総務省
Ministry of Internal Affairs and Communications

Japan's International Contribution in the Field of ICT for Disaster Risk Reduction

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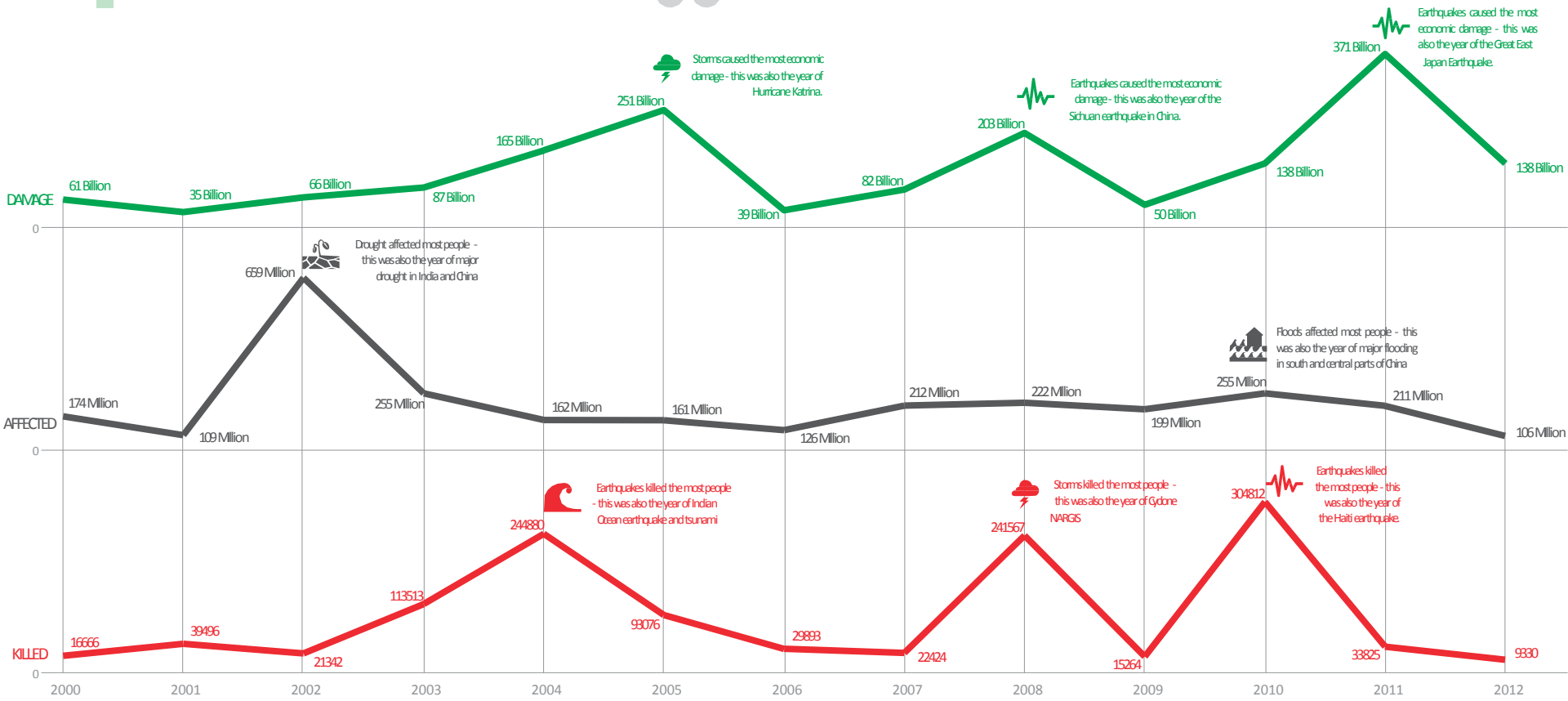
Damage by disasters all over the world since 2000

