Disaster Management Policy in Japan

Sep. 17, 2009
Cabinet Office of Japan
The number of Death and Missing Persons in Natural Disasters

- Mikawa Earthquake (2,306)
- Typhoon Makurazaki (3,756)
- Typhoon Ise-Wan (5,098)
- Fukui Earthquake (3,769)
- Torrential Rains (1,124)
- Typhoon Toyamaru (1,761)
- Great Hanshin-Awaji Earthquake (6,437)
More than 20% of Earthquake with M6 or greater in the world occurred around Japan last 30 years.
Large-scale Earthquake predicted in the future

**Tokai Earthquake**
There is a high possibility of Great earthquake occurring just before it occurs.

**Tonankai and Nankai Earthquake**
It is anticipated that wide area earthquake will occur in the first half of this century.

**Chubu area and Kinki area inland Earthquake**
It is anticipated that an earthquake will devastate old wooden urban district and cultural heritage.

**Tokyo inland Earthquake**
It is an earthquake which is anticipated that it devastate capital function. An M7 scale earthquake with an imminent possibility.

**Trench-type Earthquake in the Vicinity of the Japan and Chisima Trenches**
8 types of Earthquakes like The Miyagi-ken-oki Earthquake with a imminent possibility to occur.

**A Giant Tsunami over 20m**

**Wide area Earthquake disaster on Western Japan**

The Headquarters for Earthquake research Promotion of Government evaluated main faults. They have made result of evaluation of activity about 104 faults public.

There are Approx. 2,000 discovered active faults.
Earthquake activity prediction map

Possibility of earthquake occurrence with Japanese seismic intensity 6 or greater in the next 30 years

- **More than 26%**
- **6%-26%**
- **3%-6%**
- **01%-0.3%**
- **Below 0.1%**

Source: Prepared by Cabinet office based on the data of The Headquarters for Earthquake research Promotion of Government.
### Outline of Countermeasure against Tokyo inland Earthquake

#### Probable epicenter area and Distribution of seismic intensity

![Map showing probable epicenter area and distribution of seismic intensity.]

#### Damage to buildings and people

(Northern part of Tokyo wan Earthquake M7.3) (winter 06:00 p.m. Wind speed 15m/s)

1. **Number of houses and buildings collapsed or burned**
   - Approx. 850,000

2. **Casualties**
   - Approx. 11,000

- **Seismic Activity**
  - 150,000
- **Liquefaction**
  - 33,000
- **Landslide**
  - 12,000
- **Collapse of block wall**
  - 800
- **Fire**
  - 3,100
- **Building collapse**
  - 3,100
- **Traffic accident**
  - 200
- **Landslide**
  - 900

#### Economic Loss

(Northern part of Tokyo wan Earthquake M7.3) (winter 06:00 p.m. Wind speed 15m/s)

- **Direct damage** 66.6 trillion yen
  - Damage to Buildings 55.2 trillion yen
  - Damage to the other property and infrastructure 11.4 trillion yen
- **Indirect damage** 45.2 trillion yen
  - Reduce production 39 trillion yen
  - Opportunity loss and time loss by traffic disruption 6.2 trillion yen

**The amount of loss** Approx. 112 trillion yen

![Map showing economic loss distribution.]

### Map of Tokyo

- **Capital area**
- **Various districts**
  - Nakano
  - Yotuya
  - Shinagawa
  - Shinjuku
  - Ueno
  - Shibuya
  - Ikebukuro
  - Shinjuku
  - Tobuya
  - Ueno

![Map of Tokyo showing various districts.]

(Maginified image of the capital area)
### Outline of Countermeasure against Tokyo Inland Earthquake ②

#### Policy Framework for Tokyo Inland Earthquake

- **Secure the continuity of the capital functions**
  - Countermeasure and goals keeping 3 days after disaster occurrence in mind
- **Countermeasure to reduce massive damage**
  - ~ Forming City ~
- **Planned and prompt precaution**
- Establishment of wide-area disaster reduction system
- **Measure of recovery and rehabilitation**
  - Countermeasure against the foreseeable massive number of evacuees and people stranded without a means of returning home
  - Enforcement of disaster reduction by region and company

#### Guidelines for Tokyo Inland Earthquake Emergency Response Activity

- **Activity system of Government**
  - Establishment of Emergency disaster management headquarter and Emergency on-site disaster management headquarter
  - Activity for securing the continuity of the capital central functions
  - Keeping functions of the capital central agency
- **Specified roles of each ministry**
- **Main emergency response activities**
  - Seach, rescue, medical operation, fire fighting and emergency transportation

#### Tokyo Inland Earthquake Disaster strategy

To **halve the death toll** and to **reduce economic loss by 40%** in 10 years. (~2016)

