. Collection, analysis, management, and utilization of related data and practical information	Chapter 3:2(12)
	ii. Disaster risk analysis including potential for occurrence of multiple disasters	Chapter 2
	iii. Utilization of geographic spatial data	Chapter 3 2 (10)
	iv. Systematic assessment of disaster damage	Chapter 2
	v. Access to information regarding vulnerabilities, risks, and damage	Chapter 3:2(6)
	vi. Real-time access to credible data	Chapter 3:2(6)
	vii Experiences regarding disaster risk reduction, building knowledge through joint training, etc.	Chapter 3:2(B)
	viii. Promotion of science and policy collaboration for effective decision-making regarding disaster management	Chapter 3:2(E)
	ix. Utilization of disaster risk assessments from unique regional knowledge and customs and region-based strategies	Chapter 3:2(9)
	x. Strengthening of technical and scientific capacity for development of know-how regarding disaster risk assessment	Chapter 1 4(5)
	xi. Promotion of investment toward technological innovation and development in research regarding disaster management	Chapter 3:2(E)
	x ii. Introduction of lessons and training for knowledge regarding disaster risks	Chapter 3:2(1)
	x iii. Promotion of a national strategy for strengthening public education and national awareness regarding disaster risk reduction	Chapter 1 4(4)
	x iv. Consideration of vulnerabilities for all aspects toward policy decisions for disaster risk reduction	Chapter 2
	xv. Strengthening of cooperative relations for broadening disaster risk information through region-based organizations	Chapter 3:2(C)

Sendai Framework for Disaster Risk Reduction (Outline)		Corresponding section in this plan
IV. Priority actions (National level and regional level)	【Priority action 2: Disaster risk governance for disaster risk management】	
	i. Conduct public-private guidance on the following points and mainstreaming of disaster prevent across all sectors	Chapter 1:2
	(a)Responses to disaster risks in services and infrastructure that is publicly managed, etc.	Chapter 3:2 (1)
	(b)Promotion of policies to encourage actions by individuals, households, communities, and companies	Chapter 3:2 (A)
	(c)Strengthening of structure to ensure transparency of disaster risks and initiatives	Chapter 2
	(d)Establishment of mechanisms for coordination and organization	Chapter 1:4 (2)
	ii. Adoption and implementation of national and regional disaster risk reduction plans establishing goals, indices, and timeframes	None
	iii. Risk management capacity evaluation and implementation at the regional and national levels for responses to specific risks	Chapter 2
	iv. Establishment of structures for safety strengthening clause compliance as decided by laws, etc. on land use, etc.	None
	v. Establishment of structures for follow-up and assessment of progress situation of national and regional plans	Chapter 4:3 (1)
	vi. Clear division of roles for community representatives	Chapter 1: 4 (2)
	vii. Establishment of the following responsibilities and leadership for coordination at the national and regional levels	Chapter 1:1
	・Disaster risk specifications of each sector and extending over multiple sectors	Chapter 2
	・Development and knowledge building regarding sharing disaster risk information and data and disaster risks	Chapter 3:2 (A)
	・Cooperation and coordination concerning regional and national reports regarding disaster risks	Chapter 1:4 (3)
	・Coordination of an awareness campaign regarding disaster risks	Chapter 3:2 (A)
	・ Promotion of and support for regional multi-sector cooperation	Chapter 1:4 (3)
	・Decisions on national and regional disaster plans according to laws, regulations, standards, and procedures	Chapter 1:2 (1)
	viii. Strengthen local municipality capacity through area-level disaster risk management coordination	Chapter 3:2 (A)

Sendai Framework for Disaster Risk Reduction (Outline)		Corresponding section in this plan
IV. Priority action (national level and regional level)	ix. Encourage support for disaster risk management through legislation and budget appropriations, etc. from Diet members	None
	x. Promote establishment of certificates and awards concerning disaster risk management through participation by the private sector, etc.	Chapter 1: 4 (2)
	x i. Policy formulation aimed at responding to problems concerning movement from areas with high disaster risk, etc.	Chapter 3:2 (12)
	【Priority action 3: Investment for disaster risk reduction for resiliency】	
	i Appropriate appropriation of necessary resources for disaster risk reduction	Chapter 1:2 (3)
	ii Promotion of a structure for movement away from disaster risks and insurance, etc. to reduce economic effects of disasters	None
	iii Strengthening strong public and private investment for disasters as necessary with the below methods	Chapter 1:4 (2)
	・Measures for structural and non-structural aspects regarding important facilities	Chapter 3:2 (2)
	・Sufficient designs and construction to withstand disasters	Chapter 3:2 (2)
	・Reinforcement and renovation	Chapter 3:2 (2)
	・Improvement management and promotion of repairs	Chapter 3:2 (D)
	・Consideration of economic, social, structural, technical, and environmental risk assessment	Chapter 2
	iv Protection and support for cultural organizations and other locations with historic, cultural, and religious significance	Chapter 3:2 (2)
	v Promotion of resiliency for workplace disaster risks through policies on structural and non-structural aspects	Chapter 2
	vi Promotion of utilization of guidelines, etc. that consider disaster risk assessment mainstreaming, environmental changes, etc. for land use	Chapter 3:2 (12)
	vii Disaster risk assessment, etc. of plans and management of agricultural development through ecosystem function preservation, etc.	Chapter 3:2 (12)
	viii Review, etc. of recovery and reconstruction policy at the national and regional levels keeping in mind compatibility with area characteristics	Chapter 2:2 (5)
	ix. Strengthening of the resiliency of the national health system, etc.	Chapter 3:2 (3)

Sendai Framework for Disaster Risk Reduction (Outline)		Corresponding section in this plan
IV. Priority action (national level and regional level)	x. Improvement of access to services for health, nutrition, etc. for disaster victims towards elimination of poverty	None
	x i. Consideration for victims who have chronic illnesses, etc.	Chapter 3:2 (3)
	x ii. Encouragement of adoption of measures and plans responding to population movement caused by disasters	None
	x iii. Consideration regarding disaster risk reduction for financial and economic means and integration of measures	Chapter 1:2 (3)
	x iv. Implementation of an integrated management approach for the environment and natural resources that incorporates disaster risk reduction	Chapter 3:2 (12)
	x v. Business resilience enhancement through the entire supply chain and protection of production assets, etc.	Chapter 3: 2 (7)
	x vi. Strengthening of protection of means of living, such as livestock, animals that are used for work purposes, tools, and seeds, and production assets	None
	x vii. Promotion and integration of disaster risk management methods through the tourism industry	Chapter 1:4 (7)
	【Priority action 4: Strengthen preparation for disasters for effective emergency measures, and have good reconstruction (Build Back Better) during recovery, rebuilding, and reconstruction (Build Back Better)】	
	i. Review of a disaster response plan that considers climate change scenarios and effects of disaster risks	Chapter 4:2
	ii. Investment, development, improvement management, and strengthening of the prediction and early warning system, etc.	Chapter 1:4 (5)
	iii. Strengthening of the resilience of important facilities such as hospitals that provide lifesaving and other vital services	Chapter 3:2 (3)
	iv. Construction of community centers for raising awareness among citizens and storage of materials for lifesaving activities, etc.	Chapter 1:2 (4)
	v. Support for division of roles of public service personnel for strengthening rescue activities and reconstruction	Chapter 2:2 (5)
	vi. Strengthening of technical capacity and logistical support capacity such as volunteers through training on disaster response measures	Chapter 3:2 (B)
	vii. Ensure sustainability of activities and plans including social and economic reconstruction following a disaster.	Chapter 2:2 (4)
	viii. Implementation of period preparation, responses, and reconstruction training for swift and effective disaster response	Chapter 3:2 (A)

Sendai Framework for Disaster Risk Reduction (Outline)		Corresponding section in this plan
	ix. Cooperation among all organizations under the coordination of the national government that considers the aspects of reconstruction incurring large expenses	Chapter 1:4 (2)
	x. Integration of risk reduction capacity enhancement through development measures during reconstruction, and development of sustainable reconstruction	Chapter 3:2 (12)
	x i. Development of guidelines for reconstruction in advance through education from this 10-year reconstruction program, etc.	None
	x ii. Relocation of public facilities and infrastructure to locations that are not at risk during the reconstruction process	Chapter 3:2 (12)
	x iii. Capacity strengthening of regional administrative authorities to carry out evacuation of people who live in disaster-prone areas	Chapter 3:2 (B)
	x iv. Build a structure for a database for registration of disaster-related cases and the number of fatalities	Chapter 3:2 (3)
	x v. Provision of mental health services, etc. to all people who need them	Chapter 3:2 (3)
	x iv. Review and strengthen as necessary municipal laws and procedures concerning international cooperation	None
V. Role of stakeholders	Organization regarding the roles, focal points, etc. of volunteer organizations, science organizations, scientific research organizations, companies, financial organizations, the media, etc. as "While States have the overall responsibility for reducing disaster risk, it is a shared responsibility between Governments and relevant stakeholders" (people related to disaster management).	Chapter 1:2 (2)
VI. International cooperation and global partnership	Organization regarding necessary actions and follow-up actions from the perspective of supporting the focal points, implementation methods, and international organizations of all areas concerning technology transfers to developing countries, etc. through "international cooperation and global partnership for development."	Chapter 1:4 (6)

(Attachment 2) Results of the Vulnerability Assessment for Respective Programs

1.Prevent direct death to the utmost extent

1-1) Occurrence of a large number of casualties due to large-scale and multiple collapse of houses, buildings, transportation facilities, etc. or collapse of buildings at facilities used by the general public

○ It is important to decrease damage of houses and buildings to avoid occurrence of casualties due to earthquakes.
○ To make houses and buildings earthquake-resistant, multiple approaches should be integrated by making condominium owners aware of earthquake resistance requirements of old buildings by promotion of rebuilding old condominiums, making earthquake resistance tests mandatory and offering assistance to the renovation of targeted buildings to make houses earthquake-resistant, improving building evaluation methods, and developing financial products. Moreover, countermeasures against long-period ground motions should be deployed to existing high-rise buildings. Residential areas should also be tested for earthquake resistance and made earthquake-resistant.
○ Enhancing the earthquake resistance should be promoted for government facilities, school facilities, social education facilities, sports facilities, medical facilities, social welfare facilities, etc. In particular, enhancing the earthquake resistance has not been conducted much in municipal government office buildings and this should be promoted. Moreover, fall prevention measures and countermeasures for aging non-structural elements such as ceilings as well as safety inspections, safety measures, etc. of block walls, etc. should be promoted.
○ As for transport facilities, enhancing the earthquake resistance, removal, etc. should be promoted for facilities with grade separation, power poles, roadsides and waysides in order to avoid damages to users due to collapse of them. Moreover, development and practical realization of technologies should be enhanced regarding equipment, etc. that support field sites of inspections, diagnoses, repair, reinforcement, etc. of infrastructures in order to make preparation for the environment where only small number of engineers can be assigned on account of aging and depopulation.
○ As for underground space, disaster management measures should be promoted both in terms of non-structural aspect and structural aspect to prevent confusion and confinement of users at the time of large-scale earthquakes. Moreover, preparation of spaces and routes should be promoted so that users can temporarily evacuate from buildings, etc. that may collapse.
○ In order to secure time as much as possible to protect oneself from the time point of occurrence of earthquakes to the time point of arrival, improvement and utilization of Earthquake Early Warning (EEW), etc. should be promoted. In addition, measures to avoid overturning of furniture, methods to conduct protection of oneself, etc. should be promoted in continuous emergency drills, education for disaster prevention, etc. through schools, offices, community organizations, etc.
○ As for earthquakes that have high possibility of occurring in the areas with population concentration like the capital inland earthquake, thoroughly planned preparation should be made in particular. In addition to this, excessive population concentration status should be alleviated in the places that have high risk of occurrence of earthquakes and effective measures of boosting development of an autonomous, decentralized and coordinated nation should be considered and conducted in order to promote risk diversification. Moreover, in addition to improvement in response capacity of handling disasters in disaster response agencies, etc., promotion of enhancement of volunteer firefighter, etc. as well as promotion of preparation of plans on voluntary disaster management activities by residents, companies and others through spread, education, etc. of local disaster management plan systems should be conducted as public help can be insufficient at the time of occurrence of large-scale disasters.

(Indices that show current levels)
【Ministry of Justice】 Share of having enhanced the earthquake resistance in correctional institutions 81% (2017)
【Ministry of Justice】 Share of having enhanced the earthquake resistance in facilities of Ministry of Justice 94% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented countermeasures for aging facilities such as national university corporations that have serious problems to conduct educational and research activities 54% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented countermeasures for aging facilities of public elementary and junior high schools which require their implementation emergently 25% (2016)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented fall prevention measures in suspended ceilings, etc. of gymnasiums, etc. of public schools 97% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having prepared individual building plan for public school facilities 4% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in public school facilities 99% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented fall prevention measures in suspended ceilings, etc. of gymnasiums, etc. of facilities of national university corporations, etc. 95% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in buildings of national university corporations, etc. 98% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of schools that educate disaster safety 99.7% (2015)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in private school facilities (high schools and schools for younger pupils) 88% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in private school facilities (universities, etc.) 90% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in houses and buildings (buildings) About 85% (2013)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in houses and buildings (houses) About 82% (2013)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in bridges on emergency routes 77% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having eliminated power poles in main roads of urban areas 16% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having announced large-scale embankment reclaimed area map, etc. 52% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having started implementation of plans for disaster prevention measures in underground shopping areas 68% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in main railway lines in the areas, etc. where an earthquake with an intensity of upper 6 on the Japanese scale of 7 (capital inland earthquakes or Nankai Trough earthquakes) is expected to occur 97% (2017) ※

※ No description on vulnerability assessment

1-2) Mass casualties caused by a large-scale fire in crowded urban areas and at facilities, etc. used by the general public

○ Securement of water supply by concluding agreement, etc. on water supply, etc. with private companies, etc. as well as activities to prevent fires and mitigate damages should be promoted. Moreover, with regard to the improvement and preparation in crowded urban areas (5,745 ha (2011)) that have risks of large-scale fire occurrence and that are extremely dangerous at the time of earthquakes, etc., activities are increasingly executed by local governments but they have not succeeded in solving the problem. Consequently, preparation of roads, parks, etc. as well as removal, the demolishing and rebuilding, fireproofing, etc. of old buildings should be conducted to solve the problem according to plans by public-private partnerships. Furthermore, even after the goal is achieved, improvement of crowded urban areas should be promoted from a medium- and long-term perspective.

○ Because there is a concern of severe lack of rescue and emergency systems to prevent loss of human life from large-scale fires, cross-jurisdictional collaboration systems should be promoted in wide areas. Measures to rescue and search victims such as disaster security trainings should be also promoted.

○ Considering that there are various reasons for occurrence of fires, disaster response capacity of disaster response agencies, etc. should be enhanced through improvement of equipment and materials, various trainings, etc.

○ To prevent occurrence, etc. of escape failure, dependable notification of emergency information to residents by J Alert as well as measures relating to information and communications such as information sharing, etc. utilizing ICT should be promoted.

○ Assuming that public help can be insufficient, enhancement of volunteer firefighter, etc. as well as spread, education, etc. of local disaster prevention plan systems should be promoted to enhance measures relating voluntary disaster management activities by residents, companies, etc.

○ In order to alleviate excessively populated state in places with high disaster risks such as metropolises with densely build-up areas, effective measures should be considered and conducted to enhance development of an autonomous, decentralized and coordinated nation.

(Indices that show current levels)

【Ministry of Internal Affairs and Communications】 Fire deaths compared to previous year 93% (2016)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of metropolises where open space with a certain level of disaster management function is secured in more than one place 85% (2015)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared measures to enhance long life of park facilities 90% (2016)

【Ministry of Land, Infrastructure, Transport and Tourism】 Area of decreasing crowded urban areas that are extremely dangerous at the time of earthquakes, etc. 40% (2017)

1-3) Occurrence of extensive number of casualties due to a large-scale tsunami, etc. affecting a wide area

- ○ Preparation of disaster preventive districts against tsunamis, etc. should be promoted to change the situation in which many people still live in areas with high risk of tsunami disasters such as tsunami flood potential areas.
- ○ Enhancing the earthquake resistance of houses and building and countermeasures for aging school facilities should be promoted in order to avoid escape failure at the time of tsunamis, etc. and occurrence of blockage of evacuation routes due to collapse of houses and buildings.
- ○ Although it is difficult to make a highly reliable forecast for occurrence of large-scale earthquakes, current scientific knowledge can be used by collaboration of national government, local governments, relevant agencies, etc. to consider response in the case where abnormal phenomena that can be observed along the Nankai Trough. Moreover, preparation of observation systems as well as investigation and research should be promoted to enhance scientific knowledge which can mitigate damage by earthquakes and tsunamis in future. Furthermore, international discussion triggered by "international day of tsunami" should be conducted regarding how tsunami disaster management should be in order to promote foundation creation to find better counterplan with a broad perspective.
- ○ Preparation and earthquake resistance measures of dikes, etc. of rivers and coasts in the areas where a large-scale tsunami is expected as well as preparation of automation and remote control of water gates, sluice gates, etc. of rivers and coasts should be promoted, maintained and managed ideally. As for preparation of dikes, etc. of coasts, consideration should be made in order to co-exist with nature and secure harmony with environment.
- ○ With regard to seaside protection forests, maintenance, reinforcement, etc. of their functions should be promoted in order to obtain the effects of mitigating damage from tsunamis considering the actual situation, etc. of areas.
- ○ In order to make contribution to disaster prevention utilizing observed information, preparation of observation network should be promoted in areas where observation network is insufficient such as the western area of the Nankai Trough. Moreover, upgrading of disaster management weather information should be promoted to effectively notify results of observation and assessment to citizens. Furthermore, multiplexing and diversification of methods of notifying information should be promoted and trainings, etc. should be conducted regularly in order to secure operation of systems such as J Alert, etc. in an emergency definitely.
- ○ With regard to evacuation from tsunamis, we should keep in mind that each person should basically leave coastal area promptly and evacuate to the place of high altitude as much as possible. Creation of hazard maps and preparation of guidance signs, etc. of designated emergency evacuation sites as well as continuous emergency drills, emergency education, etc. through schools, office, self-governing organizations, etc. should be promoted. Moreover, disaster prevention capacity should be reinforced by supporting local governments through execution of practical trainings in wide areas by national government, by of promoting enhancement of volunteer firefighter, etc., by promoting spread, training, etc. of local disaster prevention plan systems and by conducting other measures.
- ○ Preparation of evacuation routes and evacuation sites needs to be promoted. Moreover, to avoid situation of delay of escape due to traffic jams, agreement as to who can use cars should be made beforehand and other people should evacuate on foot or by bicycles. On the basis of this assumption, evacuation routes and evacuation methods should be considered and feasible environments should be prepared.
- ○ Evacuation methods should be prepared considering people in various situations including those on shipboards at harbors or those on planes at airports
- ○ All possible methods to save lives of those who failed to escape and became isolated and drifted should be considered.

(Indices that show current levels)

【Ministry of Internal Affairs and Communications】 Share of organizations that have multiple methods of notifying information of automatic start by J Alert 86% (2017)

【Ministry of Education, Culture, Sports, Science and Technology】 Operating rate of seafloor observation networks for earthquakes and tsunamis 100% (2018)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of schools that educate disaster safety 99.7% (2015)

【Ministry of Agriculture, Forestry and Fisheries】 Share of having preserved seaside protection forests, etc. to protect urban areas, etc. from damages by blown sand and wind as well as by tidal wave and salty wind 98% (2017)

【Ministry of Agriculture, Forestry and Fisheries】 Share of population of fishing villages where measures to reinforce disaster management function are prepared (from 2017) 51% (2016)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared evacuation plans at harbors (more than major harbors) located in areas of special reinforcement of evacuation measures against tsunamis of Nankai Trough earthquakes 42% (2017)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having created inundation hazardous areas that correspond to tsunamis of largest class in prefectures with risks of tsunamis 85% (H29)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having made preparation of tsunami disaster management information 70% (2017)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared river dikes in areas, etc. where large-scale earthquakes (e.g. Nankai Trough great earthquakes and capital inland earthquakes) are expected (Preparation of planned levels and enhancing the earthquake resistance) 55% (2017)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared automation and remote control of water gates, sluice gates, etc. in areas, etc. where large-scale earthquakes (e.g. Nankai Trough great earthquakes and capital inland earthquakes) are expected 48% (2017)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in water gates, sluice gates, etc. in areas, etc. where large-scale earthquakes (e.g. Nankai Trough great earthquakes and capital inland earthquakes) are expected 47% (2017)

【Ministry of Agriculture, Forestry and Fisheries/ Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared automation and remote control of water gates, sluice gates, etc. in areas, etc. where large-scale earthquakes (e.g. Nankai Trough great earthquakes and capital inland earthquakes) are expected 56% (2017)

【Ministry of Agriculture, Forestry and Fisheries/Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared coastal dikes, etc. in areas, etc. where large-scale earthquakes (e.g. Nankai Trough great earthquakes and capital inland earthquakes) are expected (Preparation of planned levels and enhancing the earthquake resistance) 47% (2017)

1-4) Mass casualties caused by sudden or prolonged and wide-area flooding in urban areas

- ○ River channel dredging and embankment, preparation of flood control facilities, preparation of high standard dikes to avoid catastrophic damage by collapse of dikes, reinforcement of capacity of existing dams through improvement of facilities, flexible operations, etc. as well as preparation of drainage facilities such as drainage pump stations and stormwater storage pipes, enhancing the water resistance in those things, etc. should be promoted.
- ○ Ideal preparation, maintenance and control and upgrade of shore protection facilities, river management facilities, etc. should be conducted to avoid wide inundation, etc. due to floods, tidal waves and tsunamis. In addition, "mitigation of disasters" should be enhanced to mitigate damage while coping with changes in nature and society such as that of climate as well as decreasing birthrate and aging population. In order to realize this, introduction of various preparation methods, effective utilization of existing facilities and reinforcement of risk management systems should be promoted.
- ○ Emergency drills, disaster prevention education, etc. on how to execute activities to protect oneself should be promoted through schools, offices, community organizations, etc. In addition, planning on voluntary disaster prevention activities by residents, etc. should be promoted through spread, education, etc. of local disaster prevention planning systems.
- ○ As human resources, organizational systems, etc. tend to be insufficient in disaster management department, drainage system department, etc. of local governments, etc., human resource development and formulation of ideal organizational systems should be conducted through improvement, reinforcement, etc. of flood control companies.
- ○ Reinforcement of comprehensive disaster resilience y through execution of wide and practical trainings considering large-scales disasters, improvement and reinforcement of systems and capacity of TEC-FORCE system and features, utilization of new technologies, trainings with local governments, etc. should be promoted for the support of local governments, etc. by national government.
- ○ Considering that large-scale floods that cannot be protected by facilities are inevitable, councils, etc. composed by river administrators, prefectures, municipalities, etc. should be established for "Flood-Conscious Societies." By doing this, targets to mitigate disaster should be shared and measures in structural aspect and non-structural aspect for all rivers throughout the country including medium and small size rivers should be promoted integrally on the basis of plans.
- ○ To avoid occurrence, etc. of escape failure, information related measures including secure notification of emergency information to residents by J Alert, information sharing using ICT such as SNS, etc. should be promoted.
- ○ In order to avoid occurrence of many casualties, measures to rescue and search victims such as disaster security trainings, etc. should be promoted.
- ○ To cope with frequent occurrence of recent heavy rain with devastating damages in addition to coping with growth of runoff to rivers at the time of floods due to growth of urban areas, anti-inundation measure of underground shopping areas, etc. and preparation of rainfall storage infiltration facilities, etc. should be promoted to secure water retention and retarding functions of each basin. By realizing these, comprehensive flood control measures should be promoted not only in urban areas but in other areas throughout the country. Moreover, in the areas where measures like immediate preparation of dikes are difficult to conduct, flood control measures should be conducted considering how lands are utilized: preparation in structural aspect such as use of dike rings, etc. can be combined with measures in non-structural aspect such as regulations to use lands, etc.
- ○ To alleviate the state of excessive population concentration in places with high risks of disasters such as flood inundation hazardous areas, effective measures should be considered and conducted to promote development of an autonomous, decentralized and coordinated nation and streamlined land use.
- ○ Measures against coastal erosion should be promoted to protect hinterland from tidal waves, etc. and to preserve land area.
- ○ Considering that quantitative assessment of future forecast is possible in recent years due to improvement of technologies to forecast climate changes, flood control measures should be promoted taking account of influence of future climate changes.

(Indices that show current levels)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of schools that have educated disaster safety 99.7% (2015)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated plans for drain stock management 29% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having achieved anti-inundation measures in urban areas by drains 57% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having established councils for mitigating disaster of large-scale flood, etc. on the basis of Flood Protection Law 82% (2018)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Dams [Local governments] 47% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Rivers [Local governments] 84% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Erosion control [Local governments] 62% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) (Drains) 43% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Number of having formulated timelines for rivers controlled by country 100% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Number of target water systems among rivers controlled by country that adopt push type delivery of flood information using early warning emails 100% (2018)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having created and announced hazard maps corresponding landside waters of largest class as well as having executed trainings to boost consciousness of disaster prevention among residents 0% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having made preparation against flood equivalent to those with the goals of river improvement plans in population and assets integrated districts (Control by country） 72% (2017)
【Ministry of Agriculture, Forestry and Fisheries/Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Coasts [Local governments] 39% (2017)
【Ministry of Agriculture, Forestry and Fisheries/Ministry of Land, Infrastructure, Transport and Tourism】 Share of having completed current shoreline protection at eroding beach 77% (2017)
【Ministry of Agriculture, Forestry and Fisheries/Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared automation and remote control of water gates, sluice gates, etc. in areas, etc. where large-scale earthquakes (e.g. Nankai Trough great earthquakes and capital inland earthquakes) are expected 56% (2017)
【Ministry of Agriculture, Forestry and Fisheries/Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared coastal dikes, etc. in areas, etc. where large-scale earthquakes (e.g. Nankai Trough great earthquakes and capital inland earthquakes) are expected (Preparation of planned levels and enhancing the earthquake resistance) 47% (2017)

1-5) Mass casualties due to a large-scale volcanic eruption or sediment disasters (deep-seated landslide), etc.

- ○ Although designation of sediment disaster warning areas, formulation of evacuation plans relating volcanic disasters, etc. are enhanced, the progress is still being made and only 26% (2016) has been achieved for formulation of specific and practical evacuation plans for volcanic eruptions. When large-scale disasters occur in wide areas, current measures may not be able to cope with the situation. To overcome these challenges, measures to cope with the situation at the time large-scale disasters occur in wide area should be enhanced: utilization of the Advanced Land Observing Satellite (ALOS-4), which is scheduled to be launched in FY 2020 is one such example.
- ○ To cope with sediment disasters (e.g. deep-seated landslides), volcano eruptions, etc. of large-scale which are beyond expectation, comprehensive measures including non-structural measures such as sharing of satellite data at the time of disasters are promoted. In order to avoid human damage, human resource development in the fields of research of sediment disasters and volcanoes as well as measures to prevent and mitigate disasters including confirmation, etc. of influence on infrastructures due to large amount of ash from large-scale eruption should be promoted.
- ○ Relevant organizations will continue to coordinate on the steady promotion of infrastructural measures concerning landslide disaster countermeasures to preserve socioeconomically important facilities and evacuation points and routes. Additionally, in light of the frequency of landslide disasters in recent years, promote the creation and maintenance of permeable check dams, which are highly effective in capturing sediment and wooden debris. Move ahead with countermeasures that integrate non-infrastructural measures that increase regional disaster preparedness such as the creation of warning and evacuation frameworks and the holding of landslide emergency drills. Promote emergency drills and disaster-preparedness education on an ongoing basis, through schools, workplaces, and local autonomous organizations in each region. Encourage the drafting of plans concerning the conducting by residents of self-motivated disaster-preparedness activities through aware-raising activities relating to Community Disaster Management Plan frameworks.
- ○ There is a concern in decrease in national land conservation functions of forests and farmland due to stagnation of community activities in mountain villages, abandonment of management of farmland as well as in increase in risk of disaster occurrence in agricultural land and mountainous districts due to increase, etc. of frequency of torrential rain on account of global warming. Moreover, although measures have been taken to make preparation, etc. of afforestation facilities for mountain disaster hazard areas, etc., the progress is slow and loss of lives may be inevitable. In order to prevent and mitigate damage by driftwood, sophisticated measures corresponding to each type of earth and sand landslide and each type of occurrence and outflow of driftwood should be conducted: establishment of afforestation dams of driftwood capturing type, thinning to promote growing root systems, etc. should be conducted to prevent and mitigate damage by driftwood. With regard to forest maintenance, wildlife management should be taken and other measures should be also taken to promote various forest environments that co-exist with nature.
- ○ Activities should be executed on measures combined with measures in non-structural aspect including preservation, management, etc. of facilities that collaborate with local community.
- ○ In order to avoid failure to escape, etc., activities should be executed on measures relating information and communications such as secure notification of emergency information by J Alert as well as information sharing, etc. using ICT like SNS.
- ○ In order to avoid occurrence of many casualties, measures to rescue and search victims such as disaster security trainings should be promoted.
- ○ To secure support from national government for local governments, etc., reinforcement of disaster resilience through execution of practical trainings in wide area as well as improvement and reinforcement of systems and functions such as TEC-FORCE should be promoted.
- ○ On the basis of the goal of conducting basic investigation on the basis of the law (Law No. 57 of 2000) regarding promotion of measures to prevent sediment disasters in sediment disaster potential area, etc. by FY 2019 in all prefectures, we now have a better outlook on the basic investigation and designation of areas. Preparation should be made on the establishment of warning and evacuation systems on the basis of this outlook.

(Indices that show current levels)
【Ministry of Education, Culture, Sports, Science and Technology】 Operating rate of seafloor observation networks for earthquakes and tsunamis 100% (2018)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of schools that educate disaster safety 99.7% (2015)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having achieved target number of researchers on Integrated Program for Next Generation Volcano Research and Human Resource Development 51% (2014)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated erosion control plans of volcano eruption emergency disaster mitigation measures for volcanoes where volcano disaster potential areas are designated 59% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Erosion control [Local governments] 62% (2018)
【Ministry of Land, Infrastructure, Transport and Tourism】 Accuracy of forecast of rainfall for heavy rain warning 53% (2019)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having preserved houses against sediment disasters 25% (2018)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of municipalities that have designated sediment disaster potential areas or that have announced sediment disaster hazard maps on the basis of Sediment Disasters Prevention Act in municipalities that are planned to be designated 65% (2018)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having introduced eruption potential levels 78% (2018)

1-6) Occurrence of a large number of casualties due to blizzards, heavy snow, etc.

○ Since early and ideal evacuation activities are important to avoid occurrence of casualties due to blizzards, heavy snow, etc., upgrading of disaster management weather information should be promoted, its ideal use should be promoted at ordinary times, and going out should be avoided unless it is absolutely necessary when blizzards and heavy snow are forecasted. Moreover, the situation in which many passengers are left behind in railways or buses, in airplanes or in airports should be avoided by making ideal judgements to stop operation of public transport and providing information to passengers from early stages.

○ Activities should be executed on multiplexing and diversification of information provision methods including introduction of door-to-door receivers of radio communications for disaster management and administration, measures against defective hearing, enhancement of L -Alert, information sharing using ICT such as SNS, development of information provision app, etc. in order to communicate important information without fail.

○ To collect information such as influence of snowfalls, etc., activities should be executed on securement of various methods of collecting information such as utilization of automotive probe information of government and private companies and improvement, start of operation of systems, etc. to comprehend damage information immediately as well as preparation of robust, upgraded communication foundation, facilities, etc. such as the police, fire services, etc.

○ To make a preparation for intensive and heavy snow, preventive traffic control and concentrated snow removal actions should be taken by proactively formulating timelines and plans to remove snow and comprehending risk spots where extreme traffic jams are expected to occur. At the same time, activities on securement of road traffic, such as ensuring use of equipment including chains, etc., reinforcement of systems to remove snow, spot measures to respond to actual local situations, etc., should be advanced from both non-structural and structural aspects. Moreover, in order to secure railway traffic, development of Shinkansen networks should be promoted considering that Shinkansen is a robust infrastructure against snow, and formulation of snow removal systems of conventional lines, etc. should be promoted.

○ Working conditions, etc. should be improved from the point of securing and developing staffs of construction industry who handle opening of access routes, etc. at the time of disasters such as snow damage. Moreover, autonomous driving technologies, etc. should be used to upgrade equipment such as snow ploughs in order to make up for a deficiency of skilled workers.

○ Activities should be executed on execution of continuous emergency drills and disaster prevention education on how to act to protect oneself through schools, offices, community organizations, etc. In addition, thorough safety management at the time of removing snow should be promoted. By promoting spread, education, etc. of disaster management plan systems of community, formulation of plans on voluntary disaster prevention activities of residents, etc. should be enhanced.

○ To avoid occurrence of casualties due to cold weathers, measures in structural aspect and non-structural aspect regarding energy provision facilities should be executed: elimination of power poles as well as measures of transmission and distribution against snow damage, collaboration of administration, the Self-Defense Forces and power companies to realize prompt recovery, preparation of recovery manuals, etc.

(Indices that show current levels)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of schools that educate disaster safety 99.7% (2015)

【Ministry of Land, Infrastructure, Transport and Tourism】 Accuracy of forecast of heavy snow 61% (2016)

【Ministry of Defense】 Share of having prepared information collection systems using helicopter video transmission equipment 100% (2017)

2. Ensure prompt rescue/emergency and medical activities as well as the victim's health and the environment of their evacuation life

2-1) Suspension of supply of goods and energy relating life including food, drinking water, electric power, fuel, etc. at disaster-affected areas

○ To secure goods transport routes of land, sea and air, measures, etc. of transport foundation against earthquakes, tsunamis, flood disasters, sediment disasters and snow damages should be steadily formulated. In addition, plural transport routes should be secured through collaboration, etc. of transports mode. Moreover, preparation of manuals, etc. at local governments, etc. as well as operation, etc. of matching systems at emergency drills should be promoted for prompt response to utilize ships at the time of large-scale disaster occurrence.

○ In order to smoothly supply goods to disaster-affected areas at the time of large-scale disaster occurrence, systems of good procurement should be formulated through collaboration of government and private companies. Moreover, in order to collect and provide disaster information, activities to secure means of collection and provision of information should be promoted: these include introduction of small unmanned aerial vehicles as well as formulation and preparation of systems to comprehend damage information, etc. immediately.

○ To avoid the situation in which vehicles used for disaster emergency measures, etc. cannot reach evacuation centers due to traffic jams, prompt comprehension of information on automobile traffics and its use in measures for transportation should be promoted through utilization of automotive probe information by government and private companies, upgrading of area traffic control systems, collection of passage propriety information through relevant agencies, etc. Moreover, by providing car drivers, etc. with information on traffic regulation such as closed roads, traffic jams, etc., understanding and cooperation by citizens should be promoted: they should be asked to bypass areas of confusion and not to go out with automobiles.

○ With regard to water supply facilities, activities should be executed formulation of plans to enhance the earthquake resistance as well as promotion of enhancing the earthquake resistance of water supply facilities. Moreover, government and private companies should cooperate to promote spread of use of various water sources such as ground water, rain water, reclaimed water, etc. Consideration should be further made on use of alternate water sources of ground water at the time of disaster occurrence and use of various water sources such as rain water, reclaimed water, etc. should be spread. Furthermore, activities should be executed at facilities that are used as evacuation centers to secure water through installation of wells and feed tanks, installation emergency electric power sources, etc.

○ With regard to gas pipes of aged deterioration, principles of enhancing the earthquake resistance should be notified and exchange of those to polyethylene pipes with corrosion resistance and earthquake resistance should be promoted. Moreover, trainings, etc., on prompt recovery of gas supply should be continued to be executed.