Source : UNISDR

1.7 TRILLION DAMAGE (USD)

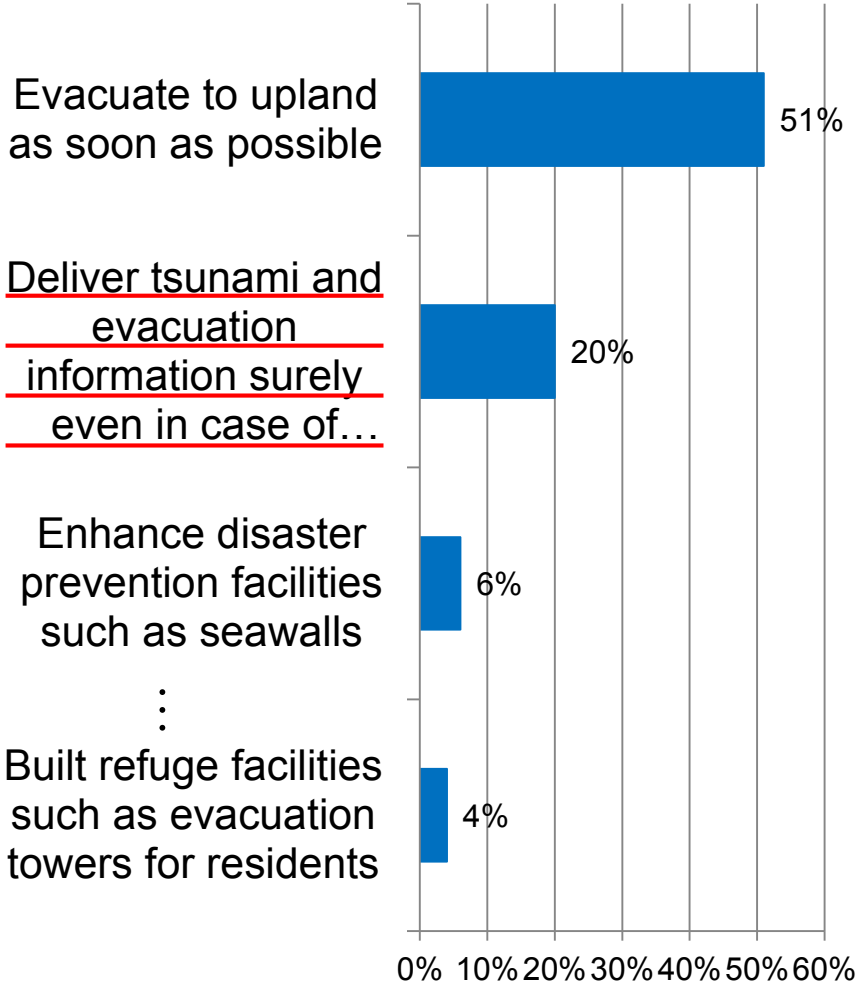
2.9 BILLION AFFECTED

1.2 MILLION KILLED

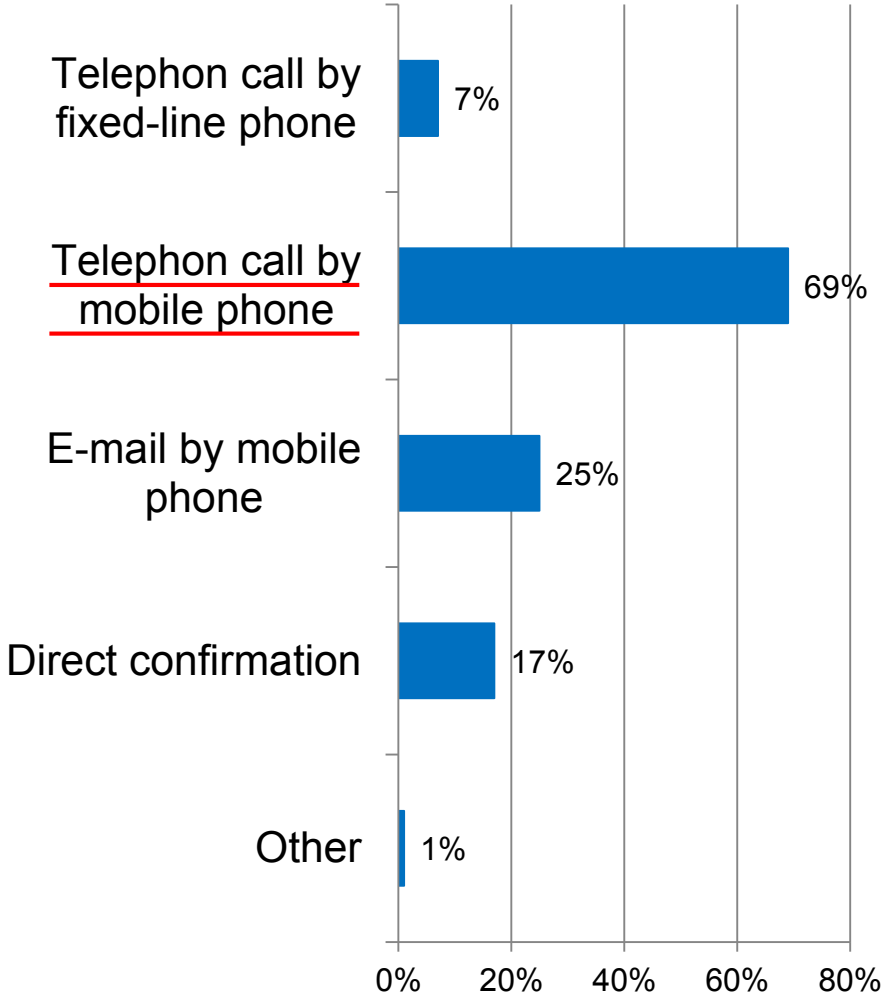


Lessons from the Great East Japan Earthquake

Most important counter measures to protect a community from tsunami



Method to confirm safety of family members living together



Source: Special Working Group of the Cabinet Office

Emergency recovery measures

- Major reason of mobile base station stop power loss and disconnection of transmission lines.

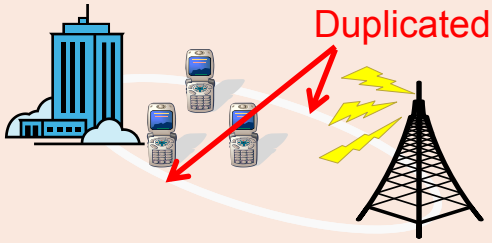
Power supply

Movale power station

Portable power generator

Spare battery

Multiple lines



Multiple routes of transmission

Satellite entrance

Micro entrance

Area coverage

Portable
Base stations

Vehicle on-board
base stations

Wide-zone base station

Emergency recovery measures: outcome

-After the Great East Japan earthquake, MIC enhanced policies for disaster management against power loss and transmission lines disconnection because these two incidents are major reasons of disruption of communication.
-At Kumamoto earthquake, many base stations were restored by these measures.

