Building National Resilience

– Creating a Strong and Flexible Country –

National Resilience Promotion Office, Cabinet Secretariat

Why Build National Resilience?

Lessons Learned from Large-scale Disasters

Japan has suffered a variety of damage due to repeated large-scale disasters, and countermeasures against disasters have been strengthened based on lessons we learned.

The Isewan Typhoon in 1959 caused the largest ever typhoon damage since the Meiji era, with a total of 5,098 people being killed or lost. This disaster triggered the enactment of the Basic Act on Disaster Control Measures, which has served as the basis of Japan's disaster prevention measures.

The Great Hanshin-Awaji Earthquake in 1995 was the first inland earthquake on record with the maximum intensity of 7 on the Japanese scale to directly hit large city areas. Nearly 80% of the victims were killed due to building collapse and the disaster caused tremendous human and property losses, including large-scale fires in densely-populated city centers and collapse of viaducts of highway.

Having learned lessons from this experience, the government started to promote the improvement of earthquake resistance of houses and buildings and strengthen measures for urban centers where many wooden houses are concentrated. Seismic strengthening works for the infrastructure were also commenced.

Furthermore, as many people trapped under collapsed houses were rescued by their neighbors, the significance of self-help efforts and mutual assistance was widely recognized.

The Great East Japan Earthquake in 2011 was a magnitude nine earthquake, the largest on record, accompanying a large-scale tsunami with the maximum running height exceeding 40m. Coastal levees were effective to some extent in delaying the arrival of the tsunami but failed to completely block it, and many people were killed or lost.

Immediately after the disaster, a large number of people were unable to return home due to traffic interruption, and a short supply of gasoline was also a serious problem. On the other hand, there were cases like the one known as "Miracle in Kamaishi" in which residents could evacuate and survive successfully thanks to disaster prevention education having been provided on a regular basis.

The Great East Japan Earthquake revealed the limits of conventional disaster prevention measures, which have mainly focused on infrastructure development from the perspective of protection against disasters.

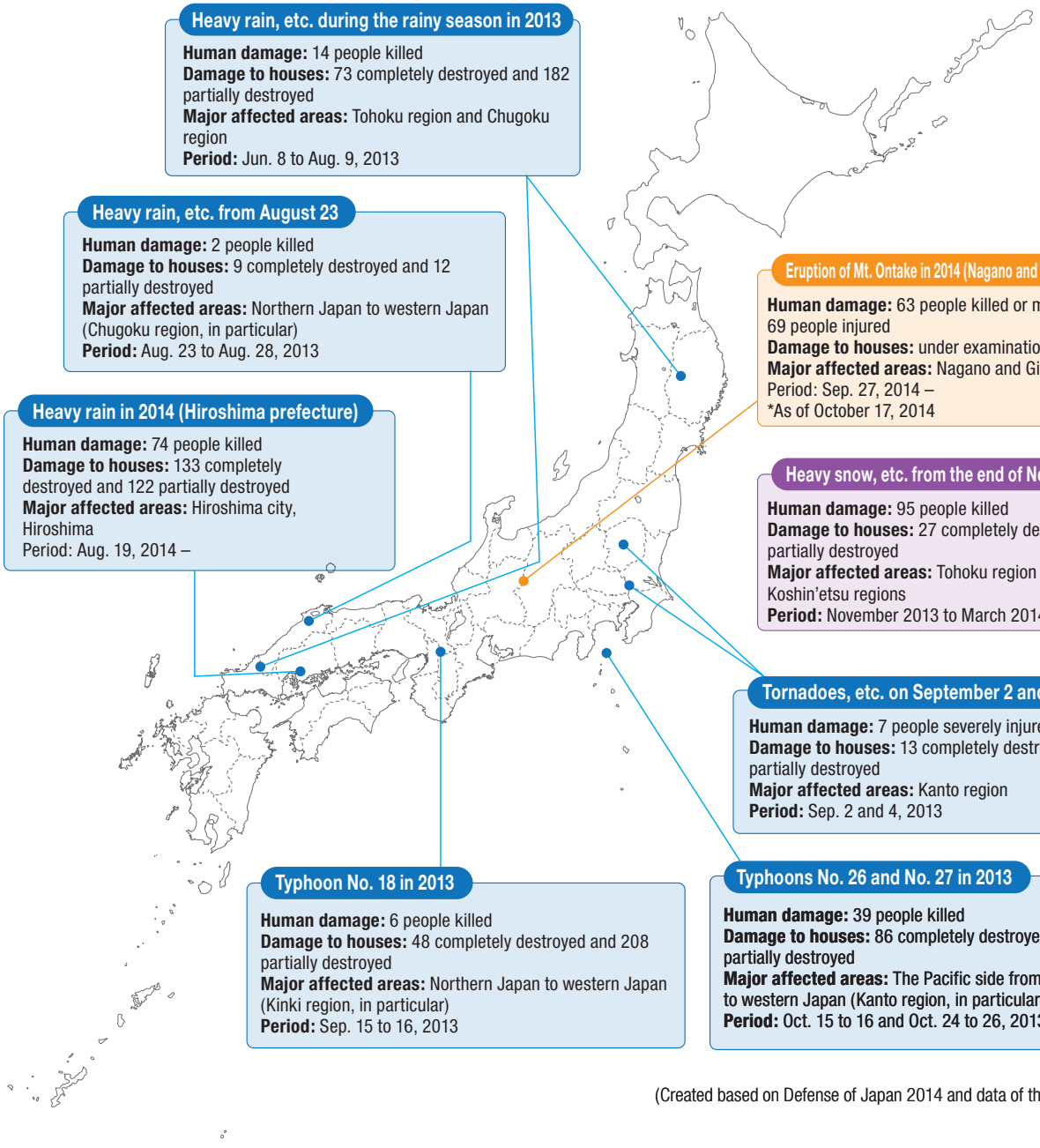
Damage by the Isewan Typhoon
(photo provided by Aichi Prefectural Government)

