

“Don’t let a lack of imagination hamper disaster preparedness” Response to natural disasters in the Covid-19 era

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January 17, 1995 Great Hanshin-Awaji Earthquake

- Many people were killed by collapsed housing.
- Buildings collapsed and blocked evacuation and emergency transportation routes.



**Urgent need for improving the
earthquake resistance of structures**



2016 Kumamoto Earthquake

M6.5 at 21:26 on April 14, and M7.3 at 01:25 on April 16



Pilotis style 7-story RC construction condominium
The pillar on the first floor buckled (1-chome, Demachi, Nishi-ku, Kumamoto City)
No noticeable damage to the temple gate directly next to it



The temple gate on the right remained almost undamaged; only a part of the white wall peeled off.



Severely damaged center of Mashiki Town



Old wooden house with heavy tiled roof and wide opening facing the street



Houses collapsed and major roads were closed



Many houses collapsed, but earthquake-resistant structures survived, even if there was some damage



Concrete block walls collapsed everywhere and scattered across roads

14:46 on March 11, 2011 Great East Japan Earthquake

Tremendous force of tsunami

Dead or missing: 18,455

Earthquake-related deaths: 3,410
(as of the end of February 2016)

Completely destroyed houses: 121,809



Toni, Kamaishi City, Iwate
Prefecture
Kojirahama area (Tsunami
surged over a DL12.5 high
embankment)



Akahama, Otsuchi Town, Iwate
Prefecture
Kamaishi City's pleasure boat
"Hamayuri" crashed onto the
roof of a guest house

Catastrophically damaged cityscape (Otsuchi Town)

Of 139 staff at
this government
building, 28
were killed. The
total death toll
of staff was 39.
Seven of 11
executives died,
including the
town mayor.



Town center seen
from the central
town hall (on the
higher ground)
used as a shelter,
a supply base,
and a temporary
office

Fire after the
tsunami
exacerbated the
damage

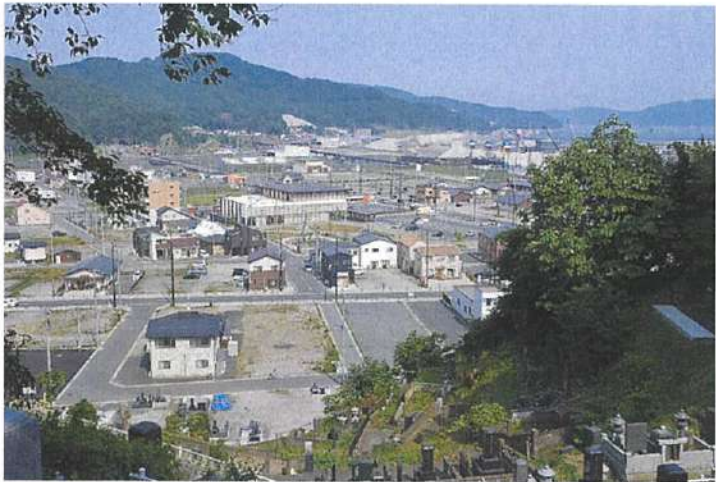


Town hall building
destroyed by the tsunami



Otsuchi Town

The government office building, where many staff were killed, was demolished and removed (Photo taken on Aug. 6, 2019)



Estimated damage by a Nankai Trough mega earthquake

(Source: Central Disaster Management Council)

Estimated number of victims by prefecture
(Maximum 320,000)

Shizuoka Pref.	109,000 people	34%
Aichi Pref.	23,000 people	7%
Mie Pref.	43,000 people	13%
Wakayama Pref.	80,000 people	25%
Tokushima Pref.	31,000 people	10%
Ehime Pref.	12,000 people	4%
Kochi Pref.	49,000 people	15%
Oita Pref.	17,000 people	5%
Miyazaki Pref.	42,000 people	13%

Many manufacturing industries are concentrated along the coast of the Tokai region.
The total value of manufactured products shipped from Aichi and Shizuoka prefectures combined accounts for 20% of the total for Japan.