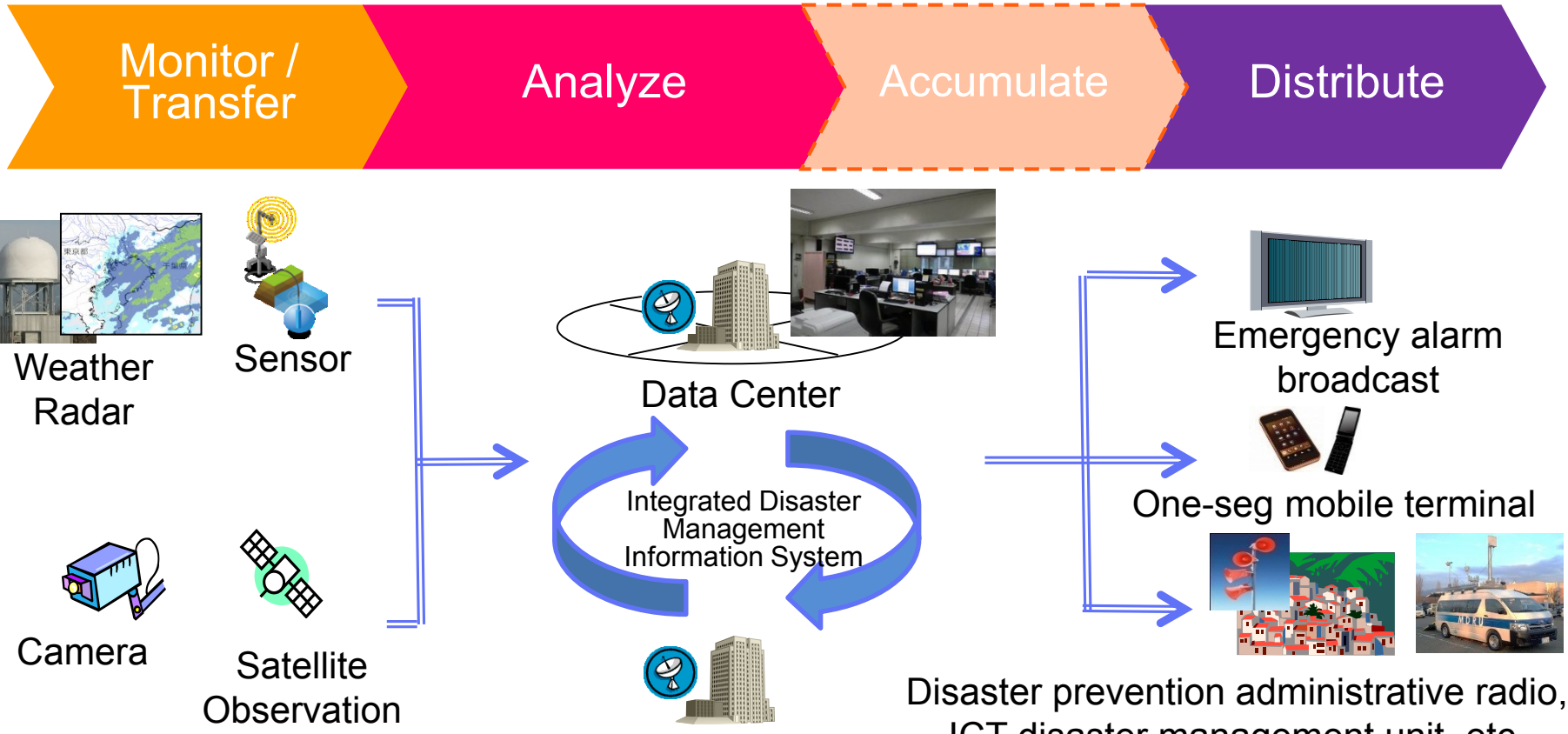
	Action items	Great East Japan earthquake (Feb. 2011)		Kumamoto earthquake (Apr. 2016)	Effect
Power loss	Movable power station, portable generators	~830	x2.7	~2,270	~115 stations restored by ~100 units
	24h Spare battery	~1,000	x5.9	~5,850	
Line disconnection	Redundant backbone transmission	2-3 routes		2-4 route	Major base station almost survived
	Microwave transmission line	~70	x5.3	~370	~40 lines restored by ~40 units
	Satellite entrance	~25	x14	~340	
Area coverage	Vehicle on-board base stations	~40	x3.5	~140	~50 locations restored by ~40 units
	Portable base station	~50	x6.8	~340	
	Wide zone base stations	0	New implementation	~115	Not set on because areas are covered by adjustment channes of stations.

These might be useful as indicators for disaster risk management

Japan's ICT solutions for Disaster Management

ICT for Disaster Management

- Information distribution is an important factor for disaster management.
- Effective and efficient disaster management is made possible by ICT.
- ICT for disaster management can be classified into 4 stages.