<table>
<thead>
<tr>
<th>Casualties</th>
<th>Approx. 11,000 → 5,600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthquake-proofing of houses and buildings</td>
<td>Quake-proof ratio 75%→90%</td>
</tr>
<tr>
<td>Fix household furniture</td>
<td>Fixation ratio Approx. 30%→60%</td>
</tr>
<tr>
<td>Improve densely populated urban area</td>
<td>Fire-proofing ratio over 40%</td>
</tr>
<tr>
<td>Improve initial fire extinguish ratio</td>
<td>Community ratio with voluntary disaster management organization 72.5%→96%</td>
</tr>
<tr>
<td>Measures for steep terrain of landslide risk area</td>
<td>No. of house safe from landslides in steep terrain increase by approx. 30%</td>
</tr>
<tr>
<td>Economic loss</td>
<td>Approx. 112 trillion yen → 70 trillion yen</td>
</tr>
<tr>
<td>Recovery cost reduction measures</td>
<td></td>
</tr>
</tbody>
</table>
  - Quake-proof houses and buildings ratio 75%→90%
  - Anti-seismic reinforcement of direct control road facilities: mostly completed
  - Improve quake-proof quays: Approx. 55%→70%
| Business continuity of companies | |
  - Ratio of companies with business continuity plans
    - Large company: mostly all
    - Medium-sized company: over 50%
| Measures for restoring transportation networks quickly | |
  - Quake-proof ratio 75%→90%
  - Anti-seismic reinforcement of emergency transportation road facilities: mostly completed
  - Improve quake-proof quays: Approx. 55%→70%
### Goal and State of Earthquake-proofing

<table>
<thead>
<tr>
<th>Main target</th>
<th>State</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>School (Public junior high school)</td>
<td>62.3% (April 2008)</td>
<td>Earthquake proofing 10,000 buildings with high possibility to collapse by 2011</td>
</tr>
<tr>
<td>Hospital (Hub hospital in disasters and Emergency medical center)</td>
<td>58.6% (May 2008)</td>
<td>Earthquake-proofing 50% of institutions which have not earthquake-proofed yet (By 2010)</td>
</tr>
<tr>
<td>Houses and Buildings</td>
<td>79% (March 2008)</td>
<td>90% (By 2015)</td>
</tr>
</tbody>
</table>

※Except these, setting goals and progressing in earthquake-proofing about water works and drainage.
Earthquake Early Warning Information

What is Earthquake Early Warning Information?

- EEW information announces the automatically estimated hypocenter, magnitude, and seismic intensity quickly between several seconds to several tens of seconds before the start of severe shaking (S-wave) with detecting P-wave near the epicenter.
- If EEM information concludes the earthquake seismic intensity 5 or greater, it announces the names of areas severely shaken (seismic intensity 4 or greater) before severe shaking arrives (to citizens).
- In areas near the epicenter, EEM can't sometimes announce before severe shaking arrives.

Earthquake

Several seconds

The seismograph near the epicenter detects shaking (P-wave) and P-wave.

Other seismographs detect shaking.

Arrive severe shaking.

Time Process

Severa, seconds

Japan Meteorological Agency

Analysis of Earthquake-wave
- Direction
- Distance to the epicenter
- Magnitude

Estimate Position of the epicenter and Magnitude

Predict seismic intensity

Announce accurate follow-up reports

Immediately analyze and instantly announce

EEW information become more accurate even only several seconds go on, but cannot be announce before severe shaking.

※ This is not "Prediction of Earthquakes", but information announced after detecting an earthquake.
Progress of International Cooperation in Disaster Reduction

Natural disasters in the world

December 2004
Sumatra large-scale earthquake • the Indian Ocean Tsunami 230,000
(Casualties and Missing)

May 2008
China Shisen Great Earthquake  Approx. 90,000
Myanmar Cyclone Nargis  Approxx. 130,000
(Casualties and Missing)

Number of earthquakes M6 over

Amount of loss (100million dollars)

Casualties (thousand)

Asia 5,760(44.3%)
Japan 936(13.0%)

World 13,012

Japan 199(20.7%)

World 961

Asia 1,234,568.8

Japan 9(0.4%)

Efforts of Japan

1994 First UN World Conference on Disaster Reduction in Yokohama
(Hanshin-Awaji Great Earthquake; January 1995)

1998 Establishment of Asian Disaster Reduction Center in Kobe

2000 International Strategy for Disaster Reduction (ISDR) started, (Resolved UN General Assembly in 1999)

(Sumatra large-scale earthquake • the Indian Ocean Tsunami; December 2004)

2005 Second UN World Conference on Disaster Reduction in Kobe
"Hyogo Framework for Action2005-2015" was adopted

2009 Japan-China-ROK ministerial meeting on disaster management in Kobe (schedule)


- Framework for disaster management in international society for 10 years (2005〜2015)
- This request to Ensure that disaster reduction is a national and local priority with a strong institutional basis for implementation.
- Hyogo Framework for Action is adopted in The United Nations World Conference on Disaster Reduction in January 2005 held in Kobe City, Hyogo prefecture. Japan lead arguments in this conference

Reduction of damage in disaster is a big issue in international society.
Japan has large stocks of knowledge and technique. We promote International Cooperation in Disaster Reduction with these.
Utilization of Satellite technology for disaster management

Observation just after natural disasters

Observation of the affected area by Sichuan earthquake in 2008

Before 2007/3/31
After 2008/5/18

Chinese government made a map for disaster recovery based on the satellite images produced by foreign countries.

Utilization for disaster preparedness

It is becoming clear that climate change affects in cold region. For example, IPCC fourth report pointed that the expansion of glacial lakes is common, ground in the region is becoming unstable and the number of avalanche is glowing. Especially in Himalayan region (Bhutan, Nepal), these are big challenge now.

Making of Hazard map utilizing satellite images

① Making hazard map will help the government action on disaster management promptly.

② Utilizing hazard map will help the citizen as well as the government prepare against natural disasters.
La ringrazio per la Sua cortese attenzione!
ご清聴ありがとうございました。