○ Fuel stockpiling and use of liquefied petroleum gas, etc. at public facilities, evacuation centers, etc. as well as introduction, etc. of non-utility generation facilities, cogeneration systems, etc. should be promoted. Activities should be executed to secure specified stockpiling volume at each family, evacuation center, etc. As many school facilities are designated as evacuation centers, disaster management function, etc. should be enhanced: activities should be executed on procurement of toilets at the time of water outage and electric power, measures of enhancing the earthquake resistance in buildings including non-structural elements, countermeasures for aging, stockpiling functions, etc.

○ With regard to effectiveness of procurement of emergency food, continuous verification should be conducted through Disaster Imagination Games (DIG), etc. In particular, with regard to Nankai Trough earthquakes which requires largest amount of emergency food, the most ideal method of supplying food should be considered taking into account of situation of roads of disaster-affected areas, situation of operation of food plants, etc. Moreover, necessity of cooking those foods should be considered and examined carefully together with the method of procurement.

○ By executing trainings, etc. mainly on last miles, formulation of systems to conduct smooth transport of support goods should be promoted to improve effectiveness of prompt and efficient responses.

○ To alleviate concentrated state of excessive population as well as concentrated state of energy facilities such as power stations at places with high risks of disaster occurrence like hazardous areas of the capital inland earthquake, etc., effective measures to boost development and use of an autonomous, decentralized and coordinated nation should be considered and conducted. Moreover, in addition to improvement of disaster response capacity of disaster response agencies, etc., enhancing the earthquake resistance should be promoted at first to avoid serious damages of houses, buildings, etc. in order to prevent occurrence of refugees and to secure emergency routes, etc.: consideration should be made on insufficiency of public help at the time of large-scale disaster. Furthermore, promoting enhancement of volunteer firefighter, etc. as well as spread, education, etc. of disaster management plan systems of community should be conducted to promote formulation of plans on voluntary disaster prevention activities of residents, companies, etc.

(Indices that show current levels)
【Ministry of Health, Labour and Welfare】 Share of having conformed the earthquake resistance in main pipelines of water supply 39% (2016)
【Ministry of Agriculture, Forestry and Fisheries】 Share of contentment of emergency food 100% (2017)
【Ministry of Economy, Trade and Industry】 Share of having installed a fuel tank at facilities that can be used as evacuation centers at the time of disasters or at public evacuation centers 86% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared evacuation plans at harbors (more than major harbors) located in areas of special reinforcement of evacuation measures against tsunamis of Nankai Trough earthquakes 42% (2017)

2-2) Simultaneous occurrence of a large number of isolated communities, etc. for a long time

○ Activities should be executed steadily on disaster management measures for roads and elimination of power poles, reinforcement of earthquake resistant and tsunami resistant structuring of railway facilities, harbor facilities, etc., measures against flood, sediment disasters, tsunamis, tidal waves and storm and flood damage, afforestation control, etc.

○ In order to effectively use existing physical distribution functions, etc. for transporting emergency goods, etc., execution of activities, etc. should be promoted to secure evacuation routes and alternative transport routes: activities should be executed on preparation of environment for emergency transport by ships, formulation of BCP for freight forwarders, preparation of sea level altitude display sheets, comprehension and utilization of roads managed by various entities including private companies in mountainous areas, improvement in accessibility to main roads of high standards, etc.

○ In order to secure flexible and effective activities at the time of disaster occurrence, activities should be promoted to secure various methods of collection and provision of information: activities should be executed on preparation of systems necessary to open access routes, etc., improvement in equipment and materials necessary for transportation, procurement of robust and high level foundation and facilities for communications, introduction of small unmanned aerial vehicles, utilization of automotive probe information by government and private companies, utilization of systems to collect and provide disaster information, utilization of geospatial information, etc.

○ Considering spread of disaster in wide areas, private companies and national government should collaborate to conduct necessary review on procurement and industries and should promote improvement of proficiency of relevant people through formulation and trainings of systems for smooth sharing of information among relevant agencies. Moreover, education should be promoted in order to promote food stockpiling in each family for disasters and measures against isolation should be considered in disaster management plans of community.

○ In order to avoid significant deterioration in functions due to damages to employees, facilities, etc. of local governments including the police, fire services, etc., activities such as enhancing the earthquake resistance in facilities should be promoted.

○ To avoid occurrence of isolation of villages, protection of slopes to avoid collapse of slopes of roads, multiplexing of access routes, etc. should be conducted. Moreover, designation of locations that can be used as landing fields should be conducted beforehand and preparation of necessary equipment should be enhanced so that access can be also made from air at the time of disasters.

○ To secure support from national government for local governments, etc., reinforcement of disaster resilience prevention through execution of practical trainings in wide area considering large-scale disasters as well as improvement and reinforcement of systems and functions such as TEC-FORCE should be promoted.

(Indices that show current levels)
【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated records with description of width, design load, traversable period, etc. for farm roads that are designated as bypasses 100% (2016)
【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated records with description of width, design load, traversable period, etc. for woodland paths that are designated as bypasses 100% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in bridges on emergency routes 77% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having implemented necessary measures on slopes of roads, banking, etc. 68% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in main railroad lines located in areas, etc. where an earthquake with an intensity of upper 6 on the Japanese scale of 7 (capital inland earthquakes or Nankai Trough earthquakes) is expected 97% (2017) ※
【Ministry of Defense】 Share of having prepared equipment (CH-47JA) to improve disaster relief capacity 100% (2017)
【Ministry of Defense】 Share of having prepared equipment (SH-60K) to improve disaster relief capacity 100% (2017)

※ No description on the assessment of vulnerabilities

2-3) Severe lack of rescue/emergency and medical activities, etc. due to damage to the Self-Defense Forces, the police services, fire services, the Japan Coast Guard, etc.

- ○ SDF, police and fire services, and the Japan Coast Guard should develop their structures to strengthen disaster response capacity for wide-area coverage and enhance their facilities and equipment for disaster response during nighttime. In addition, they should develop and enhance the TEC-FORCE structure and capabilities, enhance flood control, volunteer firefighter, and disaster prevention volunteer groups, and ensure the availability of construction human resources for removing debris on roads. Japan and the United States should clarify mutual communication methods to integrate operations with U.S. Armed Forces right after the occurrence of a large-scale disaster. Both countries also need to improve awareness and operations to receive support teams from abroad and adjust joint operations with them.
- ○ In addition to spread and regular use of "Sendai Disaster Prevention Framework 2015-2030" inside and outside country, rollout of strategic international disaster management, international disaster prevention collaboration through international organizations such as United Nations, etc. should be promoted making use of experiences, knowledge and technologies obtained through disasters of Japan.
- ○ Since systems, equipment and operational methods of disaster response are different in relevant government offices, standardization of disaster response operations, information sharing, utilization and application, etc. should be promoted. Moreover, activities should be executed on preparation of training environments that correspond with community characteristics and various disaster sites and on utilization of skills, expertise, facility equipment, organization systems, etc. owned by private companies as well as professionals, experts, etc. of community. By doing these, joint drills, etc. with specific goals and targets should be conducted to increase effectiveness of disaster response operations. Trainings considering large-scale disasters should be conducted in wide areas in order to reinforce comprehensive disaster resilience.
- ○ Disaster-resistant structuring of facilities of the police, the Self-Defense Forces and Fire Department that serve as activity bases in community should be reinforced further. Moreover, reinforcement and upgrading of disaster-resistant aspects of functions of information and communications should be promoted: this includes preparation of helicopter video transmission equipment of the Self-Defense Forces.
- ○ Local governments and related central government agencies should work together to improve the disaster resistance capacity of activity routes, enhance their facilities and equipment, promptly understand traffic situations based on automobile probe information collected by public and private sectors, modify wide-area traffic control information systems to deal with increasing volumes of traffic information aggregated by the National Police Agency, and make use of ICT to collect, share, and deliver information so they can develop a required structure and streamline their operations such as prompt and appropriate traffic management to ensure road and sea lane availability.
- ○ By enhancing the earthquake resistance in houses and buildings, occurrence of injured persons should be mitigated.
- ○ To alleviate the state of excessive population concentration in areas with high risks of disaster occurrence like hazardous areas of the capital inland earthquake, etc., effective measures to boost development of an autonomous, decentralized and coordinated nation should be considered and conducted.
- ○ Assuming that public help can be insufficient, enhancement of volunteer firefighter as well as spread, education, etc. of local disaster management plan systems should be promoted to enhance planning relating to voluntary disaster management activities of residents, companies, etc.

(Indices that show current levels)
【National Police Agency】 Share of having conducted joint drills of inter prefectural emergency rescue unit 100% (2017)
【National Police Agency】 Share of having installed disaster security training facilities 100% (2017)
【National Police Agency】 Number of facilities of prefectural police headquarters and police stations where the earthquake resistance has been enhanced 94% (2017)
【Ministry of Health, Labour and Welfare】 Share of DMAT preservation (2 or more teams of core disaster base hospitals, 1 or more regional disaster base hospitals) 99% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of prefectures that have conducted trainings with TEC-FORCE 94% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of prefectures that have conducted practical trainings in wide areas considering Nankai Trough earthquakes, capital inland earthquakes, etc. 100% (2017)
【Ministry of Defense】 Share of having prepared information collection systems using helicopter video transmission equipment 100% (2017)
【Ministry of Defense】 Share of prepared equipment (CH-47JA) that improves disaster rescue capacity 100% (2017)
【Ministry of Defense】 Share of having prepared equipment (SH-60K) that improves disaster rescue capacity 100% (2017)
【Ministry of Defense】 Share of having enhanced the earthquake resistance in facilities of the Self-Defense Forces (government office building of at least 3 stories and total floor space of at least 1,000 ㎡) 90% (2017)
【Ministry of Defense】 Share of having developed assignable major staffs 74% (2017)

2-4) Post-disaster disorder and unexpectedly high numbers of stranded persons

○ In order to mitigate confusion with return to homes, activities should be executed on introduction of systems of providing information on the current status and outlook of operation of railways and buses as well as road traffics, information on safety of children, etc., should be made on preparation of conditions which can ensure family safety such as enhancing the earthquake resistance in houses and should be made on avoidance of "unnecessary return to homes."

○ Activities should be executed on mitigation of damage of railway facilities and on preparation so that operation can be resumed promptly on the basis of procedures specified for operation resumption by each railway company. Considering that partial operation resumption can cause confusion due to concentration of passengers, etc., total influence should be considered and systems to adjust operation resumption procedures among railway companies should be formulated.

○ With regard to disaster risks of roads due to earthquakes, sediment disasters, flood, tsunamis, tidal waves, etc. and emergency routes, etc. designated as target roads that support return to homes, relevant agencies should share information and collaborate in order to secure routes that enable safe and smooth return to homes on foot and by bicycles. In addition, with regard to alternative transport in case of railway interruption, systems that can promptly adjust securement and operation routes of alternative buses should be formulated beforehand through collaboration of each transport company and relevant agencies.

○ In order to secure safe and smooth transport, activities should be executed on utilization of automotive probe information of government and private companies, upgrade of area traffic control systems, preparation of traffic safety facilities, etc. such as traffic signal power adding devices, utilization of traffic circles, etc. Moreover, to avoid the situation in which smooth operation of alternative buses cannot be conducted due to traffic jams, information on traffic regulations such as closed roads, traffic jams, etc. should be provided to car drivers, etc. and understanding and cooperation of citizens should be enhanced: bypass of confusion areas and minimization of driving should be enhanced.

○ Activities should be further executed not only on planning to secure urban renewal safety, planning to prevent disasters in areas, etc. but also on preparation to secure safety of residents, etc. on the basis of plans.

○ With regard to public facilities, spaces that accept victims in buildings of private companies, etc. and stockpiling warehouses where victims can stay as well as facilities relating to acceptance of victims (including non-utility generation facilities, water tanks, manhole toilets, etc.), enhancing the earthquake resistance and other preparation should be promoted so that places necessary for victims can be secured to accept a large number of stranded persons. Moreover, activities should be executed on preparation of parks and green spaces that can be used as locations to provide rests, information, etc. to those who return home on foot.

○ To alleviate the state of excessive concentration of population in the centers of metropolises during daytime which can cause a large number of stranded persons due to paralyzation of railways, etc., effective measures of boosting development of an autonomous, decentralized and coordinated nation and streamlined utilization of land should be considered and conducted.

(Indices that show current levels)

【Cabinet Office】 Number of districts that having executed activities to secure safety of victims, etc. on the basis of plans 122% (2017)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having executed activities to secure safety of victims, etc. on the basis of plans 71% (2017)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of districts that have made preparation on measures against stranded person in the districts where a large number of stranded persons are expected in the case of large-scale disasters in particular 80% (2017)

2-5) Paralysis of medical services due to damage to and/or severe lack of medical facilities and personnel, disruption of routes for offering support, and disruption of energy supply

○ Compared with the demand of medical resources (water, food, fuels, doctors, medicines, medical facilities, etc.) that can cope with disasters where many injured persons are expected such as Nankai Trough earthquakes or capital inland earthquakes, the volume of medical resources that can be supplied in areas and can be supplied from areas outside disaster-affected areas can be insufficient considering damage by these disasters. Specific consideration should be made across ministries and agencies including volume, speed, traffic access, etc. of transport methods and supply systems of medical resources should be established.

○ With regard to slightly injured persons who will compose most part, systems should be formulated so that this can be responded through first aid of mutual aid of community. By doing this, demand of medical resource should be alleviated.

○ Enhancing the earthquake resistance in disaster base hospitals and emergency and critical care centers should be achieved at 100%. With regard to medical facilities in inundation hazardous areas of Nankai Trough earthquakes, etc., measures, etc. should be taken to move facilities to other places. Moreover, BCP should be formulated to avoid stop of functions. Furthermore, to upgrade disaster response capacity, facilities and human resources should be improved.

○ With regard to national university hospitals, preparation of facilities such as reinforcement of disaster management and mitigation functions should be conducted in order to serve functions and roles in each area.

○ With regard to securement of energy in disaster base hospitals, activities should be executed to continuously boost awareness on the necessity of storing energy to protect oneself which includes fuel used for non-utility generation facilities, etc. In addition, collaboration between relevant agencies should be enhanced so that fuel, etc. should be allocated at high priority. Moreover, activities should be executed to enhance disaster-resistant capacity: activities should be executed on introduction of facilities of high energy efficiency, introduction of independent and dispersed energy facilities, utilization of various energy sources such as liquefied petroleum gas and kerosene, etc.

○ With regard to hospitals with patients who require large amount of clean water for dialysis, etc., activities should be executed on multiplexing of water sources using ground water, etc. at ordinary times as well as formulation of collaboration systems to recover water supply at high priority. Preparation should be made for the cases in which drains cannot be used.

○ When there are many injured persons, enough space should be secured for housing them in ideal environment inside disaster-affected areas or transferring them to places outside disaster-affected areas: this space should be secured for patients waiting medical examinations and medical treatments as well as for patients who completed them.

○ With regard to DMAT and DPAT, number of necessary teams should be considered on the basis of damage estimation, etc. to enhance development based on plans. In addition, experience on disasters should be utilized to regularly review systems of development and contents of activities so that constant maintenance and improvement of capacity can be made. Apart from DMAT and DPAT, human resource development across various occupation types should be conducted to correspond to medical support activities, etc. at the time of disaster. Moreover, execution should be executed on development of major staffs of disaster medical treatment by the Self-Defense Forces to cope with a large number of injured persons.

○ By establishing health care and medical adjustment headquarters under disaster control headquarters of prefectures of disasters to adjust dispatch of health care and medical activity teams, etc. gathered for support, resource allocation corresponding to the need of health care of each disaster-affected area as well as formulation of systems for effective activities through ideal collaboration of each health care and medical activity team should be conducted. Moreover, disaster medical coordinators that conduct dispatch adjustment, etc. should be developed.

○ To transport DMAT, etc. and relief supply to disaster base hospitals, etc., activities should be executed on preparation and access improvement of high standard main roads, etc. for securing alternative methods, reinforcement of earthquake resistant structuring in road bridges, measures to prevent road slope from collapsing, reinforcement of slope foot of banking, elimination of power poles, utilization of traffic circles, enhancing the earthquake resistance in airport facilities, reinforcement of earthquake resistant and tsunami resistant capacity of harbor facilities, measures against flood, sediment disasters, tsunamis, tidal waves, etc. Moreover, improvement should be enhanced in effectiveness of plans on opening of access routes: for example, transport routes of patients, drugs, etc. should be secured at high priority.

○ To avoid the situation in which vehicles used for disaster emergency measures, etc. cannot reach evacuation centers due to traffic jams, prompt comprehension of information on automobile traffics and its use in measures for transportation should be promoted through utilization of automotive probe information by government and private companies, upgrading of area traffic control systems, collection of passage propriety information through relevant agencies, etc. Moreover, by providing car drivers, etc. with information on traffic regulation such as closed roads, traffic jams, etc., understanding and cooperation by citizens should be promoted: they should be asked to bypass areas of confusion and not to go out with automobiles.

○ Required facilities, functionalities, and equipment should be explored and defined to enhance aircraft transportation bases and temporary medical facilities (Staging Care Unit, SCU) located there to transport and care severely injured patients who cannot be treated within disaster areas to external areas. In order to permanently maintain such medical equipment needed at the time of disaster, it should also be used in normal times.

○ To avoid occurrence of many injured persons in the first place, activities should be executed on enhancing the earthquake resistance in houses and buildings, measures against fall of outer walls, window glass, etc., measures against overturning of furniture, etc. To alleviate the state of excessive population concentration in areas with high risks of disaster occurrence like hazardous areas of the capital inland earthquake, etc. and to avoid the state where medical services cannot be maintained at ordinary times due to excessively low resident population of rural areas, effective measures to boost development of an autonomous, decentralized and coordinated nation should be considered and conducted.

(Indices that show current levels)

【Ministry of Health, Labour and Welfare】 Number of disaster base hospitals which have formulated BCP 58% (2018)

【Ministry of Health, Labour and Welfare】 Share of DMAT preservation (2 or more teams of core disaster base hospitals, 1 or more regional disaster base hospitals) 99% (2017)

【Ministry of Health, Labour and Welfare】 Share of having prepared DPAT systems 58% (2017)

【Ministry of Health, Labour and Welfare】 Share of having enhanced the earthquake resistance in disaster base hospitals and emergency and critical care centers throughout the country 89% (2017)

【Ministry of Health, Labour and Welfare】 Result of having completed trainings in prefectures 100% (2017)

【Ministry of Economy, Trade and Industry】 Share of having completed formulation of distributed energy systems 60% (2017)

【Ministry of Defense】 Share of having developed assignable major staffs 74% (2017)

2-6) Outbreak of plagues or infectious diseases on a large scale in disaster-affected areas

○ To avoid occurrence and spread of infectious diseases, ideal health examinations and vaccinations should be promoted at ordinary times. Moreover, systems should be maintained so that local governments can execute disinfection and pest control on the basis of the law relating to prevention of infectious diseases and medical activities for patients of infectious diseases (Law No. 114 of 1998) at the time of disasters.
○ To secure minimum functions of drains even at earthquake occurrences, enhancing the earthquake resistance in main pipes of drains should be conducted. In addition, BCP of drains of each organization should be brushed up on the basis of drain BCP plan manual, etc. which have been revised according to expertise obtained from Kumamoto earthquake (2016). Moreover, preparation should be made for the cases in which no drains can be utilized.
○ Measures should be taken to prevent large-scale floods that deteriorate outdoor hygienic environment.
○ To avoid spread of influenza, norovirus, O157, etc. among refugees, hygienic environment of facilities used as evacuation centers should be maintained in good conditions even at the time of disasters. Moreover, considering occurrence of these illness among those who evacuate outside evacuation centers, each local government should plan measures of notifying information on ideal prevention of infectious diseases.
○ Activities that support medical activities should be promoted steadily.
○ With regard to medicines and equipment necessary for hygiene management of evacuation centers, etc., ideal securement should be made through stockpiling and collaboration with distributors, etc. at the time of disasters.
○ In order to suppress occurrence of refugees due to collapse of houses and buildings, enhancing the earthquake resistance in houses and buildings should be promoted.

(Indices that show current levels)
【Ministry of Health, Labour and Welfare】 Share of having enhanced the earthquake resistance in disaster base hospitals and emergency and critical care centers throughout the country 89% (2017)
【Ministry of Health, Labour and Welfare】 Share of vaccination of measles and Rubella on the basis of Preventive Vaccination Law 95% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having brushed up drain BCP 0% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated plans for drain stock management 29% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) (Drains) 43% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in main pipes 48% (2016)

2-7) Deterioration of health condition of many victims or the occurrence of death due to poor living condition during evacuation and inadequate health care.

○ In order to meet the need of life at evacuation centers, etc. as much as possible, activities should be executed on preparation and upgrade of equipment as well as on repair, etc. of buildings including enhancing the earthquake resistance and execution of countermeasures for aging considering "Guidelines of activities for securing good living environments at evacuation centers." In particular, considering many school facilities are specified as designated evacuation centers, disaster management function should be reinforced as evacuation centers: this should include safety securement of facilities through enhancing the earthquake resistance measures and countermeasures for aging buildings including non-structural elements, preparation of toilets, non-utility generation facilities, introduction of barrier free structuring into facilities, etc.

○ In order to realize voluntary management of evacuation centers, utilization plans should be formulated beforehand considering families with infants, females, elderly people, etc. Moreover, activities should be executed on securement of welfare evacuation centers that act as facilities which accept persons who require special assistance and find it difficult to live in general evacuation centers and on securement of their operation systems.

○ Voluntary formulation of activity plans by residents should be promoted through spread, education, etc. of disaster management plan systems of community. In addition, emergency drills, disaster prevention education, etc. should be promoted continuously through schools, offices, community organizations, etc.

○ With regard to securement of requisite materials including water, food, fuel, etc., activities should be executed on reinforcement of emergency measures of water supply, consideration relating to utilization of various alternate water sources such as ground water, rain water, reclaimed water, etc. at the time of crises as well as promotion of spread of utilized equipment, formulation of systems to execute smooth transport of relief supplies including last mile, development of human resources that specialize in logistics support such as effective disaster relief operation, relief supply distribution, etc. to avoid excessive deterioration of life environment due to lack of goods. Moreover, necessary stockpiling, etc. should be promoted at each family and each condominium so that residents of houses with small damage need not evacuate.

○ With regard to refugees to places other than evacuation centers such as cars, formulation of schemes of collaboration between relevant ministries and local governments involved in information sharing, etc. should be promoted so that comprehension and support can be conducted smoothly. Moreover, to support victims promptly, preparation of victim ledgers by municipalities should be promoted.

○ Through collaboration by health centers, administration, health personnel, NPOs, local residents, etc., systems to conduct medium- to long-term care and health management should be established: frequent occurrence of infectious diseases, venous thrombosis (so-called economy class syndrome), disorders due to stress should be avoided mainly from disaster acute phase to disaster subacute phase; and health of victims should be protected from mental issues caused by trauma due to disasters, loss experience, economic unrest for the future and deterioration of human relations and bonds during reconstruction phase after disaster subacute phase.

○ Improvement of the earthquake resistance should be promoted in government office buildings, etc. that are used as disaster management bases at the time of disasters to avoid damage in administration functions. Moreover, activities should be executed on development, etc. of teams that are trained to support direction adjustment functions of health care and medical adjustment headquarters established in disaster control headquarters and to support those functions of health centers. By doing these, systems should be established so as to distribute support resources of health care and medical activity teams, etc. according to the need of health care in each disaster-affected area and to secure effective activities by each health care and medical activity team, etc. through ideal collaboration.

○ In case primary doctors become victims or become refugees of wide areas, other medical institutions should be able to refer to medication records, etc. of victims so that ideal treatments can be conducted.

○ Seminars should be held in normal times and at the time of disaster occurrence to appropriately notify related agencies of improved operations such as quick damage inspection and certification of houses and what local governments should work on at the time of disaster. Actions should be taken to explore and decide how to provide temporary housing in a streamlined, quick manner, temporarily repair houses, and offer multiple housing options in line with area reconstruction activities by taking into consideration the maintenance of daily life environments and communities and the care of people who need assistance such as the elderly.

○ To cope with various challenges caused by drastic change in life environment of victims such as moving from evacuation centers to temporary houses or moving from temporary houses to reconstruction houses and to provide victims with safe daily life in each environment, victims should be watched to avoid occurrence of isolation, etc. and provided with support on life consultation, life support and opportunities to provide interaction between residents, etc.

○ To mitigate occurrence of a large number of victims in metropolises and serious lack of evacuation centers, enhancing the earthquake resistance and reinforcing the fire control should be promoted in houses and building, etc. and enhancement, etc. of volunteer firefighter companies, etc. should be enhanced. In addition, by considering effective measures to boost development of an autonomous, decentralized and coordinated nation and alleviating the state of excessive population concentration in areas with high risks of disaster occurrence, demand of evacuation centers should be decreased drastically. Moreover, enhancing the earthquake resistance, etc. should be promoted in public facilities specified as designated evacuation centers to avoid decrease in capacity.

(Indices that show current levels)

【Cabinet Office】 Share of people having reached specified scores at attainment level tests 120% (2017)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of schools that educate disaster safety 99.7% (2015)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented countermeasures for aging facilities such as national university corporations that have serious problems to conduct educational and research activities 54% (2017)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented countermeasures for aging facilities of public elementary and junior high schools which require their implementation emergently 25% (2016)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented fall prevention measures in suspended ceilings, etc. of gymnasiums, etc. of public schools 97% (2017)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of having prepared individual building plan for public school facilities 4% (2017)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in public school facilities 99% (2017)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented fall prevention measures in suspended ceilings, etc. of gymnasiums, etc. of facilities of national university corporations, etc. 95% (2017)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in buildings of national university corporations, etc. 98% (2017)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in private school facilities (high schools and schools for younger pupils) 88% (2017)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in private school facilities (universities, etc.) 90% (2017)

【Ministry of Health, Labour and Welfare】 Share of having enhanced the earthquake resistance in social welfare facilities, etc. 90% (2015)

【Ministry of Health, Labour and Welfare】 Share of having enhanced the earthquake resistance in disaster base hospitals and emergency and critical care centers throughout the country 89% (2017)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having specified private good bases in disaster management plan of community 68% (2017)

3. Secure indispensable administrative functions

3-1) A decline in public safety and confusion of society due to significant deterioration of judicial functions and police functions due to disaster

○ Since the Share of enhancing the earthquake resistance in correctional institutions is 76% (2016), countermeasures for aging and enhancing the earthquake resistance should be steadily promoted. In addition, activities should be executed on upgrade and preparation f comprehensive security systems such as monitoring cameras of aged deterioration at correctional institutions as well as on formulation of systems to share information between relevant agencies at the time of disasters through trainings. Activities should be executed in connection with community: for example, part of correctional institutions should be specified as evacuation sites of government offices, etc.

○ Securement of police functions should be acquired through completion of enhancing the earthquake resistance in police facilities, the demolishing and rebuilding of old police facilities, upgrade and preparation of communication functions and order functions necessary for police activities and further upgrade of functions of police airplanes, mobile police communication corps, etc. Moreover, practical trainings on the basis of community characteristics and actual disasters and joint drills with relevant agencies should be conducted to further improve disaster-response capacity of Police Disaster Dispatch Unit and to share expertise obtained through trainings with relevant agents promptly. By doing these, formulation of systems to cope with a decline in public safety should be promoted from structural and non-structural aspects integrally.

○ Preparation of traffic safety facilities such as traffic signal power adding devices is slow and this should be promoted in addition to promotion of utilization of traffic circles, etc.

○ Systems to mitigate confusion of road traffics should be established: activities should be executed on integration of traffic information, implementation of prompt and ideal traffic regulations using automotive probe information of government and private companies, etc. In addition, by providing centralized traffic information to general road users, safe and smooth road traffics need to be secured.

(Indices that show current levels)

【National Police Agency】 Share of having comprehended road status, etc. using probe information processing system 65% (2017)

【National Police Agency】 Share of having prepared traffic signal power adding devices (subsidized projects) 35% (2017)

【National Police Agency】 Number of facilities of prefectural police headquarters and police stations where the earthquake resistance has been enhanced 94% (2017)

【Ministry of Justice】 Share of having enhanced the earthquake resistance in correctional institutions 81% (2017)

【Ministry of Justice】 Share of having enhanced the earthquake resistance in facilities of Ministry of Justice 94% (2017)

3-2) Dysfunction of central government in metropolitan area

○ Dysfunction of central government directly influences restoration speed of all phases after disasters and therefore it is critical from the point of resilience. Consequently, necessary functions should be maintained at the time of natural disasters of any scale.
○ Trainings and education should be provided on the basis of BCP of total government and BCP of each ministry considering various situations: these situations include difficulty to continue work at government offices at the time of large-scale disasters, insufficiency of gathered personnel, long-term execution of emergency priority work, etc. In addition, plans should be reviewed several times through assessment of effectiveness of plans.
○ Earthquake resistant and tsunami resistant measures have been taken in government buildings against assumable earthquakes and tsunamis according to their functions and purposes for disaster management. Progress has been steadily made for enhancing the earthquake resistance: this is completed in more than 90% of the buildings. However, with regard to aging government buildings, measures should be taken intensively on the basis of plans. Furniture of government office buildings should be fixed and enhancing the earthquake resistance, etc. in non-structural elements such as ceiling should be promoted further.
○ Ideal systems should be secured to execute tasks smoothly even in an emergency: for example, prompt collection and sharing of information necessary to cope with disasters such as damage information should be conducted and effective collaboration of relevant agencies such as national government, local government and private companies should be realized.
○ Each central government agency needs to conform to their BCP and other policies to keep their buildings earthquake-resistant, ensure power supply, make information and communications systems redundant, stockpile supplies, and reserve alternative government buildings so that their prioritized emergency activities will continue to function even if impacts inflicted by large-scale natural disasters such as a capital inland earthquake continue over a long period of time.
○ Since dysfunction can occur due to damage of infrastructures around government buildings and Since dysfunction can occur due to damage of infrastructures around government buildings and due to stop of supply of energy, ideal measures should be promoted steadily: these include measures of disaster management for roads, elimination of power poles in emergency routes, reinforcement of earthquake resistant and tsunami resistant structuring in harbor facilities, measures against flood, sediment disasters, tsunamis, tidal waves, etc.

(Indices that show current levels)
【Cabinet Office】 Share of having executed assessment of business continuity plans by each ministry 100% (2017)
【Cabinet Office】 Share of having made preparation in government buildings to establish local emergency response headquarters 75% (2017)

3-3) Significant deterioration of the functions of local governments due to damage to personnel and facilities

- ○ Securement of administrative functions such as disaster response by local governments is extremely important from the point of resilience. Consequently, necessary functions should be maintained even at the time of natural disasters of any scale.
- ○ While using guides for formulating business continuity plan for municipalities, manuals for securing business continuity for local government at the time of large-scale disaster occurrence, guidelines relating to support accepting systems at the time of disasters for local governments, etc., formulation and review of BCP of local governments as well as measures to secure effectiveness should be promoted. Moreover, to avoid dysfunction of administration due to increase in disaster response work, damage of employees and families, inability to gather employees at government office buildings due to traffic paralysis, etc., activities should be executed on securement of communication method, securement of methods to collect and notify information on the way to the gathering place, utilization of expertise owned by private companies as well as by professionals, experts, etc. of community and utilization of facility equipment, organizational systems, etc. of community. In addition, education considering various situations as well as joint drills, etc. with specific goals should be continued.
- ○ To correspond to insufficiency of administrative officers, activities should be executed on measures of reinforcing systems to continue work through acceptance of support from outside: for example, mutual aid agreement between local governments should be concluded.
- ○ With regard to public facilities, etc. that are used as disaster management bases such as police stations, fire department building, etc., the earthquake resistance has been enhanced in only part of the facilities and this should be conducted promptly.
- ○ With regard to securement of energy necessary to maintain rescue, relief and medical activities, etc. to respond to risks of damages by disasters, stockpiling, etc. should be promoted. In addition, activities should be executed on formulation of collaboration schemes between relevant ministries and local governments relating to trainings, information sharing, etc. on stockpiling methods and supply systems of petroleum products. Moreover, with regard to formulation of victim ledgers, etc., advices, etc. should be incorporated so that victim ledgers can be formulated promptly on the base of practical guidelines in municipalities at the time of disaster occurrence.
- ○ Since dysfunction can occur not only due to damage of facilities and employees of government agencies but also due to damage of surrounding infrastructures, activities should be executed steadily on disaster management measures for roads as well as elimination of power poles, reinforcement of the earthquake resistant and tsunami resistant capacity of harbor facilities, measures against flood, sediment disasters, tsunamis and tidal waves as well as afforestation control, etc.
- ○ Actual operation of the law relating to reconstruction from large-scale disasters should be enhanced even at ordinary times. Activities should be executed on sharing of activities, procedures, etc. as handbooks and case studies relating total recovery by relevant ministries and local governments to execute recovery from disasters efficiently and effectively. In addition, improvement should be made to enhance measures of recovery and reconstruction from disasters and to boost response capacity of local governments, etc. that cope with support of victims at the time of disaster occurrence.
- ○ Through spread, education, etc. of disaster prevention systems of community, formulation of plans relating to voluntary disaster prevention activities by residents, etc. should be promoted.
- ○ With regard to school facilities, enhancing the earthquake resistance in buildings should be completed immediately. Moreover, from the point of safety measures, activities should be executed on countermeasures for aging, etc.: this includes implementation of the earthquake resistant measures into non-structural elements of old construction methods and those of time-related deterioration. Furthermore, functions of evacuation centers other than school facilities should be improved by enhancing the earthquake resistance, etc. in buildings including non-structural elements.
- ○ Execution of trainings and seminars for local government and provision of technical supports to local governments should be promoted to realize prompt execution of emergency measures and disaster recovery.