Destructed viaduct of the Hanshin Expressway
(photo provided by Kobe City)

Firefighters' and volunteer firefighters' efforts to find missing people
(photo provided by Sendai City)

Looking back on these unexpected large-scale disasters, we have repeated efforts for recovery and reconstruction over years after suffering significant damage, in spite of having taken various measures. In order to avoid such cycle, it is important to make ongoing efforts from the perspective of regularly securing the resistance and flexibility of national land and social and economic systems to prevent human loss by any means and avoid fatal damage to and ensure prompt recovery of society and economy.

Major Disasters that Occurred in 2013 Onward



Heavy rain, etc. during the rainy season in 2013

Human damage: 14 people killed
Damage to houses: 73 completely destroyed and 182 partially destroyed
Major affected areas: Tohoku region and Chugoku region
Period: Jun. 8 to Aug. 9, 2013

Heavy rain, etc. from August 23

Human damage: 2 people killed
Damage to houses: 9 completely destroyed and 12 partially destroyed
Major affected areas: Northern Japan to western Japan (Chugoku region, in particular)
Period: Aug. 23 to Aug. 28, 2013

Heavy rain in 2014 (Hiroshima prefecture)

Human damage: 74 people killed
Damage to houses: 133 completely destroyed and 122 partially destroyed
Major affected areas: Hiroshima city, Hiroshima
Period: Aug. 19, 2014 –

Eruption of Mt. Ontake in 2014 (Nagano and Gifu prefectures)

Human damage: 63 people killed or missing
69 people injured
Damage to houses: under examination
Major affected areas: Nagano and Gifu prefectures
Period: Sep. 27, 2014 –
*As of October 17, 2014

Heavy snow, etc. from the end of November 2013

Human damage: 95 people killed
Damage to houses: 27 completely destroyed and 40 partially destroyed
Major affected areas: Tohoku region and Kanto and Koshin'etsu regions
Period: November 2013 to March 2014

Tornadoes, etc. on September 2 and 4

Human damage: 7 people severely injured
Damage to houses: 13 completely destroyed and 37 partially destroyed
Major affected areas: Kanto region
Period: Sep. 2 and 4, 2013

Typhoon No. 18 in 2013

Human damage: 6 people killed
Damage to houses: 48 completely destroyed and 208 partially destroyed
Major affected areas: Northern Japan to western Japan (Kinki region, in particular)
Period: Sep. 15 to 16, 2013