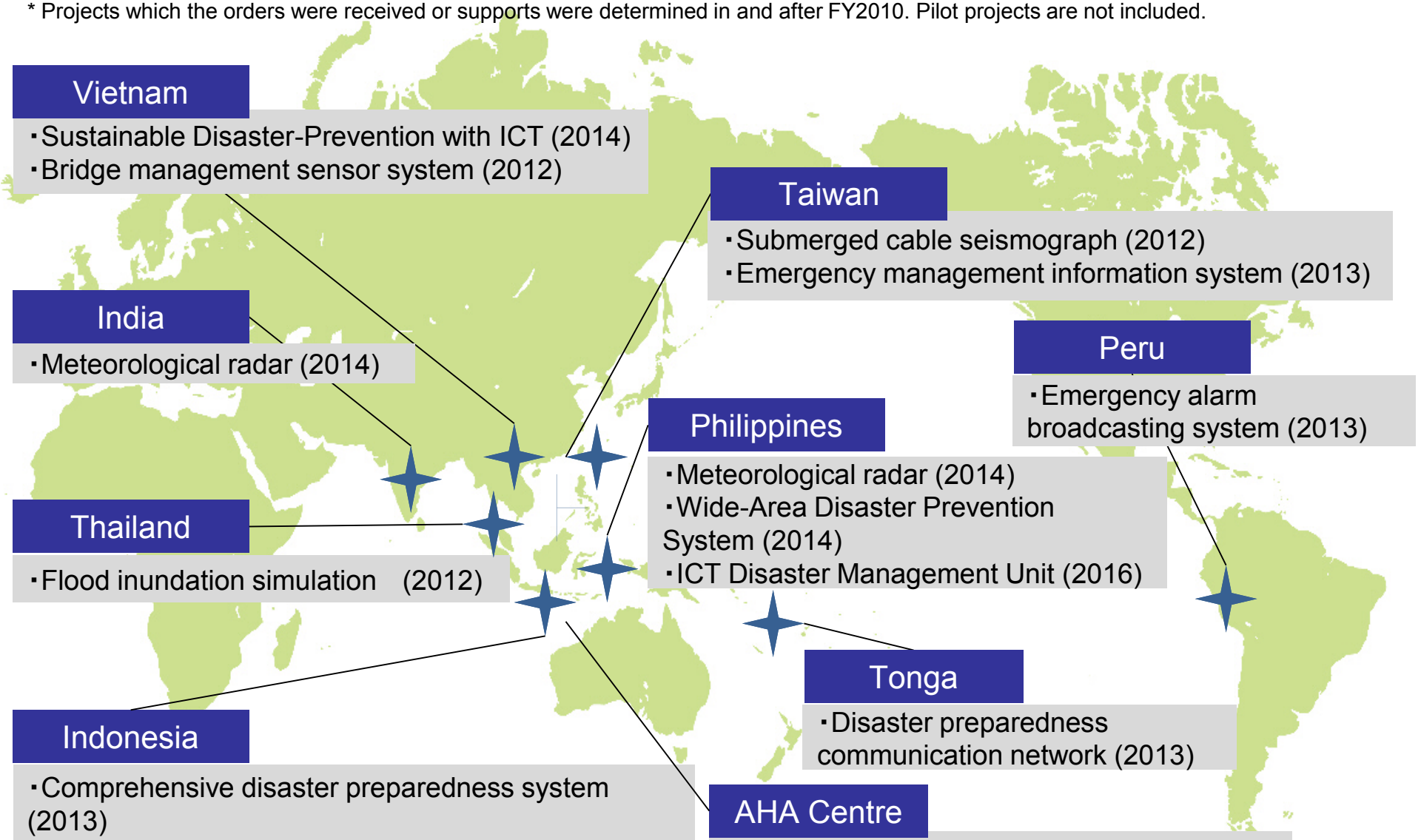


ICT Solution Map for Disaster Management

		Monitor / Transfer	Analyze	Accumulate	Distribute
Terminal on-site equipment		・Sensor (earthquake, water level, rainfall amount, wind speed, landslide, etc.) ・Meteorological radar ・Camera (fixed, mobile, helicopter) ・Satellite observation (image, position information)			・Broadcast reception terminal (IP announcement terminal, PC, etc.) ・One segment terminal ・Speaker ・Mini satellite earth station
Application		・Meteorological observation information collection system ・Damage information collection system ・Safety/evacuation information collection system ・Image monitoring/analysis system	・Meteorological analysis system ・Geographical information system ・Shelters/evacuees management system ・Supplies management system ・Administrative operation system	・Damage forecasting system	・Emergency information transmission system ・Evacuation information / announcement management system
		・J-ALERT			
		・L-ALERT			
Platform		・Sensor information collection/control infrastructure	・Comprehensive disaster prevention information system ・Risk management information management system ・Space data platform system ・Infrastructure management system ・Police/fire prevention command and control system	・Cloud platform/big data analysis	・Emergency alarm broadcast ・Cell broadcast
Communication infrastructure	Disaster prevention use	・Disaster prevention administrative radio network (mobile) ・Satellite communications			・Disaster prevention administrative radio (broadcast reception, mobile) ・Satellite communications ・ICT Disaster Management Unit
	General use	・Satellite communications ・Radio communications networks (FWA, WiFi, microwave, TV White Space, etc.) ・Submarine cable			

International Contribution in Disaster Management

* Projects which the orders were received or supports were determined in and after FY2010. Pilot projects are not included.