(Indices that show current levels)
【Cabinet Office】 Share of people having reached specified scores at attainment level tests 120% (2017)
【Cabinet Office】 Number of having solved challenge items clarified through follow-up of comprehensive emergency drill outlines of preceding fiscal year 100 %(2016)
【Cabinet Office】 Share of having formulated business continuity plans by local governments (Capital inland earthquake) 74% (2017)
【Cabinet Office】 Share of having formulated business continuity plans by local governments (Areas of Nankai Trough earthquakes) 65% (2017)
【Ministry of Internal Affairs and Communications】 Share of having enhanced the earthquake resistance in fire department building 90% (2016)
【Ministry of Internal Affairs and Communications】 Share of having enhanced the earthquake resistance in public facilities that are used as disaster management bases 92% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of progress of making preparation on information on active fault zones throughout country 66% (2017)

4. Secure indispensable information and communication functions

4-1) Paralysis and suspension of communication infrastructure needed for disaster management and disaster responses
○ By providing information of “Vulnerability assessment manual for telecommunication lines” through cooperation of telecommunications carriers, supports should be made on measures against vulnerabilities of systems of information and communications of government ministries. ○ With regard to technological standards relating to damages, defects, etc. of telecommunication equipment, execution of ideal review is planned on the basis of disaster situations, etc. (communication interruptions, power cuts, etc.) and each carrier should continue to conduct self-check of compliance of these standards. ○ By executing trainings, etc. in wide areas considering large-scale disasters, comprehensive disaster resilience should be reinforced. ○ In order to avoid long lasting stop of supply of electric power, etc., activities should be steadily executed on preparation of foundation to authenticate assessment for securing security of control systems of electric power, etc., elimination of power poles and disaster prevention measures, etc. of community against flood, sediment disasters, tsunamis and tidal waves. ○ In order to secure disaster rescue operations when lines of private carriers are stopped, ideal preparation should be made on foundation of systems of information and communications of the police, the Self-Defense Forces, the Japan Coast Guard, etc.: activities should be executed on improvement in disaster-resistant capacity, utilization of new technologies such as small unmanned aerial vehicles, etc. ○ Disaster management function, etc. should be reinforced utilizing quasi-zenith satellite system (QZSS), etc. ○ On the basis of the goal of conducting basic investigation on the basis of the law (Law No. 57 of 2000) regarding promotion of measures to prevent sediment disasters in sediment disaster potential area, etc. by FY 2019 in all prefectures, we now have a better outlook on the basic investigation and designation of areas. Preparation should be made on the establishment of warning and evacuation systems on the basis of this outlook.
(Indices that show current levels) 【National Police Agency】 Status of having executed flight trainings of drones 0% (2017) 【National Police Agency】 Upgrade and consolidation of mobile radio communication systems of the police 9% (2017) 【Ministry of Internal Affairs and Communications】 Compliance with Regulations for Telecommunications Facilities for Telecommunications Business (an ordinance by Ministry of Internal Affairs and Communications) 100% (2016) 【Ministry of Defense】 Share of having prepared satellites and micro-equipment 70% (2017)

4-2) Circumstances in which disaster information cannot be delivered to people who need it due to suspension of TV and radio broadcasting

○ Measures should be taken to prevent the interruption of radio broadcasting that serves as an important information delivery mechanism for residents at the time of disaster by transferring transmitting stations and developing FM complementary stations, supplemental transmitting stations, and relay stations.
○ In order to secure capacity to provide information at the time of interruption of broadcasts of TV and radio, preparation of alternative methods such as communication satellites as well as prompt and accurate transmission of L-Alert which is used as the foundation should be promoted. Moreover, conversion to fiber optics and duplication of networks of cable TV should be promoted.
○ Measures against floods, etc. should be promoted to avoid damage to broadcast stations, etc.

(Indices that show current levels)
【Ministry of Internal Affairs and Communications】 Share of having prepared relay stations to solve existence of poor radio reception areas relating AM broadcast stations (master stations) 85% (2017)
【Ministry of Internal Affairs and Communications】 Share of having prepared relay stations as countermeasures against disasters relating radio broadcast stations (master stations) located in potential damage areas of natural disasters 86% (2017)
【Ministry of Internal Affairs and Communications】 Total distance of optical fiber cables among cable TV main lines 67% (2016)

4-3) Circumstances in which information services to be used in the event of a disaster become dysfunction, making the collection and transmission of information unfeasible, and causing a delay in evacuation actions and rescue/support

○ In order to provide information securely through J Alert to all residents, multiplexing of methods to transmit information in connection with J Alert should be promoted. Multiplexing of methods to securely and promptly provide information to local governments and general public has been promoted through promotion of digitalization of radio communications for disaster management and administration, promotion of prompt and accurate transmission of L-Alert, measures against existence of poor radio reception areas, start of provision of information for travelers, securement of robust and upgraded communication foundation and facilities of the police, fire services, etc. There measures should be promoted steadily.
○ Diversification of secure methods to collect information should be enhanced thorough prompt comprehension of traffic status utilizing automotive probe information, etc. of government and private companies, upgrade of area traffic control systems and upgrade of traffic lights to respond to growth of traffic information integrated at National Police Agency, provision of earthquake related information using GPS swell meters, observation networks for earthquakes and tsunamis in sea areas, GNSSI information providing system, etc. and utilization of IT, SNS, etc. Moreover, activities should be executed on to speed up provision of information on scales of earthquakes through use of MOWLAS, etc.
○ Although preparation of methods of collection and provision of information has been enhanced, there are still challenges to further improve effective utilization of information obtained through them. Activities on G-Spatial Information Center, comprehensive disaster management systems, comprehensive disaster information system, disaster information hubs as well as SIP4D, etc. should be utilized to respond to various disaster response of each ministry, each local government, etc. In addition, activities should be executed on securing employees and systems of local governments that are main entities for collection and provision of information.
○ Through measures of roads against snow, cold weathers, liquefaction, reinforcement of earthquake resistant structuring in bridges of roads, slopes, etc., activities should be executed to avoid slow refuges due to traffic jams that take place after occurrence of disasters at high probability.
○ Transportation information relating to automobile traffics such as traffic result information should be provided to general users of roads promptly.
○ By executing trainings in wide areas considering large-scale disasters, comprehensive disaster resilience should be reinforced.
○ Measures against floods, sediment disasters, etc. should be promoted to avoid damage of communication infrastructures, etc.
○ Measures to secure transportation network should be promoted to avoid insufficiency of employees that handle tasks of transmission of information.
○ Relevant measures should be improved to avoid system down and loss of storage media.
○ Research and development should be promoted on component technologies, systems, etc. relating to collection, preparation, analysis and transmission of information.

(Indices that show current levels)
【Ministry of Education, Culture, Sports, Science and Technology】 Operating rate of seafloor observation networks for earthquakes and tsunamis 100% (2018)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having achieved target number of researchers on Integrated Program for Next Generation Volcano Research and Human Resource Development 51% (2014)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having used comprehensive disaster information systems at the time of initial activities against disasters 100% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of annual operation for having provided disaster management weather information 100% (2016)

5. Prevent economic dysfunction

5-1) Deterioration of international competitiveness due to a decline in companies' productivity caused by disruption of supply chains, etc.
○ Formulation of BCP measures by manufacturing industry and logistics providers should be promoted. In particular, focus should be made on the promotion in small and medium-sized enterprises where the progress is slow. In addition, formulation of BCP measures should be promoted through collaboration of companies such as collaboration of manufacturing industry (owner of goods) and logistics providers. ○ By utilizing frameworks of law relating to promotion of integration and efficiency of distribution business (Law No. 85 of 2005), activities should be executed on enhancement of preparation of logistics facilities of private companies resilient to disasters, etc. to promote preparation of facilities, etc. that can contribute to business continuity of private companies. ○ Measures to enhance disaster resistance of logistics facilities, routes, etc. should be promoted through activities on formulation of effective vessel traffic control, formulation of plans for opening access routes of ships, disaster management measures for roads and elimination of power poles, reinforcement of earthquake resistance and wave resistance of harbor facilities, measures against flood, sediment disasters, tsunamis, tidal waves, etc. ○ Regional relocation and expansion of the headquarter function of companies should be actively supported, and the development of a business environment should be comprehensively promoted to ensure that the relocation and expansion proceed smoothly. ○ Since supply chains cover not only domestic areas but also overseas areas, reinforcement of disaster resilience of foreign countries should be also enhanced by sharing knowledge, etc. owned by Japan. ○ In order to make it easy for companies to execute activities on business continuity, sophisticated provision of information such as specific damage forecast of community should be promoted and systems such as comprehensive inquiry counters should be prepared. ○ Human resources of experts who can lead resilience of private companies should be developed in each community.
(Indices that show current levels) 【Cabinet Office】 Number of certified plans to prepare special task facilities to improve regional power 3% (2017) 【Ministry of Economy, Trade and Industry】 Formulation of execution plans of measure for industrial safety and execution of the PDCA cycle 100% (2017) 【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated BCP among logistics providers (Medium-sized enterprises) 44% (2015)

5-2) Serious impact on the sustainability of socioeconomic activities and supply chains due to suspension of energy supply

○ With regard to collaboration plans on supply of petroleum at the time of disasters, collaboration plans on supply of petroleum and gas at the time of disasters and series of BCPs, their effectiveness should be enhanced through execution of trainings, roll out of good case studies among relevant people, etc. Constant reviews should be also conducted on those plans. Moreover, consideration should be further made on improvement of procedures to transport fuels smoothly.
○ To secure supply routes of fuels, etc., countermeasures against disasters on transport foundation should be promoted. In addition, to secure opening of transport routes promptly after disasters, improvement in equipment and materials and preparation of collaboration systems of relevant agencies should be promoted.
○ Through preparation of resident base service stations, execution of emergency drills, etc., activities are executed on reinforcement of disaster response capacity of service stations and liquefied petroleum gas main filling stations that function as community energy bases at the time of disasters. Moreover, to maintain supply chains of fuel supply, measures should be promoted to solve problem of areas where only small number of service stations exist. In addition, support should be reinforced on measures on consumer side which include stockpiling of fuels, etc.
○ Activities should be executed to promote spread of use of renewable energy and hydrogen energy, cogeneration system, liquefied petroleum gas, etc. and to promote spread of systems, etc. to supply electric power from fuel cells, storage batteries, electric cars and fuel cell electric vehicles into each family, building, hospital, etc. Formulation of smart community should be also conducted. Through these activities, diversification and decentralization of energy supply sources are promoted to avoid and mitigate disaster risks: for example, independent and decentralized energy should be introduced.

(Indices that show current levels)
【Ministry of Economy, Trade and Industry】 Share of having formulated plans by local governments against areas where only small number of service stations exist 0.3% (2017)
【Ministry of Economy, Trade and Industry】 Share of having improved situations on challenges identified by trainings on the basis of collaboration plans of supply of petroleum and gas at the time of disasters 100% (2017)
【Ministry of Economy, Trade and Industry】 Share of having improved situations on challenges of last year from trainings on execution of collaboration plans of supply of petroleum at the time of disasters 100% (2016)
【Ministry of Economy, Trade and Industry】 Number of resident base service stations 17% (2017)
【Ministry of Economy, Trade and Industry】 Execution of business to develop human resources such as emergency drills by prefectures throughout the country 100% (2017)
【Ministry of Economy, Trade and Industry】 Share of having completed formulation of decentralized energy systems 60% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Number of areas where independent and decentralized energy systems of whole region are introduced in base areas where urban development including disaster response bases are planned 33% (2017)

5-3) Damages, fires, explosions, etc. at complexes and other important industrial facilities

○ With regard to disaster management plans of petroleum complexes which have been reviewed by relevant prefectures, continuous execution of activities should be promoted to secure effectivity through trainings and reinforcement of collaboration between relevant agencies.
○ Enhancing the earthquake resistance should be promoted in petroleum refinery facilities and high-pressure gas facilities. Moreover, with regard to high-pressure gas facilities, consideration should be promoted to review standards of earthquake-resistant designs considering giant earthquakes such as Nankai Trough earthquakes.
○ Disasters at complexes have risks of drastically influencing functions of harbors as well as life, economic activities, etc. of surrounding areas. Consequently, fire resistance at ordinary times should be promoted and collaboration systems by relevant agencies should be also formulated and reinforced.
○ With regard to Dragon Hyper Command Units of total of 12 sets whose deployment are planned to be completed by 2018, systems of operating the units should be reinforced through execution of joint drills with relevant agencies, etc.
○ BCP for harbors should be formulated: according to those plans, collaboration should be made among relevant people of harbors of important harbors or more with petroleum refineries and oil terminals.

(Indices that show current levels)
【Ministry of Internal Affairs and Communications】 Number of headquarters that have executed trainings on the basis of disaster management plans of petroleum complexes, etc. 81% (2017)
【Ministry of Economy, Trade and Industry】 Share of having enhanced the earthquake resistance of high-pressure gas facilities (Important facilities of complexes) 66% (2016)
【Ministry of Economy, Trade and Industry】 Share of having enhanced the earthquake resistance of high-pressure gas facilities (Braces of spherical storage tanks) 87% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated business continuity plans of harbors (BCP of harbors) with petroleum refineries and oil terminals through collaboration of relevant people considering petroleum refineries and oil terminals 80% (2017)

5-4) Tremendous influence on overseas trade due to suspension of maritime transport functions
○ Domestic and international vessel operators should be encouraged to understand and create tsunami evacuation manuals for passenger ships and vessels in consideration of the 2020 Tokyo Olympic and Paralympic Games. ○ With regard to systems that enable prompt matching of utilization need of ships with availability of ships, test operation, etc. should be conducted during emergency drills to further promote securement of effectiveness from now on. ○ Promotion should be made on enhancing the earthquake resistance and the wave resistance in infrastructure facilities necessary to maintain marine transport such as channel marks and harbor facilities. ○ Effectiveness of harbor BCP should be improved and consideration should be made on the substitutability of harbor functions of wider areas.
(Indices that show current levels) 【Ministry of Land, Infrastructure, Transport and Tourism】 Number of harbors for which harbor BCP has been formulated 100% (2016) 【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having executing trainings through collaboration with relevant agencies at international strategic harbors, international base harbors and important harbors 67% (2017) 【Ministry of Land, Infrastructure, Transport and Tourism】 Number of channel marks that have made preparation to maintain functions 25% (2017) 【Ministry of Land, Infrastructure, Transport and Tourism】 Number of channel marks that have made preparation through reinforcing the earthquake resistance 84% (2017) 【Ministry of Land, Infrastructure, Transport and Tourism】 Number of channel marks that have made preparation through reinforcing the wave resistance 87% (2017)

5-5) Tremendous influence on logistics and human flow due to dysfunction of the core road/marine transport networks, such as disruption of arteries in the Pacific Belt Zone

- ○ Analysis of risks of interruption of main line transport and standardization of recognition should be promoted through wide collaboration of owner of goods, carriers, transport companies, managers of roads, etc. and research institutes. By doing these, the analysis and standardization should be incorporated into BCP, etc. of each organization. For example, business plans should be considered on the basis of the situation in which transport networks cannot be used due to large-scale natural disasters: transport companies should select routes to bypass areas or time zones where storms, blizzards, etc. are forecasted whereas demand side should secure inventory of parts of certain volume.
- ○ Reinforcement of transport infrastructures themselves should be promoted: activities should be executed on reinforcement of the earthquake resistance of bridges of roads and enhancement of the earthquake resistance of facilities of harbors and airports, measures against liquefaction, measures against waves and tsunamis, measures to prevent collapse of slopes of roads, reinforcement of toes of slopes of banking, etc.
- ○ To avoid significant influence in the case of interruption of transport, information on the status of current operation, places of closed routes and outlook of opening routes in future should be appropriately provided in a timely fashion.
- ○ Formulation of road networks and railway networks with high substitutability should be promoted. Moreover, preparation of access ways for emergency vehicles, improvement in accessibility to main roads of high standards, etc. should be promoted. With regard to road transportation networks that are important for logistics, reinforcement of functions to secure stable transportation should be promoted even for ordinary times.
- ○ In order to avoid total transportation paralysis due to partial damage of transportation networks, relevant people should collaborate to designate priorities of opening of access routes, prepare alternate transportation between plural modes and reinforce management capacity of total transport. Moreover, consideration should be made for the situation expected: transportation demand of bicycles is expected to increase in the case where no railways and automobiles can be used.
- ○ With regard to responses where vehicles are damaged, complexity of procedures, etc. should be mitigated so that victims can respond to the situation promptly.
- ○ In order to avoid interruption of main line transportation, activities should be executed to promote countermeasures for aging, formulation of plans to reinforcement of collaboration for opening of access routes of vehicles and ships, comprehension and sharing of information on roads such as farm roads, woodland paths and other roads that can be used as bypass routes, preparation of transportation safety facilities, etc. including traffic signal power adding devices, utilization of traffic circles, etc.
- ○ Utilization of automotive probe information of government and private companies, upgrade of area traffic control systems, collection of passage propriety information through relevant agencies, etc. should be conducted. Through these activities, prompt comprehension of traffic information on passage of automobiles, utilization for traffic measures and prompt provision of traffic information for general users of roads should be conducted.
- ○ To make a preparation for intensive and heavy snow, preventive traffic control and concentrated snow removal actions should be taken by proactively formulating timelines and plans to remove snow and comprehending risk spots where extreme traffic jams are expected to occur. At the same time, activities on securement of road traffic, such as ensuring use of equipment including chains, etc., reinforcement of systems to remove snow, spot measures to respond to actual local situations, etc., should be advanced from both non-structural and structural aspects.

(Indices that show current levels)
【National Police Agency】 Share of having comprehended road status, etc. using probe information processing system 65% (2017)
【National Police Agency】 Share of having prepared traffic signal power adding devices (Subsidized projects) 35% (2017)
【National Police Agency】 Share of having upgraded old traffic signals (Subsidized projects) 47% (2017)
【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated records with description of width, design load, traversable period, etc. for farm roads that are designated as bypasses 100% (2016)
【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated records with description of width, design load, traversable period, etc. for woodland paths that are designated as bypasses 100% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having secured sea routes for emergency where plans have been formulated for opening of access routes of ships 100%(2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated plans for drain stock management 29% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having achieved anti-inundation measures in urban areas by drains 57% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in bridges on emergency routes 77% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Dams [Local governments] 47% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Rivers [Local governments] 84% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Erosion control [Local governments] 62% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) (Drains) 43% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared ring roads in three major metropolitan areas 74%(2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having eliminated power poles in main roads of urban areas 16% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in main pipes 48% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having secured quick-deliverability between cities by roads 54% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having implemented measures in parts such as slopes of roads, banking, etc. where those implementation is necessary 68% (2016)

5-6) Tremendous influence on international air transportation due to concurrent damage to multiple airports

○ Airport facilities, including the minimum-required basic facilities and the management facilities necessary to ensure supervisory functions, should be made earthquake resistant.
○ Collaboration systems with relevant agencies should be continued and reinforced in order to maintain airport functions: these include preparation of systems through formulation of immediate recovery plans and trainings at airports as well as securement of equipment and staffs of airline companies, etc.
○ Land transport functions should be ensured, such as roads and railways in order to guarantee the substitutability of airport functions.

(Indices that show current levels)
【Ministry of Land, Infrastructure, Transport and Tourism】 Number of airports with functions that maintain aviation networks at the time of earthquakes among important airports for air transport 46% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Number of airports controlled by the national government that has formulated immediate recovery plans against earthquakes and tsunamis 39% (2017)

5-7) Serious impact on citizenry, business transactions, etc. due to dysfunction of financial services, postal services, etc.

○ Safety should be ensured for post office buildings with insufficient earthquake resistance. To this end, Japan Post Co., Ltd. should enhance the earthquake resistance of its directly-managed post office buildings. Disaster management measures for roads, etc. should be promoted in order to prevent suspension of postal services due to paralysis of transportation.
○ Most of the preparation has been completed for formulation of BCP of Central Bank, financial institutions and Financial Services Agency, securement of redundancy of systems and communication methods, enhancing the earthquake resistance in shops, etc., and securement of backup sites of system centers, etc. However, measures should be implemented immediately at all major financial institutions from now on. Moreover, measures to maintain and improve effectiveness of BCP should be executed continuously.
○ Measures against flood, etc. should be promoted to avoid damage of financial institutes, etc.

(Indices that show current levels)
【Financial Services Agency】 Share of having formulated BCP in financial institutions (All financial institutions that handle deposits) 98% (2016)
【Financial Services Agency】 Execution of trainings using maps by government 100% (2016)
【Financial Services Agency】 Central Bank, financial institutions, system centers, etc. that have enhanced their earthquake resistance (Regular members of Japanese Bankers Association) 100% (2016)
【Financial Services Agency】 Central Bank, financial institutions, system centers, etc. that have enhanced their earthquake resistance (All financial institutions that handle deposits) 99% (2016)
【Financial Services Agency】 Diversification of communications 100% (2017)

5-8) Stagnation of stable supply of food, etc.

○ Spread of BCP guidelines should be enhanced among fishing port managers, fishermen's cooperative association, etc. to promote formulation of BCP for individual area relating to series of production and distribution process of marine products. Moreover, with regard to land improvement districts, etc. that manage irrigation facilities, formulation of business continuity plans should be promoted.

○ To maintain smooth food supply even at the time of large-scale disasters, formulation of collaborative and cooperative systems of total food supply chains as well as spread and education of those systems should be promoted. For this purpose, formulation of BCP by business operators should be also promoted. Moreover, independent and decentralized energy facilities should be introduced, and various energy sources should be utilized enhance disaster resistance.

○ In terms of production bases relating to agriculture, forestry, and fishery, agricultural irrigation facilities and bridges on farming roads are to be made earthquake resistant, and conservation measures and comprehensive disaster management and disaster mitigation measures are to be promoted. Distribution bases for marine products and production base facilities are also to be made earthquake resistant.

○ To secure smooth flow from upstream to downstream of supply chains, formulation of logistics infrastructure networks should be conducted taking account of following points: enhancing the earthquake resistance in road bridges, enhancing the earthquake resistance of logistics infrastructures such as harbors, airports, etc., mutual collaboration of transport modes and reinforcement of industrial competitiveness at ordinary times.

○ Actions should be implemented in normal times to stockpile supplies appropriately and efficiently and ensure stable import. At the time of disaster, steady actions should be implemented to leverage stockpiled supplies and ensure import.

(Indices that show current levels)

【Ministry of Agriculture, Forestry and Fisheries】 Share of having achieved FY 2020 target values of handling amount per central wholesale market 96% (2016)

【Ministry of Agriculture, Forestry and Fisheries】 Share of having started implementation of measures for key irrigation facilities that need upgrade obviously 19% (2017H29)

【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated business continuity plans in land improvement districts that control government-managed preparation facilities of high importance 55% (2017)

【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated collaboration and cooperation systems in food industry business operators, etc. 50% (2017)

【Ministry of Agriculture, Forestry and Fisheries】 Share of fishing harbors that have formulated immediate recovery systems of the fisheries industry among fishing harbors that act as distribution bases of marine products 0% (2016)

【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated plans to enhance the earthquake resistance in government-managed preparation facilities of high importance that need enhancement of the earthquake resistance obviously 62% (2017)

【Ministry of Agriculture, Forestry and Fisheries】 Share of having achieved target areas of long-term plans to improve agricultural lands and surrounding areas where flood damage, etc. is prevented 31% (2017)

【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated plans to preserve functions of farm bridges (extension of 15m or more) and farm road tunnels (plan for individual facility) 36% (2017)

【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated plans to preserve functions of bridges of woodland paths (extension of 4m or more) and woodland path tunnels (plan for individual facility) 22% (2016)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated BCP among logistics providers (Large companies) 63% (2015)

5-9) Tremendous influence on production activities associated with disruption of water supply for specific uses due to drought, etc.

○ Although enhancing the earthquake resistance is promoted in water supply, industrial water and irrigation facilities, reinforcement, etc. of human resources and expertise should be promoted through collaboration between prefectures, water suppliers, etc.
○ In order to quickly recover during large-scale disasters, wide-ranging support systems should be maintained, and the effective use of water resources, such as the use of rainwater and recycled water based on the Act on the Promotion of Rain Water Usage (Act No. 17 of 2014) should be disseminated and promoted.
○ It is thought that water shortages, etc. that exceed the current standard levels of water supplies should further increase in frequency and severity due to the influence of climate change, etc., and so in addition to ensuring that relevant parties work closely together to share information, efforts should be made in accordance with the Basic Act on the Water Cycle (Act No. 16 of 2014) and the Water Circulation Basic Plan (Cabinet Council decision on July 10, 2015) to enhance the functionality of water resource facilities, effectively utilize water resources currently effectively used as stock, and make use of groundwater as a substitute water resource in times of crisis.
○ Strategic maintenance, management, and functional enhancement, including improvement of longevity of aging waterworks, industrial water supplies, and agricultural irrigation facilities should be carried out.

(Indices that show current levels)
【Ministry of Health, Labour and Welfare】 Share of having conformed the earthquake resistance in main pipelines of water supply 39% (2016)
【Ministry of Economy, Trade and Industry】 Share of having formulated upgrade plans using "Guidelines of upgrade, enhancing the earthquake resistance and asset management of industrial water facilities" 39% (2017)
【Ministry of Economy, Trade and Industry】 Share of having achieved formulation of nationwide support systems 100% (2016)

6. Minimize damage to lifelines, fuel supply related facilities, transport networks, etc., and seek early recovery of these infrastructures

6-1) Prolonged suspension of functions of power supply networks (power generating/transforming stations, transmission/distribution equipment), city gas supply, and oil/LP gas supply chains
○ Since the number of small-scale renewable energy facilities (e.g. solar power generators) shows a rapid increase, electricity facilities should be assessed for their resilience to natural disasters and related standards should be developed. Based on this, disaster resilience and recovery capabilities should be enhanced for power plants, substations, power transmission networks, and electric power systems. ○ Considering resistance assessment of petroleum refineries, enhancing the earthquake resistance (measures for enhancing the earthquake resistance, measures against liquefaction, measures for safe stop of facilities, etc.), reinforcement of shore protection, etc. should be enhanced steadily. Moreover, with regard to relevant collaboration plans for supply and BCP, effectiveness should be promoted through execution of trainings, etc. Furthermore, BCP for harbors through collaboration of relevant people should be formulated for harbors of important harbors or more where petroleum refineries and oil terminals. ○ Stockpiling of petroleum products, petroleum and gas by the national government should be maintained. ○ Activities should be executed to promote spread of use of renewable energy and hydrogen energy, cogeneration system and to promote spread of systems, etc. to supply electric power from fuel cells, storage batteries, electric cars and fuel cell electric vehicles into each family, building, hospital, etc. Formulation of smart community should be also conducted. Through these activities, diversification and decentralization of energy supply sources are promoted to avoid and mitigate disaster risks: for example, independent and decentralized energy should be introduced. ○ To secure supply routes of fuels, etc., countermeasures against disasters on transport foundation should be promoted. In addition, improvement in equipment and materials, collection of passage propriety information, etc. should be promoted to enhance formulation of systems of prompt opening of transport routes and prompt recovery of facilities through collaboration of relevant agencies.
(Indices that show current levels) 【Ministry of Economy, Trade and Industry】 Share of having executed resistance assessment on power generation dedicated dams with the height of 15m or more 99% (2017) 【Ministry of Economy, Trade and Industry】 Share of having improved situations on challenges identified by trainings on the basis of collaboration plans of supply of petroleum and gas at the time of disasters 100% (2017) 【Ministry of Economy, Trade and Industry】 Share of having improved situations on challenges of last year from trainings on execution of collaboration plans of supply of petroleum at the time of disasters 100% (2016) 【Ministry of Economy, Trade and Industry】 Share of progress of reinforcement of the earthquake resistance in petroleum refineries 38% (2016) 【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated business continuity plans of harbors (BCP of harbors) with petroleum refineries and oil terminals through collaboration of relevant people considering petroleum refineries and oil terminals 80% (2017)

6-2) Prolonged suspension of water supply, etc.

○ Although the share of adapting earthquake resistance is increasing through enhancing the earthquake resistance of water supply, industrial water facilities, etc., the share remains at about 40% (2016) currently which is partly explained by the long extension of main pipelines. In addition to ensuring effective earthquake resistance measures, human resources and expertise should be enhanced through cooperation with prefectural authorities and water suppliers.
○ In order to quickly recover during large-scale disasters, wide-ranging support systems should be maintained, someone should be made responsible for disaster management and disaster mitigation in the local construction industry, TEC-FORCE systems and functions should be enhanced and strengthened, countermeasures for road disasters should be implemented, substitute water sources should be considered when there is a groundwater crisis, and the effective use of water resources, such as the use of rainwater and recycled water based on the Act on the Promotion of Rain Water Usage (Act No. 17 of 2014), should be disseminated and promoted.
○ Measures, etc. against flood should be promoted to avoid damage to water supply facilities, etc.

(Indices that show current levels)
【Ministry of Health, Labour and Welfare】 Share of having conformed the earthquake resistance in main pipelines of water supply 39% (2016)
【Ministry of Economy, Trade and Industry】 Share of having formulated upgrade plans using "Guidelines of upgrade, enhancing the earthquake resistance and asset management of industrial water facilities" 39% (2017)
【Ministry of Economy, Trade and Industry】 Share of having achieved formulation of nationwide support systems 100% (2016)

6-3) Prolonged suspension of functions of sewage treatment facilities, etc.

○ The main sewage pipes should steadily be made earthquake resistant, with cooperation from local governments. Moreover, there should be strategic maintenance and control of aging sewage facilities, including prolonging the life of these facilities.
○ Activities such as brush up of BCP for drains as well as preparation of manholes and toilets by local governments should promoted according to the revised drain BCP formulation manual to mitigate damage.
○ Considering the low Share of 58% (2016) for function diagnosis of aging of drainage facilities of rural communities, function diagnosis should be conducted immediately to steadily enhance countermeasures for aging and enhance the earthquake resistance on the basis of the diagnosis.
○ With regard to Johkasou, decentralized domestic wastewater treatment system, installation of combined treatment Johkasou (for black water and gray water) should be promoted. In addition, preparation of Johkasou Inventory (data base system) should be proceeded to secure comprehension of the status of installation and management.

(Indices that show current levels)
【Ministry of Agriculture, Forestry and Fisheries】 Share of having executed function diagnosis of drainage facilities of rural communities 58% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having brushed up drain BCP 0% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated plans for drain stock management 29% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) (Drains) 43% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in main pipes 48% (2016)
【Ministry of the Environment】 Share of having implemented measures for aging incineration plants 93% (2017)

6-4) Prolonged suspension of functions of land/sea/air transport infrastructure from Shinkansen and other core infrastructure to regional transport networks

○ To improve effectiveness of plans of opening access routes for vehicles and ships, a series of trainings, etc. on the basis of agreements, etc. should be executed.
○ Efforts should be made to regularly maintain a base of education and training for construction workers in each region in order to rapidly ensure the presence and action of equipment such as heavy machinery and skilled workers with local knowledge.
○ To send recovery personnel and equipment including support in wide area in parallel to disaster-affected areas, formulation of road networks with high substitutability should be promoted as core functions. Moreover, preparation of access roads, improvement in accessibility to main roads of high standards, etc. should be promoted.
○ In terms of logistically important road networks, there should be functional improvements in order to ensure stable transportation, even under normal circumstances, as well as rapid function recovery with the nation acting as the agent for disaster recovery, opening relevant road networks and alternative/supplementary roads in times of disaster.
○ To make a preparation for intensive and heavy snow, preventive traffic control and concentrated snow removal actions should be taken by proactively formulating timelines and plans to remove snow and comprehending risk spots where extreme traffic jams are expected to occur. At the same time, activities on rapid recovery of road traffic, such as reinforcement of systems to remove snow, spot measures to respond to actual local situations, etc., should be advanced from both non-structural and structural aspects.
○ Measures should be taken to avoid a significant decline of functions of local administrative organs (including the police and fire services) due to injuries and damage to their personnel and facilities.

○ To mitigate damage, surrounding measures to prevent blocking of traffic facilities should be promoted: these include large-scale repair of Shinkansen structures on the basis of plans, reinforcement of the earthquake resistance in road bridges, measures against sediment disasters, elimination of power poles in roads, upgrade of old traffic lights, enhancing the earthquake resistance relating to other traffic facilities, measures against liquefaction, measures of wave resistance and tsunami resistance, etc. Moreover, development of technologies relating to maintenance, management and upgrade of transport infrastructures and their practical use should be promoted.
○ A system should be maintained that can swiftly grasp the extent of any damage and apply quick drafts of recovery plans by making accurate use of ALOS series wide-area, high resolution satellites, etc. There is also to be stable investment in GNSS Continuously Operating Reference Stations as location information infrastructure. Moreover, satellites that can grasp the extent of any damage more accurately and quickly, regardless of weather or time of day or night, should be developed and introduced. Disaster-response robots that make it possible to carry out surveys and restorative construction work in disaster areas where it is difficult for humans to enter are also to be developed and introduced, and there should be training in their operation.
○ In order to ensure safe, uninterrupted traffic to the greatest extent possible until roads are repaired, information from public and private probes should be used.

(Indices that show current levels)
【National Police Agency】 Share of having comprehended road status, etc. using probe information processing system 65% (2017)
【National Police Agency】 Share of having prepared traffic signal power adding devices (subsidized projects) 35% (2017)
【National Police Agency】 Share of having upgraded old traffic signals (Subsidized projects) 47% (2017)
【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated plans to preserve functions of farm bridges (extension of 15m or more) and farm road tunnels (plan for individual facility) 36% (2017)
【Ministry of Agriculture, Forestry and Fisheries】 Share of having formulated plans to preserve functions of bridges of woodland paths (extension of 4m or more) and woodland path tunnels (plan for individual facility) 22% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in bridges on emergency routes 77% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having implemented necessary measures on slopes of roads, banking, etc. 68% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in main railroad lines located in areas, etc. where an earthquake with an intensity of upper 6 on the Japanese scale of 7 (capital inland earthquake or Nankai Trough earthquakes) is expected 97% (2017) ※

※ No description on vulnerability assessment

6-5) Significant deterioration of the functions of disaster management infrastructure for a prolonged period

○ Measures to ensure earthquake resistance and countermeasures for liquefaction should be systematically and steadily enacted towards the completion of disaster-prevention infrastructure such as coastal embankments in areas where large-scale earthquakes are expected to occur; embankments should be created, floodgates, etc. should be automated or operated remotely, and seaside disaster management forests should be maintained in river or coastal areas that are at high risk of tsunamis.

○ In order to quickly reconstruct disaster management infrastructure during large-scale disasters, wide-ranging support systems should be maintained, someone should be made responsible for disaster management and disaster mitigation in local construction industries, TEC-FORCE systems and functions should be enhanced and strengthened, training and classes for local public bodies to ensure rapid response and disaster recovery should be held, and technical support should be offered.

○ Through comprehensive disaster management information systems, comprehensive disaster information systems, SIP4D, etc., information sharing should be promoted smoothly in relevant agencies.