Typhoons No. 26 and No. 27 in 2013

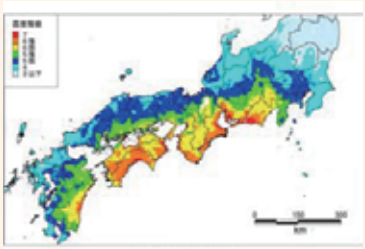
Human damage: 39 people killed
Damage to houses: 86 completely destroyed and 65 partially destroyed
Major affected areas: The Pacific side from eastern Japan to western Japan (Kanto region, in particular)
Period: Oct. 15 to 16 and Oct. 24 to 26, 2013

(Created based on Defense of Japan 2014 and data of the Cabinet Office)

Large-scale Earthquakes that May Occur in the Future

Nankai Trough Giant Earthquake: Predicted Damage (epicenter on the land side)

- **Number of houses that may be destroyed by earthquake or fire:**
  Approx. 2.4 million at the most
- **Number of deaths:**
  Approx. 323 thousand people at the most
- **Economic damage:**
  Approx. 214 trillion yen
  Direct damage such as loss of assets: Approx. 169 trillion yen
  Damage due to deterioration of production and services: Approx. 45 trillion yen

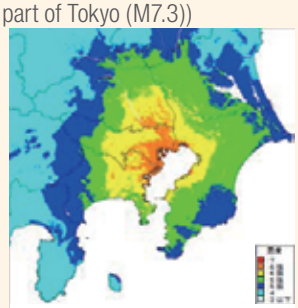


Distribution of intensity levels, case of epicenter on the land side

(Source: Second Report by the Working Group Examining Measures for a Nankai Trough Giant Earthquake (Cabinet Office))

Inland Earthquake in Tokyo: Predicted Damage (epicenter in the southern part of Tokyo (M7.3))

- **Number of houses that may be destroyed by earthquake or fire:**
  Approx. 0.61 million at the most
- **Number of deaths:**
  Approx. 23 thousand people at the most
- **Economic damage:**
  Approx. 95 trillion yen
  Direct damage such as loss of assets: Approx. 47 trillion yen
  Damage due to deterioration of production and services: Approx. 48 trillion yen



Distribution of intensity levels in the event of an inland earthquake in Tokyo (M7.3)

(Source: Final Report by the Working Group Examining Measures for an Inland Earthquake at the National Capital (Cabinet Office))

Building National Resilience

What is resilience?

Resilience means to be strong and flexible. For example...

- ○ Having a resilient body means that a person has a healthy body resistant to a cold or flu and does not suffer a serious symptom even if being infected and can get well soon.
- ○ Under a resilient natural environment, wetlands hold resilience to maintain the eco-system against abnormal climate and other significant environmental changes and are not affected significantly by floods or droughts, if any, and can recover promptly.
- ○ Ichiro, a professional baseball player, has acquired a resilient body and mental power, as well as excellent batting techniques, through his ongoing efforts and has continued to be active on the front lines throughout his career both in Japan and the United States.

The antonym of "resilience" is "vulnerability." For example...

- ○ A vulnerable eco-system is easily affected by environmental factors, such as global warming.
- ○ Vulnerability in the field of information security means that there are weak points or errors that may lead to the divulging of information, which could damage the security of the system, networks, applications or related protocols.
- ○ Plate movements in waters close to Japan strongly distort the archipelago and form a volcanically-active region that is the most prone to earthquakes in the world. Also with the uplifting of the earth's crust, the Japanese archipelago is located on very vulnerable ground.

What does it mean to achieve resilient national land and social and economic systems?

Achieving resilient national land and social and economic systems means to have our national land, economy and social life acquire the strength to avoid fatal damage due to disasters or accidents and the flexibility to make a swift recovery.

Basic Principles of Building National Resilience

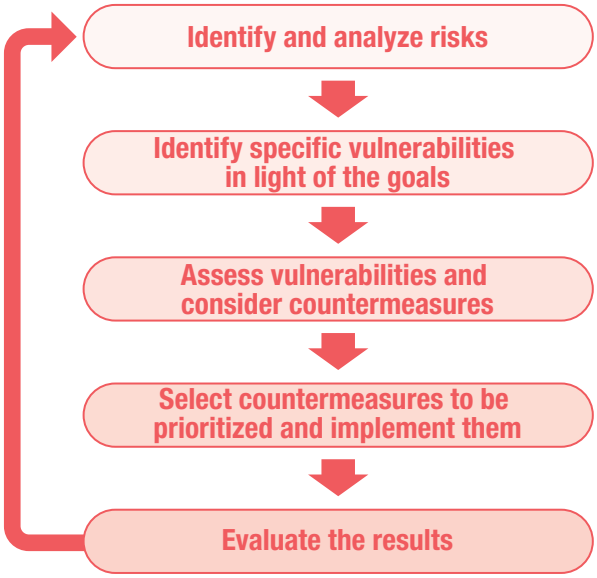
1. Prevent human loss by any means.
2. Avoid fatal damage to important functions for maintaining administration as well as social and economic systems.
3. Mitigate damage to property and facilities and prevent expansion of damage.
4. Achieve swift recovery and reconstruction.