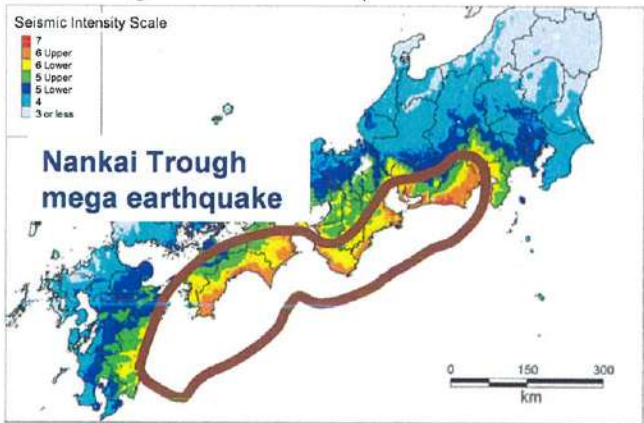
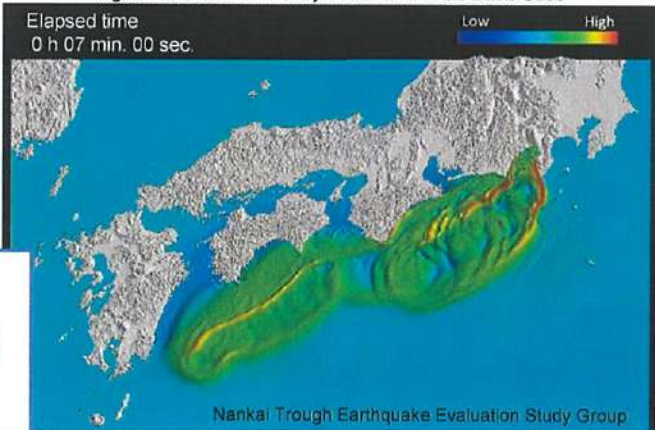


Figure 5.1 Seismic Intensity Distribution in the Basic Case

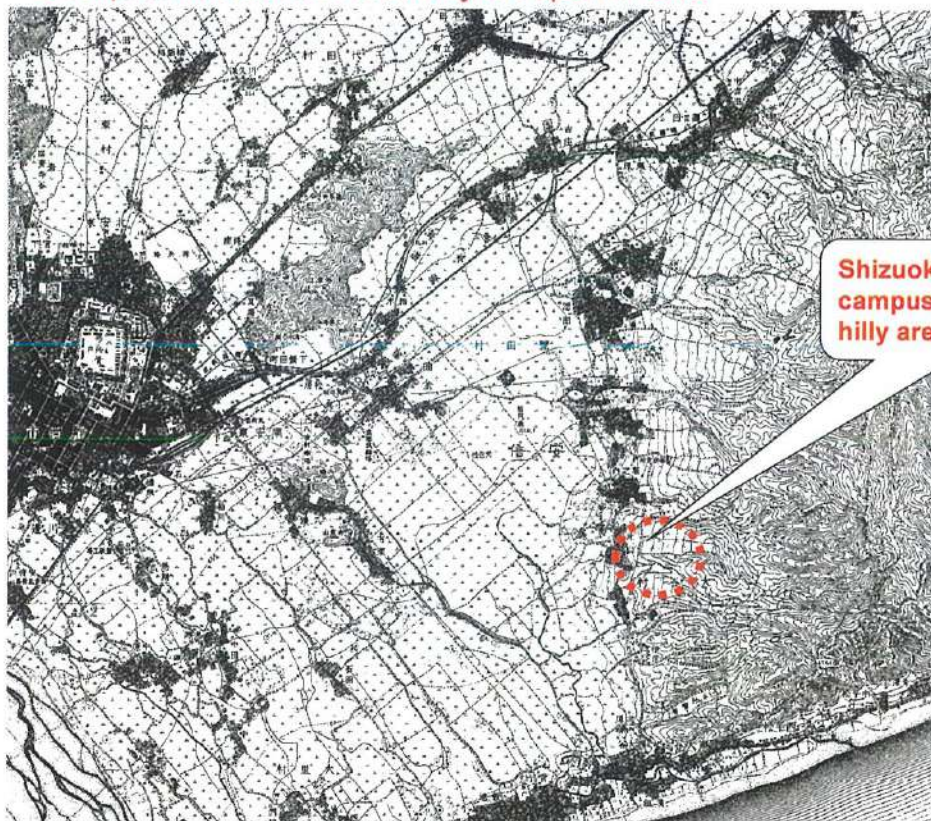


Estimated damage by a Nankai Trough earthquake and earthquake directly under the capital