(Indices that show current levels)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Dams [Local governments] 47% (2016)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Rivers [Local governments] 84% (2016)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Erosion control [Local governments] 62% (2016)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having executed trainings, seminars, etc. of disaster recovery business by damage assessors of the ministry proper in local governments 66% (2017)

7. Uncontrollable complex disasters and secondary disasters should be avoided

7-1) Mass casualties caused by the occurrence of a large-scale fire in an urban area accompanying earthquakes
○ Activities should be conducted to eliminate crowded urban areas (5,745ha (2011)) that are extremely dangerous at the time of earthquakes due to high risks of large-scale fires. Even when these problems are not solved, promotion should be made on preparation of roads, green areas, parks, etc. that are effective to prevent spread of fires, removal, the demolishing and rebuilding as well as enhancing the fireproofing of old buildings, etc. should be promoted. Moreover, in order to alleviate the state of excessive population concentration in places with high disaster risks such as potential areas of the capital inland earthquake, metropolises with densely build-up areas, etc., effective measures to promote development and use of an autonomous, decentralized and coordinated nation should be considered and conducted. ○ With regard to enhancing the earthquake resistance in houses and buildings, this should be promoted by combining all methods including promotion of rebuilding old condominiums, improvement in awareness of necessity of enhancing the earthquake resistance among owners, improvement in support measures and building assessment methods for upgrading the earthquake resistance in houses and target buildings with obligations of the earthquake resistance diagnosis, development of financial instruments, etc. ○ Government facilities, school education facilities, social education facilities, sports facilities, medical facilities, social welfare facilities, etc. should be made earthquake resistant. Moreover, preventative measures should be put in place to ensure that non-structural elements such as ceilings will not fall in, and measures for aging should be promoted. ○ Spread of seismic breakers should be promoted to prevent electric fires after earthquakes. ○ To avoid closed roads and hindrance of firefighting operations, reinforcement of earthquake resistant structuring in road bridges, measures to prevent road slope from collapsing, reinforcement of banking, measures against liquefaction, elimination of power poles, etc. should be promoted. In addition, preparation of roads, etc. of high standards that are used as emergency routes and evacuation routes in wide areas, preparation of access roads, operation of systems combining and utilizing automotive probe information of government and private companies, upgrade of area traffic control systems, etc. should be promoted. Moreover, to collect passage propriety information effectively, patrol, etc. using bicycles should be considered, deployed and trained. ○ Preparation of parks, green areas, squares, etc. as evacuation sites should be promoted. ○ Activities should be executed on promotion of preparation of fire command center of high functionality and fire disaster management facilities such as seismic storage tanks as well as on preparation of disaster management foundation, etc. through enhancing the earthquake resistance in public facilities, etc. that are used as disaster management bases. ○ In order to avoid loss of water supplies for fire-fighting due to an earthquake, waterworks should be made earthquake resistant, earthquake-resistant water tanks should be maintained, and the conservation and use of sustainable groundwater should be considered. ○ Assuming that public help can be insufficient, enhancement of volunteer firefighter as well as spread, education, etc. of local disaster management plan systems should be promoted to enhance planning relating to voluntary disaster management activities of residents, companies, etc.
(Indices that show current levels) 【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented countermeasures for aging facilities such as national university corporations that have serious problems to conduct educational and research activities 54% (2017) 【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented countermeasures for aging facilities of public elementary and junior high schools which require their implementation emergently 25% (2016) 【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented fall prevention measures in suspended ceilings, etc. of gymnasiums, etc. of public schools 97% (2017) 【Ministry of Education, Culture, Sports, Science and Technology】 Share of having prepared individual building plan for public school facilities 4% (2017) 【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in public school facilities 99% (2017)

【Ministry of Education, Culture, Sports, Science and Technology】 Share of having implemented fall prevention measures in suspended ceilings, etc. of gymnasiums, etc. of facilities of national university corporations, etc. 95% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in buildings of national university corporations, etc. 98% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in private school facilities (high schools and schools for younger pupils) 88% (2017)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of having enhanced the earthquake resistance in private school facilities (universities, etc.) 90% (2017)
【Ministry of Health, Labour and Welfare】 Share of having conformed the earthquake resistance in main pipelines of water supply 39% (2016)
【Ministry of Health, Labour and Welfare】 Share of having enhanced the earthquake resistance in disaster base hospitals and emergency and critical care centers throughout the country 89% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Area of having decreased crowded urban areas that are extremely dangerous at the time of earthquakes, etc. 40% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of metropolises where open space with a certain level of disaster management function is secured in more than one place 85% (2015)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared measures to enhance long life of park facilities 90% (2016)

7-2) Occurrence of an extensive complex disaster on the sea or in coastal areas
○ In terms of holding joint drills with relevant organizations, a cooperative framework with the relevant organizations should be confirmed, including focusing on more practical training, disseminating information to local residents, and promoting evacuation; additionally, the functionality of materials and equipment should be improved, and more efficient establishment of systems promoted. Moreover, disaster-prevention training and education should be continually implemented, based on the characteristics of disasters in the region. ○ Enhancing the earthquake resistance in facilities that handle dangerous materials, preparation and enhancing the earthquake resistance of breakwaters, coastal dikes, etc., measures against earthquakes and tsunamis and research and development of relevant technologies should be steadily promoted. ○ Spillage from containers, automobiles, ships, oil tanks, etc. due to large-scale tsunamis may lead to significant secondary disasters such as damage of urban areas and large-scale fires. Because of this, measures to prevent flotsam should be promoted. ○ The disaster management and disaster mitigation functions of the natural environment should be quantitatively evaluated, and the scale of disasters should be reduced effectively and efficiently through the conservation and regeneration of the natural environment.
(Indices that show current levels) 【Ministry of Internal Affairs and Communications】 Deployment of vehicles that formulate function of bases 35% (2017) 【Ministry of Internal Affairs and Communications】 Reinforcement of National Fire Service Team for Disaster Response 99.6% (2017) 【Ministry of Internal Affairs and Communications】 Deployment of heavy machines and transport vehicles of heavy machines 41% (2017) 【Ministry of Internal Affairs and Communications】 Number of headquarters that have executed trainings on the basis of disaster prevention plans of petroleum complexes, etc. 81% (2017) 【Ministry of Internal Affairs and Communications】 Provision of “Outline of accidents in specific offices of special disaster management areas such as petroleum complexes, etc.” during last year 100% (2018) 【Ministry of Internal Affairs and Communications】 Deployment of vehicles against tsunamis and large-scale storm and flood damages 48% (2017) 【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Rivers [Local governments] 84% (2016) 【Ministry of Agriculture, Forestry and Fisheries/Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared coastal dikes, etc. in areas, etc. where large-scale earthquakes (e.g. Nankai Trough great earthquakes and capital inland earthquakes) are expected (Preparation of planned levels and enhancing the earthquake resistance) 47% (2017)

7-3) Blocked conditions accompanying collapse of buildings along railroads and roads, and traffic paralysis due to depression accompanying the collapse of underground structures etc.

○ In terms of ensuring that residences and buildings are earthquake resistant, awareness should be raised regarding the necessity for owners to make buildings earthquake-resistant, and earthquake resistance should be ensured for residences and buildings that are subject to seismic evaluation.
○ To prevent accidents and disasters due to roadsides (outside road areas), road administrators should promote appropriate management by administrators of land, etc. of roadside areas.
○ In addition to road closures following the collapse of road-side residences and buildings, roads may also be closed due to fallen civil engineering structures at intersections or at the side of the road, collapsed roadside real estate, or the collapse of road-specific structures such as utility poles, and these should be made earthquake resistant or removed.
○ Measures to prevent railway closures should also be considered.
○ Roads can become impassible due to subsidence caused by damage to underground structures; underground structures should be made earthquake resistant, water leakages, etc. that cause cavities around underground structures should be examined, repaired, and the cavity filled in, and information about the ground should be collected, shared, and used.
○ In situations in which transport networks and destinations are concentrated in a place of high disaster risk, these should be decentralized due to concerns that this could lead to complete paralysis in an emergency, caused by closures or collapses.
○ When a road is impassible by automobile, an effective means of surveying the area should be ensured, e.g. by bicycle, and the impassible places should be quickly detected though the use of existing measuring and observational devices such as traffic surveillance cameras and highway management cameras, and public and private automobile probe information. Moreover, wide-area traffic control systems should be enhanced, etc.
○ To secure support from national government for local governments, etc., reinforcement of disaster management capacity through execution of practical trainings in wide area considering large-scale disasters as well as improvement and reinforcement of systems and functions such as TEC-FORCE, etc. should be promoted.

(Indices that show current levels)
【Ministry of Health, Labour and Welfare】 Share of having enhanced the earthquake resistance in disaster base hospitals and emergency and critical care centers throughout the country 89% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated plans for drain stock management 29% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) (Drains) 43% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having eliminated power poles in main roads of urban areas 16% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having enhanced the earthquake resistance in main pipes 48% (2016)

7-4) Occurrence of a large number of casualties due to damage to and functional failure of reservoirs, disaster management infrastructure, and natural dams, etc., and due to deposited earth and sand as well as flowing volcanic ejecta

- ○ Policies related to information are to be promoted, such as multiplexing means of information transmission with cooperation from J-ALERT, investigating the history of volcanic eruptions and maintaining a geological map of volcanoes, and making use of satellite images, etc. Sharing appropriate disaster information with citizens should ensure that they are able to escape in time.
- ○ On the basis of the goal of conducting basic investigation on the basis of the law (Law No. 57 of 2000) regarding promotion of measures to prevent sediment disasters in sediment disaster potential area, etc. by FY 2019 in all prefectures, we now have a better outlook on the basic investigation and designation of areas. Preparation should be made on the establishment of warning and evacuation systems on the basis of this outlook.
- ○ With regard to facility management, more effective inspection and diagnosis, etc. should be promoted. Moreover, asset management systems of preventive maintenance type on the basis of community characteristics should spread and formulation of information platforms that can manage various data such as map information, disaster prevention information, etc. should be conducted so that those can be utilized at the time of disasters.
- ○ In areas where landslide disasters have occurred due to large-scale earthquakes and ensuing rainfall, measures to prevent the reoccurrence of a disaster, the rescue of disaster victims in order to prevent numerous casualties, measures relating to searches, and generator equipment to ensure the functionality of facilities should be introduced.
- ○ In the case of a river channel being blocked (a natural dam), an emergency investigation is to be carried out to enable municipalities to make appropriate judgements concerning evacuation orders for residents, and information about the area where/period when damage is expected to occur should be shared among municipalities, based on the Act on Sediment Disaster Countermeasures for Sediment Disaster Prone Areas (Act no. 57 of 2000).
- ○ The proper maintenance of forests is to be promoted. There should be an accurate understanding of locations where there are likely to be mountain disasters, forest preserves should be properly maintained, measures combining the maintenance of afforestation facilities and forests should be implemented, and responses to disasters involving drifting wood should be strengthened. At this time, consideration should be given to demonstrating the effects of “green infrastructure” that makes use of diverse functions, including the disaster management and disaster reduction functions of the natural environment, and initiatives are to be promoted.
- ○ Although measures against sediment disasters, enhancing the earthquake resistance in reservoirs, etc. should be promoted, a long time is necessary to conduct measures against estimated scales of plans. Moreover, in earthquakes, etc. of scales that is beyond estimations, responses are difficult to conduct and large-scale human damage can occur. Because of this, collaboration of relevant ministries, local governments, resident of communities, facility managers, etc. should be conducted to implement measures combining structural and non-structural aspects.
- ○ There should be constant evaluations of the natural disaster-resistance of key facilities that support Japan’s electricity system, such as dams used for electricity generation, and necessary measures to maintain regulations are to be implemented.
- ○ Consideration should be made to solve population concentration in locations of high risks of earthquake disasters. Moreover, disaster response capacity of disaster response agencies, etc. should be improved. In addition, enhancement of volunteer firefighter, etc. should be promoted considering the insufficiency of public help at the time of large-scale disasters. Furthermore, execution of continuous emergency drills and disaster prevention education on how to act to protect oneself through schools, offices, community organizations, etc. should be promote.

(Indices that show current levels)
【Ministry of Education, Culture, Sports, Science and Technology】 Share of schools that educate disaster safety 99.7% (2015)
【Ministry of Agriculture, Forestry and Fisheries】 Share of disaster management emphasis reservoirs that have executed non-structural measures such as hazard maps, etc. 73% (2019)
【Ministry of Agriculture, Forestry and Fisheries】 Share of having achieved target areas of long-term plans to improve agricultural lands and surrounding areas where flood damage, etc. is prevented 31% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Dams [Local governments] 47% (2016)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Erosion control [Local governments] 62% (2016)

7-5) Expansion of damage caused by large-scale diffusion and outflow of toxic substances

○ Equipment should be prepared, and drills and training carried out in order to prevent the large-scale spread and leakage of hazardous materials. Moreover, in addition to supporting the creation of an incident response manual relating to chemical substances, local public bodies are to increase the effectiveness of the manual, for example by carrying out follow-up actions.
○ The revision of standards to prevent leakage of high-pressure gas, ensuring the earthquake resistance of high-pressure gas facilities based on this, and measures for mine waste dumps where there is concern of hazardous materials leaking during large-scale disasters should be rapidly implemented.

(Indices that show current levels)
【Ministry of Economy, Trade and Industry】 Number of storage spaces that have implemented countermeasures 44% (2017)

7-6) Devastation of the national land due to damages to farmland and forests

○ Preparation of facilities such as enhancing the earthquake resistance of irrigation facilities, etc. should be promoted. Moreover, it is concerned that weakening of local communities makes it difficult to conduct maintenance and management of agricultural land, etc. through joint activities, etc. of communities and decrease disaster management capacity and activity capacity of communities. Because of this, appropriate maintenance and management of community resources such as agricultural land, irrigation facilities, etc. by local communities, etc. utilizing independence and cooperation of communities should be promoted and preparation of systems should be promoted so that disaster management activities and recovery activities can be conducted independently at the time of disasters. Moreover, maintenance and activation of local communities through interchange between urban areas and rural districts should be enhanced.

○ Frequent torrential rain and earthquakes have recently raised the likelihood of large-scale disasters. In line with this situation, actions should be enhanced to deal with disasters in mountainous regions based on proactive disaster management and mitigation by appropriately understanding areas with high mountain disaster risk, deploying forest reserves, taking integrated actions including the development of forestry management facilities and the maintenance of forests, and enhancing actions against floodwood disasters through the development of floodwood containment dams. Coastal disaster prevention forests should be developed to mitigate damage by large-scale tsunamis and ensure the safety of houses and public facilities. In this case, actions should be implemented to leverage a variety of functions (e.g. disaster management and mitigation functionalities) offered by natural environments, which play the role of "green infrastructure."

○ In order to execute implementation of measures to prevent recurrence of disasters after occurrence of sediment disasters, formulate planned evacuation systems after generation of large-scale earthquakes and realize prompt recovery, advanced technologies should be utilized. Moreover, considering recent situation of occurrence of sediment disasters, preparation of transmission check dams with high effects of capturing sediments and driftwoods should be promoted.

○ Wildlife management to prevent harm to forests is to be promoted; management costs should be reduced in order to steadily carry out forest maintenance such as tree thinning, including in areas with disadvantageous conditions, and reforestation after felling trees to ensure the multifaceted functions of forests. Efforts should be made to create demand for new timber using regional forests, such as by developing and disseminating CLT, etc. Moreover, in addition to gaining the cooperation of municipalities in supporting forest conservation management activities through regional activity organizations, the maintenance of conditions to consolidate management and the clarification of forest boundaries should be promoted.

○ In order to preserve the disaster management and reduction functions of the natural environment, park facilities should be maintained appropriately and measures to improve longevity should be promoted.

○ Production activities should be maintained in communities for agriculture, forestry, and fisheries and the deterioration of agricultural land and forests should be prevented so that national land can be appropriately conserved.

○ In order to make localities more resilient, effective policies that should stimulate the development and use of national land through "autonomy, decentralization, and cooperation," such as regional creation initiatives and initiatives that improve the community levels in local areas, should be considered and enacted.

(Indices that show current levels)
【Ministry of Agriculture, Forestry and Fisheries】 Share of forests where functions are maintained appropriately among artificial forests categorized as forests that maintains and promote functions of water source protection, etc. by municipal forest preparation plans, etc. 70% (2016)
【Ministry of Agriculture, Forestry and Fisheries】 Share of having achieved target goals of FY 2018 of number of villages with appropriate functions, etc. to prevent mountain disasters of surrounding forests 97% (2017)
【Ministry of Agriculture, Forestry and Fisheries】 Population exchange between urban cities and rural communities through village activities 87% (2016)
【Ministry of Agriculture, Forestry and Fisheries】 Number of participants in local joint activities mainly conducted communities 21% (2016)
【Ministry of Agriculture, Forestry and Fisheries】 Share of population of fishing villages where measures to reinforce disaster management functions are formulated 51% (2016)

8. Develop conditions for swift reconstruction of society and economy with improved resilience

8-1) Circumstances where reconstruction is delayed significantly due to stagnation in treatment of a large amount of disaster waste generated

○ Securement of free depots in accordance with estimated generation of disaster waste should be promoted.
○ Systems and facilities that enable the rapid treatment of disaster waste even during large-scale natural disasters should be maintained, including introducing independently operable waste incineration plants.
○ The local governments creating disaster waste management plan shoud be promoted and human resources should be developed through training and drills in order to improve the effectiveness of their measures.
○ Measures for hazardous waste from municipalities in times of disaster should be considered.
○ With regard to long-range transportation for disaster waste, a disaster waste transportation system that makes use of the characteristics of mass transportation, such as freight railways and marine transport, should be constructed.
○ Measures to suppress occurrence of large amount of disaster waste at the time of disasters should be promoted through enhancing the earthquake resistance, etc. of houses and buildings.

(Indices that show current levels)
【Ministry of Health, Labour and Welfare】 Share of having enhanced the earthquake resistance in disaster base hospitals and emergency and critical care centers throughout the country 89% (2017)
【Ministry of the Environment】 Share of having prepared temporary storage sites 49% (2017)
【Ministry of the Environment】 Share of having executed education and trainings (Municipalities) 10% (2017)
【Ministry of the Environment】 Share of having executed education and trainings (Prefectures) 51% (2017)
【Ministry of the Environment】 Share of facilities whose operation can be resumed at the time of disasters 22% (2017)
【Ministry of the Environment】 Share of having formulated the disaster waste management plan (Municipalities) 24% (2017)
【Ministry of the Environment】 Share of having formulated disaster waste management plan (Prefectures) 57% (2017)
【Ministry of the Environment】 Share of having formulated the disaster waste management plans (Prefectures) 57% (2017)

8-2) Circumstances where reconstruction becomes not feasible to achieve due to shortage of personnel in charge of supporting reconstruction-related activities (experts, coordinators, workers, engineers well versed in respective regions, etc.), and lack of visions for a better reconstruction

○ Formulation of BCP of business operators that constitute local industries including agriculture, forestry and fisheries, development of persons who undertake these and activities to enhance community capacity of districts should be promoted. In order to conduct reconstruction in a better manner than current status, construction visions considering disaster risks of communities, future images of industry structures, etc. should be considered even at ordinary times. By doing these, damage does not directly lead to movement into other districts. Moreover, plans on reconstruction of communities should be formulated beforehand on the basis of reconstruction visions and strategic preparation should be promoted even at ordinary times towards resilient community images defined by reconstruction visions.
○ Preparations for reconstruction should be in place in advance, such as systems and procedures relating to reconstruction and an understanding of issues, enabling the rapid and accurate determination of an urban reconstruction plan after a disaster.
○ In addition to training human resources in the construction industry responsible for the maintenance of reconstruction bases, young people who will lead the next generation are to be given mechanisms and opportunities for urban and regional development, and an environment that allows the smooth implementation of reconstruction work should be maintained in the case of an emergency, including consensus building towards reconstruction plans.
○ Engineers with expertise in a variety of fields should be trained in each area, while training for human resources who can carry out specialist research and make use of the results on site, utilizing experience of large-scale disasters and on-site training, should be offered.
○ Policies for the smooth and rapid provision of emergency temporary housing, etc., policies for the promotion of emergency repairs on residences, and options for diverse provision of housing in cooperation with reconstruction and urban development should be considered based on the perspectives of watching over households with people who need consideration, such as the elderly, and maintaining living environments and communities, indicating the direction in which they should be taken. Moreover, in addition to constructing a base for local communities that functions in normal circumstances, bonds between residents should be strengthened through forest maintenance activities by local activity organizations.
○ In order to prevent loss of medical treatment in disaster areas from leading to loss of peace of mind in residents' daily lives and workplaces for healthcare providers, as well as an outflow of residents, the disaster resistance of medical organizations should be improved.
○ In order to avoid a situation in which the vitality of localities declines, and resident populations decrease too much so that reconstruction is not possible in the case of an emergency, efforts should be made to inject energy into local economies, such as through regional creation initiatives, and implement effective policies that should stimulate the development and use of national land through "autonomy, decentralization, and cooperation, decentralized and coordinated nation.
○ To avoid occurrence of a large number of people who lose houses, enhancing the earthquake resistance in houses as well as measures to streamline land usage for solving the state where population is concentrated in locations with high disaster risks should be considered and implemented.

(Indices that show current levels)
【Ministry of Health, Labour and Welfare】 Share of having enhanced the earthquake resistance in disaster base hospitals and emergency and critical care centers throughout the country 89% (2017))

8-3) Circumstances where reconstruction is delayed significantly due to extensive and prolonged flooding damage caused by ground subsidence in broad areas, etc..

○ Preparation of basic geospatial information should be conducted even at ordinary times and high accuracy positioning data, etc. obtained through realization of seven satellites consternation of quasi-zenith satellite system (QZSS) should be utilized. By doing these, activities on disaster information sharing should be promoted through G-Spatial Information Center, SPI4D, disaster information hubs, etc.

○ After a disaster, high precision observation data from observation satellites should be rapidly and frequently shared with relevant organizations etc., and in addition efforts should be made concerning the training of human resources with the skills to interpret data, and the research and development of analysis tools.

○ In addition to steadily implementing countermeasures for flooding caused by earthquakes, tsunamis, floods, and storm surges, measures against coastal erosion, and consistent, comprehensive initiatives to manage sediment from mountain areas to the coast, disaster reduction measures should be promoted in watershed areas to help mitigate damage through measures for rapid emergency reconstruction and drainage, such as enhancing and strengthening TEC-FORCE systems and functions, including ensuring that someone is made responsible for disaster management and disaster reduction in the local construction industry, and maintaining wide-ranging support systems.

○ To secure support from national government for local governments, etc., reinforcement of disaster management capacity through execution of practical trainings in wide area considering large-scale disasters as well as improvement and reinforcement of systems and functions such as TEC-FORCE should be promoted.

(Indices that show current levels)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Dams [Local governments] 47% (2016)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Rivers [Local governments] 84% (2016)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Erosion control [Local governments] 62% (2016)

【Ministry of Agriculture, Forestry and Fisheries/Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated long life plan for each facility (plan for individual facility) Coasts [Local governments] 39% (2017)

【Ministry of Agriculture, Forestry and Fisheries/Ministry of Land, Infrastructure, Transport and Tourism】 Share of having completed current shoreline protection at eroding beach 77% (2017)

【Ministry of Agriculture, Forestry and Fisheries/Ministry of Land, Infrastructure, Transport and Tourism】 Share of having prepared coastal dikes, etc. in areas, etc. where large-scale earthquakes (e.g. Nankai Trough great earthquakes and capital inland earthquakes) are expected (Preparation of planned levels and enhancing the earthquake resistance) 47% (2017)

8-4 Loss of precious cultural assets and environmental assets, and decline or loss of tangible and intangible cultures due to collapse of regional communities

○ Cultural assets should be made earthquake resistant, including stone walls, etc., and disaster prevention facilities should be maintained. In addition, the environmental assets behind lifestyle and culture are to be healthily maintained, and their disaster resistance increased. At this time, consideration should be given to demonstrating the effects of “green infrastructure” that makes use of diverse functions, including the disaster management and disaster reduction functions of the natural environment, and initiatives are to be promoted.

○ Regardless of whether a region is urban or rural, the collapse of community does not just mean the loss of intangible folk cultural assets, it also affects tangible cultural assets such as buildings that are maintained in the community; therefore, local cooperative activities that should preserve the vitality of the community are to be set up in normal circumstances.

○ To make preparation of taking actions against damages of cultural assets, transfer of skills to repair those should be maintained.

○ Exhibition and storage methods at museums (history, art, folk, industrial, natural science, etc.) are to be inspected, and the damage to exhibited and stored items minimized. Moreover, in addition to exhibited and stored items, the tangible and intangible culture of each area is to be recorded as images, and measures should be taken to protect cultural assets, such as an archive.

○ In order to avoid a situation in which the vitality of localities declines, and resident populations decrease too much so that reconstruction is not possible, which may lead to the loss of lifestyle and folk culture in the event of an emergency, efforts should be made to inject energy into local economies, such as through regional creation initiatives, and implement effective policies that should stimulate the development and use of national land through “autonomy, decentralization, and cooperation.

(Indices that show current levels)

【Ministry of the Environment】 Share of having reached target number of wild boars in "Drastic measures to strengthen capture of designated wildlife species for control” 53% (2011)

【Ministry of the Environment】 Share of having reached target number of sika deer in “Drastic measures to strengthen capture of designated wildlife species for control” 43% (2011)

8-5) Circumstances where reconstruction is delayed significantly due to sluggish progress in ensuring commercial land and developing temporary housing, temporary stores, and temporary work places

○ In order to secure smooth recovery and reconstruction after disasters, metes, bounds, etc. should be clarified by cadastral surveys, etc. However, the Share of conducting cadastral surveys remains at 52% (2017). For this reason, supports should be provided to local governments to promote cadastral surveys. In addition, latest surveying techniques such as GNSS surveys should be introduced improve the effectiveness of these tasks and focus should be laid on preparing basic information of boundaries of public and private sectors in potential districts of disasters. Moreover, focus should be laid on creating registry equipped maps in metropolises, disaster-affected areas, etc. on the basis of "Secondary ten year plan for tasks of creating registry equipped maps."

○ In addition to maintaining the stable operation of GNSS Continuously Operating Reference Stations (CORS) established throughout the country as location information infrastructure, changes to the earth's crust are to be noted in real-time, and information useful for measures against earthquakes, tsunamis, and volcanic disasters is to be shared. Moreover, to ensure the stable operation of CORS, failures and suspensions are to be preemptively prevented, and functions are to be optimized, including the renewal of equipment.

○ National government, local governments, etc. should maintain functions to comprehend and analyze disaster situation immediately after occurrence of large-scale natural disasters. In order to do this, preparation, upgrade and provision should be conducted on disaster prevention geographical information like basic geospatial information such as Digital Japan Basic Map, nationwide active fault zone information that shows relationship between natural disasters and geography, etc. In addition, digital survey results arranged by Geospatial Information Authority of Japan, national government, local governments, etc. should be maintained so that they can be searched, browsed and obtained comprehensively.

○ There are concerns that in the future there will be a lack of responsible parties in the construction industry, due to the decrease of young people entering the industry and the aging of skilled workers. The construction industry plays a vital role in organizing temporary housing, shops, and offices to aid reconstruction; from the perspective of guaranteeing and training these parties there should be improvements in the working environment. In addition, in order to maintain supply chains that provide the necessary fuel for the maintenance and operation of temporary housing, shops, and offices, measures to resolve so-called SS underpopulated area issues should be promoted.

○ Since aging population increases and a lot of succession of their estates is expected, the number of land with unknown owners is expected to grow. For this reason, with regard to land where all or part of their ownership is unknown, special systems to streamline expropriation procedures under certain conditions, new systems where rights to use them for specific periods are set for public projects and systems to streamline search of owners should be promoted in order to secure land for recovery and reconstruction smoothly. Moreover, the way of registration system and land ownership should be considered and improved: these include systems of incorporating the information of transfer of ownership due to succession in registration, systems of releasing land that are unmanaged, etc.

○ In order to enable the rapid and accurate determination of an urban reconstruction plan after a disaster, systems and procedures relating to reconstruction should be considered, and image training for reconstruction and urban development, which preemptively grasps issues involved in reconstruction in the case of a disaster, should be implemented; in addition to continuing to educate local public bodies about advance preparations for reconstruction, an environment where it is easy to for local public bodies to focus on these preparations should be considered.

○ In order to rapidly ensure housing for disaster victims and rebuild their lifestyles, improvements should be made to operations, such as making damage assessment surveys of housing more rapid, and points that must be addressed by local public bodies in times of a disaster should accurately be made general knowledge in normal circumstances and in times of disaster through information sessions, etc. Moreover, policies for the smooth and rapid provision of emergency temporary housing, etc., policies for the promotion of emergency repairs on residences, and options for diverse provision of housing in cooperation with reconstruction and urban development should be considered based on the perspectives of watching over households with people who need consideration, such as the elderly, and maintaining living environments and communities, indicating the direction to be taken by local public authorities.

○ In times of large-scale disasters, it is necessary to secure sites for various disaster response services, and so the expected use of the sites for each service, from use in normal circumstances to the emergency stage to the recovery and reconstruction stages, should be collected for local public bodies, and adjustments encouraged.
○ To avoid occurrence of a large number of people who lose houses, enhancing the earthquake resistance in houses as well as measures to streamline land usage for solving the state where population is concentrated in locations with high disaster risks should be considered and implemented.

(Indices that show current levels)
【Ministry of Justice】 Area that achieved map creation 21% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of progress of making preparation on information on active fault zones throughout country 66% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having conducted cadastral surveys 52% (2017)
【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having made preparation of boundaries of public and private sectors in areas where cadastral surveys have not been conducted among high risk potential areas where whole buildings are expected to collapse due to tsunamis of Nankai Trough earthquakes 54% (2017)

8-6) Tremendous influence on the national economy etc., due to damage by international harmful rumor, credit uneasiness, delay in recovery of productivity, and a large number of unemployment/bankruptcy

○ In order to ensure that Japan's valuable natural world, tourist attractions, and safe and secure social and economic environment are not lost due to a large-scale disaster, maximum preparations should be made, and the construction of systems that enable initial responses which consider any information to be transmitted and transmission routes according to the circumstances, in order to disseminate correct information within Japan and overseas in times of disasters, should be promoted. In addition, a resilient society that should not yield to disaster should be constructed, with help from international society, through cooperation for training human resources such as government officials and local leaders who should shoulder the responsibility of disaster management and reconstruction in each country.

○ Actual operation of the law relating to reconstruction from large-scale disasters (Law No. 55 of 2013) should be enhanced even at ordinary times. Activities should be executed on sharing of activities, procedures, etc. relating total recovery by relevant ministries and local governments to execute recovery from disasters efficiently and effectively. In addition, improvement should be made to enhance measures of recovery and reconstruction from disasters and to boost response capacity of local governments, etc. that cope with support of victims at the time of disaster occurrence.

○ In order for rapid reconstruction to take place after large-scale natural disasters, disaster waste management plan should be determined and systems relating to the long-range transportation of disaster waste should be constructed. Moreover, in addition to carrying out training for people who should be responsible for local industry in the future, supporting the entry of local goods into overseas markets, and implementing initiatives for local creation and initiatives that should improve local community levels, an environment that allows the smooth implementation of reconstruction work is to be maintained, including consensus building towards reconstruction plans in an emergency, such as considering a vision for reconstruction in normal circumstances.

○ In order to ensure the continuity of financial settlement functions in times of large-scale disaster, financial institutions must determine a BCP and ensure its effectiveness. Financial institutions who have not yet determined their BCP should be encouraged to do so, and there should be continuous discussions, etc. concerning the effectiveness of the BCP that has been determined.

○ Methods for evaluating the impact of earthquakes and tsunamis on industrial facilities should be determined. Moreover, to ensure that supply chains are not irreparably damaged in times of large-scale disasters, the maintenance of private logistical facilities that are highly resistant to disasters should be promoted, the BCPs for manufacturing and logistics companies should be determined, and above all, there should be a focus on small and medium-sized enterprises where there are delays in progress; the joint determination of BCPs by owners and logistics companies should also be encouraged.

(Indices that show current levels)

【Financial Services Agency】 Status of having made preparation beforehand regarding information transmission 100% (2016)

【Ministry of Land, Infrastructure, Transport and Tourism】 Share of having formulated BCP among logistics providers (Large companies) 63% (2015)

Note 1) Vulnerability assessment was conducted as of August 2018.

Note 2) Current values indicated as Indices of current levels come from the data as of end of fiscal year in the brackets.

(Attachment 3) Results of the Vulnerability Assessment for Respective Sectors of Measures

1. Individual sectors of measures

1) Administrative Functions, Police and Fire services, and Disaster Prevention Education, etc.

[Administrative functions]
(Enhancement of business continuity and disaster response capacity of central administrative organizations)
○ Each central government agency needs to conform to their BCP and other policies to keep their buildings earthquake-resistant, ensure power supply, make information and communications systems redundant, stockpile supplies, and reserve alternative government buildings so that their prioritized emergency activities will continue to function even if impacts inflicted by large-scale natural disasters such as a capital inland earthquake continue over a long period of time.
○ Trainings and education should be provided on the basis of BCP of total government and BCP of each ministry considering various situations: these situations include difficulty to continue work at government offices at the time of large-scale disasters, insufficiency of gathered personnel, long-term execution of emergency priority work, etc. In addition, plans should be reviewed several times through assessment of effectiveness of plans.
(Enhancement of business continuity and disaster response capacity of local governments)
○ While using guides for formulating business continuity plan for municipalities, manuals for securing business continuity for local government at the time of large-scale disaster occurrence, guidelines relating to support accepting systems at the time of disasters for local governments, etc., formulation and review of BCP of local governments as well as measures to secure effectiveness should be promoted. Moreover, to avoid dysfunction of administration due to increase in disaster response work, damage of employees and families, inability to gather employees at government office buildings due to traffic paralysis, etc., activities should be executed on securement of communication method, securement of methods to collect and notify information on the way to the gathering place, utilization of expertise owned by private companies as well as by professionals, experts, etc. of community and utilization of facility equipment, organizational systems, etc. of community. In addition, education considering various situations as well as joint drills, etc. with specific goals should be continued.
○ In order to avoid significant deterioration in functions due to damages to employees, facilities, etc. of local governments including the police, fire services, etc., activities such as enhancing the earthquake resistance in facilities and ensuring the availability of power supply and energy should be promoted.
○ Local governments should make their facilities earthquake-resistant and ensure the availability of power supply and energy in order to avoid the significant degradation of capabilities due to the victimization of local government staff and facilities including those engaged in police and fire services.
(Others)
○ Ideal systems should be secured to execute tasks smoothly even in an emergency: for example, prompt collection and sharing of information necessary to cope with disasters such as damage information should be conducted and effective collaboration of relevant agencies such as national government, local government and private companies should be realized.
○ To secure support from national government for local governments, etc., reinforcement of disaster management capacity through execution of practical trainings in wide area considering large-scale disasters as well as improvement and reinforcement of systems and functions such as TEC-FORCE, etc. should be promoted.
○ Systematic, focused initiatives should be implemented to make government buildings resistant to earthquakes and tsunamis. Office furniture in government buildings should be fixated to walls and non-structural elements like ceilings should also be made earthquake-resistant.

[Police and fire services]
(Making information collection, delivery, and communications sophisticated and redundant)
○ J-Alert should be used to securely communicate emergency information to residents and ICT should be leveraged to share information so no one is left behind without a chance to escape.
○ The Self-Defense Forces (SDF) should enhance and advance the disaster resistance capacity of information and communications functions by equipping helicopters with image transmission devices.
○ Police capabilities should be ensured at the time of disaster by upgrading communications and command capabilities to support police activities, advancing the capabilities of police aircraft and police communications support teams, and making communications infrastructure and facilities more robust and sophisticated.
(Enhancing disaster response capacity by improving human resources and organizations through training and enhancing equipment and facilities)
○ SDF, police and fire services, and the Japan Coast Guard should develop their structures to strengthen disaster response capacity for wide-area coverage and enhance their facilities and equipment for disaster response during nighttime. To implement various drills including disaster prevention drills, they should work with related agencies in planning phases to respond to a variety of disasters and situations, prepare for joint drills, and develop training facilities. In addition, they should develop and enhance the TEC-FORCE structure and capabilities, enhance flood control, volunteer firefighter, and disaster prevention volunteer groups, and ensure the availability of construction human resources for removing debris on roads. Japan and the United States should clarify mutual communication methods to integrate operations with U.S. Armed Forces right after the occurrence of a large-scale disaster. Both countries also need to improve awareness and operations to receive support teams from abroad and adjust joint operations with them.
○ Disaster response capabilities of police disaster relief teams should be further improved based on practical training in line with local characteristics and actual disasters and joint drills with related agencies. Insights obtained from drills should be promptly shared with related agencies. A structure should be developed to prevent security degradation by making the most of infrastructure and expertise.
○ Capabilities of disaster response agencies should be enhanced through improved facilities and equipment and a variety of drills and training to deal with various root causes triggering fires. Initiatives for ensuring water supply as well as preventing fires and mitigating their impact should be enhanced by enhancing permanent fire-fighting capabilities based on wide-area coverage of fire-fighting activities and executing mutual agreements with private companies for providing water.
(Enhancing the disaster resistance capacity of facilities)
○ Police, SDF, and fire-fighting facilities and offices that server as local activity centers should be made more disaster-resistant by promptly making them earthquake-resistant and ensuring the availability of power supply and energy.
○ Activities should be executed on promotion of preparation of fire command center of high functionality and fire disaster management facilities such as seismic storage tanks.
(Others)
○ Local governments and related central government agencies should work together to improve the disaster resistance capacity of activity routes used at the time of disaster, enhance their facilities and equipment, promptly understand traffic situations based on automobile probe information collected by public and private sectors, modify wide-area traffic control information systems to deal with increasing volumes of traffic information aggregated by the National Police Agency, and make use of satellites, artificial intelligence (AI) technologies, big data, IoT, and ICT to collect, share, and deliver information so they can develop a required structure and streamline their operations such as prompt and appropriate traffic management to ensure road and sea lane availability.
○ In order to meet the need of life at evacuation centers, etc. as much as possible, activities should be executed on preparation and upgrade of equipment as well as on repair, etc. considering “Guidelines of activities for securing good life environments at evacuation centers.