How to Build National Resilience?

To create a strong and flexible country

– Evaluate the vulnerability and make efforts in a planned manner –

In order to build safe national land, regions, and economy and society with strength and flexibility, the government will continuously review and implement the PDCA cycle to check the soundness of the national land and promote initiatives to build national resilience.



1) Clarify the final goals and identify and analyze major risks.

2) Analyze and assess risk scenarios and their effects, and identify specific vulnerabilities in light of the goals.

3) Analyze and assess vulnerabilities and consider countermeasures against problems and risks in overcoming the relevant vulnerabilities.

4) Review policies necessary for solving problems, select countermeasures to be prioritized, and implement them in a planned manner.

5) Properly evaluate the results and review and improve the initiatives as a whole.

Topic Initiatives in other countries

In England, flooding in 2007 caused 13 deaths and submerged 55,000 buildings. The suspension of water supply and sewerage services for 17 days at the longest affected 350,000 people and the 24-hour blackout affected 42,000 people. Due to the interruption of motorways and train traffic, many people were forced to stay overnight on the road or in train cars. After suffering such huge damage, the UK government established a critical infrastructure resilience program.

In the United States, Hurricane Katrina in 2005 caused tremendous damage—approximately 1,200 deaths and 160,000 submerged buildings—in New Orleans, totaling as much as 125 billion dollars. The U.S. government reviewed the National Infrastructure Protection Plan and has taken various measures.

Damage caused by Hurricane Katrina
(Source: Website of the Federal Emergency Management Agency)

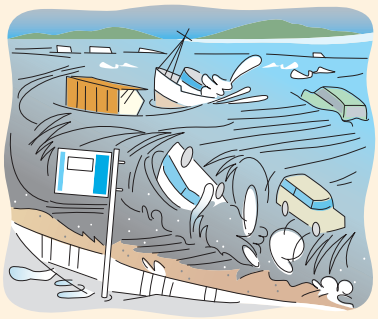
Prioritization of Measures

The government tries to select measures to be prioritized in consideration of changes in people's demand due to population decrease, etc. and the aging of social capital, from the perspective of ensuring implementation of relevant measures on an ongoing basis through effective use of financial funds. 15 programs to be prioritized (see below) have been selected from among the worst events that should never happen and should be avoided through implementing programs, in light of the significance of the national government's role and the seriousness of the influence and degree of urgency, and intensive efforts have been made.

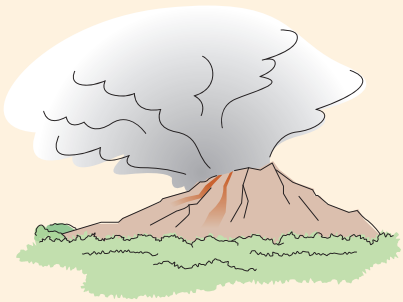
As these programs relate to various sectors, cross-sectoral government-wide efforts are to be promoted also in cooperation with local governments and the private sector.

The worst events that should never happen

- Casualties due to multiple and large-scale collapse, etc. of buildings and transportation facilities in large cities and fires in densely-populated areas



- Extensive human loss due to a large-scale tsunami, etc. affecting wide areas



- A large number of casualties due to a large-scale volcanic eruption or sediment disaster (deep-seated landslide), which may also increase vulnerability of national land into the future

- Extensive and prolonged flooding in urban areas due to abnormal weather, etc.