Nankai Trough Mega Earthquake M9 (Central Disaster Management Council in 2012 and 2013)		Earthquake Directly Under the Capital M7 (Central Disaster Management Council in 2013)
Up to 2,382,000 houses	Completely destroyed/burnt houses	Up to 610,000 houses
Up to 323,000	Deaths	Up to 23,000
Up to 623,000	Injured Seriously injured	Up to 123,000 Up to 24,000
Up to 340,000	Persons requiring rescue	Up to 72,000
Water outage: 34.4 million people Power outage: 27.1 million houses	Lifelines	Water outage: 14.4 million people (about 50%) Power outage: 12.2 million houses (about 10%)
Stranded people: 10.6 million Evacuees: 9.5 million	Evacuation	Stranded people: 8 million Evacuees: 7.2 million
Up to 220 trillion yen Direct damage: 169.5 trillion yen Indirect damage: 50.8 trillion yen	Economic damage	Up to 95 trillion yen Direct damage: 47.4 trillion yen Indirect damage: 47.9 trillion yen

Excerpts from materials issued by the Central Disaster Management Council in 2012 and 2013

Old version of topographic map (Shizuoka city) published by the Geospatial Information Authority of Japan in 1918



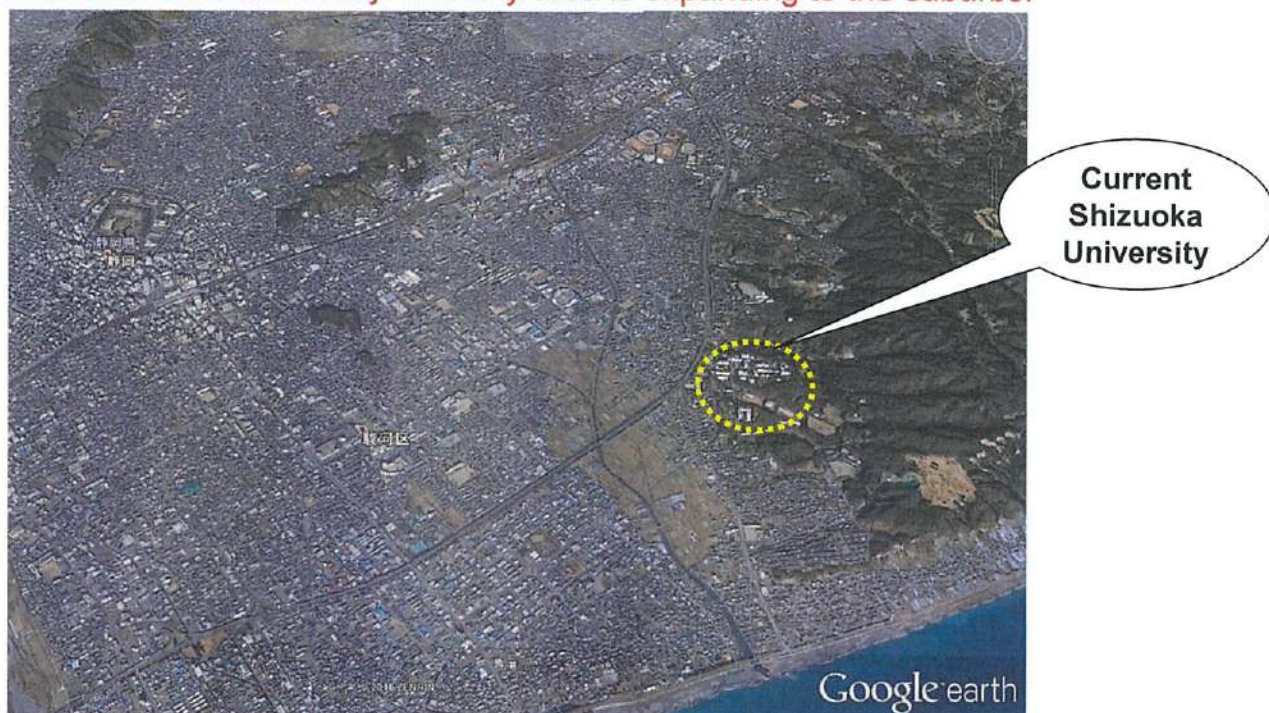
Shizuoka University campus moved to this hilly area in the 1970s