[Disaster prevention education]
○ Emergency drills, disaster prevention education, etc. on how to execute activities to protect oneself should be promoted through schools, offices, community organizations, etc. In addition, planning on voluntary disaster prevention activities by residents, etc. should be promoted through spread, education, etc. of local disaster management planning systems. In addition, proactive usage plans of independently operated evacuation centers should be created to respond to the needs of households with infants, women, and elderly people.
○ As human resources, organizational systems, etc. tend to be insufficient in disaster prevention department etc. of local governments, etc., human resource development and formulation of ideal organizational systems should be conducted through improvement, reinforcement, etc. of flood control companies.
○ Special research and study should be implemented to incorporate lessons learned from past disasters to field operations and human resources should be developed to leverage research results in field operations, while each local area needs to develop specialists well versed in various domains.
○ The Sendai Framework for Disaster Risk Reduction disaster should be further promoted and retained all over the world and experience, insights, and technologies obtained from Japan's disasters should be leveraged to implement strategic international disaster prevention cooperation and promote international disaster management cooperation and other initiatives through international organizations such as the United Nations.
○ The World Tsunami Awareness Day should be used as an opportunity to engage in international discussions on disaster risk reduction against tsunamis so better actions will be detected based on broad perspectives.

2) Housing and Cities

(Making houses and buildings earthquake-resistant)
○ Houses and buildings should be made earthquake-resistant to avoid issues such as people injured or killed by an earthquake, victims trapped inside buildings, unavailability of evacuation routes and emergency transportation routes due to collapsed buildings, confusion triggered by a large number of people trying to go home at the same time to confirm the safety of family members, and the destruction of local communities triggered by a large number of disaster victims with damaged homes or losing their homes who move to other areas.
○ To make houses and buildings earthquake-resistant, multiple approaches should be integrated by making condominium owners aware of earthquake resistance requirements of old buildings by promotion of rebuilding old condominiums, making earthquake resistance tests mandatory and offering assistance to the renovation of targeted buildings to make houses earthquake-resistant, improving building evaluation methods, and developing financial products. Moreover, countermeasures against long-period ground motions should be deployed to existing high-rise buildings. Residential areas should also be tested for earthquake resistance and made earthquake-resistant.
○ Government facilities, school facilities, social education facilities, sports facilities, medical facilities, social welfare facilities, etc. should be made earthquake-resistant. In particular, initiatives are belated to make local government buildings that serve as disaster prevention centers earthquake-resistant and this should be expedited. Moreover, preventative measures will be put in place to ensure that non-structural elements such as ceilings will not fall in, and countermeasures for aging should be promoted.
(Measures against fires)
○ Local governments are working on improving and developing crowded urban areas (5,745 ha as of 2011) that are particularly risky to trigger large-scale fires at the time of an earthquake, but this issue has not been resolved yet. Public and private sectors should work together to resolve this issue systematically by developing roads, green space, and parks that help prevent the spread of fire, removing and rebuilding outdated buildings, and making them fire-resistant. After these goals are achieved, crowded urban areas should be further improved from a medium and long-term perspective.
○ Spread of seismic breakers should be promoted to prevent electric fires after earthquakes.
○ Preparation of parks, green areas, squares, etc. as evacuation sites should be promoted.

(Measures for underground space and people stranded due to a disaster)

○ As for underground space, disaster management prevention measures should be promoted both in terms of non-structural aspect and structural aspect to prevent confusion and confinement of users at the time of large-scale earthquakes. Moreover, preparation of spaces and routes should be promoted so that users can temporarily evacuate from buildings, etc. that may collapse. Flooding in underground malls should also be prevented.

○ Activities should be further executed not only on planning to secure urban renewal safety, planning to manage disasters in areas, etc. but also on preparation to secure safety of residents, etc. on the basis of plans.

○ With regard to public facilities, spaces that accept victims in buildings of private companies, etc. and stockpiling warehouses where victims can stay as well as facilities relating to acceptance of victims, enhancing the earthquake resistance and other preparation should be promoted so that places necessary for victims can be secured to accept a large number of stranded persons. Moreover, activities should be executed on preparation of parks and green spaces that can be used as locations to provide rests, information, etc. to those who return home on foot.

○ To alleviate the state of excessive concentration of population in the centers of metropolises during daytime which can cause a large number of stranded persons due to paralyzation of railways, etc., effective measures of boosting development of an autonomous, decentralized and coordinated nation and streamlined utilization of land should be considered and conducted.

(Ensuring the availability of water and capacity for draining and processing dirty water)

○ Availability should be ensured for drinking water and daily life water used at disaster evacuation centers, clean water for artificial dialysis and other purposes, water for fire-fighting, and water for industrial and agricultural purposes.

○ To ensure the availability of water at the time of disaster, public water suppliers and other operators should create earthquake resistance plans and strategically maintain/upgrade facilities by enhancing the earthquake resistance and longevity of water facilities. Collaborative arrangements should be made to recover water services for hospitals in a preferential manner. Prefectural governments and water operators should work together to enhance human resources and expertise, make effective use of rain and recycled water, and leverage underground water as an alternative water source used in crisis.

○ To secure minimum functions of drains even at earthquake occurrences, enhancing the earthquake resistance in main pipes of drains should be conducted. In addition, BCP of drains of each organization should be brushed up on the basis of drain BCP plan manual, etc. which have been revised according to expertise obtained from Kumamoto earthquake (2016). Moreover, preparation should be made for the cases in which no drains can be utilized.

○ Sewers should be strategically maintained and managed to enhance their longevity. Damaged underground structures may lead to road subsidence and make roads unusable. Thus, underground structures should be made earthquake-resistant and water leakage that may trigger cavities around underground structures should be checked, repaired, and filled. Ground information should be further collected, shared, and leveraged.

(Enhancement of disaster response capabilities of various facilities)

○ Since many school facilities are designated as evacuation centers, their safety should be ensured by making those facilities including non-structural elements earthquake-resistant and countermeasures for aging facilities and their disaster management function should be enhanced by ensuring the availability of toilets and in-house power generation facilities, maintaining warehouses storing supplies, and making facilities barrier-free. In addition, conditions for confirming the safety of family members should be developed by appropriately providing safety information of children in a timely manner so that confusion will be minimized by a large number of people trying to go home at the same time.

○ When there are many injured persons, enough space should be secured for housing them in ideal environment inside disaster-affected areas or transferring them to places outside disaster-affected areas: this space should be secured for patients waiting medical examinations and medical treatments as well as for patients who completed them.

○ Activities should be executed to promote spread of use of renewable energy and hydrogen energy, cogeneration system and to promote spread of systems, etc. to supply electric power from fuel cells, storage batteries, electric cars and fuel cell electric vehicles into each family, building, hospital, etc. Formulation of smart community should be also conducted. Through these activities, diversification and decentralization of energy supply sources are promoted to avoid and mitigate disaster risks: for example, independent and decentralized energy should be introduced.

(Disaster management measures for cultural properties)

○ Cultural properties including stone walls and other assets should be made earthquake-resistant.

○ Exhibition and storage methods at museums (history, art, folk, industrial, natural science, etc.) are to be inspected, and the damage to exhibited and stored items minimized. Moreover, in addition to exhibited and stored items, the tangible and intangible culture of each area is to be recorded as images, and measures should be taken to protect cultural assets, such as an archive.

(Supporting people's life for reconstruction)

○ Seminars should be held in normal times and at the time of disaster occurrence to appropriately notify related agencies of improved operations such as quick damage inspection and certification of houses and what local governments should work on at the time of disaster. Actions should be taken to explore and decide how to provide temporary housing in a streamlined, quick manner, temporarily repair houses, and offer multiple housing options in line with area reconstruction activities by taking into consideration the maintenance of daily life environments and communities and the care of people who need assistance such as the elderly.

3) Healthcare and Welfare

(Making medical facilities earthquake-resistant and developing other facilities)

○ Medical and social welfare facilities should be made earthquake-resistant. In particular, all disaster base hospitals and emergency and critical care centers should be made earthquake-resistant. Measures (e.g. transfer to safer locations) should be taken for medical facilities located within estimated flooded areas of Nankai Trough earthquakes and other disasters.

○ With regard to securement of energy in disaster base hospitals, activities should be executed to continuously boost awareness on the necessity of storing energy to protect oneself which includes fuel used for non-utility generation facilities, etc. In addition, collaboration between relevant agencies should be enhanced so that fuel, etc. should be allocated at high priority. Moreover, activities should be executed to enhance disaster-resistant capacity: activities should be executed on introduction of facilities of high energy efficiency, introduction of independent and dispersed energy facilities, utilization of various energy sources.

○ With regard to hospitals with patients who require large amount of clean water for dialysis, etc., activities should be executed on multiplexing of water sources using ground water, etc. at ordinary times as well as formulation of collaboration systems to recover water supply at high priority. Preparation should be made for the cases in which drains cannot be used.

○ With regard to national university hospitals, preparation of facilities such as reinforcement of disaster management and mitigation functions should be conducted in order to serve functions and roles in each area.

(Developing disaster medical care structures)

○ Compared with the demand of medical resources (water, food, fuels, doctors, medicines, medical facilities, etc.) that can cope with disasters where many injured persons are expected such as Nankai Trough earthquakes or capital inland earthquakes, the volume of medical resources that can be supplied in areas and can be supplied from areas outside disaster-affected areas can be insufficient considering damage by these disasters. Specific consideration should be made across ministries and agencies including volume, speed, traffic access, etc. of transport methods and supply systems of medical resources should be established.

○ With regard to slightly injured persons who will compose most part, systems should be formulated so that this can be responded through first aid of mutual aid of community. By doing this, demand of medical resource should be alleviated.
○ With regard to DMAT and DPAT, number of necessary teams should be considered on the basis of damage estimation, etc. to enhance development based on plans. In addition, experience on disasters should be utilized to regularly review systems of development and contents of activities so that constant maintenance and improvement of capacity can be made. Apart from DMAT and DPAT, human resource development across various occupation types should be conducted to correspond to medical support activities, etc. at the time of disaster. Moreover, execution should be executed on development of major staffs of disaster medical treatment by the Self-Defense Forces to cope with a large number of injured persons.
○ By establishing health care and medical adjustment headquarters under disaster control headquarters of prefectures of disasters to adjust dispatch of health care and medical activity teams, etc. gathered for support, resource allocation corresponding to the need of health care of each disaster-affected area as well as formulation of systems for effective activities through ideal collaboration of each health care and medical activity team should be conducted. Moreover, disaster medical coordinators that conduct dispatch adjustment, etc. and teams trained to support command coordination capabilities of the section coordinating healthcare activities and public health centers should be developed.
○ Facilities and human resources should be enhanced to enhance disaster response capabilities by developing logistical support human resources who assist with the effective dispatch of disaster relief teams and the supply of disaster relief goods at the time of disaster.
○ Required facilities, functionalities, and equipment should be explored and defined to enhance aircraft transportation bases and temporary medical facilities (Staging Care Unit, SCU) located there to transport and care severely injured patients who cannot be treated within disaster areas to external areas. In order to permanently maintain such medical equipment needed at the time of disaster, it should also be used in normal times.
○ A BCP should be crated to prevent the service interruption of disaster base hospitals.
○ In case primary doctors become victims or become refugees of wide areas, other medical institutions should be able to refer to medication records, etc. of victims so that ideal treatments can be conducted.

(Measures against infectious diseases and management of daily life and health for disaster victims)

○ Appropriate medical checks and vaccination should be implemented in normal times and the sanitation of facilities that serve as evacuation centers should be maintained in good conditions at the time of disaster to prevent infectious diseases such as measles, rubella, influenza, norovirus, and O157 among evacuees. A structure enabling disinfection and extermination of insect pests as required should be maintained in line with the Act on the Prevention of Infectious Diseases and Medical Care for Patients with Infectious Diseases (Act No. 114 of 1998). Each local government should plan a mechanism to deliver health management information (e.g. accurate information on the prevention of infectious diseases) to residents in order to support people who evacuate to other locations than evacuation centers.
○ Through collaboration by health centers, administration, health personnel, NPOs, local residents, etc., systems to conduct medium- to long-term care and health management should be established: frequent occurrence of venous thrombosis (so-called economy class syndrome) and disorders due to stress should be avoided mainly from disaster acute phase to disaster subacute phase; and health of victims should be protected from mental issues caused by trauma due to disasters, loss experience, economic unrest for the future and deterioration of human relations and bonds during reconstruction phase after disaster subacute phase.
○ With regard to medicines and equipment necessary for hygiene management of evacuation centers, etc., ideal securement should be made through stockpiling and collaboration with distributors, etc. at the time of disasters.
○ A structure should be ensured to support people who need care in daily life but cannot be accommodated by general evacuation centers and provide and operate welfare evaluation centers that accept those people.

4) Energy

(Enhancement of energy supply structures)

○ Effective measures should be created and implemented to create and use the national land in an “autonomous, distributed, and coordinated” manner in order to mitigate the concentration of energy facilities such as power plants in areas with great disaster risk.

○ With regard to collaboration plans on supply of petroleum at the time of disasters, collaboration plans on supply of petroleum and gas at the time of disasters and series of BCPs, their effectiveness should be enhanced through execution of trainings, roll out of good case studies among relevant people, etc. Constant reviews should be also conducted on those plans. A structure should be created to enable speedy transportation of fuels at the time of disaster by streamlining fuel transportation procedures.

○ Stockpiling of petroleum products, petroleum and gas by the national government should be maintained.

○ To secure supply routes of fuels, etc., countermeasures against disasters on transport foundation should be promoted. In addition, improvement in equipment and materials, collection of passage propriety information, etc. should be promoted to enhance formulation of systems of prompt opening of transport routes and prompt recovery of facilities through collaboration of relevant agencies.

(Advanced capabilities of energy-related facilities)

○ Oil factory facilities and high-pressure gas facilities should be made earthquake-resistant based on the resilience assessment of oil factories by making those facilities resistant to earthquakes and liquefaction, stopping them to ensure safety, and reinforcing embankment. High-pressure gas facilities should be securely made earthquake-resistant by revisiting earthquake-resistant design standards in line with large-scale earthquakes such as Nankai Trough earthquakes.

○ With regard to gas pipes of aged deterioration, principles of enhancing the earthquake resistance should be notified and exchange of those to polyethylene pipes with corrosion resistance and earthquake resistance should be promoted. Moreover, trainings, etc., on prompt recovery of gas supply should be continued to be executed.

○ Since the number of small-scale renewable energy facilities (e.g. solar power generators) shows a rapid increase, electricity facilities should be assessed for their resilience to natural disasters and related standards should be developed. Based on this, disaster resilience and recovery capabilities should be enhanced for power plants, substations, power transmission networks, and electric power systems.

(Increasing variety of energy supply methods)

○ Activities should be executed to promote spread of use of renewable energy and LP gas and kerosene, cogeneration system and to promote spread of systems, etc. to supply electric power from fuel cells, storage batteries, electric cars and fuel cell electric vehicles into each family, building, hospital, etc. Formulation of smart community should be also conducted. Through these activities, diversification and decentralization of energy supply sources are promoted to avoid and mitigate disaster risks: for example, independent and decentralized energy should be introduced.

○ Through preparation of resident base service stations, execution of emergency drills, etc., activities are executed on reinforcement of disaster response capacity of service stations and liquefied petroleum gas main filling stations that function as community energy bases at the time of disasters. Moreover, to maintain supply chains of fuel supply, measures should be promoted to solve problem of areas where only small number of service stations exist. In addition, support should be reinforced on measures on consumer side which include stockpiling of fuels, etc.

5) Finance

(Enhanced capacity of facilities related to financial institutions)

○ Most of the preparation of Central Bank, financial institutions and Financial Services Agency, securement of redundancy of systems and communication methods, enhancing the earthquake resistance of shops, etc., and securement of backup sites of system centers, etc., has been completed. However, measures should continue to be implemented at all major financial institutions from now on.

(Enhanced structures of financial services)

○ In order to ensure the continuity of financial settlement functions in times of large-scale disaster, financial institutions must determine a BCP and ensure its effectiveness. Financial institutions who have not yet determined their BCP should be encouraged to do so, and there should be continuous discussions, etc. concerning the effectiveness of the BCP that has been determined.

(Others)

○ A structure should be enhanced to enable initial actions in line with types of information to be disseminated based on situations and information delivery channels so that accurate information is disseminated domestically and internationally at the time of disaster.

6) Information and Communications

(Enhancement of information delivery and sharing)

○ In order to provide information securely through J Alert to all residents, multiplexing of methods to transmit information in connection with J Alert should be promoted.

○ Secure and prompt information delivery methods for residents including the elderly and people with disability should be implemented in several ways by digitalizing local governments' disaster management radio, promptly and accurately transmitting L-Alert, improving the accessibility of radio broadcasting for hearing-impaired people, providing information to tourists, and making police and fire service communication infrastructure and facilities more robust and sophisticated.

○ Measures should be taken to prevent the interruption of radio broadcasting that serves as an important information delivery mechanism for residents at the time of disaster by transferring transmitting stations and developing FM complementary stations, supplemental transmitting stations, and relay stations. In addition, information should continuously be delivered even in case television and radio broadcasting is interrupted by aggressively developing and leveraging substitute measures such as the quasi-zenith satellite system (QZSS), implementing optical cables for cable television networks, and making those networks redundant.

(Enhanced disaster resistance capacity of information communication facilities)

○ With regard to technological standards relating to damages, defects, etc. of telecommunication equipment, execution of ideal review is planned on the basis of disaster situations, etc. (communication interruptions, power cuts, etc.) and each carrier should continue to conduct self-check of compliance of these standards.

○ In order to secure disaster rescue operations when lines of private carriers are stopped, ideal preparation should be made on foundation of systems of information and communications of the police, the Self-Defense Forces, the Japan Coast Guard, etc.: activities should be executed on improvement in disaster-resistant capacity, utilization of new technologies such as small unmanned aerial vehicles, etc.

○ By providing information of "Vulnerability assessment manual for telecommunication lines" through cooperation of telecommunications carriers, supports should be made on measures against vulnerabilities of systems of information and communications of government ministries.

(Technology development)

○ Diversification of secure methods to collect information should be enhanced thorough prompt comprehension of traffic status utilizing automotive probe information, etc. of government and private companies, upgrade of area traffic control systems to respond to growth of traffic information integrated at National Police Agency, provision of earthquake related information using GPS swell meters, observation networks for earthquakes and tsunamis in sea areas, GNSSI information providing system and development of integrated disaster information systems as well as utilization of IT and SNS.

○ Relevant measures should be improved to avoid system down and loss of storage media.

○ Research and development should be promoted on component technologies, systems, etc. relating to collection, analysis and transmission of information.

(Others)

○ Safety should be ensured for post office buildings with insufficient earthquake resistance. To this end, Japan Post Co., Ltd. should enhance the earthquake resistance of its directly-managed post office buildings. It should also rework its BCP as required to ensure its effectiveness.

7) Industrial Structures

(Assistance with the creation of business continuity structures)

○ Manufacturing companies and their stakeholders should work together to create BCPs. In particular, medium and small-sized companies should work on this initiative since their efforts are belated. To this end, root cases for the belated creation of BCPs should be analyzed and worked on. Initiatives should be explored to allow private companies to autonomously work on their BCPs.

○ Supply chains are getting more complex due to the deepening of domestic and international division of labor. A BCP should be developed to integrate a wide range of stakeholders such as manufacturers (cargo owners), logistic operators, related government agencies, and industries. Since supply chains include not only domestic operators but also foreign operators, disaster management function of foreign operators should be enhanced by sharing Japan's insights with them.

○ In order to enhance the creation of BCPs and improve their effectiveness, private companies and their management should be educated through manuals created for each industry and sector and participation in seminars, workshops, and drills. Human resources who engage in the creation of BCPs and business continuity activities should be further developed.

○ Disaster response capacity of industrial facilities should be enhanced by making them earthquake-resistant and ensuring the availability of emergency power supply, while initiatives should be promoted to improve energy supply, logistics, and information communication infrastructure supporting supply chains. Actions should also be explored and taken to make supply chains redundant, ensure the availability of alternate parts, transfer and distribute areas with high disaster risk such as factories and offices for the avoidance of risks.

○ Regional relocation and expansion of the headquarter function of companies should be actively supported, and the development of a business environment should be comprehensively promoted to ensure that the relocation and expansion proceed smoothly.

(Ensuring human resources for construction)

○ The construction industry that will share the responsibilities for developing recovery/reconstruction infrastructure (e.g. ensuring the availability of roads) at the time of disaster have concerns about the availability of future human resources due to a decreasing number of new young workers and the aging of skilled workers. Work conditions of those workers should be improved to attract and develop workers.

8) Transportation and Logistics

(Making transportation facilities earthquake-resistant and enhancing their disaster resistance capacity)

○ It is critical to prevent the danger of users due to collapsed facilities, ensure the availability of evacuation routes and disaster relief routes, provide transportation routes of disaster relief teams such as DMATs, supplies, and fuels, secure transportation routes of severely injured people, ensure routes enabling administrative staff and workers engaging in information delivery to report to their office, prevent the interruption of supply chains, and minimize damage and enable prompt recovery. To this end, actions should be taken to make transportation facilities (e.g. roads, railroads, ports, beacons, and airports) earthquake-resistant through the reinforcement of bridges and other measures, deal with liquefaction, protect slopes, prevent slope landslide, reinforce embankment, prevent flooding in underground malls, implement measures against disasters such as tidal waves, tsunamis, and storm surges, and implement countermeasures for aging buildings and facilities. In order to prevent blocked routes due to the destruction of structures close to these old facilities, nearby residential land, and other facilities such as utility poles, it is also important to take necessary actions to areas close to these facilities and remove dangerous facilities located there. Actions should be taken to make logistics facilities disaster-resilient. In addition, technology development should be enhanced and put to practical use to maintain and upgrade facilities and resources by improving the disaster resistance capacity of transportation infrastructure and dealing with a decreasing number of engineers.

○ Electric transmission lines should be buried underground in order to prevent blocked roads and interrupted power supply due to collapsed utility poles.

○ Spillage from containers, automobiles, ships, oil tanks, etc. due to large-scale tsunamis may lead to significant secondary disasters such as damage of urban areas and large-scale fires. Because of this, measures to prevent flotsam should be promoted.

○ Roads can become impassible due to subsidence caused by damage to underground structures; underground structures should be made earthquake resistant, water leakages, etc. that cause cavities around underground structures should be examined, repaired, and the cavity filled in, and information about the ground should be collected, shared, and used.

(Developing transportation networks and bases)

○ High-standard alternative road networks and emergency transportation roads should be developed to enable the simultaneous transportation of relief supplies, disaster relief reams, disaster relief support teams such as DMATs, and recovery staff and facilities to disaster-stricken areas through several routes based on wide-area relief assistance, support wide-area evacuation, or ensure the availability of transportation routes of severely injured people. Measures should be taken to ensure the availability of multiple transportation routes by setting up entry routes of emergency vehicles, improving access to high-standard arterial highways, developing Shinkansen railway networks, and integrating ground, marine, and air transportation modes and to make marine transportation bases earthquake-resistant in case ground transportation is unavailable. Moreover, the capacity of logistically important road transportation networks should be enhanced so that they ensure stable transportation in normal times and at the time of disaster.

○ Distribution infrastructure networks enabling shorter lead time and greater industrial competitiveness should be developed to prevent the interruption of supply chains. The availability of ground transportation capabilities such as roads and railroads should be ensured as substitute measures for port and airport capabilities.

○ Evacuation routes and sites from tsunamis and other disasters should be developed.

○ To avoid occurrence of isolation of villages, multiplexing of access routes, etc. should be conducted. Moreover, designation of locations that can be used as landing fields should be conducted beforehand and preparation of necessary equipment should be enhanced so that access can be also made from air.

○ Venues that serve as local community activity bases in normal times and as wide-area support acceptance bases at the time of disaster should be developed.

○ In situations in which transport networks and destinations are concentrated in a place of high disaster risk, these should be decentralized due to concerns that this could lead to complete paralysis in an emergency, caused by closures or collapses.

(Transportation management, logistics managements, and delivery of traffic information)

○ In order to avoid total transportation paralysis due to partial damage of transportation networks, relevant people should collaborate to designate priorities of opening of access routes, prepare alternate transportation between plural modes and reinforce management capacity of total transport.

○ Initiatives should be enhanced to develop signs showing altitude information and monitor and use roads managed by public and private entities in mountain areas in order to ensure the availability of evacuation routes. To prevent the delayed evacuation of people due to traffic jams, it is necessary to proactively limit people who can use automobiles and require others to evacuate on foot or by bicycle by planning evacuation routes and methods and developing necessary environments.

○ Many people may be stranded and unable to come home or report to office since they cannot use trains or privately-owned cars at the time of disaster. In order to prevent this situation, stakeholders should work together to proactively share disaster risk and other information related to emergency evacuation roads designated as prioritized roads for people coming home, enable the availability of routes allowing people to safely come home on foot or by bicycle, plan the availability of alternate transportation systems when railroads are not available, and deal with increasing demand for bicycles to support people's commuting needs after a disaster. Actions are required to enable the prompt resumption of train services in line with procedures defined by railroad companies. Different railroad companies should work together to adjust their procedures for resuming train services since partial resumption of train services may trigger the concentration of passengers. Their impact on overall train services should be considered.

○ It is vital to prevent the delay of emergency vehicles used for relief operations and ensure the safety and streamlined operations of traffic after disaster occurrence. To this end, facilities ensuring traffic safety should be developed through the utilization of public-private probe information, the advancement of wide-area traffic control systems, and the development of facilities ensuring traffic safety (e.g. power supply equipment attached to traffic signals) and rotaries should be leveraged.

○ A structure should be developed to effectively use existing logistical functionalities for ensuring streamlined transportation of relief supplies (e.g. support for last one-mile distribution). Actions should be taken to create manuals for utilizing ships at the time of disaster and utilize the private ship matching system so that marine vessels can be used for emergency transportation operations. It is also necessary to develop effective marine traffic control systems and make logistical operators create their BCPs. Initiatives should be implemented to monitor and utilize roads managed by a variety of entities in mountains.

○ With regard to long-range transportation for disaster waste, a disaster waste transportation system that makes use of the characteristics of mass transportation, such as freight railways and marine transport, should be constructed.

○ Appropriate decisions for stopping public transportation services should be made at the time of blizzard and heavy snow and proactive information should be provided to passengers. This will enable quick and appropriate evacuation of passengers and prevent situations in which many passengers are stranded inside trains, buses, aircraft, or airports.

○ Information on train and bus services as well as current status and future prospects of road traffic should be appropriately provided in a timely manner in order to prevent confusion triggered by many people trying to go home at the same time and severe impacts created by interrupted traffic services.

○ Actions should be taken to provide tourists with information so that secure and quick information delivery methods for general public can be made redundant and diversified.

(Facility management and crisis management structures)

○ Actions should be taken to enable the availability of disaster relief routes and transportation routes of disaster relief teams, relief supplies, and fuels, prevent the interruption of arterial highways and supply chains, collaboratively create plans for making roads and sea lanes available to minimize damage and enable prompt recovery, and remove snow to ensure the availability of train services in winter. Moreover, joint drills should be repeated based on mutual agreements and initiatives should be continuously implemented to optimize plans for making roads available and removing snow by improving facilities and equipment and planning the prioritized availability of transportation routes of patients and medical supplies.

○ The central government should enable the availability logistically important ground transportation networks at the time of disaster. In case they are not available, it should make substitute or complimentary roads available and enable disaster recovery so that functionalities can be promptly recovered.
○ To make a preparation for intensive and heavy snow, preventive traffic control and concentrated snow removal actions should be taken by proactively formulating timelines and plans to remove snow and comprehending risk spots where extreme traffic jams are expected to occur. At the same time, activities on securement of road traffic, such as reinforcement of systems to remove snow, spot measures to respond to actual local situations, etc., should be advanced from both non-structural and structural aspects. Moreover, formulation of snow removal systems to secure railway traffic should be promoted.
○ To prevent accidents and disasters due to roadsides (outside road areas), road administrators should promote appropriate management by administrators of land, etc. of roadside areas.
○ Public-private automobile probe information and existing measurement/observation equipment should be used to quickly understand roads that cannot be used by vehicles. Measures such as bicycles should be ensured to effectively investigate local situations in areas that cannot be navigated by vehicles. Disaster response robots should also be developed and deployed to investigate disaster locations where humans cannot operate. In addition, automated vehicle operation technology should be leveraged to advance functionalities of snow removal machines and compensate for the lack of skilled operators.
○ Collaboration systems with relevant agencies should be continued and reinforced in order to maintain airport functions: these include preparation of systems through formulation of immediate recovery plans and trainings at airports as well as securement of equipment and staffs of airline companies, etc.

(Readiness of users and operators)

○ Analysis of risks of interruption of main line transport and standardization of recognition should be promoted through wide collaboration of owner of goods, carriers, transport companies, managers of roads, etc. and research institutes. By doing these, the analysis and standardization should be incorporated into BCP, etc. of each organization.
○ In order not to interrupt supply chains, various companies such as manufacturers (cargo owners) and logistics operators should work together to design BCPs and the framework based on the Act on Promotion of Integration and Rationalization of the Distribution Services (Act No. 85 of 2005) should be leveraged to make private logistic facilities disaster-resilient, enable mutual integration of different transportation modes, reduce distribution costs in normal times, and improve the effectiveness of port BCPs.
○ Domestic and international vessel operators should be encouraged to understand and create tsunami evacuation manuals for passenger ships and vessels in consideration of the 2020 Tokyo Olympic and Paralympic Games. Evacuation methods should be developed to deal with people located in ports, ships, airports, and aircraft.

9) Agriculture, Forestry, and Fisheries

(Enhancing disaster response capacity by developing agriculture, forestry, and fisheries and maintaining communities for agriculture, forestry, and fisheries)

○ Production activities should be maintained in communities for agriculture, forestry, and fisheries and the deterioration of agricultural land and forests should be prevented so that national land can be appropriately conserved.

○ Vulnerabilities of local communities may make it difficult to conserve and manage agricultural land based on local collaboration and lead to the deterioration of disaster prevention capacity and activities. Thus, a structure should be developed to enable autonomous disaster management and recovery activities at the time of disaster by helping local communities conserve and manage local assets (e.g. agricultural land, agricultural and water-supply facilities, and forests) based on local autonomous collaboration. In addition, interactions between urban and agricultural areas based on local assets should help maintain and reinvigorate local communities.

○ Prompt functional checks should be done to aging water drainage facilities in agricultural villages. Based on this, steady actions should be implemented to improve outdated facilities and make them earthquake-resistant.

(Development of disaster-resistant forests)

○ Frequent torrential rain and earthquakes have recently raised the likelihood of large-scale disasters. In line with this situation, actions should be enhanced to deal with disasters in mountainous regions based on proactive disaster management and mitigation by appropriately understanding areas with high mountain disaster risk, deploying forest reserves, taking integrated actions including the development of forestry management facilities and the maintenance of forests, and enhancing actions against floodwood disasters through the development of floodwood containment dams. Coastal disaster prevention forests should be developed to mitigate damage by large-scale tsunamis and ensure the safety of houses and public facilities. In this case, actions should be implemented to leverage a variety of functions (e.g. disaster management and mitigation functionalities) offered by natural environments, which play the role of "green infrastructure."

○ Forests should be securely and organically maintained so they can retain a variety of functions through the planting trees in forests after thinning and cutting. Actions should be taken to reduce forestry management costs, promote wildlife management, prepare conditions enabling the centralization of forestry management operations, and clarify forest boundaries.

(Enhancing disaster response actions for domestic food production from a perspective of infrastructure and intelligence management)

○ Integrated disaster management and mitigation actions should be implemented to production infrastructures for agriculture, forestry, and fisheries by making agricultural and water-supply facilities (e.g. irrigation ponds) earthquake-resistant and ensuring the safety of agricultural and water-supply facilities and agricultural roads and bridges. Fishery ports that serve as distribution bases for marine products and production infrastructure facilities should be made earthquake-resistant. It is taking some time for related parties to design their actions against expected scale of plan. Related central government agencies, local governments, residents, and facility management operators should work together to create a BCP supporting a series of production and distribution processes for marine products for a specific region and design a BCP for operators managing agricultural and water-supply facilities from an intelligence management perspective. In addition, climate change is expected to make droughts severer and more frequent going forward due to insufficient water supply from current facilities. Related parties should share information and implement integrated countermeasures against drought.

(Enhancing the disaster response capacity of supply chains)

○ Food industry operators should work on creating collaboration structures to maintain overall food supply chains so that food supply can be streamlined even at the time of large-scale disasters. To this end, food industry operators should work with operators in related sectors to raise the awareness of this issue and create BCPs. Their disaster resistance capacity should be further enhanced by deploying autonomous, distributed energy facilities and leveraging a variety of energy sources.

(Developing a structure to providing emergency food and supplies and stockpile supplies)

○ Desktop drills should be implemented to assess the effectiveness of procuring emergency food. In particular, the largest volume of emergency food is required for Nankai Trough earthquakes. Optimal food supply methods should be explored in line with road situations and operational status of food factories in disaster-stricken areas. In addition, cooking methods should also be assessed in addition to procurement methods.

(Ensuring the availability of food through import and stockpiling)

○ Actions should be implemented in normal times to stockpile supplies appropriately and efficiently and ensure stable import. At the time of disaster, steady actions should be implemented to leverage stockpiled supplies and ensure import.

10) National Land Conservation

(Enhancing the development of facilities and equipment from a perspective of infrastructure and intelligence management)

○ Actions should be taken in areas that can be hit by large-scale tsunamis to develop river and costal embankments and make them earthquake-resistant, enable automatic and remote operations of river and coastal floodgates and sluices, and develop coastal disaster management forests.

○ Many people still continue to live in high tsunami risk areas (e.g. areas that can be hit by tsunami-based flood). Actions should be implemented to create local communities resistant to tsunamis in order to rectify this situation.

○ Costal conservation facilities and river management facilities should be appropriately developed, maintained, and upgraded in order to prevent wide-area flooding based on floods, tidal waves, and tsunamis Actions should be implemented to deploy multiple development methods, effectively leverage existing facilities, and enhance risk management structures so that "disaster mitigation" can be enabled by minimizing damage while dealing with natural and social changes (e.g. climate change and aging population with declining birthrate).

○ Based on the assumption that large-scale floods exceeding the capacity of facilities are certain to happen at some time, river administrators, prefectural governments, and local municipalities should establish councils to share disaster mitigation goals and promote structural and non-structural measures for rivers nationwide (including small and medium-sized rivers) in a unified and planned manner, towards rebuilding "Flood-Conscious Societies."

○ Countermeasures are required against more frequent, severer heavy rain in recent years. Actions should be implemented to develop river channels, flooding adjustment facilities, and rain water accumulation and infiltration facilities, enhance resilience by improving and flexibly operating existing dams, and develop water drainage facilities (e.g. drainage pump stations and rain water accumulation pipes). This way, a variety of water management actions (including anti-flood measures in underground malls) should be implemented. In particular, initiatives should be promoted to prevent fatal socio-economic damage due to large-scale floods in sea-level zones of Japan's three major urban areas. In areas where countermeasures such as prompt embankment development are difficult, anti-flood measures should be implemented in line with land use situations by combining infrastructure-based measures (e.g. anti-flood dikes protecting specific areas) and intelligence-based measures (e.g. land use regulations).

○ Related organizations should work together against sediment disasters by securely implementing structural measures and developing alert/evacuation structures while promoting non-structural measures that enhance local disaster management capacity through disaster prevention drills against sediment disasters. At the same time, schools, offices, and local autonomous organizations should enhance education on disaster prevention to help people protect their own life through actions.