- A large number of casualties due to delay in evacuation caused by failure of information transmission, etc.
- Prolonged suspension of supply of food, drinking water and other vital materials in affected areas
- Absolute lack of rescue and emergency activities due to damage to the self-defense forces, the police, fire services, the Japan Coast Guard, etc.
- Malfunction of the central government in the capital region
- Paralysis and prolonged suspension of information transmission due to suspension of power supply, etc.
- Decline of companies' international competitiveness due to deterioration in production capacity caused by disruption of supply chains, etc.
- Suspension of energy supply necessary for social economic activities and for maintaining supply chains
- Malfunction of the core road/marine transport networks, such as disruption of arteries in the Pacific Belt Zone
- Stagnation of stable supply of food, etc.
- Suspension of functions of power supply networks (power station and substation, and power transmission/distribution equipment) and oil/LP gas supply chains
- Expansion of damage due to devastation of farmland and forests

What are Included in Concrete Measures?

Combination of non-structural and structural measures

– Further prioritizing non-structural measures –

Non-structural measures need to be prioritized more than ever in building national resilience. The government will implement measures effectively by properly combining non-structural and structural measures depending on disaster risks and characteristics of the regions.

Measures against flood and tsunami disasters (example)

Non-structural Measures

- Preparation and utilization of hazard maps
- Implementation of evacuation drills

Proper combination

Structural Measures

- Development of river banks and sea dikes
- Rapid and smooth development of shelters and evacuation routes

Topic Various types of emergency drills

Relevant organizations must cooperate with each other in carrying out emergency drills for large-scale natural disasters. In order to make these drills more practical and effective, it is important to contrive a means to incorporate practical exercises by combining drills to manage people and goods and map-based training to have participants make judgments on their own based on given conditions.

The government will promote various types of emergency drills, such as the comprehensive emergency drill preparing for an earthquake that directly hits the metropolitan area on National Disaster Prevention Day (September 1), tsunami prevention drills with the participation of local residents organized at seven locations nationwide centered on Tsunami Disaster Prevention Day (November 5), drills operated by emergency response headquarters in respective areas, and volcanic eruption disaster prevention drills.

Furthermore, extensive medical evacuation drills are also conducted with the aim of ensuring prompt transfer of severely injured people to medical institutions outside the affected areas for treatment.

Comprehensive emergency drill on National Disaster Prevention Day

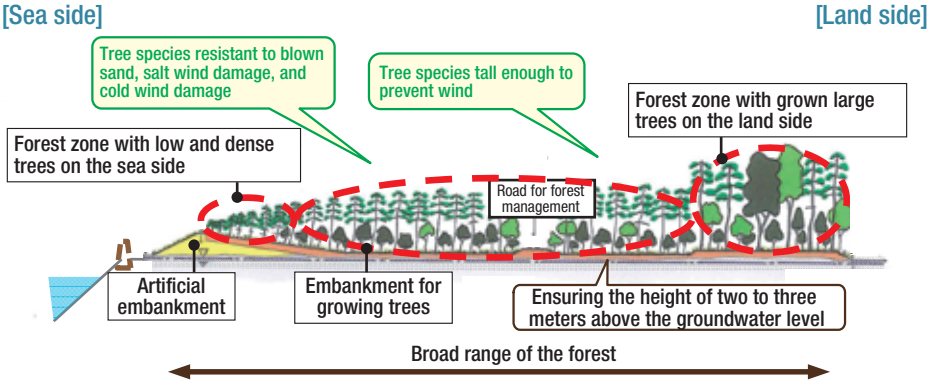
Extensive medical evacuation drill

(Source: Cabinet Office)

Device to Effectively Utilize Disaster Prevention Measures at Normal Times

When taking any disaster prevention measures, it is important not only to ensure their effectiveness such as disaster reduction and mitigation in the event of a disaster but also to give due consideration to the scenery and devise a means to utilize them locally even at normal times.

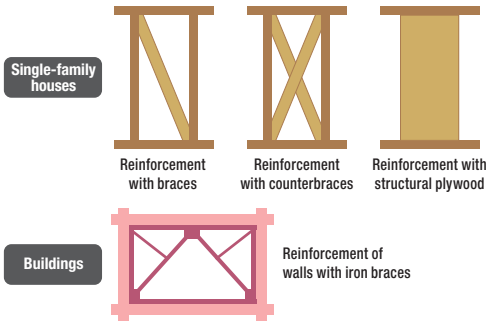
Development of a seaside disaster-prevention forest (example)



Cooperation with local residents and private companies

Principles of self-help efforts, mutual assistance and public help should be properly combined and the national and local governments must cooperate and share roles with local residents and private companies.