Until the time of this map, villages were located making good use of the natural terrain of the Shizuoka Plain.

Today, villages around Shizuoka University also make use of the slightly higher ground on the hills, avoiding the low-lying flood plains where the ground is soft and susceptible to flood damage.

Copy of old edition of topographic map published by the Geospatial Information Authority of Japan

The Shizuoka Plain today. The city area is expanding to the suburbs.

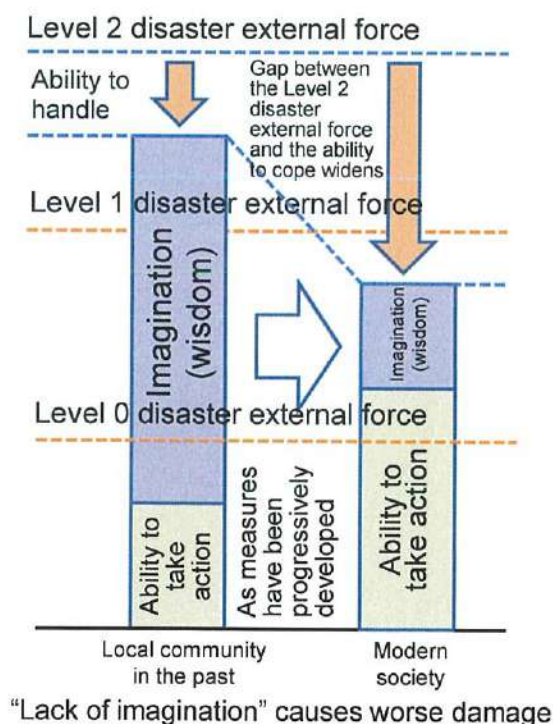


The urban area has been expanding to the suburbs since the period of high economic growth began after the war. Most of the soft floodplain lowlands, which were previously uninhabited, have been urbanized.

By improving sewers and river drainage channels, an urban area has been created that seems safe against daily external disaster forces. But if the limit is exceeded, serious damage may occur.

“Lack of imagination” aggravates the damage.

It is unacceptable if we can foresee, but do not take action.



- “Lack of imagination” creates an “unexpected trap” (Kunio Yanagita)

- As preventive measures have become technically more advanced, we no longer care about damages and disasters caused by Level 0 external forces.
- The fact that we can no longer imagine a disaster in daily life could lead to an unexpected disaster.

1854 Ansei Tokai Earthquake

Picture depicting a tsunami striking Shimoda Port



The flagship *Diana* of the Russian Fleet led by Admiral Putjatin running aground.
Reproduction of a picture drawn by Mozhayski
(Collection of Heda Shipyard Museum of Folklore)

