International Standards
Smart Community Infrastructures and Disaster Risk Reduction

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SCIENCE FOR RESILIENCE
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IRIDeS
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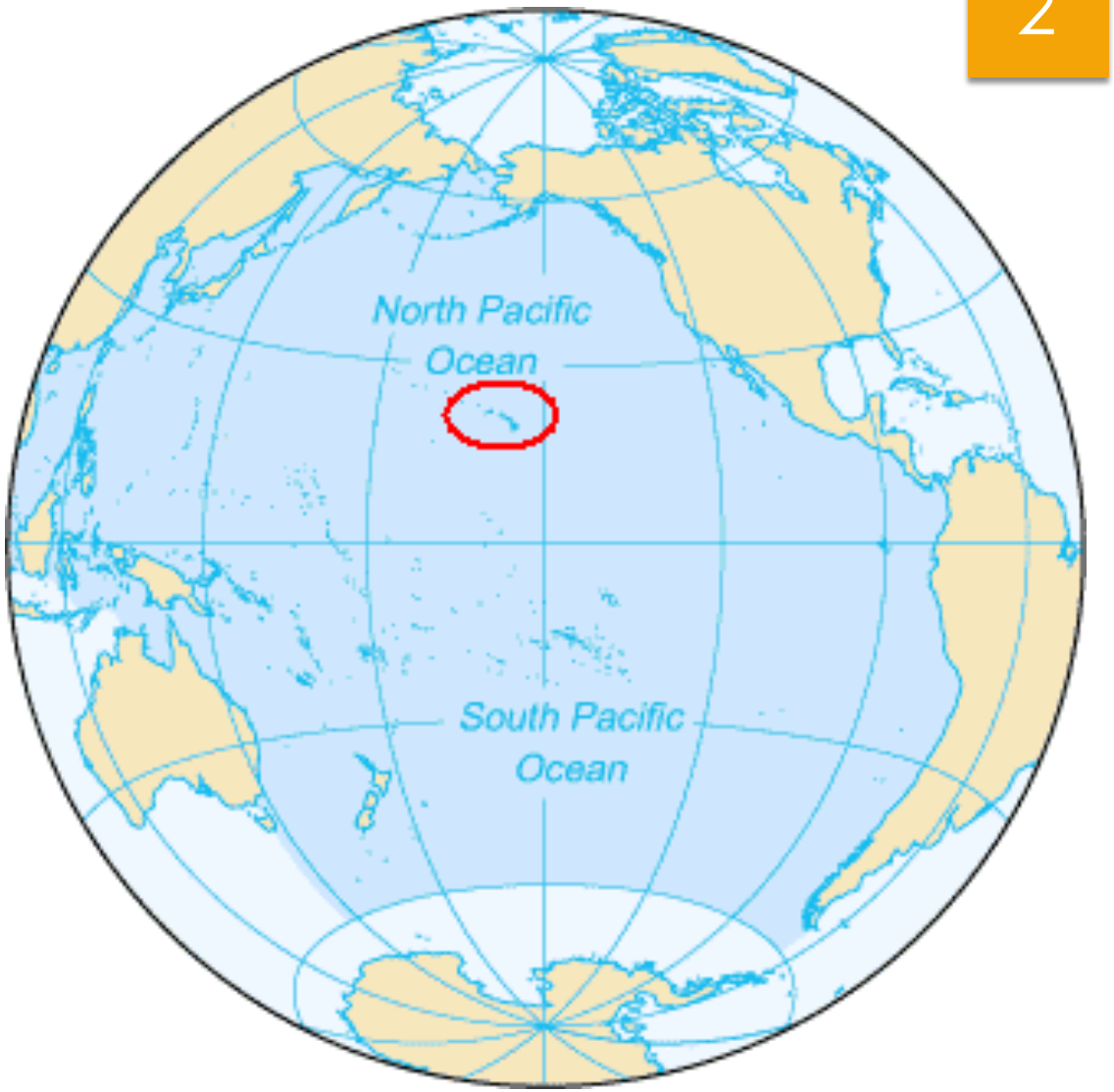
About Me