○ Countermeasures for preventing repeated disasters after sediment disaster should be implemented and alert and evacuation structures should be developed and enhanced after the occurrence of disasters such large-scale earthquakes. Advanced technologies should be leveraged to enable prompt recovery.

○ More effective checks and inspections should be implemented to manage facilities and increase their longevity. In addition, preventive conservation-based asset management systems should be implemented across local governments in line with local characteristics.

○ Considering that quantitative assessment of future forecast is possible in recent years due to improvement of technologies to forecast climate changes, flood control measures should be promoted taking account of influence of future climate changes.

○ Measures against coastal erosion should be promoted to protect hinterland from tidal waves, etc. and to preserve land area.

(Enhancement of intelligence-based countermeasures)

○ On the basis of the goal of conducting basic investigation on the basis of the law (Law No. 57 of 2000) regarding promotion of measures to prevent sediment disasters in sediment disaster potential area, etc. by FY 2019 in all prefectures, we now have a better outlook on the basic investigation and designation of areas. Preparation should be made on the establishment of warning and evacuation systems on the basis of this outlook.

○ Early and appropriate evacuation actions are necessary in order to prevent casualty at the time of large-scale earthquakes, typhoons, torrential rain, blizzards, and heavy snow. Actions should be further enhanced to refine weather information enabling disaster management and appropriately utilize this information in normal times so that casualty triggered by earthquake, tsunami, volcanic, and climatic disasters can be reduced.

○ In order to make contribution to disaster prevention utilizing observed information, preparation of observation network should be promoted in areas where observation network is insufficient such as the western area of the Nankai Trough. It is also important to maintain the stable operations of electronic measurement points deployed across the country as infrastructure providing position information and securely deliver monitored data.

○ A variety of geospatial information such as map and disaster information should be developed and upgraded in normal times. Information platforms should be developed to provide and mange this information so that they can be utilized at the time of disaster.

○ It is necessary to deal with sediment disasters (deep-seated landslides), volcanic eruptions, and other disasters that are more serious than expected. Dealing with this scenario requires not only integrated countermeasures including intelligence-based measures (e.g. sharing of satellite data at the time of disaster) but also disaster management and mitigation measures that include the utilization of the Advanced Optical Satellite (ALOS-3) and the Advanced Land Observing Satellite (ALOS-4) and the development of human resources working on sediment disasters and volcanic research.

○ It is thought that water shortages, etc. that exceed the current standard levels of water supplies should further increase in frequency and severity due to the influence of climate change, etc., and so in addition to ensuring that relevant parties work closely together to share information, efforts should be made in accordance with the Basic Act on the Water Cycle (Act No. 16 of 2014) and the Water Circulation Basic Plan (Cabinet Council decision on July 10, 2015) to enhance the functionality of water resource facilities, effectively utilize water resources currently effectively used as stock, and make use of groundwater as a substitute water resource in times of crisis.

(Enhancement of disaster response measures)

○ It is necessary to appropriately and promptly collect and deliver disaster-related information and implement flexible, effective actions at the time of disaster. To this end, a structure is required to make roads available, improve facilities and equipment used for transportation, make communication infrastructures and facilities more robust and advanced, develop and deploy disaster response robots and develop their operators, deploy disaster response small-sized drones, leverage geospatial information and public-private automobile probe information, and enhance initiatives for sharing disaster-related information such as integrated disaster prevention information systems, integrated disaster information systems, and SIP4D.

○ In order to quickly recover during large-scale disasters, comprehensive disaster resilience should be reinforced through wide-ranging support systems, making someone responsible for disaster management and disaster mitigation in local construction industries, and conducting trainings. In addition, TEC-FORCE systems and functions should be enhanced and strengthened, and countermeasures for road disasters should be implemented.

○ Although it is difficult to make a highly reliable forecast for occurrence of large-scale earthquakes, current scientific knowledge can be used by collaboration of national government, local governments, relevant agencies, etc. to consider response in the case where abnormal phenomena that can be observed along the Nankai Trough.

11) Environment

(Enhancing disaster management and mitigation using natural ecosystems)

○ The disaster management and disaster mitigation functions of the natural environment should be quantitatively evaluated, and the scale of disasters should be reduced effectively and efficiently through the conservation and regeneration of the natural environment.

○ Wildlife management should be implemented to prevent the deterioration of land conservation functionalities due to the destruction of forests caused by wildlife. Actions should also be taken to develop appropriate park facilities and improve their longevity in order to maintain disaster management and mitigation functionalities.

(Disposal of disaster-related wastes after the occurrence of large-scale natural disasters)

○ Local governments should create the disaster waste management plan and develop human resources through training and drills in order to improve the effectiveness of their measures.

○ Securement of temporary storage sites in accordance with estimated generation of disaster waste should be promoted, and facilities such as waste incineration plants that can independently operate even at the time of disaster should be built.

(Enhancing measures for monitoring discharged or leaked toxic substances and preventing their spread)

○ Preventing the large-scale spread and leakage of toxic substances requires the development of facilities and equipment as well as drills and training. Information should be collected and shared on how local governments respond to accidents related to chemical substances. This way, assistance and support will be given to each local government so they can decide required actions.

○ The revision of standards to prevent leakage of high-pressure gas, ensuring the earthquake resistance of high-pressure gas facilities based on this, and measures for mine waste dumps where there is concern of hazardous materials leaking during large-scale disasters should be rapidly implemented.

(Others)

○ Installation of Combined Treatment Johkasou (for black water and gray water) should be promoted. While proceeding the preparation of Johkasou Inventory (data base system), we need to conduct research and examination of reinforcement of the disaster corresponding capabilities of the entire Johkasou system.

12) Land Use (National Land Use)

(Mitigating the concentration of population in high disaster risk areas and reinvigorating local communities)

○ The concentration of population and energy facilities (e.g. power plants) in high disaster risk areas (e.g. areas with high risk of capital inland earthquake and tsunami-based flooding and big cities with congested downtown areas) should be mitigated to distribute risks. It is also critical to prevent the following scenarios: local communities losing their vitality, shrinking population making it impossible to maintain medical and other services in normal times and enable recovery at the time of disaster, and people's daily life and culture totally lost. To this end, effective measures should be explored and implemented to enable the creation and utilization of national land in an "autonomous, distributed, and coordinated" manner.

○ Climate change may trigger unexpected disasters that cannot be supported by the existing social capital. In this situation, it is not enough to implement existing measures targeted for artificial structures. It is also important to implement and promote the concepts of ecosystem-based disaster risk reduction (Eco-DRR) and green infrastructure so that each area can enhance its resilience by avoiding the use of vulnerable land and leveraging ecosystem-based functionalities. Resilience of each area should be enhanced based on the revision of how national land use and management should be.

(Preparation for reconstruction and implementation of proactive reconstruction)

○ Initiatives should be implemented to create BCPs for local industries (including agriculture, forestry, and fisheries), develop future human resources, and enhance capabilities of local communities. Moreover, a vision for reconstruction should be explored in normal times in line with disaster risks and future industrial structures of each area so that the area can be reconstructed and be a better community after a disaster. This will prevent residents from immediately moving to other areas as after a disaster. To make these initiatives effective, actions should be implemented to enable each area to explore reconstruction structures and procedures and proactively plan reconstruction by imagining what challenges should be resolved. It is vital to educate local governments on how they can proactively plan reconstruction and provide environments enabling them to prepare for reconstruction. It is also important to develop local community bases that can function in normal times. In this case, actions should be implemented to leverage a variety of functions (e.g. disaster prevention and mitigation functionalities) offered by natural environments, which play the role of "green infrastructure."

○ In coastal areas where population is increasing aging, "protecting people's lives based on evacuation" is not a perfect solution. "Proactive reconstruction" measures should be implemented from a long-term perspective through the proactive transfer of houses to elevated areas.

(Developing environments for quick reconstruction)

○ Cadastral surveys should be implemented and land boundaries should be clarified in order to streamline recovery and reconstruction after a disaster. It is also important to create maps stored at registries especially for big cities and disaster-stricken areas. Furthermore, systems for enabling land with unknown owners, which is expected to increase going forward, to be used for public projects and a mechanism to streamline the owner search should be made widespread. Moreover, the way of registration system and land ownership should be considered and improved: these include systems of incorporating the information of transfer of ownership due to succession in registration, systems of releasing land that are unmanaged, etc.

○ Fundamental geospatial information should be developed and maintained in normal times. High-precision position data obtained from seven satellites constellation of quasi-zenith satellite system (QZSS) should also be leveraged to work on such initiatives as Association for Promotion of Infrastructure G-Spatial Information Center, SPI4D, and Disaster Information Hub.

2. Cross-cutting sectors

A) Risk Communication

○ It is actions taken by private corporations and associations as well as local residents, communities, and NPOs that support the initiatives for national resilience. Thus, self and mutual help initiatives implemented by these entities should be effective and continuous. To this end, continuous actions should be implemented to enable interactive communication through education, training, and information delivery on national resilience so that all stakeholders can fully understand the concept of self, mutual, and public help and autonomously take actions.

○ Local community capabilities should be maintained and improved in normal times since they play a critical role to improve disaster response capacity through mutual help among residents at the time of disaster and mentally support disaster victims. A vision for reconstruction should also be created in normal times. This way, a structure is developed to streamline reconstruction activities at the time of disaster by ensuring consensus for a reconstruction plan. In addition, autonomous activities by organizations and associations protecting each local area (e.g. disaster prevention volunteers) should be enhanced by improving logistical support and offering more opportunities for mutual interactions.

○ Education and information delivery should be done to enable each individual, household, company, and association to invest in and work on national resilience by designing a BCP and improving its effectiveness, making houses and buildings earthquake-resistant, and stockpiling supplies.

○ Emergency drills, disaster prevention education, etc. on how to execute activities to protect oneself should be promoted through schools, offices, community organizations, etc. In addition, planning on voluntary disaster management activities by residents, etc. should be promoted.

○ Japan has been hit by many natural disasters and is one of the countries in the world that have implemented advanced national resilience initiatives. Thus, Japan should deepen mutual understanding on various domains related to national resilience with other countries and contribute to the international community. Japan should implement educational activities domestically and internationally to promote and establish the Sendai disaster management framework and raise the awareness of disaster risk reduction and mitigation through the World Tsunami Awareness Day.

B) Human Resources Development

○ Various practical drills such as integrated disaster prevention drills should be implemented to develop human resources working for disaster prevention organizations so that disaster response capacity (e.g. lifesaving capacity) can be enhanced based on public support. In particular, first aid actions at disaster locations are critical. Thus, it is necessary to develop a structure and human resources for various situations (e.g. wide-area support and support during nighttime) and enhance volunteer firefighter. Actions should also be taken to systematically develop DMATs and develop cross-sectional human resources engaging in medical support at the time of disaster and related structures. The central government should help and promote local governments and private companies to develop their human resources.

○ Administrative staff should be developed to streamline various disaster-related administrative operations (e.g. operating disaster centers and issuing disaster victim certificates) to enable the prompt recovery of disaster victims' livelihood.

○ Human resources at private business operators such as skilled workers in the construction industry who are familiar with respective regions and will be responsible for road clearing and channel clearing, snow removal work, swift recovery and reconstruction, and maintenance work for infrastructure in normal times.

○ With the aim of enhancing self-help and public assistance initiatives, the private sector will work on human resources development in private businesses by fostering expert personnel who will play the leading role in improving the resilience among the private business operators, in addition to those who will be responsible for realizing BCP within the private business operators.

○ It is vital to logically support disaster management volunteers and implement autonomous activities to protect each area. To this end, local communities should develop leaders who accurately understand lessons and knowledge obtained from disasters and implement practical actions. Especially from a perspective of reconstruction, forward-thinking young leaders who understand how they can develop their own local community should be developed.

○ Based on the fact that Japan, as an advanced country in terms of disaster management, is expected by overseas countries to provide support and contributions in this field, relevant ministries and agencies will conduct the fostering of disaster experts in sediment disasters and volcanology, human resources that will make use of their experiences of a large-scale disaster, lessons learnt from the experiences, and research outcomes in the disaster-affected sites, while also working to foster engineers and other experts who possess good knowledge of diverse academic disciplines in different regions.

C) Public-Private Collaboration

○ Public-private collaboration will be promoted to utilize skills and expertise of private business operators and experts in respective regions, as well as utilizing facilities, equipment, and organizational system of private business operators in various disaster responses such as road and channel clearance, emergency recovery construction, operational management and livelihood support at designated shelters, and procurement and transport of emergency relief supplies. In order to make this collaboration effective, conclusion of agreement between the national and local governments and private business operators and industry groups, establishment of individual plans and collaborative regional plans reflecting the collaboration, and implementation of practical joint exercises will also be promoted. Furthermore, private business operators will maintain and secure personnel with familiarity with respective regions and equipment/materials, and enhance the robustness of facilities, while advancing the enhancement and enhancing of disaster prevention volunteer groups.

○ To enable the prompt collection, delivery, and sharing of information (e.g. damage information) required to deal with disaster and reconstruct local economy, actions should be implemented to deploy new technologies, implement research and development for the collection, maintenance, and utilization of big data, and centralize information delivery.

○ Local governments, Social Welfare Councils, resident associations, and NPOs should work together to develop assistance acceptance structures to streamline activities supporting disaster-stricken areas by individual volunteers and NPOs at the time of disaster. Disaster response headquarters set up by local governments should consider accepting private-sector specialists as members.

○ Initiatives based on a view that policies involving cooperation between regional industries and the respective region from normal times will demonstrate disaster management effects at the event of a disaster should be promoted. Furthermore, local governments and private business operators in the area of infrastructure and lifeline should provide, in cooperation, specific damage prediction of the region, while local governments and economic organizations will cooperate to set up a system such as a general consultation desk, thereby supporting private business operators establishing BCP and other initiatives for responding to disasters.

D) Countermeasures for Aging Infrastructure

○ People's livelihood and socio-economic activities of Japan depends on industrial infrastructures (e.g. roads, railroads, ports, and airports), livelihood infrastructures (e.g. water supply and sewerage systems, parks, and schools), food production/supply infrastructures (e.g. agricultural and water-supply facilities and fishery ports), national land resilience infrastructures (e.g. forestry/water management and coastal embankment), and other infrastructures composing national land, cities, and rural areas for agriculture, forestry, and fisheries. As these infrastructures are increasingly aging, it is a big issue that infrastructures developed during and after Japan's high economic growth period will get obsolete at the same time. To deal with this issue, it is vital to reduce and level out medium- and long-term total costs and develop and deploy new technologies, while systematically maintaining and upgrading infrastructures.

○ Some local governments do not have enough or any technical staff maintaining or managing infrastructures. Their structure for dealing with aging infrastructures is not always sufficient. Further actions should be implemented to develop and support the structure.

E) Research and Development
○ A structure enabling innovations based on research and development for national land resilience is insufficient. More efforts should be made to enable research and development by developing superior researchers and engineers and giving them incentives. It is also vital to promote the deployment of latest cutting-edge technologies, enhance and promote research and development, and put research results to practical use. ○ Initiatives enabling Society 5.0 and achieving SDGs are required through the prompt collection, sharing, and analysis of disaster information using satellites, artificial intelligence (AI) technology, big data, IoT, ICT, and the Fifth-Generational Mobile Communication System (5G). In addition, technology development in a wide spectrum of areas from basic technology to applied technology is required through the development of technologies making structures earthquake-resistant, manufacturing new component materials, inspecting/diagnosing aging structures, and deploying disaster response robots in field locations where humans cannot operate. Based on this, further research and development should be implemented to deploy various technologies for actual field operations.

Note: Vulnerability assessment results are based on information as of August 2018.

（Attachment 4）Policies for Promoting Respective Programs

1. Prevent direct death to the utmost extent

1-1）Occurrence of a large number of casualties due to large-scale and multiple collapse of houses, buildings, transportation facilities, etc. or collapse of buildings at facilities used by the general public

○ To make houses and buildings earthquake-resistant, multiple approaches will be integrated by making condominium owners aware of earthquake resistance requirements of old buildings by promotion of rebuilding old condominiums, making earthquake resistance tests mandatory and offering assistance to the renovation of targeted buildings to make houses earthquake-resistant, improving building evaluation methods, and developing financial products. Moreover, countermeasures against long-period ground motions will be deployed to existing high-rise buildings. Residential areas will also be tested for earthquake resistance and made earthquake-resistant.

○ Enhancing the earthquake resistance should be promoted for government facilities, school facilities, social education facilities, sports facilities, medical facilities, social welfare facilities, correctional facilities, etc. In particular, enhancing the earthquake resistance has not been conducted much in municipal government office buildings and this should be promoted. Moreover, fall prevention measures and countermeasures for aging non-structural elements such as ceilings as well as safety inspections, safety measures, etc. of block walls, etc. should be promoted.

○ In regard to transportation facilities, enhance earthquake resistance, removal, etc. of multi-level crossing facilities, telephone poles, roads along railway lines, etc. In addition, promote and implement technology development for equipment, etc. that supports infrastructure inspection, diagnosis, repairs and reinforcement, etc.

○ In regard to underground spaces, promote disaster management measures for both structural and non-structural aspects. In addition, advance repairs for spaces and roads in which temporary evacuations are carried out from buildings, etc. that are in danger of collapsing.

○ Regarding promotion of further improvements and utilization of emergency earthquake reports, etc., as well as adoption of fall-prevention measures for furniture and self-protection measures, promote continuous emergency drills and disaster prevention education through regional independent organizations, etc.

○ In regard to earthquakes that are said to have a high potential to hit highly-populated areas such as the capital inland earthquake, in order to particularly prepare careful responses, alleviate excessive population centralization in areas that have a high risk of earthquakes, and distribute risks, consider and promote initiatives for effective measures to encourage formation of “an autonomous, decentralized and coordinated nation.” In addition, together with improving the disaster response capacity of disaster response organizations, etc. and promoting enhancement of fire companies, etc., encourage plan formulation regarding voluntary disaster prevention activities by citizens, companies, and others.

○ Promote initiatives to control damage by flying objects during times with strong winds, such as measures against flying objects in entryways of residences and buildings.

○ In addition, promote controls on areas with high disaster risks and relocation to outside those areas through visualization of disaster risks, utilization of a system regarding locations of buildings, etc., and more.

1-2）Mass casualties caused by a large-scale fire in crowded urban areas and facilities, etc. used by the general public

○ Promote initiatives for securing the water supply, fire prevention, and damage reduction through concluding agreements, etc. regarding water supply activities, etc. with private businesses. In addition, regarding improved maintenance of crowded urban areas that have considerable danger of high risk for large fires during earthquakes, etc., have public-private collaboration for systematic reduction through maintaining roads, parks, etc., removing and rebuilding aging buildings, fireproofing, etc. Furthermore, work toward improving crowded urban areas from a medium- and long-term perspective after achieving the goals.
○ Together with promoting wide-area collaboration for rescue and emergency systems to prevent loss of human life during large fires, promote victim rescue and search-related measures such as disaster defense training.
○ Considering that there are various reasons for occurrence of fires, disaster response capacity of disaster response agencies, etc. will be enhanced through improvement of equipment and materials, various trainings, etc.
○ In order to avoid failure to escape, etc., activities will be executed on measures relating information and communications such as secure notification of emergency information by J Alert as well as information sharing, etc. using ICT.
○ Assuming that public help can be insufficient, enhancement of volunteer firefighters well as spread, education, etc. of local disaster management plan systems will be promoted to enhance planning relating to voluntary disaster management activities of residents, companies, etc.
○ In order to alleviate excessively populated state in places with high disaster risks such as metropolises with densely build-up areas, effective measures will be considered and conducted to enhance development of an autonomous, decentralized and coordinated nation.”
○ In addition, promote controls on areas with high disaster risks and relocation to outside those areas through visualization of disaster risks, utilization of a system regarding locations of buildings, etc., and more.

1-3）Occurrence of extensive number of casualties due to a large-scale tsunami, etc. affecting a wide area

○ Enhancing the earthquake resistance of houses and building and countermeasures for aging school facilities will be promoted
○ Promote earthquake resistance of residences and buildings, as well as countermeasures for aging school facilities, etc.
○ Promote considerations for cooperation among national and regional public organizations and related organizations regarding responding to the occurrence of observable abnormal phenomena along the Nankai Trough. Furthermore, further enhance the scientific expertise by promoting improvement of the observation system and investigative research. In addition, develop international discussions regarding ideal tsunami prevention and promote the foundation for discovering better countermeasures.

○ Together with promoting improving and enhancing earthquake resistance of rivers, sea walls, etc. in areas predicted to have large tsunami as well as improvement of automation and remote operation of water gates, pipes, etc. of rivers and coasts, have proper management of the improvement. Conduct considerations for coexistence with nature and harmony with the environment when improving sea walls, etc.
○ With regard to seaside protection forests, maintenance, reinforcement, etc. of their functions will be promoted in order to obtain the effects of mitigating damage from tsunamis considering the actual situation, etc. of areas.
○ Promote improvement of observation networks in areas where they are short-staffed such as the west side area of the Nankai Trough. In addition, promote acceleration of disaster-related weather information to more effectively communicate to citizens results of observation and assessment. Furthermore, together with promoting diversifying and multiplexing information transmission methods, implement training, etc. at fixed intervals.
○ Together with promoting formulation of hazard maps and improvement of guidance signs, etc. toward designated emergency evacuation sites promote continuous disaster prevention training, disaster prevention education, etc. through schools, workplaces, regional independent organizations, etc. In addition, strengthen disaster management capacity through supporting local public bodies through wide-area, effective training implemented by the national government, enhance fire companies, etc., and spread and raise awareness of district disaster management plan systems.
○ Preparation of evacuation routes and evacuation sites will be promoted. Moreover, to avoid situation of delay of escape due to traffic jams, agreement as to who can use cars should be made beforehand and other people should evacuate on foot or by bicycles. On the basis of this assumption, evacuation routes and evacuation methods will be considered and feasible environments should be prepared.
○ Arrange evacuation methods that assume various situations people could be in, such as aboard ships in ports or inside planes at airports.
○ Study plans to save the lives of people who are isolated or adrift as much as possible.
○ In addition, promote controls on areas with high disaster risks and relocation to outside those areas through visualization of disaster risks, utilization of a system regarding locations of buildings, etc., and more.

1-4) Mass casualties caused by sudden or prolonged and wide-area inundation in urban areas

○ River channel dredging and embankment, preparation of flood control facilities, preparation of high standard dikes to avoid catastrophic damage by collapse of dikes, reinforcement of capacity of existing dams through improvement of facilities, flexible operations, etc. as well as preparation of drainage facilities such as drainage pump stations and storm water storage pipes, enhancing the water resistance in those things, etc. will be promoted.
○ Carry out appropriate creation, maintenance management, and upgrading of coastal protection facilities and river management facilities etc. in order to prevent widespread inundation etc. due to flooding, storm surges, and tsunami. Also move forward with the introduction of a diverse range of maintenance methods, effective utilization of existing facilities, and strengthening of crisis management systems to contribute to efforts aimed at minimizing damage through disaster mitigation while also responding to changes to natural and societal conditions such as climate change, declining birthrates, and population ageing.

○ Continuous reviews will be conducted on the way to take evacuation procedures to protect oneself, enabling them to be conscious about their responsibility to for protecting their own life, and to take evacuation behavior on their own judgement. At the same time, disaster prevention exercises and disaster prevention education will be promoted continuously through schools, workplaces, local autonomous organizations, and other relevant organizations. In addition, voluntary formulation of an action plan by local residents will be encouraged by widely disseminating and making awareness of the Community Disaster Management Plan Planning System.
○ Enhancement and strengthening etc. of flood control companies in disaster management departments and sewerage-related departments of local governments in order to train human resources and build appropriate organizational structures.
○ In order for the country to support local public bodies, disaster prevention capabilities will be enhanced through regional and practical training in expectation of a large-scale disaster, and systems and functions such as TEC-FORCE will be enhanced and strengthened.
○ Based on the assumption that large-scale flood exceeding the capacity of facilities are certain to happen at some time, establish councils consisting of river administrators, prefectural governments and local municipalities to share disaster mitigation goals and promote structural and non-structural measures for rivers nationwide (including small and medium-sized rivers) in a unified and planned manner, towards rebuilding Flood-Conscious Societies."
○ To prevent incidents where people take too long to evacuate to safety, promote information-related measures including providing emergency information to residents with surety using the J-Alert system and other ICT-based information-sharing methods including social media.
○ In order to avoid occurrence of many casualties, measures to rescue and search victims such as disaster security trainings, etc. will be promoted.
○ To cope with frequent occurrence of recent heavy rain with devastating damages in addition to coping with growth of runoff to rivers at the time of floods due to growth of urban areas, anti-inundation measure of underground shopping areas, etc. and preparation of rainfall storage infiltration facilities, etc. should be promoted to maintain and enhance water retention and retarding functions of each basin. By realizing these, comprehensive flood control measures should be promoted not only in urban areas but in other areas throughout the country. Moreover, in the areas where measures like immediate preparation of dikes are difficult to conduct, flood control measures should be conducted considering how lands are utilized: preparation in structural aspect such as use of dike rings, etc. can be combined with measures in non-structural aspect such as regulations to use lands, etc.
○ To alleviate the state of excessive population concentration in places with high risks of disasters such as flood inundation hazardous areas, effective measures will be considered and conducted to promote development of an autonomous, decentralized and coordinated nation and streamlined land use.
○ Measures against coastal erosion will be promoted to protect hinterland from tidal waves, etc. and to preserve land area.
○ Considering that quantitative assessment of future forecast is possible in recent years due to improvement of technologies to forecast climate changes, flood control measures will be promoted taking account of influence of future climate changes.
○ In addition, promote controls on areas with high disaster risks and relocation to outside those areas through visualization of disaster risks, utilization of a system regarding locations of buildings, etc., and more.

1-5) Mass casualties due to a large-scale volcanic eruption or sediment disasters (deep-seated landslide), etc.

○ Work on the designation of landslide disaster caution zones, drafting of volcanic disaster-related evacuation plans, and so on, is still underway. Since there are issues such as potential inability to sufficiently respond to major wide-area disasters based on current measures and policies, promote measures concerning how to respond to major wide-area disasters including the utilization of the Advanced Land Observing Satellite-4 (ALOS-4), which is scheduled to be launched in FY 2020.

○ To prevent human suffering due to landslide disasters (deep-seated failures, sediment/floodwater overflows, etc.), volcanic eruptions, and so on, promote disaster management/mitigation measures including development of human resources to research landslide disasters and volcanos, and consideration of matters such as the impact on infrastructure of large volumes of volcanic ash following a major eruption.

○ Relevant organizations will continue to coordinate on the steady promotion of infrastructural measures concerning landslide disaster countermeasures to preserve socioeconomically important facilities and evacuation points and routes. Additionally, in light of the frequency of landslide disasters in recent years, promote the creation and maintenance of permeable check dams, which are highly effective in capturing sediment and wooden debris. Move ahead with countermeasures that integrate non-infrastructural measures that increase regional disaster preparedness such as the creation of warning and evacuation frameworks and the holding of landslide emergency drills. Promote emergency drills and disaster-preparedness education on an ongoing basis, through schools, workplaces, and local autonomous organizations in each region while also promoting constant revision by residents to enable them to engage in evacuation activities based on their own judgement and be aware that when evacuating to protect themselves it is they themselves that need to act to save their own lives. Encourage the drafting of plans concerning the conducting by residents of self-motivated disaster-preparedness activities through aware-raising activities relating to Community Disaster Management Plan frameworks.

○ To prevent and reduce damage from wooden debris, install erosion control dams able to capture wooden debris, carry out forest thinning to promote the development of root systems etc., and implement finely tuned measures that are responsive to the manner of the occurrence and form of various catastrophic landslides and wooden debris. Carry out forest maintenance work to create diverse forests that exist in harmony with nature utilizing community-based tree-planting activities after having promoted wildlife management.

○ Activities will be executed on measures combined with measures in non-structural aspect including preservation, management, etc. of facilities that collaborate with local community.

○ To prevent incidents where people take too long to evacuate to safety, promote information-related measures including providing emergency information to residents with surety using the J-Alert system and other ICT-based information sharing methods including social media.

○ In order to avoid occurrence of many casualties, measures to rescue and search victims such as disaster security trainings, etc. will be promoted.

○ To secure support from national government for local governments, etc., reinforcement of disaster prevention capacity through execution of practical trainings in wide area as well as improvement and reinforcement of systems and functions such as TEC-FORCE will be promoted.

○ Promote initiatives to create necessary warning/evacuation frameworks taking into account basic research and zone designation based on the Act on Sediment Disaster Countermeasures for Sediment Disaster Prone Areas (Act No. 57 of 2000)

○ In addition, promote controls on areas with high disaster risks and relocation to outside those areas through visualization of disaster risks, utilization of a system regarding locations of buildings, etc., and more.

6) Mass casualties caused by blizzard, heavy snow, etc.

- ○ To prevent loss of human life due to blizzards and heavy snowfall etc., move ahead with the enhancement of disaster and meteorological information and promote initiatives relating to the appropriate utilization of such information under normal non-disaster conditions, and also promote initiatives to curb non-essential/non-urgent outings when blizzards and heavy snowfall are predicted. Also work on appropriate judgments relating to halting public transport and providing information to passengers at an early stage.
- ○ Activities will be executed on multiplexing and diversification of information provision methods including introduction of door-to-door receivers of radio communications for disaster management and administration, measures against defective hearing, enhancement of L -Alert, information sharing using ICT such as SNS, development of information provision app, etc.
- ○ To collect information such as influence of snowfalls, etc., activities will be executed on securement of various methods of collecting information such as utilization of traffic monitoring cameras and road management cameras etc., utilization of automotive probe information of government and private companies and improvement, start of operation of systems, etc. to comprehend damage information immediately as well as preparation of robust, upgraded communication foundation, facilities, etc. such as the police, fire services, etc.
- ○ To make a preparation for intensive and heavy snow, preventive traffic control and concentrated snow removal actions will be taken by proactively formulating timelines and plans to remove snow and comprehending risk spots where extreme traffic jams are expected to occur. At the same time, activities on securement of road traffic, such as ensuring use of equipment including chains, etc., reinforcement of systems to remove snow, collaboration among road managers, spot measures such as pull-off areas to respond to actual local situations, etc., will be advanced from both non-structural and structural aspects. Moreover, in order to secure railway traffics, development of Shinkansen networks will be promoted considering that Shinkansen is a robust infrastructure against snow, and formulation of snow removal systems of conventional lines, etc. will be promoted.
- ○ Working conditions, etc. will be improved from the point of securing and developing staffs of construction industry who handle opening of access routes, etc. at the time of disasters such as snow damage. Moreover, autonomous driving technologies, etc. will be used to upgrade equipment such as snow ploughs in order to make up for a deficiency of skilled workers.
- ○ Continuous reviews will be conducted on the way to take evacuation procedures to protect oneself, enabling them to be conscious about their responsibility to for protecting their own life, and to take evacuation behavior on their own judgement. At the same time, disaster prevention exercises and disaster prevention education and ensuring safety during snow removal will be promoted continuously through schools, workplaces, local autonomous organizations, and other relevant organizations. In addition, voluntary formulation of an action plan by local residents will be encouraged by widely disseminating and making awareness of the Community Disaster Management Plan Planning System.
- ○ To avoid occurrence of casualties due to cold weathers, measures in structural aspect and non-structural aspect regarding energy provision facilities will be executed: elimination of power poles as well as measures of transmission and distribution against snow damage, collaboration of administration, the Self-Defense Forces and power companies to realize prompt recovery, preparation of recovery manuals, etc.

2. Ensure prompt rescue/emergency and medical activities as well as the victims' health and the environment of their evacuation life

2-1) Suspension of supply of goods and energy relating life including food, drinking water, electric power, fuel, etc. at disaster-affected areas

○ To secure goods transport routes of land, sea and air, measures, etc. of transport foundation against earthquakes, tsunamis, flood disasters, sediment disasters and snow damages will be steadily formulated. In addition, plural transport routes will be secured through collaboration, etc. of transports mode. Moreover, preparation of manuals, etc. at local governments, etc. as well as operation, etc. of matching systems at emergency drills will be promoted for prompt response to utilize ships at the time of large-scale disaster occurrence.

○ In order to smoothly supply goods to disaster-affected areas at the time of large-scale disaster occurrence, systems of good procurement will be formulated through collaboration of government and private companies. Moreover, in order to collect and provide disaster information, activities to secure means of collection and provision of information will be promoted.

○ To avoid situations in which vehicles involved in disaster emergency response become unable to reach evacuation centers, move ahead with the utilization of traffic monitoring cameras and road administration cameras etc., utilization of public-private probe vehicle data, enhancement of wide-area traffic control systems, and gathering of information on whether or not roads are passable through coordination between relevant organizations in order to rapidly grasp information on whether vehicles are able to travel on certain roads and apply this information to traffic-related measures.

○ Promote the drafting of earthquake-resistant plans and earthquake resistance of waterworks facilities by water supply utilities. Additionally, promote the widespread use of diverse water sources including groundwater, rainwater, and recycled water. Move ahead with deliberations relating to water sources providing alternatives to groundwater during crisis situations and promote the widespread use of diverse waters sources such as rainwater and recycled water. Also, move ahead with initiatives to secure water supplies including boring wells and installing water supply tanks at facilities designated for use as evacuation centers and installing emergency electricity sources.

○ With regard to gas pipes of aged deterioration, principles of enhancing the earthquake resistance will be notified and exchange of those to polyethylene pipes with corrosion resistance and earthquake resistance will be promoted. Moreover, trainings, etc., on prompt recovery of gas supply will be continued to be executed.

○ Encourage the strengthening of disaster management function at public facilities/evacuation centers including the installation of self-reliant and decentralized energy, earthquake resistance measures, countermeasures for aging, enhancement of storage capabilities, and ensuring the availability of toilet facilities that operate even when water supplies are disrupted.

○ With regard to effectiveness of procurement of emergency food, continuous verification will be conducted through Disaster Imagination Games (DIG), etc. In particular, with regard to Nankai Trough earthquakes which require the largest amount of emergency food, the most ideal method of supplying food will be considered taking into account of situation of roads of disaster-affected areas, situation of operation of food plants, etc. Moreover, necessity of cooking those foods will be considered and examined carefully together with the method of procurement.

○ By executing trainings, etc. mainly on last miles, formulation of systems to conduct smooth transport of support goods will be promoted to improve effectiveness of prompt and efficient responses.

○ Consider effective measures and move ahead with initiatives to form an “autonomous, de-centralized and coordinated nation” and encourage rational land use to reduce excessive population concentrations in places with high disaster risk levels. Also move ahead with earthquake resistance measure in order to prevent the incidence of people needing to evacuate and also in order to secure emergency transportation routes. Encourage the enhancement and strengthening of fire services while also encouraging the drafting of plans relating to the voluntary firefighting activities of local residents and companies through activities to raise awareness about the Community Disaster Management Plan framework.

2-2) Simultaneous occurrence of a large number of isolated communities, etc. for a long time

○ Activities will be executed steadily on disaster management measures for roads and elimination of power poles, reinforcement of earthquake resistant and tsunami resistant structuring of railway facilities, harbor facilities, etc., measures against flood, sediment disasters, tsunamis, tidal waves and storm and flood damage, afforestation control, etc.

○ In order to effectively use existing physical distribution functions, etc. for transporting emergency goods, etc., execution of activities, etc. will be promoted to secure evacuation routes and alternative transport routes: activities will be executed on preparation of environment for emergency transport by ships, formulation of BCP for freight forwarders, preparation of sea level altitude display sheets, comprehension and utilization of roads managed by various entities including private companies in mountainous areas, improvement in accessibility to main roads of high standards, etc.