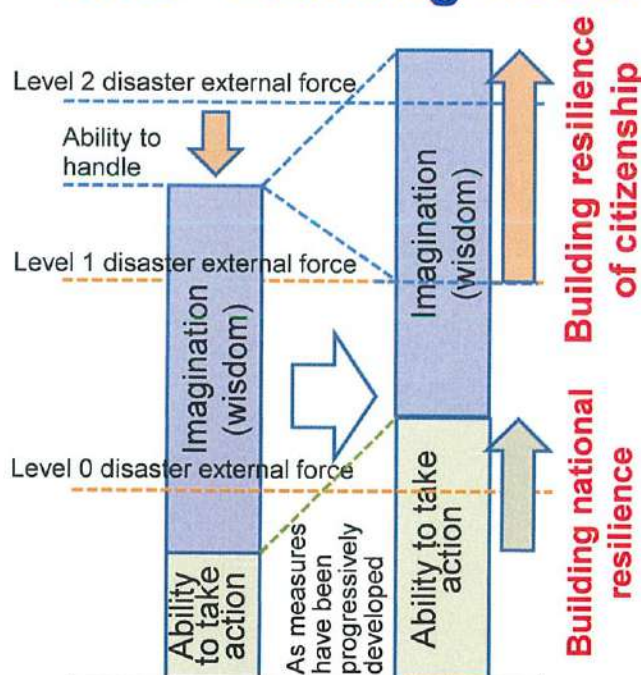
A large tsunami of up to 6.8 m struck Shimoda Port a few minutes after the earthquake.
871 of 875 houses were swept away (**damage rate 99.5%**).

Out of a population of 3,851, there were 99 fatalities (**casualty rate 2.6%**).

Reference:
Otsuchi Town, Iwate Prefecture, which had the highest casualty rate due to the tsunami after the 2011 Great East Japan Earthquake:

- House **damage rate: 68.2%**
- **Casualty rate: 8.1%**
(inside the flooded area: 10.7%)

“Building Resilience of Citizenship” along with “Building National Resilience”



- Improve the basic ability to cope with disasters by building national resilience.
 - Increase the ability to cope with disasters by “building resilience of citizenship.”
- ↓
- Overcome not only Level 1 but also Level 2 disasters.

Both “building national resilience” and “building resilience of citizenship” are important.

Don't let a lack of imagination hamper disaster preparedness

- In society today, disaster prevention measures focused on the “hardware” or facilities are progressing steadily; people no longer care about relatively heavy rain that we encounter on a daily basis.
- The same is true for earthquakes and tsunamis, but there is the potential risk that we cannot handle disasters once the limits are exceeded.
- It is important to use our imagination and think what could happen around us on a daily basis, so that we do not regard a disaster as an unexpected event.
- This will enable us to plan how to respond to disasters.

Then, we merely have to put the plan into practice!

Japan Floods, July 2018

👉 This type of heavy rain disaster has occurred frequently in recent years.

Due to heavy rains that continued throughout western Japan from June 28 to July 8, 2018, 221 people were killed or missing, mainly in Okayama, Hiroshima, and Ehime prefectures. Most fatalities occurred on July 6 and 7.

Mabi Town, Kurashiki City

The embankments of the Oda River and its tributaries broke, and the flood water reached as high as the second floor, causing many casualties.



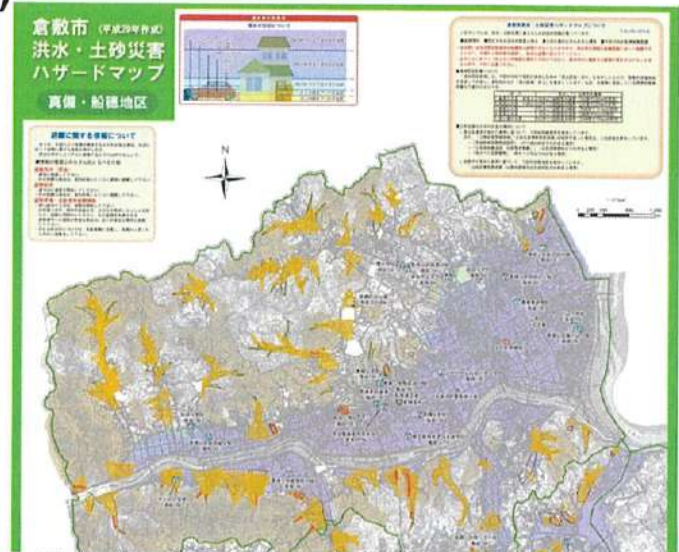
Sakane Area in Mabi Town



Japan Floods, July 2018

Flood in Mabi Town, Kurashiki City, Okayama Prefecture (51 casualties)

Flood records (Geospatial Information Authority of Japan)



Hazard map distributed to residents in advance (Kurashiki City)

75% of residents knew about the existence of hazard maps (Sakamoto in 2018). However, 80% thought the risk of flooding was low (Ushiyama in 2018). On the other hand, 30% of people evacuated in response to calls made by firefighters, police, neighbors, family members and relatives (survey of disaster victims conducted by NHK in Hiroshima, Okayama and Ehime).