Vietnam
- Sustainable Disaster-Prevention with ICT (2014)
- Bridge management sensor system (2012)

India
- Meteorological radar (2014)

Thailand
- Flood inundation simulation (2012)

Indonesia
- Comprehensive disaster preparedness system (2013)
- National space data infrastructure system (2014)
- Smartphone-Based, Participatory Disaster Information-Sharing System (2015)

Taiwan
- Submerged cable seismograph (2012)
- Emergency management information system (2013)

Philippines
- Meteorological radar (2014)
- Wide-Area Disaster Prevention System (2014)
- ICT Disaster Management Unit (2016)

Peru
- Emergency alarm broadcasting system (2013)

Tonga
- Disaster preparedness communication network (2013)

AHA Centre
- ICT materials/equipment support (2011-)

Source: industry survey by MIC

Distribution：ICT Disaster Management Unit

Container type

Vehicle type

Attaché case type

Foreign case examples

- ITU, Ministry of Internal Affairs and Communications of Japan (MIC) and the Department of Science and Technology of Philippines signed a cooperation agreement for the joint project. Following this, the feasibility study using MDRU in Philippines was deployed from December 2014 to March 2016. As a result, a municipality in Philippines (San Remigio) decided to introduce this unit.
- MIC continuously disseminate information on achievements of this study, and have been working on the introduction of ICT disaster management units all over the world including Philippines.

MDRU-employed Support Activities for Kumamoto Earthquake Disaster (Immediately after Disaster through Recovery Phase)

In response to the huge earthquakes that hit Kumamoto Prefecture, we transported MDRUs to Takamori Town in the Prefecture and provided an Internet-access service and a voice call service at the town office and a shelter. A branch of MIC Japan there is still ready to offer some MDRUs by requests from local governments and other organizations.

MDRU with NICT's vehicle-mounted satellite base station

Internet-access service

Residents using the Internet to collect information in a shared space

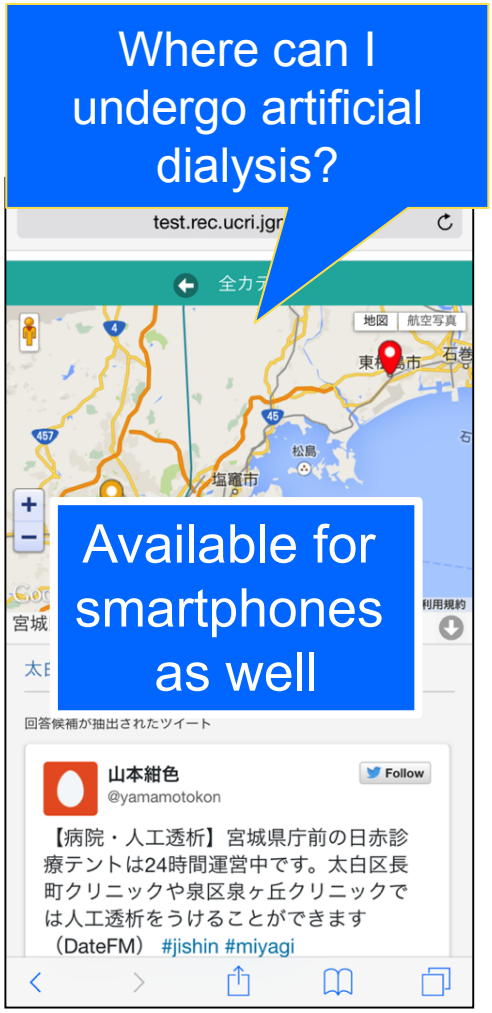
MDRU with Docomo's satellite-based mobile phones

Voice call service

Staff member using his smartphone to make a call via satellite at his desk

Analyze: DISAANA (DISaster information ANAlyzer)

Problem: A large quantity of information, such as “No food” and “No water”, was posted to Twitter and valuable information was not recognized.
Aim: Give only useful information only by providing compact answers.



http://disaana.jp

Disaana

Developing by NICT

Distribution：Disaster Information Delivery to Residents

Observation | Analysis/Centralization | Accumulation | Delivery

Satellite Observation

Meteorological Radar

Sensor

Camera

Information Provider

National government

Prefectures

Municipal government

L-Alert

Connected with standard format

Various types of format

Collection, Format conversion, and Distribution

Information Communicator

TV operator (Cable / Terrestrial)