- Originally from Hawaii
- PHD in Civil Engineering and Urban Planning
- Focus area on disaster risk reduction planning in tourism and transportation
- Project Leader in ISO



What is the International Organization for Standardization (ISO)

- Founded in 1946
- World's leading standardization body
- Consists of 168 member countries

Increased Commonality

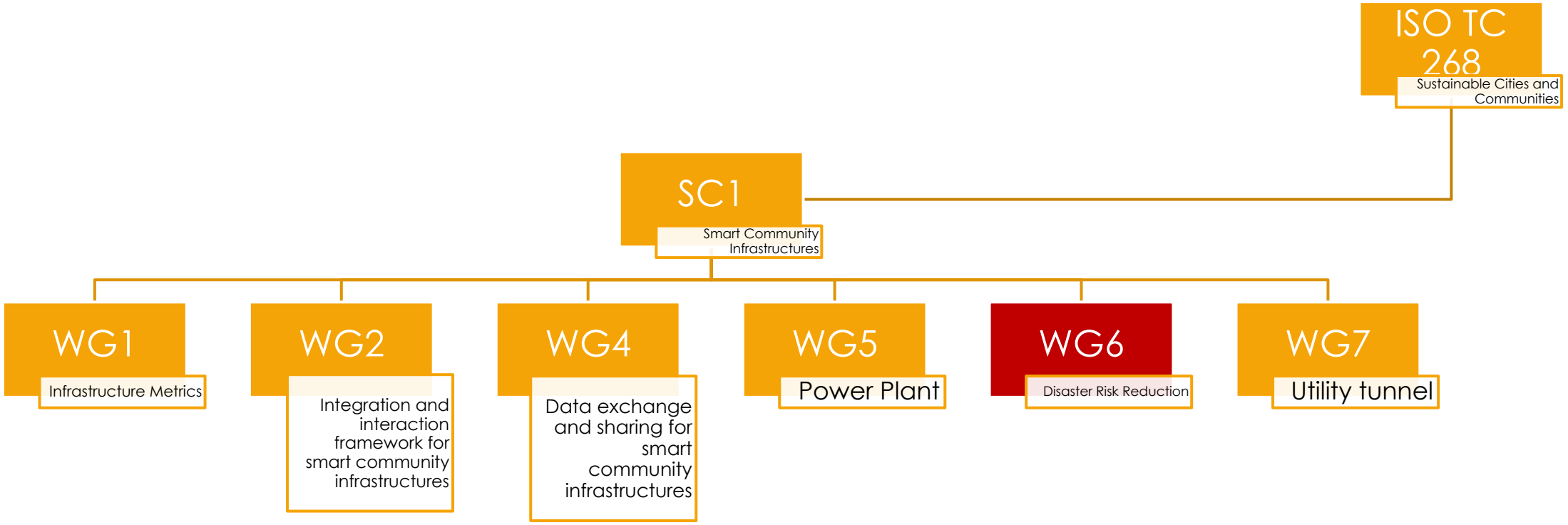
Reduced Cost, Time, Labor

Improved Logistics

Technology Transfer Developed -> Developing Countries

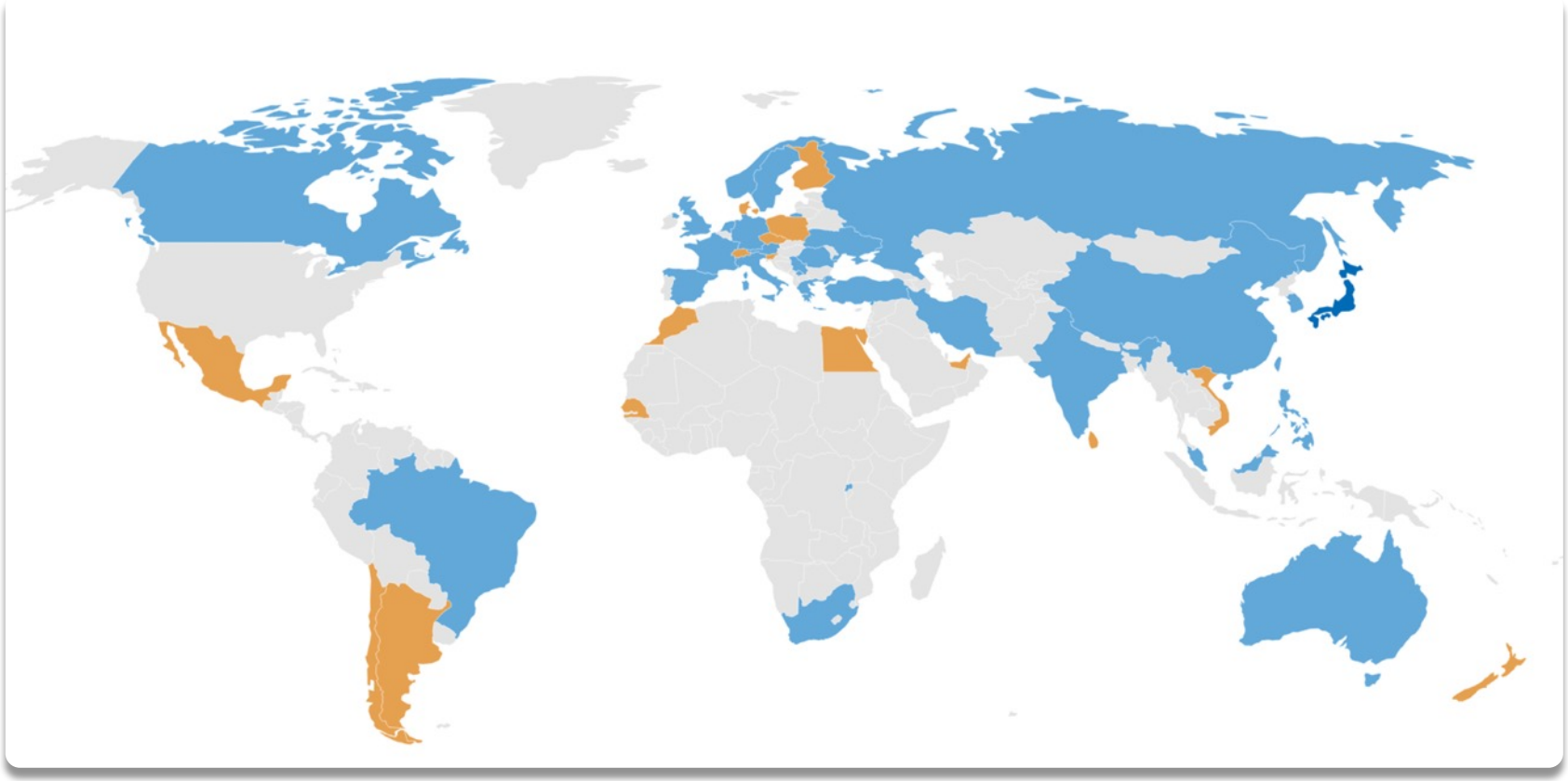
Used by certification bodies

Our Committee



ISO TC 268 SC1 Members

- Blue = P-member countries
- Orange = O-member countries
- Secretariat is currently based in Japan



Our Publications

ISO TC 268 SC1 WG6 Smart community infrastructures — Disaster risk reduction

- TR 6030: Survey Gaps and Analysis
- ISO 37174: Guidelines for implementing seismometer systems
- ISO 37179: Basic framework for the implementation of disaster risk reduction

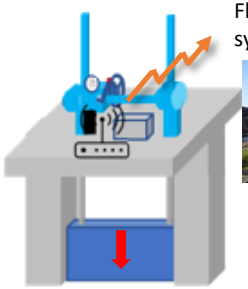
Prospective work items in the future

- Data Sharing
- Disaster Risk Financing

TR 6030: Global Examples of Smart DRR infrastructure

- A survey of 50 global examples of smart community infrastructure for disaster risk reduction
- Examples: Japan, Germany, Colombia, Chile, Greece, Turkey, Australia, etc
- Identifies Functions, Hazard Focus, and Disaster Phase
- Identifies areas for future standardization activities