Seismic work for houses and buildings (example)



Seismic work for houses, etc.

Volunteers securing furniture to a wall at an elderly person's house

(Source: Wagayanet)

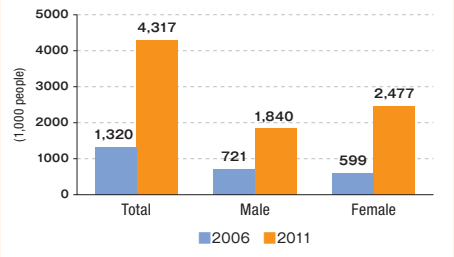
A school building reinforced with a seismic frame

Seismic work for public facilities

Topic Changes in people's awareness

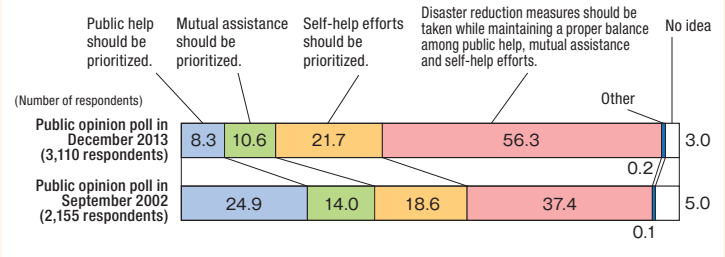
The Great East Japan Earthquake raised people's awareness of disaster prevention and strengthened bonds among people. The number of people willing to participate in volunteer activities upon a disaster increased significantly.

Comparison of the Public Opinion Polls on Disaster Prevention conducted in September 2002 and December 2013 revealed changes in the answers, i.e., a decrease in the percentage of people considering that public help should be prioritized in disaster prevention measures, and an increase in the percentage of people considering that disaster prevention measures should be taken while maintaining a proper balance among public help, mutual assistance and self-help efforts.



Number of participants in volunteer activities upon a disaster

(Source: Prepared based on the "2011 Sociological Research about Fundamental Aspects of Social Life" (Statistics Bureau, Ministry of Internal Affairs and Communications))



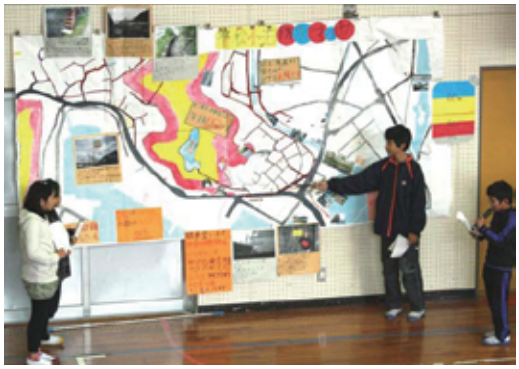
Disaster prevention measures to be prioritized (self-help efforts, mutual assistance, and public help)

(Source: Prepared based on the "Public Opinion Poll on Disaster Prevention (December 2013)" (Cabinet Office))

For Correct Understanding and Actions

It is indispensable to improve risk communication through providing education for disaster prevention and taking other measures to develop the resilience of individuals, including children and local residents, so that each one of us can understand the situation correctly in the event of a disaster and can evacuate or take other proper actions for survival.

Education for disaster prevention (example)



Upper left:
Preparation of a disaster prevention map
(Source: "FY2012 White Paper on Education, Culture, Sports, Science and Technology"*1)

Upper right:
Joint evacuation drill with participation of local residents
(Source: "Development of Disaster Prevention Education to Develop Survival Skills"*1)

Lower left:
Students participating in a local emergency drill
(Source: "Project to Improve Disaster Preparedness of School Facilities"*1)

(*1 Ministry of Education, Culture, Sports, Science and Technology)

Topic Measures for people unable to return home in the event of a disaster

Based on the lessons from the Great East Japan Earthquake, public-private efforts are being promoted as measures for people who may become unable to return home in the event of an inland earthquake in Tokyo.