Radio operator

Net operator

Mobile phone operator

Municipal Disaster Radio Broadcast System

Municipal office

Residents

Digital TV

Radio

Web distribution

Mobile phone・Smartphone

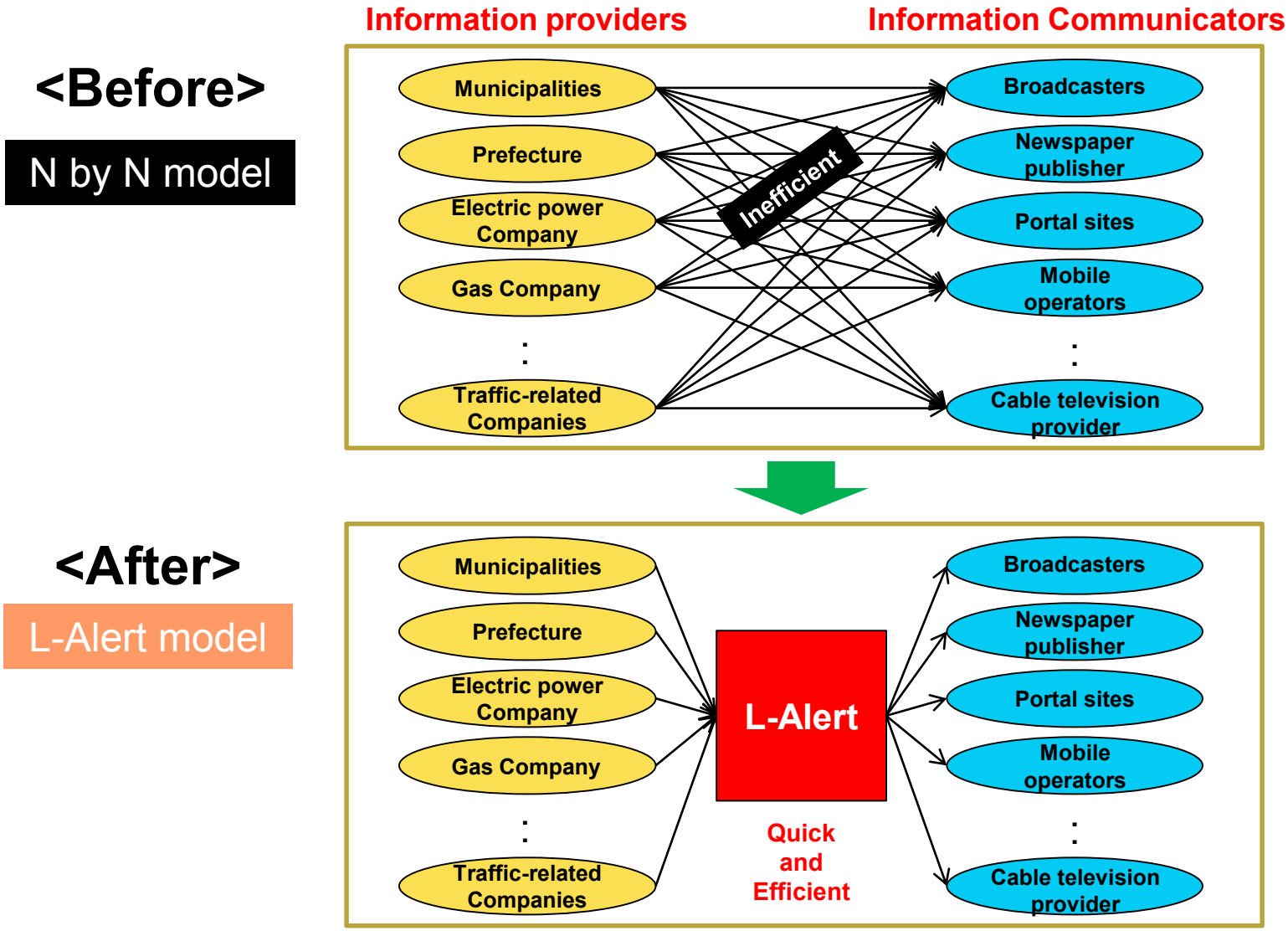
Outdoor Loudspeaker

Home Receiver

※L-Alert : 832 groups including 47 prefectures are participating. (33 out of 47 prefectures distributes information in practice)
Direct information distribution without L-Alert from information provider also existed.