(From information materials prepared by the Cabinet Office in Dec. 2018)

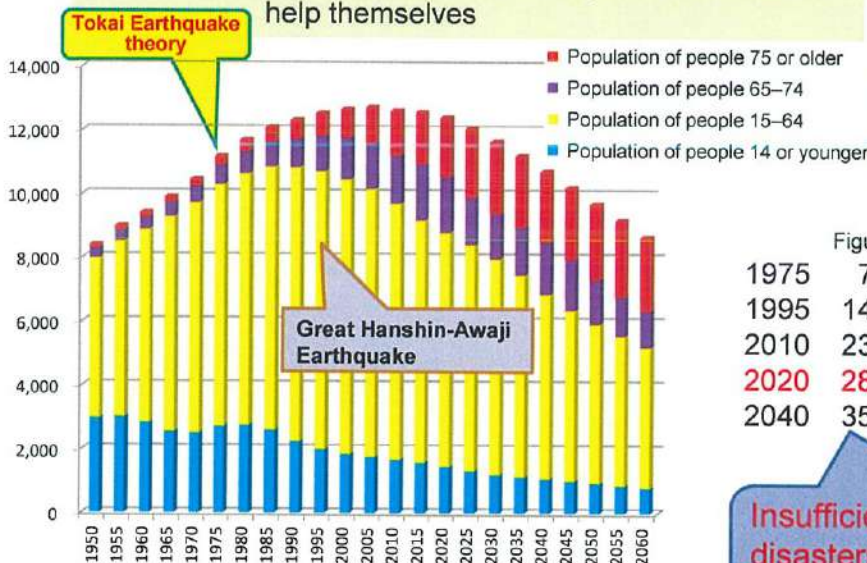
45 years since starting to promote measures against the Tokai earthquake

Emerging issues

Ultra-rapid decline in birthrate and aging population

Remarkable increase in the aging population even though society is becoming more sophisticated

⇒ Persons who used to help others now need help themselves



80% of people in need of rescue were rescued by their neighbors



Figures in () show the rate of very old people.

1975	7.9%	(2.5%)
1995	14.6%	(5.7%)
2010	23.0%	(11.0%)
2020	28.9%	(14.9%) (estimated)
2040	35.5%	(20.2%) (estimated)

(White Paper on the Aging Society: 2020)

Insufficient ability to cope with disasters in the local community in the event of a disaster

• Aging of the core infrastructure of society

Increased maintenance costs for roads, railroads, water and sewage, electricity, communications, etc.

Floods in Kyushu and Chubu Regions, July

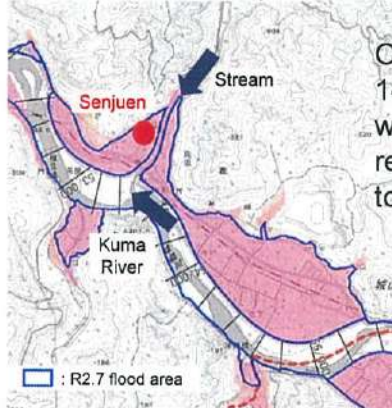
Tragedy repeated in facilities for the elderly

The tragedy of Senjuen, a special nursing home for the elderly in Kuma Village

- At Senjuen, a special nursing home for the elderly in Kuma Village, the first floor of the facility was submerged (flooded to a depth of about 3 m), and 14 of the 65 residents were killed.



Estimated flood area of the Kuma River and the location of Senjuen



Of the 65 residents, 14 were killed, while 51 were rescued and taken to hospital.

*1) The flood area was estimated by flood trace surveys, etc.
*2) This is a "quick report" and may change in the future.