A drill for dealing with people unable to return home (a railway company)
(Source: "Guidelines for Protecting Users at Large Facilities and Stations, etc."*2)

Facilities for temporary stay that the Tokyo Metropolitan Government has secured (Tokyo metropolitan facilities) (Apr. 1, 2014)

Number of facilities: 200 / Capacity: Approx. 70,000 people

A drill for opening a facility for temporary stay (a private facility)
(Source: "Guidelines for Securing and Operating Facilities for Temporary Stay"*2)

(*2 Council for Measures for People Unable to Return Home in the Event of an Inland Earthquake at the National Capital)

Basic Act for National Resilience Contributing to Preventing and Mitigating Disasters for Developing Resilience in the Lives of the Citizenry

☐ Purpose and Basic Principles

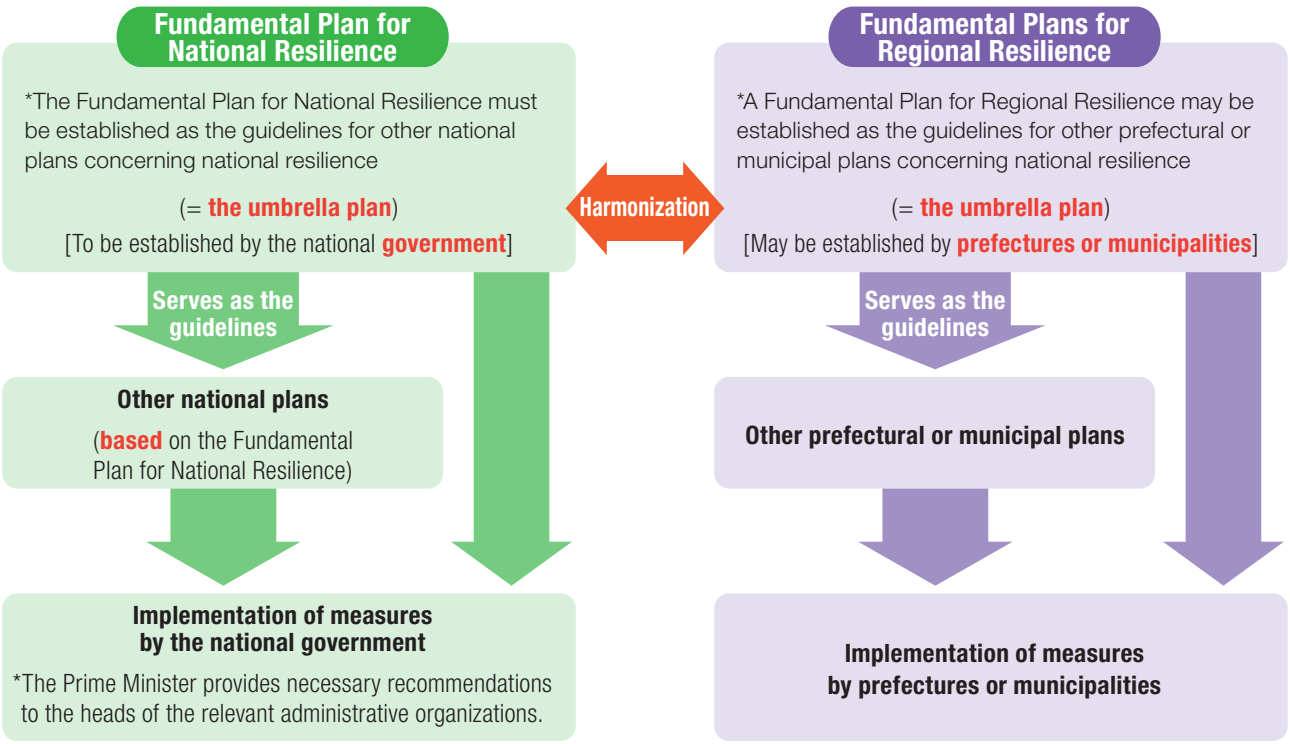
- Promote initiatives aiming to achieve the goal of making the entirety of the national land more resilient to large-scale natural disasters
- Establish necessary measures under clear goals through such means as assessing the current status and incorporate such measures into the national plans (The Fundamental Plan for National Resilience will serve as the guidelines therefor.)