Seismometers on high speed rail lines In Japan and Turkey



Powerless closure

Flood gate and landlock closing sensing systems in Japan

Digital twins for DRR in New South Wales, Australia

SISMAN LISA and SIMAC
Integrated systems for monotiring of Manizales, Colombia

Blue-Green infrastructure in Ruhr region of Germany

Source: TR 6030

ISO 37174 Guidelines for implementing seismometer systems

Prepared by International Standardization Acceleration Project by the Ministry of economy trade and industry of Japan in FY 2021 and 2022

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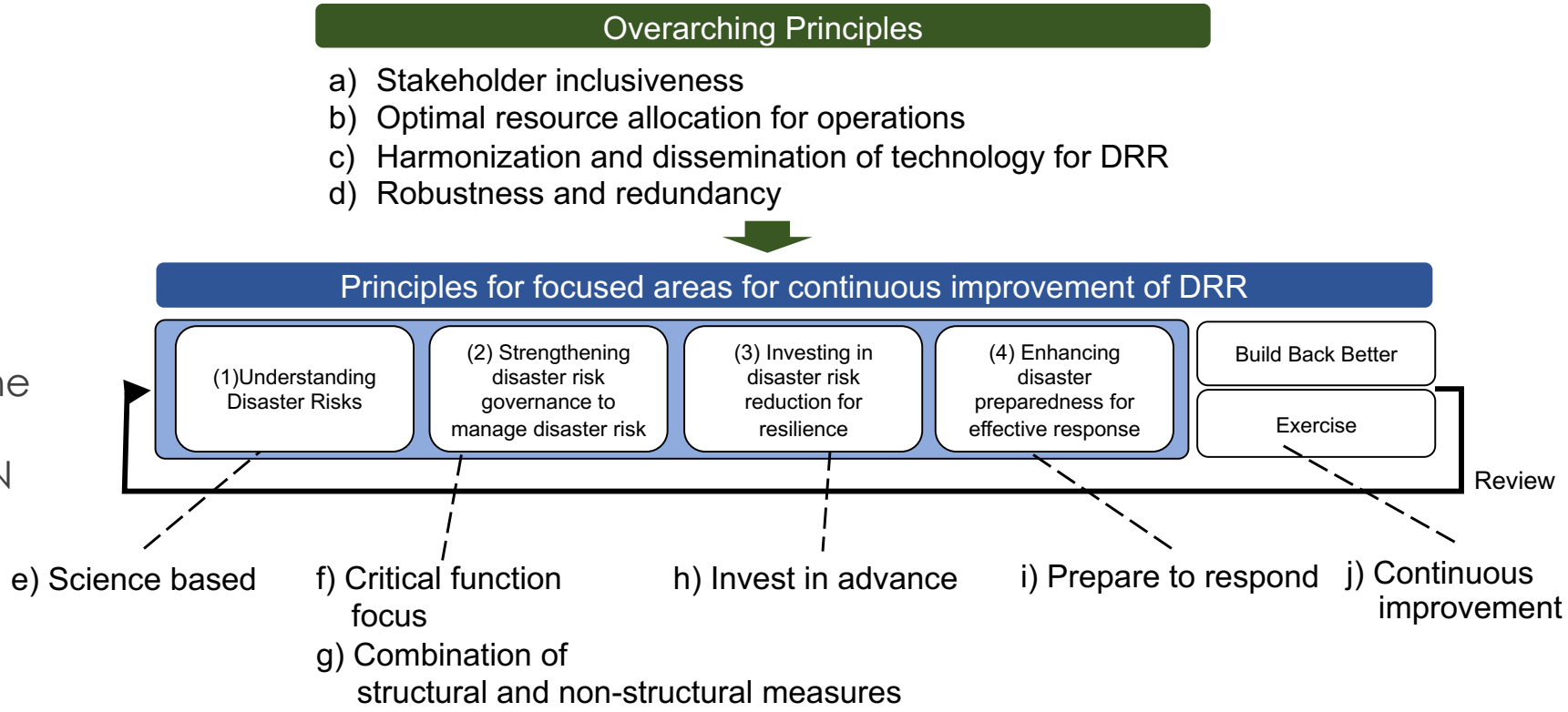
ISO 37179 Smart community infrastructures — Disaster risk reduction —