○ In order to secure flexible and effective activities at the time of disaster occurrence, activities will be promoted to secure various methods of collection and provision of information: activities will be executed on preparation of systems necessary to open access routes, etc., improvement in equipment and materials necessary for transportation, procurement of robust and high level foundation and facilities for communications, introduction of disaster response drones, utilization of traffic monitoring cameras and road management cameras etc., utilization of automotive probe information by government and private companies, utilization of systems to collect and provide disaster information, utilization of geospatial information, etc.

○ Based on the scenario of a disaster affecting a wide area, promote the performance of necessary reviews of industries and items to be procured such as emergency food supplies, creation of mechanisms to facilitate smooth information sharing between relevant organizations, drills, and enhancement of the proficiency levels of relevant personnel through drills etc. Additionally, popularize and promote the keeping of emergency food stores in households for use in disasters and consider isolation countermeasures in local disaster management plans also.

○ In order to avoid significant deterioration in functions due to damages to employees, facilities, etc. of local governments including the police, fire services, etc., activities such as enhancing the earthquake resistance in facilities will be promoted.

○ To avoid occurrence of isolation of villages, protection of slopes to avoid collapse of slopes of roads, multiplexing of access routes, etc. will be conducted. Moreover, designation of locations that can be used as landing fields will be conducted beforehand and preparation of necessary equipment will be enhanced so that access can be also made from air.

○ To secure support from national government for local governments, etc., reinforcement of disaster prevention capacity through execution of practical trainings in wide area considering large-scale disasters as well as improvement and reinforcement of systems and functions such as TEC-FORCE will be promoted.

2-3) Severe lack of rescue/emergency and medical activities, etc. due to damage to the Self-Defense Forces, the police services, fire services, the Japan Coast Guard, etc.

○ SDF, police and fire services, and the Japan Coast Guard will develop their structures to strengthen disaster response capacity for wide-area coverage and enhance their facilities and equipment for disaster response during nighttime. In addition, they will develop and enhance the TEC-FORCE structure and capabilities, enhance flood control, volunteer firefighter, and disaster prevention volunteer groups, and ensure the availability of construction human resources for removing debris on roads. Japan and the United States will clarify mutual communication methods to integrate operations with U.S. Armed Forces right after the occurrence of a large-scale disaster. Both countries also will improve awareness and operations to receive support teams from abroad and adjust joint operations with them.

○ The Sendai Framework for Disaster Risk Reduction disaster will be further promoted and retained all over the world and experience, insights, and technologies obtained from Japan's disasters should be leveraged to implement strategic international disaster prevention cooperation and promote international disaster management cooperation and other initiatives through international organizations such as the United Nations.

○ Promote standardization of the disaster response work and information sharing/utilization by relevant ministries and agencies. Also heighten the effectiveness of disaster response work by creating environments for drills that are compatible with the special characteristics of each region and a wide range of disaster sites, and implement joint drills etc. that utilize the skills, knowhow, facilities, equipment, and organizational resources of private sector companies and local professionals and experts etc.

○ Further increase the disaster resistance of police facilities services, Self-Defense Forces facilities, and fire stations, which are used as regional operational headquarters. Also, promote the reinforcement and enhancement of the disaster resistance of communications functions such as by fitting Self-Defense Force helicopters with video transmission devices.

○ Local governments and related central government agencies will work together to improve the disaster resistance capacity of activity routes, enhance their facilities and equipment, promptly understand traffic situations based on automobile probe information collected by public and private sectors, modify wide-area traffic control information systems to deal with increasing volumes of traffic information aggregated by the National Police Agency, and make use of ICT to collect, share, and deliver information so they can develop a required structure and streamline their operations such as prompt and appropriate traffic management to ensure road and sea lane availability.

○ By enhancing the earthquake resistance in houses and buildings, occurrence of injured persons will be mitigated.

2-4) Post-disaster disorder and unexpectedly high numbers of stranded persons

- ○ Move ahead with the introduction of systems to obtain information concerning the current status and outlook for rail and bus operations and road traffic and systems for sequentially and accurately verifying the safety of children, and also move ahead with the meeting of conditions that enable people to be sure about the safety of their family members such as earthquake resistance measures of housing.
- ○ Activities will be executed on mitigation of damage of railway facilities and on preparation so that operation can be resumed promptly on the basis of procedures specified for operation resumption by each railway company. Considering that partial operation resumption can cause confusion due to concentration of passengers, etc., the framework for coordination between relevant companies will be reinforced to enable them to cooperate with each other in a rapid fashion when resuming operations.
- ○ With regard to disaster risks of roads due to earthquakes, sediment disasters, flood, tsunamis, tidal waves, etc. and emergency routes, etc. designated as target roads that support return to homes, relevant agencies will share information and collaborate in order to secure routes that enable safe and smooth return to homes on foot and by bicycles. In addition, with regard to alternative transport in case of railway interruption, systems that can promptly adjust securement and operation routes of alternative buses will be formulated beforehand through collaboration of each transport company and relevant agencies.
- ○ In order to secure safe and smooth transport, activities will be executed on utilization of automotive probe information of government and private companies, upgrade of area traffic control systems, preparation of traffic safety facilities, etc. such as traffic signal power adding devices, utilization of traffic circles, etc. Moreover, to avoid the situation in which smooth operation of alternative buses cannot be conducted due to traffic jams, information on traffic regulations such as closed roads, traffic jams, etc. will be provided to car drivers, etc. through utilization of optical beacons, ETC2.0, etc. and understanding and cooperation of citizens will be enhanced: bypass of confusion areas and minimization of driving will be enhanced.
- ○ Activities will be further executed not only on planning to secure urban renewal safety, planning to manage disasters in areas, etc. but also on preparation to secure safety of residents, etc. on the basis of plans.
- ○ With regard to public facilities, spaces that accept victims in buildings of private companies, etc. and stockpiling warehouses where victims can stay as well as facilities relating to acceptance of victims (including non-utility generation facilities, water tanks, manhole toilets, etc.), enhancing the earthquake resistance and other preparation will be promoted. Moreover, activities will be executed on preparation of parks and green spaces that can be used as locations to provide rests, information, etc. to those who return home on foot.
- ○ To alleviate the state of excessive concentration of population in the centers of metropolises during daytime which can cause a large number of stranded persons due to paralyzation of railways, etc. effective measures of boosting development of an autonomous, decentralized and coordinated nation and streamlined utilization of land will be considered and conducted

2-5) Paralysis of medical services due to damage to and/or severe lack of medical facilities and personnel, disruption of routes for offering support, and disruption of energy supplies

- ○ Compared with the demand of medical resources (water, food, fuels, doctors, medicines, medical facilities, etc.) that can cope with disasters where many injured persons are expected such as Nankai Trough earthquakes or capital inland earthquakes, the volume of medical resources that can be supplied in areas and can be supplied from areas outside disaster-affected areas can be insufficient considering damage by these disasters. Specific consideration will be made across ministries and agencies including volume, speed, traffic access, etc. of transport methods and supply systems of medical resources will be established.
- ○ With regard to slightly injured persons who will compose most part, systems will be formulated so that this can be responded through first aid of mutual aid of community.
- ○ Enhancing the earthquake resistance in disaster base hospitals and emergency and critical care centers will be achieved at 100%. With regard to medical facilities in inundation hazardous areas of Nankai Trough earthquakes, etc., measures, etc. will be taken to move facilities to other places. Moreover, BCP will be formulated to avoid stop of functions. Furthermore, to upgrade disaster response capacity, facilities and human resources will be improved.
- ○ With regard to national university hospitals, preparation of facilities such as reinforcement of disaster management and mitigation functions will be conducted in order to serve functions and roles in each area.
- ○ With regard to securement of energy in disaster base hospitals, activities will be executed to continuously boost awareness on the necessity of storing energy to protect oneself which includes fuel used for non-utility generation facilities, etc. In addition, collaboration between relevant agencies will be enhanced so that fuel, etc. should be allocated at high priority. Moreover, activities will be executed to enhance disaster-resistant capacity: activities will be executed on introduction of facilities of high energy efficiency, introduction of emergency energy sources, introduction of self-reliant and decentralized energy facilities, utilization of various energy sources such as liquefied petroleum gas and kerosene, etc.
- ○ With regard to hospitals with patients who require large amount of clean water for dialysis, etc., activities will be executed on multiplexing of water sources using ground water, etc. at ordinary times as well as formulation of collaboration systems to recover water supply at high priority. Preparation will be made for the cases in which drains cannot be used.
- ○ When there are many injured persons, enough space will be secured for housing them in ideal environment inside disaster-affected areas or transferring them to places outside disaster-affected areas: this space will be secured for patients waiting medical examinations and medical treatments as well as for patients who completed them.
- ○ Implement training of DMAT members following consideration of the number of teams required based on the expected extent of damage. Implement constant maintenance/enhancement of capabilities by holding regular reviews of training frameworks and DMAT activities and the enhancement of equipment such as information systems. In addition to DMAT training, carry out work out to enable an adequate response to post-disaster demand for DPATs and medical support activities etc. through personnel training that spans different professions. Also provide training to develop core Self-Defense Force disaster medics able to cope with large numbers of injured people.
- ○ By establishing health care and medical adjustment headquarters under disaster control headquarters of prefectures of disasters to adjust dispatch of health care and medical activity teams, etc. gathered for support, resource allocation corresponding to the need of health care of each disaster-affected area as well as formulation of systems for effective activities through ideal collaboration of each health care and medical activity team will be conducted. Moreover, disaster medical coordinators that conduct dispatch adjustment, etc. will be developed.

○ To transport DMAT, etc. and relief supply to disaster base hospitals, etc., activities will be executed on preparation and access improvement of high standard main roads, etc. for securing alternative methods, reinforcement of earthquake resistant structuring in road bridges, measures to prevent road slope from collapsing, reinforcement of slope foot of banking, elimination of power poles, utilization of traffic circles, enhancing the earthquake resistance in airport facilities, reinforcement of earthquake resistant and tsunami resistant capacity of harbor facilities, measures against flood, sediment disasters, tsunamis, tidal waves, etc. Moreover, improvement will be enhanced in effectiveness of plans on opening of access routes: for example, transport routes of patients, drugs, etc. will be secured at high priority.

○ To avoid the situation in which vehicles used for disaster emergency measures, etc. cannot reach evacuation centers due to traffic jams, prompt comprehension of information on automobile traffics and its use in measures for transportation should be promoted through utilization of automotive probe information by government and private companies, upgrading of area traffic control systems, collection of passage propriety information through relevant agencies, etc. Moreover, by providing car drivers, etc. with information on traffic regulation such as closed roads, traffic jams, etc. through the utilization of optical beacons and ETC2.0, etc., understanding and cooperation by citizens will be promoted: they should be asked to bypass areas of confusion and not to go out with automobiles.

○ Required facilities, functionalities, and equipment should be explored and defined to enhance aircraft transportation bases and temporary medical facilities (Staging Care Unit, SCU) located there to transport and care severely injured patients who cannot be treated within disaster areas to external areas. In order to permanently maintain such medical equipment needed at the time of disaster, it will also be used in normal times.

○ Carry out work on measures relating to issues such as earthquake resistance measure of houses and buildings, preventing external walls and glass from falling from buildings, and preventing furniture from falling over. Consider effective measures and implement initiatives to form an “autonomous, decentralized and coordinated nation” to reduce excessive population concentrations in places with high disaster risk levels such as areas expected to be affected by an inland capital earthquake and prevent situations in which the residential populations of rural areas decline so much that medical services cannot even be maintained even during normal non-disaster conditions.

2-6) Outbreak of plagues or infectious diseases on a large scale in disaster-affected areas

○ To avoid occurrence and spread of infectious diseases, ideal health examinations and vaccinations will be promoted at ordinary times. Moreover, systems will be maintained so that local governments can execute disinfection and pest control on the basis of the law relating to prevention of infectious diseases and medical activities for patients of infectious diseases (Law No. 114 of 1998) at the time of disasters.
○ To secure minimum functions of drains even at earthquake occurrences, enhancing the earthquake resistance in main pipes of drains will be conducted. In addition, BCP of drains of each organization will be brushed up on the basis of drain BCP plan manual, etc. which have been revised according to expertise obtained from Kumamoto earthquake (2016). Moreover, preparation will be made for the cases in which no drains can be utilized.
○ Measures will be taken to prevent large-scale floods that deteriorate outdoor hygienic environment.
○ To avoid spread of influenza, norovirus, O157, etc. among refugees, hygienic environment of facilities used as evacuation centers will be maintained in good conditions even at the time of disasters. Moreover, considering occurrence of these illness among those who evacuate outside evacuation centers, each local government will plan measures of notifying information on ideal prevention of infectious diseases.
○ Activities that support medical activities will be promoted steadily.
○ With regard to medicines and equipment necessary for hygiene management of evacuation centers, etc., ideal securement will be made through stockpiling and collaboration with distributors, etc. at the time of disasters.
○ In order to suppress occurrence of refugees due to collapse of houses and buildings, enhancing the earthquake resistance in houses and buildings will be promoted.

2-7) Deterioration of health condition of many victims or the occurrence of death due to poor living condition during evacuation and inadequate health care.

○ In order to meet the need of life at evacuation centers, etc. activities will be executed on preparation and upgrade of equipment as well as on repair, etc. of buildings including enhancing the earthquake resistance and execution of countermeasures for aging considering "Guidelines of activities for securing good life environments at evacuation centers." In particular, considering many school facilities are designated as designated evacuation centers, disaster management function will be reinforced as evacuation centers: this will include safety securement of facilities through enhancing the earthquake resistance measures and countermeasures for aging buildings including non-structural elements, preparation of toilets, non-utility generation facilities, introduction of barrier free structuring into facilities, etc.

○ In order to realize voluntary management of evacuation centers, utilization plans will be formulated beforehand considering families with infants, females, elderly people, etc. Moreover, activities will be executed on securement of welfare evacuation centers that act as facilities which accept persons who require special assistance and find it difficult to live in general evacuation centers and on securement of their operation systems.

○ Voluntary formulation of activity plans by residents will be promoted through spread, education, etc. of disaster management plan systems of community. In addition, emergency drills, disaster prevention education, etc. will be promoted continuously through schools, offices, community organizations, etc.

○ With regard to securement of requisite materials including water, food, fuel, etc., activities will be executed on reinforcement of emergency measures of water supply, consideration relating to utilization of various alternate water sources such as ground water, rain water, reclaimed water, etc. at the time of crises as well as promotion of spread of utilized equipment, formulation of systems to execute smooth transport of relief supplies including last mile, development of human resources that specialize in logistics support such as effective disaster relief operation, relief supply distribution, etc. to avoid excessive deterioration of life environment due to lack of goods. Moreover, necessary stockpiling, etc. will be promoted at each family and each condominium so that residents of houses with small damage need not evacuate.

○ With regard to refugees to places other than evacuation centers such as cars, formulation of schemes of collaboration between relevant ministries and local governments involved in information sharing, etc. will be promoted so that comprehension and support can be conducted smoothly. Moreover, to support victims promptly, preparation of victim ledgers by municipalities will be promoted.

○ Through collaboration by health centers, administration, health personnel, NPOs, local residents, etc., systems to conduct medium- to long-term care and health management will be established: frequent occurrence of infectious diseases, venous thrombosis (so-called economy class syndrome), disorders due to stress will be avoided mainly from disaster acute phase to disaster subacute phase; and health of victims will be protected from mental issues caused by trauma due to disasters, loss experience, economic unrest for the future and deterioration of human relations and bonds during reconstruction phase after disaster subacute phase.

○ Improvement of the earthquake resistance will be promoted in government office buildings, etc. that are used as disaster management bases at the time of disasters to avoid damage in administration functions. Moreover, activities will be executed on development, etc. of teams that are trained to support direction adjustment functions of health care and medical adjustment headquarters established in disaster control headquarters and to support those functions of health centers. By doing these, systems will be established so as to distribute support resources of health care and medical activity teams, etc. according to the need of health care in each disaster-affected area and to secure effective activities by each health care and medical activity team, etc. through ideal collaboration.

○ Make efforts to ensure the implementation of appropriate measures through the creation of frameworks for wide-area coordination through utilization of healthcare-related information even when primary care physicians are adversely affected by disasters or during wide-area evacuations.

○ Hold briefing meetings etc. during normal non-disaster conditions and also following disasters to disseminate accurate information regarding enhancements to building damage assessments of residential houses (including acceleration of the process) and information regarding matters that local governments need to respond to following disasters. Local government organizations should carry out deliberations taking into account issues such as how to maintain living environments and communities and protect those requiring special assistance when considering measures to facilitate the smooth and rapid supply of temporary emergency housing, measures to promote emergency repairs to housing, and the provision of a diverse range of housing options linked to post-disaster urban reconstruction efforts.

○ To cope with various challenges caused by drastic change in life environment of victims such as moving from evacuation centers to temporary houses or moving from temporary houses to reconstruction houses and to provide victims with safe daily life in each environment, victims will be watched to avoid occurrence of isolation, etc. and provided with support on life consultation, life support and opportunities to provide interaction between residents, etc.

○ To mitigate occurrence of a large number of victims in metropolises and serious lack of evacuation centers, enhancing the earthquake resistance and reinforcing the fire control will be promoted in houses and building, etc. and enhancement, etc. of volunteer firefighter, etc. will be enhanced. In addition, by considering effective measures to boost development of an autonomous, decentralized and coordinated nation and alleviating the state of excessive population concentration in areas with high risks of disaster occurrence, demand of evacuation centers will be decreased drastically. Moreover, enhancing the earthquake resistance, etc. will be promoted in public facilities specified as designated evacuation centers to avoid decrease in capacity.

3. Securing indispensable administrative functions

3-1) A decline in public safety and confusion of society due to significant deterioration of judicial functions and police functions due to disaster

○ Steadily implement countermeasures for earthquake resistance and aging correctional facilities and Ministry of Justice facilities at which worst-case scenarios involving the escape etc. of inmates are envisaged. Move ahead with work—through training etc.−on the upgrading of correctional facilities' general security systems such as security cameras that have degraded over time and the creation of frameworks for post-disaster information-sharing between relevant organizations. Implement initiatives coordinated with local communities such as designating some correctional facilities as local government evacuation.

○ Securement of police functions will be acquired through completion of enhancing the earthquake resistance in police facilities, the demolishing and rebuilding of old police facilities, upgrade and preparation of communication functions and order functions necessary for police activities and further upgrade of functions of police airplanes, mobile police communication corps, etc. Moreover, practical trainings on the basis of community characteristics and actual disasters and joint drills with relevant agencies will be conducted to further improve disaster-response capacity of Police Disaster Dispatch Unit and to share expertise obtained through trainings with relevant agents promptly. By doing these, formulation of systems to cope with a decline in public safety will be promoted from structural and non-structural aspects integrally.

○ Move ahead with the creation of traffic safety facilities such as traffic signals equipped with additional power source devices and the utilization of roundabouts.

○ Systems to mitigate confusion of road traffics should be established: activities will be executed on integration of traffic information, implementation of prompt and ideal traffic regulations using automotive probe information of government and private companies, etc. In addition, by providing centralized traffic information to general road users, safe and smooth road traffics will be secured.

3-2) Dysfunction of central government in metropolitan area

○ Dysfunction of central government directly influences restoration speed of all phases after disasters and therefore it is critical from the point of resilience. Consequently, necessary functions will be maintained at the time of natural disasters of any scale.
○ Trainings and education will be provided on the basis of BCP of total government and BCP of each ministry considering various situations: these situations include difficulty to continue work at government offices at the time of large-scale disasters, insufficiency of gathered personnel, long-term execution of emergency priority work, etc. In addition, plans will be reviewed several times through assessment of effectiveness of plans.
○ Carry out earthquake resistance measures of aging government facilities in a planned and focused manner. Also promoted further work on fixing in place furnishings in government buildings and making non-structural elements such as ceilings earthquake resistant.
○ Establish frameworks to ensure smooth performance of duties even during emergencies including the rapid collection and dissemination of information required for disaster response efforts such as information concerning disaster-related damage and effective coordination with relevant central government, local governments, and private sector organizations.
○ Each central government agency needs to conform to their BCP and other policies to keep their buildings earthquake-resistant, secure energy sources, such as electricity and gas, make information and communications systems redundant, stockpile supplies, and reserve alternative government buildings so that their prioritized emergency activities will continue to function even if impacts inflicted by large-scale natural disasters such as a capital inland earthquake continue over a long period of time.
○ Since dysfunction can occur due to damage of infrastructures around government buildings and due to stop of supply of energy, ideal measures will be promoted steadily: these include measures of disaster prevention for roads, elimination of power poles in emergency routes, reinforcement of earthquake resistant and tsunami resistant structuring in harbor facilities, measures against flood, sediment disasters, tsunamis, tidal waves, etc.

3-3) Significant deterioration of the functions of local governments due to damage to personnel and facilities

○ Securement of administrative functions such as disaster response by local governments is extremely important from the point of resilience. Consequently, necessary functions will be maintained even at the time of natural disasters of any scale.

○ While using guides for formulating business continuity plan for municipalities, manuals for securing business continuity for local government at the time of large-scale disaster occurrence, guidelines relating to support accepting systems at the time of disasters for local governments, etc., formulation and review of BCP of local governments as well as measures to secure effectiveness will be promoted. Moreover, to avoid dysfunction of administration due to increase in disaster response work, damage of employees and families, inability to gather employees at government office buildings due to traffic paralysis, etc., activities will be executed on securement of communication method, securement of methods to collect and notify information on the way to the gathering place, utilization of expertise owned by private companies as well as by professionals, experts, etc. of community and utilization of facility equipment, organizational systems, etc. of community. In addition, education considering various situations as well as joint drills, etc. with specific goals will be continued.

○ Local governments will make efforts to enhance their business continuity structure based on support received from external organizations by entering into mutual agreements among them so they can deal with the lack of administrative staff.

○ With regard to public facilities, etc. that are used as disaster management bases such as police stations, fire department building, etc., the earthquake resistance has been enhanced in only part of the facilities and this will be conducted promptly.

○ With regard to securement of energy necessary to maintain rescue, relief and medical activities, etc. to respond to risks of damages by disasters, stockpiling, etc. will be promoted. In addition, activities will be executed on formulation of collaboration schemes between relevant ministries and local governments relating to trainings, information sharing, etc. on stockpiling methods and supply systems of petroleum products. Moreover, with regard to formulation of victim ledgers, etc., advices, etc. will be incorporated so that victim ledgers can be formulated promptly on the base of practical guidelines in municipalities at the time of disaster occurrence.

○ Since dysfunction can occur not only due to damage of facilities and employees of government agencies but also due to damage of surrounding infrastructures, activities will be executed steadily on disaster management measures for roads as well as elimination of power poles, reinforcement of the earthquake resistant and tsunami resistant capacity of harbor facilities, measures against flood, sediment disasters, tsunamis and tidal waves as well as afforestation control, etc.

○ Actual operation of the law relating to reconstruction from large-scale disasters (Law No. 55 of 2013) will be enhanced even at ordinary times. Activities will be executed on sharing of activities, procedures, etc. as handbooks and case studies relating total recovery by relevant ministries and local governments to execute recovery from disasters efficiently and effectively. In addition, improvement will be made to enhance measures of recovery and reconstruction from disasters and to boost response capacity of local governments, etc. that cope with support of victims at the time of disaster occurrence.

○ Through spread, education, etc. of disaster prevention systems of community, formulation of plans relating to voluntary disaster prevention activities by residents, etc. will be promoted.

○ With regard to school facilities, enhancing the earthquake resistance in buildings will be completed immediately. Moreover, from the point of safety measures, activities will be executed on countermeasures for aging, etc.: this includes implementation of the earthquake resistant measures into non-structural elements of old construction methods and those of time-related deterioration. Furthermore, functions of evacuation centers other than school facilities will be improved by enhancing the earthquake resistance, etc. in buildings including non-structural elements.
○ Execution of trainings and seminars for local government and provision of technical supports to local governments will be promoted to realize prompt execution of emergency measures and disaster recovery.

4. Secure indispensable information and communication functions

4-1) Paralysis and suspension of communication infrastructure needed for disaster management and disaster responses

○ By providing information of "Vulnerability assessment manual for telecommunication lines" through cooperation of telecommunications carriers, supports should be made on measures against vulnerabilities of systems of information and communications of government ministries.
○ With regard to technological standards relating to damages, defects, etc. of telecommunication equipment, execution of ideal review is planned on the basis of disaster situations, etc. (communication interruptions, power cuts, etc.) and each carrier will continue to conduct self-check of compliance of these standards.
○ By executing trainings, etc. in wide areas considering large-scale disasters, comprehensive disaster management capacity will be reinforced.
○ In order to avoid long lasting stop of supply of electric power, etc., activities will be steadily executed on preparation of foundation to authenticate assessment for securing security of control systems of electric power, etc., elimination of power poles and disaster management measures, etc. of community against flood, sediment disasters, tsunamis and tidal waves.
○ In order to secure disaster rescue operations when lines of private carriers are stopped, ideal preparation should be made on foundation of systems of information and communications of the police, the Self-Defense Forces, the Japan Coast Guard, etc.: activities will be executed on improvement in disaster-resistant capacity, utilization of new technologies such as small unmanned aerial vehicles, etc.
○ Disaster management function, etc. will be reinforced utilizing the quasi-zenith satellite systems (QZSS), etc.
○ Promote initiatives to create necessary warning/evacuation frameworks taking into account basic research and zone designation based on the Act on Sediment Disaster Countermeasures for Sediment Disaster Prone Areas (Act No. 57 of 2000)

4-2) Circumstances in which disaster information cannot be delivered to people who need it due to suspension of TV and radio broadcasting

○ Measures will be taken to prevent the interruption of radio broadcasting that serves as an important information delivery mechanism for residents at the time of disaster by transferring transmitting stations and developing FM complementary stations, supplemental transmitting stations, and relay stations.
○ In order to secure capacity to provide information at the time of interruption of broadcasts of TV and radio, preparation of alternative methods such as communication satellites as well as prompt and accurate transmission of L-Alert which is used as the foundation will be promoted. Moreover, conversion to fiber optics and duplication of networks of cable TV will be promoted.
○ Measures against floods, etc. will be promoted to avoid damage to broadcast stations, etc.

4-3）Circumstances in which information services to be used in the event of a disaster become dysfunction, making the collection and transmission of information unfeasible, and causing a delay in evacuation behavior and rescue/support

○ In order to provide information securely through J Alert to all residents, multiplexing of methods to transmit information in connection with J Alert will be promoted.
○ Through promotion of the digitization of the government disaster management radio system; the prompt and accurate transmission of, and enhancement of, L-Alert; measures by radio stations to counter poor radio reception; development of apps to provide information to travelers; and work on fortification and enhancement of police and fire service telecommunications infrastructure/facilities, we have been making progress with the diversification of secure and prompt means to provide information to local governments and the general public.
○ Move ahead with facilitating rapid grasping of traffic conditions through utilization of public-private probe vehicle data etc. and refining wide-area traffic control systems to increase the amount of traffic information collected by the National Police Agency; updating of traffic signals; provision of earthquake-related information using GPS wave gauges, monitoring networks for maritime earthquakes and tsunamis, and the GNSS1 information provision system etc.; and diversification/securing of information gathering methods including through the use of IT/social media and so on. In addition, move ahead with initiatives to accelerate provision of information concerning earthquake magnitudes through use of the MOWLAS integrated land and sea observation network for earthquakes, tsunami and volcanos.
○ Utilize the G-Spatial Information Center, the Comprehensive Disaster Prevention Information System, Integrated Disaster Information System, the Disaster Information Hub initiative, SIP4D, etc. in the disaster response activities of ministries and agencies, local governments, and so on. Also develop local government personnel/frameworks to take the initiative in implementing information gathering/provision.
○ Through measures of roads against snow, cold weathers, liquefaction, reinforcement of earthquake resistant structuring in bridges of roads, slopes, etc., activities will be executed to avoid slow refuges due to traffic jams that take place after occurrence of disasters at high probability.
○ Transportation information relating to automobile traffics such as traffic result information will be provided to general users of roads promptly.
○ By executing trainings in wide areas considering large-scale disasters, comprehensive disaster management capacity will be reinforced.
○ Measures against floods, sediment disasters, etc. will be promoted to avoid damage of communication infrastructures, etc.
○ Measures to secure transportation network will be promoted to avoid insufficiency of employees that handle tasks of transmission of information.

○ Relevant measures will be improved to avoid system down and loss of storage media.
○ Research and development will be promoted on component technologies, systems, etc. relating to collection, preparation, analysis and transmission of information.

5. Prevent economic dysfunction

5-1) Deterioration of international competitiveness due to a decline in companies' productivity caused by disruption of supply chains, etc.

○ Formulation of BCP measures by manufacturing industry and logistics providers will be promoted. Focus will be made on the promotion in small and medium-sized enterprises. In addition, formulation of BCP measures will be promoted through collaboration of companies such as collaboration of manufacturing industry (owner of goods) and logistics providers.
○ Promote the development of facilities at private companies etc. that contribute to business continuity, including promotion of the development of private sector logistics facilities that are highly resistant to disasters.
○ Measures to enhance disaster resistance of logistics facilities, routes, etc. will be promoted through activities on formulation of effective vessel traffic control, formulation of plans for opening access routes of ships, disaster management measures for roads and elimination of power poles, reinforcement of earthquake resistance and wave resistance of harbor facilities, measures against flood, sediment disasters, tsunamis, tidal waves, etc.
○ Regional relocation and expansion of the headquarter function of companies will be actively supported, and the development of a business environment will be comprehensively promoted to ensure that the relocation and expansion proceed smoothly. [Cabinet Office; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism]
○ Share Japan's knowhow, and work on strengthening disaster management capabilities overseas.
○ Promote the provision of highly detailed information including concrete regional disaster predictions, and develop frameworks for general consultation services.
○ Human resources of experts who can lead resilience of private companies will be developed in each community.

5-2) Serious impact on the sustainability of socioeconomic activities and supply chains due to suspension of energy supply

○ With regard to collaboration plans on supply of petroleum at the time of disasters, collaboration plans on supply of petroleum and gas at the time of disasters and series of BCPs, their effectiveness will be enhanced through execution of trainings, roll out of good case studies among relevant people, etc. Constant reviews will be also conducted on those plans. Moreover, consideration will be further made on improvement of procedures to transport fuels smoothly.
○ In addition to promoting countermeasures against disasters for transport bases used for fuel supply routes, etc., to facilitate rapid reopening of transportation routes following disasters promote the enhancement of equipment and materials through coordination between relevant organizations and promote the development of frameworks for coordination between relevant organizations.
○ Through preparation of resident base service stations, execution of emergency drills, etc., activities are executed on reinforcement of disaster response capacity of service stations and liquefied petroleum gas main filling stations that function as community energy bases at the time of disasters. Moreover, to maintain supply chains of fuel supply, measures will be promoted to solve problem of areas where only small number of service stations exist. In addition, support will be reinforced on measures on consumer side which include stockpiling of fuels, etc.
○ Activities will be executed to promote spread of use of renewable energy and hydrogen energy, cogeneration system, liquefied petroleum gas, etc. and to promote spread of systems, etc. to supply electric power from fuel cells, storage batteries, electric cars and fuel cell electric vehicles into each family, building, hospital, etc. Formulation of smart community will be also conducted. Through these activities, diversification and decentralization of energy supply sources are promoted to avoid and mitigate disaster risks: for example, self-reliant and decentralized energy will be introduced.
○ In preparation for shortages of gasoline etc., relevant ministries will work on diversification/decentralization of fuel type for transportation such as electric vehicles, CNG-powered vehicles, LPG vehicles and ships, and LNG vehicles and ships.

5-3) Damages, fires, explosions, etc. at complexes and other important industrial facilities

○ Promote and sustain initiatives to ensure the effectiveness of the disaster management plans of petrochemical complexes through drills and enhancement of coordination between relevant organizations.
○ Enhancing the earthquake resistance will be promoted in petroleum refinery facilities and high-pressure gas facilities. Moreover, with regard to high-pressure gas facilities, consideration will be promoted to review standards of earthquake-resistant designs considering giant earthquakes such as Nankai Trough earthquakes.
○ Fire resistance for complexes at ordinary times will be promoted and collaboration systems by relevant agencies will be also formulated and reinforced.
○ Work to reinforce the operational frameworks of the Dragon Hyper Command Unit through the implementation of joint drills with relevant organizations, etc.
○ BCP for harbors will be formulated: according to those plans, collaboration will be made among relevant people of harbors of important harbors or more with petroleum refineries and oil terminals.

5-4) Tremendous influence on overseas trade due to suspension of maritime transport functions

○ Promote understanding from domestic and overseas shipping companies of tsunami evacuation manuals for passenger vessels and others ships and also promote the creation of such manuals.
○ With regard to systems that enable prompt matching of utilization need of ships with availability of ships, test operation, etc. will be conducted during emergency drills to further promote securement of effectiveness from now on.
○ Promotion will be made on enhancing the earthquake resistance and the wave resistance in infrastructure facilities necessary to maintain marine transport such as channel marks and harbor facilities.
○ Effectiveness of harbor BCP will be improved and consideration will be made on the substitutability of harbor functions of wider areas.

5-5) Tremendous influence on logistics and human flow due to dysfunction of the core road/marine transport networks, such as disruption of arteries in the Pacific Belt Zone

○ Analysis of risks of interruption of main line transport and standardization of recognition will be promoted through wide collaboration of owner of goods, carriers, transport companies, managers of roads, etc. and research institutes. By doing these, the analysis and standardization will be incorporated into BCP, etc. of each organization. For example, business plans will be considered on the basis of the situation in which transport networks cannot be used due to large-scale natural disasters: transport companies should select routes to bypass areas or time zones where storms, blizzards, etc. are forecasted whereas demand side will secure inventory of parts of certain volume.
○ Reinforcement of transport infrastructures themselves will be promoted: activities will be executed on reinforcement of the earthquake resistance of bridges of roads and enhancement of the earthquake resistance of facilities of harbors and airports, measures against liquefaction, measures against waves and tsunamis, measures against flooding, measures against power failures, measures to prevent collapse of slopes of roads, reinforcement of toes of slopes of banking, etc.
○ Information concerning current operating circumstances, the closures of any passages, and when they are expected to be opened is to be shared in a timely and accurate fashion.
○ Road and rail networks with high substitutability should be constructed. Based on comprehensive assessments such as individual project evaluations, there should be steady maintenance of expressway networks, including greater metropolitan ring roads, and a Shinkansen network that is resistant to disasters such as snow and heavy rainfall, which will function as a substitute route in times of disaster; functional enhancements should also be promoted, including the conversion of temporary two-lane expressways to four lanes. Moreover, approach paths for emergency vehicles should be installed, and accessibility to arterial high-standard highways, etc. should be improved. In terms of logistically important road transport networks, there should be functional improvements in order to ensure stable transportation, even under normal circumstances.
○ In order to avoid total transportation paralysis due to partial damage of transportation networks, relevant people will collaborate to designate priorities of opening of access routes, prepare alternate transportation between plural modes and reinforce management capacity of total transport. Moreover, consideration will be made for the situation expected: transportation demand of bicycles is expected to increase in the case where no railways and automobiles can be used.
○ With regard to responses where vehicles are damaged, complexity of procedures, etc. will be mitigated so that victims can respond to the situation promptly.