☐ Basic Policies

1. Ensure the protection of human lives to the extent possible.
2. Avoid fatal damage to important functions of the nation and society and ensure that such functions are maintained.
3. Minimize damage to the property of the citizenry and public facilities.
4. Contribute to swift recovery and reconstruction.
5. Develop a system for the purpose of promoting initiatives for building national resilience by combining measures for non-structural and structural measures.
6. Make efforts for disaster prevention and mitigation based on an appropriate combination of self-help efforts, mutual assistance and public help, with the national government playing a central role in particularly serious or urgent situations.
7. Select and implement measures intensively in consideration of changes in people's demand and the aging of social capital

Whole picture of the umbrella plan

Relationship between the Fundamental Plan for National Resilience and Fundamental Plans for Regional Resilience



Major Points of Fundamental Plan for National Resilience, Action Plan, and Guidelines for Establishing Fundamental Plans for Regional Resilience

Fundamental Plan for National Resilience

- Statutory plan; Cabinet decision; To be reviewed once around every five years
- Contains promotion policies for each sector of measures and for each program for avoiding the worst events
- To be reflected in the review of other national plans and in promoting concrete measures

●Basic Concept concerning National Resilience (Chapter 1)

[Principles] (i) Protect human lives (ii) Avoid fatal damage and maintain important functions of the nation and the society (iii) Minimize damage to the property of the citizenry and public facilities (iv) Swift recovery and reconstruction

[Basic Policies, etc.] ○Management by repeating the PDCA cycle, etc.

[Matters Requiring Particular Consideration] ○Measures for the coming Olympic and Paralympic Games, etc.

●Policies for Promoting Initiatives for Building National Resilience (Chapter 3)
- Promotion Policies for Each Sector of Measures -

(Example) **[Housing and cities]** · Measures against fires in densely-populated areas
[Energy] · Strengthening of capacity for mutual accommodation of energy among regions
[Information and communications] · Early implementation of measures against long-term suspension of power supply
[Industrial structures] · Promotion of the preparation of BCP/BCM for enterprise partnerships
[Transportation and logistics] · Enhancement of disaster resilience of transportation and logistics facilities

●Promotion and Constant Review of the Plan (Chapter 4)

○The content of the plan shall be reviewed once around every five years, and required amendments are to be made within five years, if necessary.
○ The National Resilience Promotion Headquarters establishes a plan for promoting programs for avoiding the worst events that should never happen as an action plan for building national resilience for every fiscal year.
○ 15 programs to be prioritized are to be promoted intensively.

Action Plan for National Resilience 2014

- Decision by the National Resilience Promotion Headquarters (established for every fiscal year)
- To be utilized for managing the progress of programs and considering measures for every fiscal year
- Contains plans for promoting each of the programs for avoiding the worst events (promotion policies and Key Performance Indicators (KPI)) and major measures therefor

●Plans for Promoting Programs (Example)

Examples of the Worst Events that Should Never Happen	Example of Promotion Plans	Example of Key Performance Indicators (KPI)
Extensive human loss due to a large-scale tsunami, etc.	Steady promotion of structural measures combined with non-structural measures	**[MLIT*/MAFF**]** Completion ratio of the development of coastal dikes, etc. (construction of coastal dikes, etc. up to the planned height and seismic reinforcement work) in areas with a high possibility of being hit by a large-scale earthquake, such as a Tokai, Tonankai or Nankai earthquake: Approx. 31% (2012) → Approx. 66% (2016) **[MLIT/MAFF]** Percentage of municipalities that have prepared and publicized hazard maps for largest-scale tsunamis and have conducted emergency drills: 14% (2012) → 100% (2016)
Decline of companies' international competitiveness caused by disruption of supply chains, etc.	Preparation of BCPs for each enterprise and for enterprise partnerships for the purpose of securing supply chains	**[Cabinet Office]** Percentage of large enterprises and medium-sized enterprises that have prepared BCPs: **Large enterprises:** 45.8% (2011) → Almost 100% (2020) **Medium-sized enterprises:** 20.8% (2011) →50% (2020)

*MLIT: Ministry of Land, Infrastructure, Transport and Tourism
**MAFF: Ministry of Agriculture, Forestry and Fisheries

Guidelines for Establishing Fundamental Plans for Regional Resilience

- Prepared as guidelines to help the smooth establishment of Fundamental Plans for Regional Resilience by prefectures and municipalities
- It is explained that local governments shall also establish regional plans in line with the process of establishing the national Fundamental Plan, by clarifying goals, identifying risks, assessing vulnerability, considering countermeasures and selecting and prioritizing measures to be implemented intensively, and shall promote measures for building national resilience efficiently and effectively while undertaking the PDCA cycle.