Ministry of Health, Labour and Welfare: Reprinted from materials of the first study group session on securing the evacuation of welfare facilities for the elderly in light of the flood in July 2020

As of July 9, 2020, **72 facilities for the elderly were flooded, 20 in a power outage, and 14 in a water outage** in Kumamoto, Oita, Nagasaki, Fukuoka, Gifu, and Nagano Prefectures.
(Source: Extreme Disaster Management Headquarters)

Records of disaster damages to facilities for people requiring special care, and pending issues

- Sand/rock debris flow caused by heavy rains on July 21, 2009 struck the special elderly nursing home "Life Care Takasago" in Hofu City, Yamaguchi Prefecture, and killed seven residents.



Issues and countermeasures

- ◆ Recognized the importance of close cooperation between the civil welfare department and the erosion control department in order to protect facilities for people requiring special care from landslides.

➡ A joint notification was issued by the Ministry of Health, Labour and Welfare and the Ministry of Land, Infrastructure, Transport and Tourism to strengthen cooperation such as information sharing between the civil welfare department and the erosion control department.

- The flood of the Omoto River in Iwate Prefecture caused by rainfall during Typhoon No. 10 on August 30, 2016 caused great damage, killing 9 residents in the group home "Ran Ran."



Photo from video of the damaged long-term care facility in Iwazumi Town, Iwate Prefecture in August, 2016, by Geospatial Information Authority of Japan

Issues and countermeasures

- ◆ Disaster prevention information is not fully understood by the managers of facilities for people requiring special care, and evacuation security plans and evacuation drills for flood damages are not sufficiently implemented.

➡ It became obligatory to make an evacuation security plan and conduct evacuation drills at facilities for people requiring special care (2017 revision of the Flood Control Law, etc.).

Ministry of Health, Labour and Welfare: Reprinted from materials of the first study group session on securing the evacuation of welfare facilities for the elderly in light of the flood in July 2020

In a super-aged society with a very low birthrate, How to prevent damages to facilities for the elderly

- Delay in making a decision to evacuate due to lack of information
 - ☞ Provide more effective information for better decision-making.
- Lack of support for evacuation
 - ☞ Cooperation of neighbors

e.g.: Shizuoka Hirono Hospital (Nursing Medical Center) in Mochimune, Shizuoka City opens up its facility as a tsunami evacuation building for local residents. The facility has stockpiles of emergency food, etc. Local residents provide evacuation support for inpatients.

- Issuance of building permits
 - ☞ **Tighten development permits in urbanization control areas** where there is a risk of flood and inundation.
 - ☞ **Renovate existing noncompliant facilities.**
 - ☞ **Introduce emergency evacuation equipment, etc.**

The key is our determination to prevent anyone from being left behind in the event of a disaster.



Gravity-type high-altitude evacuation device LGL (Life Guard Lift)



Nepal Gorkha Earthquake (M7.8) on April 25, 2015



Trisley settlement in the mountains

(Masonry structures were completely destroyed)

Square in the center of Kathmandu
(Lines of tents made by evacuees)



Management of shelters in the age of Covid-19

In local communities (Activities of residents' associations in Shizuoka City)

Local residents take the lead in managing shelters and
sharing issues

Various organizations such as local NPOs collaborate



Setting up partitions and beds made of
cardboard for people requiring special
care (Fujimi Elementary School)



Two-step checks at outdoors
and indoors of the shelter
when accepting evacuees to
prevent infectious diseases
(Nishi Toyoda Elementary
School)



Guidance for the visually impaired
(fully blind)

Society based on disaster prevention in the Covid-19 era

- How to save vulnerable people in the event of a drastic change in the environment such as a disaster or Covid-19 pandemic 📌 **Starting point of a mature society**
- Various individuals, organizations and groups use their imagination to implement countermeasures against severe natural disasters 📌 **Towards a society of the future**
- **We should be aware of the importance of self-help and mutual help, firmly supported by public assistance**
- Creating a barrier-free society
Simple practice:
One wheelchair per family
📌 **Changing the awareness of each individual**



You can easily climb over steps if you
pull the wheelchair from the front

The key to disaster prevention measures is how realistically we can imagine infrequent disasters.

- **Self-help to protect our own lives**
- **Mutual help to protect our communities**
- **Public assistance to firmly support our efforts**