Background of Development of L-Alert in Japan

➢ **Communication path**



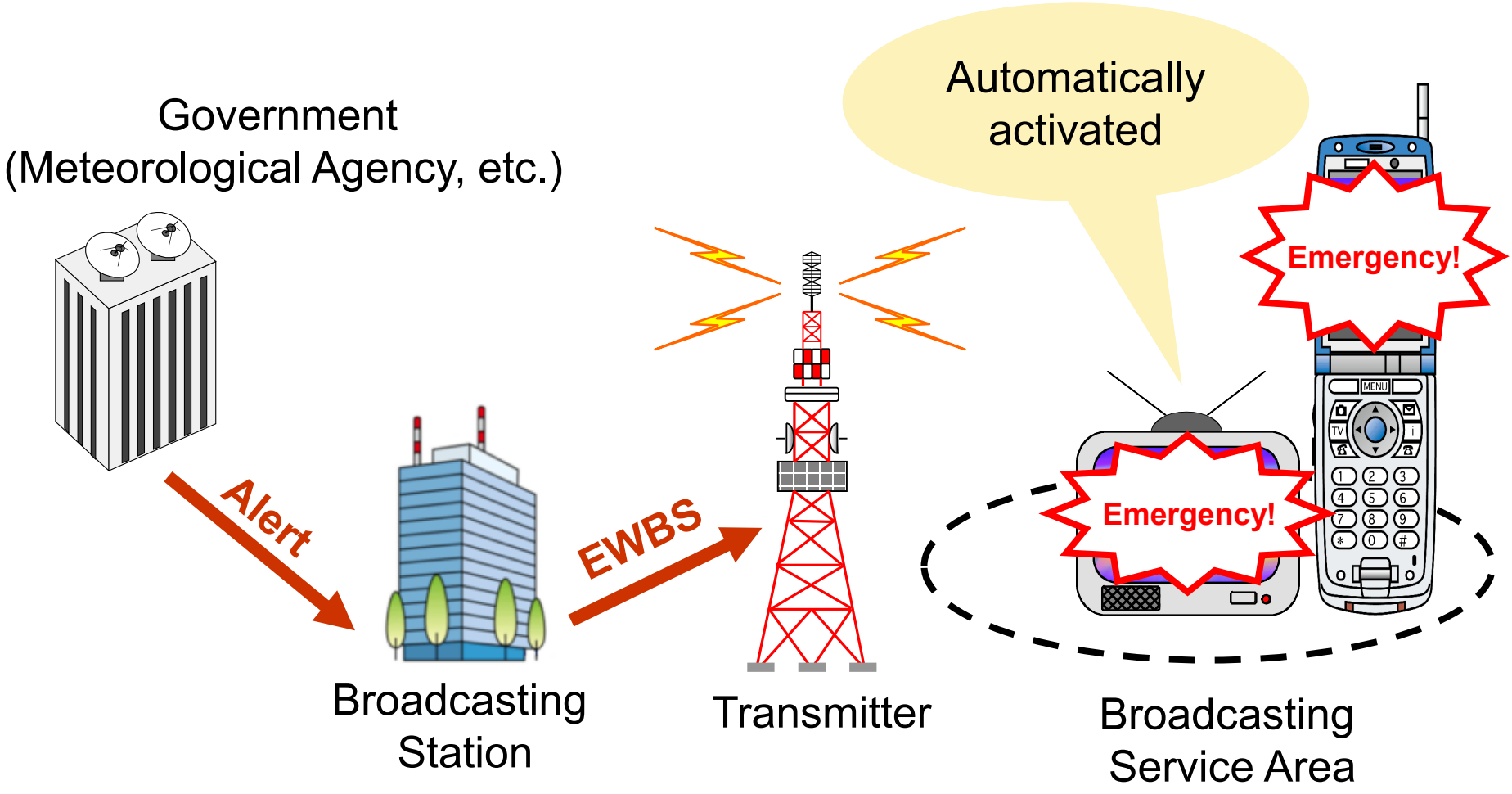
Progress of L-Alert in 2016

- 40 of 47 prefectures have implemented this system and another 7 prefectures have a plan within 2 years.
- 82% of towns have implemented.
- 603 distributers (terrestrial TV, CATV, radio, newspaper, signages)
- 59 gas companies (72.6% users coverage) joined to provide information of gas supplying
- Electric companies joined to verification experiments.
- Metrological agency started to provide eruption information in this year
- Trainings and drills are carried out periodically.
- Japanese government promotes to distribution this system strategically and check their progress periodically.

These might be useful as indicators for disaster risk management

Distribution : EWBS

EWBS : Emergency Warning Broadcasting System



Summary

- After the Great East earthquake MIC enhanced policies for quick restoration of ICT infrastructure when a disaster happens.
- These measurements ensured these effects at the Kumamoto earthquake in last April.
- These measurements might be useful as indicators for disaster risk management.

- Japan is contributing to international communities through the ICT disaster risk management solution.

Thank You for your attention!

Ministry of Internal Affairs and Communications, JAPAN