○ There should be maintenance of traffic safety facilities, etc., including countermeasures for aging, closer cooperation for determining plans to open roads and sea routes, the understanding and provision of information concerning agriculture and forestry roads and others that may become diversions, the construction of effective sea traffic control, and electric power supply equipment for traffic lights. Traffic circles should also utilize.
○ Through the use of traffic surveillance cameras and highway management cameras, etc., public and private automobile probe information, the enhancement of wide-area traffic control systems, and the accumulation of information concerning whether passage is possible with cooperation from relevant institutions, there should be a rapid understanding of traffic information relating to automobile access, the application of traffic countermeasures, and rapid provision of information to general road users.
○ To make a preparation for intensive and heavy snow, preventive traffic control and concentrated snow removal actions will be taken by proactively formulating timelines and plans to remove snow and comprehending risk spots where extreme traffic jams are expected to occur. At the same time, activities on securement of road traffic, such as ensuring use of equipment including chains, etc., reinforcement of systems to remove snow, collaboration among road managers, spot measures such as pull-off areas to respond to actual local situations, etc., will be advanced from both non-structural and structural aspects.

5-6) Serious impact on international air transportation due to concurrent damage to multiple airports

○ Airport facilities, including the minimum-required basic facilities and the management facilities necessary to ensure supervisory functions, will be made earthquake resistant.
○ Collaboration systems with relevant agencies will be continued and reinforced in order to maintain airport functions: these include preparation of systems through formulation of immediate recovery plans and trainings at airports as well as securement of equipment and staffs of airline companies, etc.
○ Land transport functions are to be ensured, such as roads and railways in order to guarantee the substitutability of airport functions.

5-7) Serious impact on citizenry, business transactions, etc. due to dysfunction of financial services, postal services, etc.

○ Post offices directly managed by Japan Post Co. Ltd. should be made earthquake-resistant. In addition, their BCPs should carry out reviews as necessary to ensure effectiveness, as well as implement countermeasures for road disasters to ensure that the postal service does not cease due to traffic paralysis.
○ All major financial institutions are to promptly determine a BCP, ensure redundancy in systems and means of communication, make stores earthquake resistant, and secure a back-up site for their systems center. Moreover, they are to continuously implement measures to maintain and improve the effectiveness of their BCP.
○ Measures against flood, etc. will be promoted to avoid damage of financial institutes, etc.

5-8) Stagnation of stable supply of food, etc.

○ The determination of BCPs for individual regions, relating to the continuous production and distribution of marine products, is to be promoted, and plans for the continuation of business are to be implemented, even in land improvement districts, etc. that manage agricultural irrigation facilities.
○ In order to maintain uninterrupted food supplies even in times of large-scale disasters, facilities involved in the production and distribution of agricultural and livestock products are to be made disaster resistant, the construction of a coordinated, collaborative system for whole food supply chains is to be promoted and disseminated, and the determination of BCPs by business operators is to be promoted. Moreover, disaster-resistance is to be improved, with the introduction of self-reliant and decentralized energy facilities, and the use of diverse energy sources.
○ In terms of production bases relating to agriculture, forestry, and fishery, agricultural irrigation facilities and bridges on farming roads are to be made earthquake resistant, and conservation measures and comprehensive disaster management and disaster mitigation measures are to be promoted. Distribution bases for marine products and production base facilities are also to be made earthquake resistant.
○ To secure smooth flow from upstream to downstream of supply chains, formulation of logistics infrastructure networks will be conducted taking account of following points: enhancing the earthquake resistance in road bridges, enhancing the earthquake resistance of logistics infrastructures such as harbors, airports, etc., mutual collaboration of transport modes and reinforcement of industrial competitiveness at ordinary times.
○ Actions will be implemented in normal times to stockpile supplies appropriately and efficiently and ensure stable import. At the time of disaster, steady actions will be implemented to leverage stockpiled supplies and ensure import.

5-9) Serious impact on production activities associated with disruption of water supply for specific uses due to drought, etc.

○ In terms of ensuring that waterworks, industrial water supplies, and agricultural irrigation facilities are earthquake-resistant, human resources and expertise will be enhanced through cooperation with prefectural authorities and water suppliers.
○ In order to quickly recover during large-scale disasters, wide-ranging support systems will be maintained, and the effective use of water resources, such as the use of rainwater and recycled water based on the Act on the Promotion of Rain Water Usage (Act No. 17 of 2014) is to be disseminated and promoted.
○ It is thought that water shortages, etc. that exceed the current standard levels of water supplies will further increase in frequency and severity due to the influence of climate change, etc., and so in addition to ensuring that relevant parties work closely together to share information, efforts will be made in accordance with the Basic Act on the Water Cycle (Act No. 16 of 2014) to enhance the functionality of water resource facilities, effectively utilize water resources currently effectively used as stock, and make use of groundwater as a substitute water resource in times of crisis.
○ Strategic maintenance, management, and functional enhancement, including improvement of longevity of aging waterworks, industrial water supplies, and agricultural irrigation facilities will be carried out.

6. Minimize damage to lifelines, fuel supply related facilities, transport networks, etc., and seek early recovery of these infrastructures

6-1) Prolonged suspension of functions of power supply networks (power generating/transforming stations, transmission/distribution equipment), city gas supply, and oil/LP gas supply chains

○ Electricity facilities, including solar power generators, will be assessed for their resilience to natural disasters and related standards will be developed. Based on this, disaster resilience and recovery capabilities will be enhanced for power plants, substations, power transmission networks, and electric power systems.
○ Considering resistance assessment of petroleum refineries, enhancing the earthquake resistance (measures for enhancing the earthquake resistance, measures against liquefaction, measures for safe stop of facilities, etc.), reinforcement of shore protection, etc. will be enhanced steadily. Moreover, with regard to relevant collaboration plans for supply and BCP, effectiveness will be promoted through execution of trainings, etc. Furthermore, BCP for harbors through collaboration of relevant people will be formulated for harbors of important harbors or more where petroleum refineries and oil terminals.
○ The national crude oil stores and the mobility of product release are to be ensured, and a national store of LP gas is to be ensured and maintained.
○ Activities will be executed to promote spread of use of renewable energy and hydrogen energy, cogeneration system and to promote spread of systems, etc. to supply electric power from fuel cells, storage batteries, electric cars and fuel cell electric vehicles into each family, building, hospital, etc. Formulation of smart community will be also conducted. Through these activities, diversification and decentralization of energy supply sources are promoted to avoid and mitigate disaster risks: for example reliant and decentralized energy will be introduced.○ In addition to promoting countermeasures against disasters for transport bases used for fuel supply routes, etc., a system should be maintained that rapidly ensures the opening of transport routes and the recovery of facilities with cooperation from relevant parties, including an abundance of materials and equipment and an accumulation of information as to whether routes are passable.
○ In addition to promoting countermeasures against disasters for transport bases used for fuel supply routes, etc., a system should be maintained that rapidly ensures the opening of transport routes and the recovery of facilities with cooperation from relevant parties, including an abundance of materials and equipment and an accumulation of information as to whether routes are passable.

6-2) Prolonged suspension of water supply, etc.

○ In addition to ensuring effective earthquake resistance measures for waterworks and industrial water supply facilities, human resources and expertise will be enhanced through cooperation with prefectural authorities and water suppliers.
○ In order to quickly recover during large-scale disasters, wide-ranging support systems will be maintained, someone will be made responsible for disaster management and disaster mitigation in the local construction industry, TEC-FORCE systems and functions will be enhanced and strengthened, countermeasures for road disasters will be implemented, substitute water sources will be considered when there is a groundwater crisis, and the effective use of water resources, such as the use of rainwater and recycled water based on the Act on the Promotion of Rain Water Usage (Act No. 17 of 2014), is to be disseminated and promoted.
○ Measures, etc. against flood will be promoted to avoid damage to water supply facilities, etc.

6-3) Prolonged suspension of functions of sewage treatment facilities, etc.

- ○ The main sewage pipes will steadily be made earthquake resistant and waterproof, with cooperation from local governments. Moreover, there will be strategic maintenance and control of aging sewage facilities, including prolonging the life of these facilities.
- ○ Local governments are to implement initiatives to minimize any damage, such as improving sewage BCPs and maintaining manhole toilets.
- ○ Function diagnosis for waste facilities in farming communities will be speedily executed, and based on these countermeasures for aging and earthquake resistance will be steadily implemented.
- ○ With regard to Johkasou, decentralized domestic wastewater treatment system, installation of combined treatment Johkasou (for black water and gray water) will be promoted. In addition, preparation of Johkasou Inventory (data base system) will be proceeded to secure comprehension of the status of installation and management.

6-4) Prolonged suspension of functions of land/sea/air transport infrastructure from Shinkansen and other core infrastructure to regional transport networks

○ To improve effectiveness of plans of opening access routes for vehicles and ships, a series of trainings, etc. on the basis of agreements, etc. will be executed.
○ Efforts are to be made to regularly maintain a base of education and training for construction workers in each region in order to rapidly ensure the presence and action of equipment such as heavy machinery and skilled workers with local knowledge.
○ To send recovery personnel and equipment including support in wide area in parallel to disaster-affected areas, formulation of road networks with high substitutability will be promoted as core functions. Moreover, preparation of access roads, improvement in accessibility to main roads of high standards, etc. will be promoted.
○ In terms of logistically important road networks, there will be functional improvements in order to ensure stable transportation, even under normal circumstances, as well as rapid function recovery with the nation acting as the agent for disaster recovery, opening relevant road networks and alternative/supplementary roads in times of disaster.
○ To make a preparation for intensive and heavy snow, preventive traffic control and concentrated snow removal actions will be taken by proactively formulating timelines and plans to remove snow and comprehending risk spots where extreme traffic jams are expected to occur. At the same time, activities on rapid recovery of road traffic, such as reinforcement of systems to remove snow, collaboration among road managers, spot measures such as pull-off areas to respond to actual local situations, etc., will be advanced from both non-structural and structural aspects.
○ Measures will be taken to avoid a significant decline of functions of local administrative organs (including the police and fire services) due to injuries and damage to their personnel and facilities.
○ There should be systematic large-scale repair of Shinkansen structures, earthquake reinforcement of highway bridges, landslide-disaster countermeasures, the removal of utility poles along roads, the renewal of aging traffic lights, the earthquake resistance of other transport facilities, countermeasures for liquefaction, countermeasures for tsunamis and waves, measures to ensure water resistance, measures to prevent power failure, and countermeasures in the vicinity to prevent the obstruction of transportation facilities. In addition, there is to be maintenance and control of transport infrastructure, and technological development relating to the renewal of infrastructure is to be implemented.
○ A system will be maintained that can swiftly grasp the extent of any damage and apply quick drafts of recovery plans by making accurate use of ALOS series wide-area, high resolution satellites, etc. There is also to be stable investment in GNSS Continuously Operating Reference Stations as location information infrastructure. Moreover, satellites that can grasp the extent of any damage more accurately and quickly, regardless of weather or time of day or night, will be developed and introduced. Disaster-response robots that make it possible to carry out surveys and restorative construction work in disaster areas where it is difficult for humans to enter are also to be developed and introduced, and there should be training in their operation.
○ In order to ensure safe, uninterrupted traffic to the greatest extent possible until roads are repaired, information from public and private probes will be used.
○ Facilities, including the minimum-required basic facilities and the management facilities necessary to ensure airport functions, must be made earthquake resistant and have countermeasures against flooding.

6-5) Significant deterioration of the functions of disaster management infrastructure for a prolonged period

○ Measures to ensure earthquake resistance and countermeasures for liquefaction will be systematically and steadily enacted towards the completion of disaster management infrastructure such as coastal embankments in areas where large-scale earthquakes are expected to occur; embankments will be created, floodgates, etc. will be automated or operated remotely, and seaside disaster management prevention forests will be maintained in river or coastal areas that are at high risk of tsunamis.
○ In order to quickly reconstruct disaster management infrastructure during large-scale disasters, wide-ranging support systems will be maintained, someone will be made responsible for disaster management and disaster mitigation in local construction industries, TEC-FORCE systems and functions will be enhanced and strengthened, training and classes for local public bodies to ensure rapid response and disaster recovery will be held, and technical support will be offered.
○ Through comprehensive disaster prevention information systems, comprehensive disaster information systems, SIP4D, etc., information sharing will be promoted smoothly in relevant agencies.

7. Uncontrollable complex disasters and secondary disasters should be avoided

7-1) Mass casualties caused by the occurrence of a large-scale fire in an urban area accompanying earthquakes

○ Activities will be conducted to eliminate crowded urban areas that are extremely dangerous at the time of earthquakes due to high risks of large-scale fires. Even when these problems are not solved, promotion will be made on preparation of roads, green areas, parks, etc. that are effective to prevent spread of fires, removal, the demolishing and rebuilding as well as enhancing the fireproofing of old buildings, etc. will be promoted. Moreover, in order to alleviate the state of excessive population concentration in places with high disaster risks such as potential areas of the capital inland earthquake, metropolises with densely build-up areas, etc., effective measures to promote development and use of an autonomous, decentralized and coordinated nation will be considered and conducted.
○ With regard to enhancing the earthquake resistance in houses and buildings, this will be promoted by combining all methods including promotion of rebuilding old condominiums, improvement in awareness of necessity of enhancing the earthquake resistance among owners, improvement in support measures and building assessment methods for upgrading the earthquake resistance in houses and target buildings with obligations of the earthquake resistance diagnosis, development of financial instruments, etc.
○ Government facilities, school facilities, social education facilities, sports facilities, medical facilities, social welfare facilities, correctional facilities, etc. will be made earthquake resistant. Moreover, preventative measures will be put in place to ensure that non-structural elements such as ceilings will not fall in, and countermeasures for aging should be promoted.
○ Spread of seismic breakers should will be promoted to prevent electric fires after earthquakes.
○ In addition to earthquake resistance measure for highway bridges, measures to prevent the collapse of roadside slopes, reinforcement of embankments, liquefaction countermeasures, and the removal of utility poles, high-standard highways that can serve as emergency transport routes or wide evacuation routes should be maintained, as should approach paths for emergency vehicles, systems that integrate and use public and private automobile probe information should be operated, and wide-area transport control systems should be enhanced. Moreover, in order to efficiently gather information concerning whether roads are passable, traffic surveillance cameras and highway management cameras should be used, and patrols using bicycles should be considered, deployed, and trained.

○ Preparation of parks, green areas, squares, etc. as evacuation sites will be promoted.
○ Activities will be executed on promotion of preparation of fire command center of high functionality and fire disaster management facilities such as seismic storage tanks as well as on preparation of disaster management foundation, etc. through enhancing the earthquake resistance in public facilities, etc. that are used as disaster management bases.
○ In order to avoid loss of water supplies for fire-fighting due to an earthquake, waterworks will be made earthquake resistant, earthquake-resistant water tanks will be maintained, and the conservation and use of sustainable groundwater will be considered.
○ Assuming that public help can be insufficient, enhancement of volunteer firefighter as well as spread, education, etc. of local disaster prevention plan systems will be promoted to enhance planning relating to voluntary disaster prevention activities of residents, companies, etc.

7-2) Occurrence of an extensive complex disaster on the sea or in coastal areas

○ In terms of holding joint drills with relevant organizations, a cooperative framework with the relevant organizations will be confirmed, including focusing on more practical training, disseminating information to local residents, and promoting evacuation; additionally, the functionality of materials and equipment is to be improved, and more efficient establishment of systems promoted. Moreover, disaster-prevention training and education will be continually implemented, based on the characteristics of disasters in the region.
○ Enhancing the earthquake resistance in facilities that handle dangerous materials, preparation and enhancing the earthquake resistance of breakwaters, coastal dikes, etc., measures against earthquakes and tsunamis and research and development of relevant technologies will be steadily promoted.
○ It is necessary to promote measures to prevent objects from drifting, such as containers, vehicles, ships, oil tanks, etc., due to a large tsunami or storm surge.
○ From the perspective of preventing a secondary disaster caused by marine debris, etc., promote smooth treatment of marine debris, etc.
○ The disaster management and disaster mitigation functions of the natural environment will be quantitatively evaluated, and the scale of disasters will be reduced effectively and efficiently through the conservation and regeneration of the natural environment.

7-3) Blocked conditions accompanying collapse of buildings along railroads and roads, and traffic paralysis due to depression accompanying the collapse of underground structures etc.

○ In terms of ensuring that residences and buildings are earthquake resistant, awareness will be raised regarding the necessity for owners to make buildings earthquake-resistant, and earthquake resistance will be ensured for residences and buildings that are subject to seismic evaluation.
○ To prevent accidents and disasters due to roadsides (outside road areas), road administrators will promote appropriate management by administrators of land, etc. of roadside areas.
○ In addition to road closures following the collapse of road-side residences and buildings, roads may also be closed due to fallen civil engineering structures at intersections or at the side of the road, collapsed roadside real estate, or the collapse of road-specific structures such as utility poles, and these will be made earthquake resistant or removed.
○ Measures to prevent railway closures will also be considered.

○ Roads can become impassible due to subsidence caused by damage to underground structures; there will be evaluations of cavities underneath the road surface, underground structures will be made earthquake resistant, water leakages, etc. that cause cavities around underground structures will be examined, repaired, and the cavity filled in, and information about the ground will be collected, shared, and used.
○ In situations in which transport networks and destinations are concentrated in a place of high disaster risk, these will be decentralized due to concerns that this could lead to complete paralysis in an emergency, caused by closures or collapses.
○ When a road is impassible by automobile, an effective means of surveying the area will be ensured, e.g. by bicycle, and the impassible places will be quickly detected though the use of existing measuring and observational devices such as traffic surveillance cameras and highway management cameras, and public and private automobile probe information. Moreover, wide-area traffic control systems will be enhanced, etc.
○ To secure support from national government for local governments, etc., reinforcement of disaster management capacity through execution of practical trainings in wide area considering large-scale disasters as well as improvement and reinforcement of systems and functions such as TEC-FORCE, etc. will be promoted.

7-4) Occurrence of a large number of casualties due to damage to and functional failure of reservoirs, disaster management infrastructure, and natural dams, etc., and due to deposited earth and sand as well as flowing volcanic ejecta

○ Policies related to information are to be promoted, such as multiplexing means of information transmission with cooperation from J-ALERT, investigating the history of volcanic eruptions and maintaining a geological map of volcanoes, and making use of satellite images, etc. Sharing appropriate disaster information with citizens will ensure that they are able to escape in time.
○ All prefectural authorities are to complete basic investigations based on the Act on Sediment Disaster Countermeasures for Sediment Disaster Prone Areas (Act no. 57 of 2000) by the end of FY2019, designate zones, and promote initiatives to maintain necessary warning and evacuation systems based on this.
○ More efficient inspections and diagnosis are to be promoted for facility management. In addition, as well as extending asset management systems for preventative maintenance based on regional characteristics to local public bodies, information platforms that can manage diverse data, including information concerning maps and disaster management, are to be constructed and made use of in times of disaster.
○ In areas where landslide disasters have occurred due to large-scale earthquakes and ensuing rainfall, measures to prevent the reoccurrence of a disaster, the rescue of disaster victims in order to prevent numerous casualties, measures relating to searches, and generator equipment to ensure the functionality of facilities will be introduced.
○ In the case of a river channel being blocked (a natural dam), an emergency investigation is to be carried out to enable municipalities to make appropriate judgements concerning evacuation orders for residents, and information about the area where/period when damage is expected to occur is to be shared among municipalities, based on the Act on Sediment Disaster Countermeasures for Sediment Disaster Prone Areas (Act no. 57 of 2000).
○ The proper maintenance of forests is to be promoted. There will be an accurate understanding of locations where there are likely to be mountain disasters, forest preserves will be properly maintained, measures combining the maintenance of afforestation facilities and forests will be implemented, and responses to disasters involving drifting wood will be strengthened. At this time, consideration will be given to demonstrating the effects of “green infrastructure” that makes use of diverse functions, including the disaster management and disaster reduction functions of the natural environment, and initiatives are to be promoted.

○ Measures against landslides and ensuring the earthquake resistance of reservoirs will involve measures that appropriately combine structural and non-structural approaches, with cooperation from relevant ministries and agencies, local public bodies, local residents, and facility managers.
○ There is to be constant evaluations of the natural disaster-resistance of key facilities that support Japan's electricity system, such as dams used for electricity generation, and necessary measures to maintain regulations are to be implemented.
○ Consideration will be made to solve population concentration in locations of high risks of earthquake disasters. Moreover, disaster response capacity of disaster response agencies, etc. will be improved. In addition, enhancement of volunteer firefighter, etc. will be promoted considering the insufficiency of public help at the time of large-scale disasters. Furthermore, execution of continuous emergency drills and disaster prevention education on how to act to protect oneself through schools, offices, community organizations, etc. will be promote.

7-5) Expansion of damage caused by large-scale diffusion and outflow of toxic substances

○ Equipment will be prepared, and drills and training carried out in order to prevent the large-scale spread and leakage of hazardous materials. Moreover, in addition to supporting the creation of an incident response manual relating to chemical substances, local public bodies are to increase the effectiveness of the manual, for example by carrying out follow-up actions.
○ The revision of standards to prevent leakage of high-pressure gas, ensuring the earthquake resistance of high-pressure gas facilities based on this, and measures for mine waste dumps where there is concern of hazardous materials leaking during large-scale disasters will be rapidly implemented.

7-6) Devastation of national land due to damage to farmland and forests

○ Facilities will be maintained, including making agricultural irrigation facilities, etc. earthquake resistant. In addition, appropriate conservation management of local resources such as farmland and agricultural irrigation facilities will be carried out, through local communities that make use of regional independence and cooperation, and the maintenance of systems that carry out autonomous disaster management and recovery activities in times of disaster will be promoted. The maintenance and stimulation of local communities through exchanges between rural communities and cities that make use of local resources will also be promoted.

○ Measures against mountain disasters should be strengthened for preemptive disaster management and reduction, by gaining an accurate understanding of locations where there is great danger of mountain disasters, the appropriate deployment of forest preserves, the implementation of measures to maintain both afforestation facilities and forests, and the strengthening of responses to disasters involving drifting wood such as establishing driftwood-catching check dams. In addition, houses and public facilities should be preserved by reducing damage from large tsunamis, etc., through maintaining seaside disaster management forests. At this time, consideration should be given to demonstrating the effects of "green infrastructure" that makes use of diverse functions, including the disaster management and disaster reduction functions of the natural environment, and initiatives are to be promoted.

○ In order to execute implementation of measures to prevent recurrence of disasters after occurrence of sediment disasters, formulate planned evacuation systems after generation of large-scale earthquakes and realize prompt recovery, advanced technologies will be utilized. Moreover, considering recent situation of occurrence of sediment disasters, preparation of transmission check dams with high effects of capturing sediments and driftwoods will be promoted.

○ Wildlife management to prevent harm to forests is to be promoted; management costs are to be reduced in order to steadily carry out forest maintenance such as tree thinning, including in areas with disadvantageous conditions, and reforestation after felling trees to ensure the multifaceted functions of forests. Efforts are to be made to create demand for new timber using regional forests, such as by developing and disseminating CLT, etc. Moreover, in addition to gaining the cooperation of municipalities in supporting forest conservation management activities through regional activity organizations, the maintenance of conditions to consolidate management and the clarification of forest boundaries are to be promoted.

○ In order to preserve the disaster management and reduction functions of the natural environment, park facilities will be maintained appropriately and measures to improve longevity will be promoted.

○ Production activities will be maintained in communities for agriculture, forestry, and fisheries and the deterioration of agricultural land and forests will be prevented so that national land can be appropriately conserved.

○ In order to make localities more resilient, effective policies that will stimulate the development and use of national land through "autonomy, decentralization, and cooperation," such as regional creation initiatives and initiatives that improve the community levels in local areas, will be considered and enacted.

8. Develop conditions for swift reconstruction of society and economy with improved resilience

8-1) Circumstances where reconstruction is delayed significantly due to stagnation in treatment of a large amount of disaster waste generated

○ Temporary storage sites for disaster waste that meet estimated amounts, and effective materials and equipment, etc. in times of disaster are to be guaranteed.
○ Systems and facilities that enable the rapid treatment of disaster waste even during large-scale natural disasters will be maintained, including introducing independently operable waste incineration plants.
○ Local governments will create the disaster waste management plan and develop human resources through training and drills in order to improve the effectiveness of their measures.
○ Measures for hazardous waste from municipalities in times of disaster will be considered.
○ With regard to long-range transportation for disaster waste, a disaster waste transportation system that makes use of the characteristics of mass transportation, such as freight railways and marine transport, is to be constructed.
○ Measures to control the incidence of large amounts of disaster waste in times of disaster, such as ensuring the earthquake resistance of residences and buildings, and the recycling of disaster waste will be promoted.

8-2) Circumstances where reconstruction becomes not feasible to achieve due to shortage of personnel in charge of supporting reconstruction-related activities (experts, coordinators, workers, engineers well versed in respective regions, etc.), and lack of visions for a better reconstruction

- ○ Formulation of BCP of business operators that constitute local industries including agriculture, forestry and fisheries, development of persons who undertake these and activities to enhance community capacity of districts should be promoted. In order to conduct reconstruction in a better manner than current status, construction visions considering disaster risks of communities, future images of industry structures, etc. should be considered even at ordinary times. By doing these, damage does not directly lead to movement into other districts. Moreover, plans on reconstruction of communities should be formulated beforehand on the basis of reconstruction visions and strategic preparation should be promoted even at ordinary times towards resilient community images defined by reconstruction visions.
- ○ Preparations for reconstruction will be in place in advance, such as systems and procedures relating to reconstruction and an understanding of issues, enabling the rapid and accurate determination of an urban reconstruction plan after a disaster.
- ○ In addition to training human resources in the construction industry responsible for the maintenance of reconstruction bases, young people who will lead the next generation are to be given mechanisms and opportunities for urban and regional development, and an environment that allows the smooth implementation of reconstruction work is to be maintained in the case of an emergency, including consensus building towards reconstruction plans.
- ○ Engineers with expertise in a variety of fields are to be trained in each area, while training for human resources who can carry out specialist research and make use of the results on site, utilizing experience of large-scale disasters and on-site training, is to be offered.
- ○ Policies for the smooth and rapid provision of emergency temporary housing, etc., policies for the promotion of emergency repairs on residences, and options for diverse provision of housing in cooperation with reconstruction and urban development will be considered based on the perspectives of watching over households with people who need consideration, such as the elderly, and maintaining living environments and communities, indicating the direction in which they will be taken. Moreover, in addition to constructing a base for local communities that functions in normal circumstances, bonds between residents will be strengthened through forest maintenance activities by local activity organizations.
- ○ In order to prevent loss of medical treatment in disaster areas from leading to loss of peace of mind in residents' daily lives and workplaces for healthcare providers, as well as an outflow of residents, the disaster resistance of medical organizations is to be improved.
- ○ In order to avoid a situation in which the vitality of localities declines, and resident populations decrease too much so that reconstruction is not possible in the case of an emergency, efforts will be made to inject energy into local economies, such as through regional creation initiatives, and implement effective policies that will stimulate the development and use of national land through "autonomy, decentralization, and cooperation."
- ○ To avoid occurrence of a large number of people who lose houses, enhancing the earthquake resistance in houses as well as measures to streamline land usage for solving the state where population is concentrated in locations with high disaster risks will be considered and implemented.

8-3) Circumstances where reconstruction is delayed significantly due to extensive and prolonged flooding damage caused by ground subsidence in broad areas, etc.

○ In addition to maintaining basic geospatial information in normal circumstances, high precision positioning data obtained from the realization of a seven satellites constellation of quasi-zenith satellite system (QZSS) should be made use of, and initiatives to share disaster data through the G-spatial Information Center, SPI4D, and disaster information hubs should be promoted.
○ After a disaster, high precision observation data from observation satellites is to be rapidly and frequently shared with relevant organizations etc., and in addition efforts are to be made concerning the training of human resources with the skills to interpret data, and the research and development of analysis tools.
○ In addition to steadily implementing countermeasures for flooding caused by earthquakes, tsunamis, floods, and storm surges, measures against coastal erosion, and consistent, comprehensive initiatives to manage sediment from mountain areas to the coast, disaster reduction measures will be promoted in watershed areas to help mitigate damage through measures for rapid emergency reconstruction and drainage, such as enhancing and strengthening TEC-FORCE systems and functions, including ensuring that someone is made responsible for disaster management and disaster reduction in the local construction industry, and maintaining wide-ranging support systems.
○ To secure support from national government for local governments, etc., reinforcement of disaster management capacity through execution of practical trainings in wide area considering large-scale disasters as well as improvement and reinforcement of systems and functions such as TEC-FORCE will be promoted.

8-4) Loss of precious cultural assets and environmental assets, and decline or loss of tangible and intangible cultures due to collapse of regional communities

○ Cultural assets will be made earthquake resistant, including stone walls, etc., and disaster management facilities will be maintained. In addition, the environmental assets behind lifestyle and culture are to be healthily maintained, and their disaster resistance increased. At this time, consideration will be given to demonstrating the effects of “green infrastructure” that makes use of diverse functions, including the disaster management and disaster reduction functions of the natural environment, and initiatives are to be promoted.
○ Regardless of whether a region is urban or rural, the collapse of community does not just mean the loss of intangible folk cultural assets, it also affects tangible cultural assets such as buildings that are maintained in the community; therefore, local cooperative activities that will preserve the vitality of the community are to be set up in normal circumstances.
○ To make preparation of taking actions against damages of cultural assets, transfer of skills to repair those will be maintained.
○ Exhibition and storage methods at museums (history, art, folk, industrial, natural science, etc.) are to be inspected, and the damage to exhibited and stored items minimized. Moreover, in addition to exhibited and stored items, the tangible and intangible culture of each area is to be recorded as images, and measures will be taken to protect cultural assets, such as an archive.
○ In order to avoid a situation in which the vitality of localities declines, and resident populations decrease too much so that reconstruction is not possible, which may lead to the loss of lifestyle and folk culture in the event of an emergency, efforts will be made to inject energy into local economies, such as through regional creation initiatives, and implement effective policies that will stimulate the development and use of national land through “autonomy, decentralization, and cooperation.”

8-5) Circumstances where reconstruction is delayed significantly due to sluggish progress in ensuring commercial land and developing temporary housing, temporary stores, and temporary work places

○ In addition to promoting land register surveys of urban areas, etc. with support from local public bodies and others, there is to be a focus on maintaining fundamental information concerning public and private boundaries in areas expected to be affected by disasters, while introducing the latest surveying technologies such as GNSS measurement and optimizing work. Moreover, in large urban areas and disaster areas, the focus is to be on creating registry office equipping maps, based on the "Second 10 Year Plan for the Creation of Registry Office Equipping Maps."

○ In addition to maintaining the stable operation of GNSS Continuously Operating Reference Stations (CORS) established throughout the country as location information infrastructure, changes to the earth's crust are to be noted in real-time, and information useful for measures against earthquakes, tsunamis, and volcanic disasters is to be shared. Moreover, to ensure the stable operation of CORS, failures and suspensions are to be preemptively prevented, and functions are to be optimized, including the renewal of equipment.

○ In order for national and local governments to maintain their functions of understanding and organizing in disastrous circumstances, geographical disaster management information is to be continually maintained, updated and shared, including information concerning active faults around the country, which illustrates the relationship between natural disasters and the shape of the land, and basic geospatial information such as Digital Japan Basic Map. In addition, digital survey results arranged by Geospatial Information Authority of Japan, national government, local governments, etc. are to be maintained so that they can be searched, browsed and obtained comprehensively.

○ There are concerns that in the future there will be a lack of responsible parties in the construction industry, which plays a vital role in organizing temporary housing, shops, and offices to aid reconstruction; from the perspective of guaranteeing and training these parties there will be improvements in the working environment. In addition, in order to maintain supply chains that provide the necessary fuel for the maintenance and operation of temporary housing, shops, and offices, measures to resolve so-called SS underpopulated area issues will be promoted.

○ With regard to land where all or part of their ownership is unknown, special systems to streamline expropriation procedures under certain conditions, new systems where rights to use them for specific periods are set for public projects and systems to streamline search of owners will be promoted in order to secure land for recovery and reconstruction smoothly. Moreover, the way of registration system and land ownership will be considered and improved: these include systems of incorporating the information of transfer of ownership due to succession in registration, systems of releasing land that are unmanaged, etc.

○ In order to enable the rapid and accurate determination of an urban reconstruction plan after a disaster, systems and procedures relating to reconstruction are to be considered, and image training for reconstruction and urban development, which preemptively grasps issues involved in reconstruction in the case of a disaster, is to be implemented; in addition to continuing to educate local public bodies about advance preparations for reconstruction, an environment where it is easy to for local public bodies to focus on these preparations is to be considered.

○ In order to rapidly ensure housing for disaster victims and rebuild their lifestyles, improvements are to be made to operations, such as making damage assessment surveys of housing more rapid, and points that must be addressed by local public bodies in times of a disaster are to accurately be made general knowledge in normal circumstances and in times of disaster through information sessions, etc. Moreover, policies for the smooth and rapid provision of emergency temporary housing, etc., policies for the promotion of emergency repairs on residences, and options for diverse provision of housing in cooperation with reconstruction and urban development will be considered based on the perspectives of watching over households with people who need consideration, such as the elderly, and maintaining living environments and communities, indicating the direction to be taken by local public authorities.
○ In times of large-scale disasters, it is necessary to secure sites for various disaster response services, and so the expected use of the sites for each service, from use in normal circumstances to the emergency stage to the recovery and reconstruction stages, is to be collected for local public bodies, and adjustments encouraged.
○ To avoid occurrence of a large number of people who lose houses, enhancing the earthquake resistance in houses as well as measures to streamline land usage for solving the state where population is concentrated in locations with high disaster risks will be considered and implemented.

8-6) Tremendous influence on the national economy etc., due to damage by international harmful rumor, credit uneasiness, delay in recovery of productivity, and a large number of unemployment/bankruptcy

○ In order to ensure that Japan's valuable natural world, tourist attractions, and safe and secure social and economic environment are not lost due to a large-scale disaster, maximum preparations will be made, and the construction of systems that enable initial responses which consider any information to be transmitted and transmission routes according to the circumstances, in order to disseminate correct information within Japan and overseas in times of disasters, will be promoted. In addition, a resilient society that will not yield to disaster will be constructed, with help from international society, through cooperation for training human resources such as government officials and local leaders who will shoulder the responsibility of disaster management and reconstruction in each country.
○ Actual operation of the law relating to reconstruction from large-scale disasters (Law No. 55 of 2013) will be enhanced even at ordinary times. Activities will be executed on sharing of activities, procedures, etc. relating total recovery by relevant ministries and local governments to execute recovery from disasters efficiently and effectively. In addition, improvement will be made to enhance measures of recovery and reconstruction from disasters and to boost response capacity of local governments, etc. that cope with support of victims at the time of disaster occurrence.
○ In order for rapid reconstruction to take place after large-scale natural disasters, disaster waste disposal plans will be determined and systems relating to the long-range transportation of disaster waste will be constructed. Moreover, in addition to carrying out training for people who will be responsible for local industry in the future, supporting the entry of local goods into overseas markets, and implementing initiatives for local creation and initiatives that will improve local community levels, an environment that allows the smooth implementation of reconstruction work is to be maintained, including consensus building towards reconstruction plans in an emergency, such as considering a vision for reconstruction in normal circumstances.
○ In order to ensure the continuity of financial settlement functions in times of large-scale disaster, financial institutions must determine a BCP and ensure its effectiveness. Financial institutions who have not yet determined their BCP are to be encouraged to do so, and there are to be continuous discussions, etc. concerning the effectiveness of the BCP that has been determined.

○ Methods for evaluating the impact of earthquakes and tsunamis on industrial facilities will be determined. Moreover, to ensure that supply chains are not irreparably damaged in times of large-scale disasters, the maintenance of private logistical facilities that are highly resistant to disasters is to be promoted, the BCPs for manufacturing and logistics companies are to be determined, and above all, there will be a focus on small and medium-sized enterprises where there are delays in progress; the joint determination of BCPs by owners and logistics companies is also to be encouraged.

Note: Compiled based on vulnerability assessments up to August 2018.