Basic framework for the implementation of disaster risk reduction

- Provides 10 principles and general requirements for government planners on implementing DRR smart infrastructure
- Principles contributes to the principles identified in the Sendai Framework and UN SDG

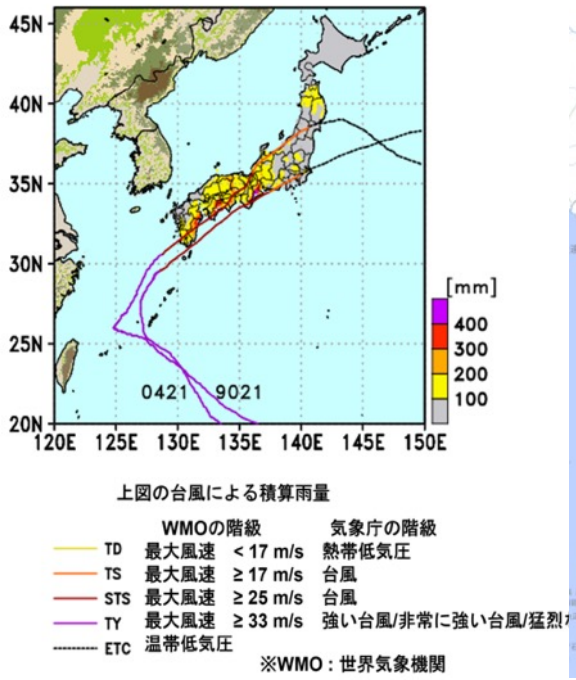


Prospective standards

1. DATA SHARING

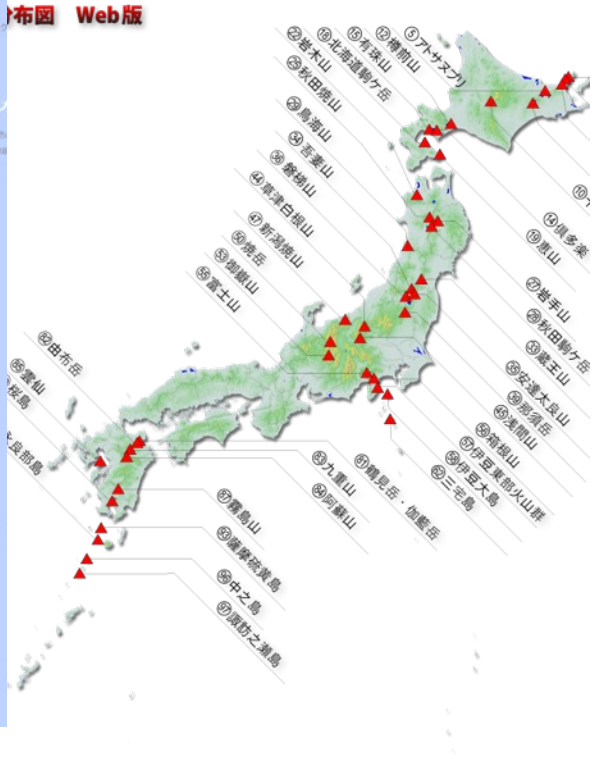
Japan is a country with many natural hazard risks

Earthquake/Seismic Risk



Typhoons

Landslides



Volcanoes

Source: NIED

Lessons from 1995 Hanshin-Awaji Earthquake (Kobe)

- 1995 M6.9 Earthquake struck western Japan
- Epicenter close to densely populated areas
- Over 6,000 deaths, significant infrastructural damages
- Criticism of slow response
- Lack of coordination between governments
- Issues with infrastructure safety measures

- Strengthen risk management at the local government level
- Development of laws to promote the use of spatial data
- Develop information systems for preparedness and response at local and national levels
- Reinforce older structures

Pictures: Satoru Nishikawa

Lessons from 2011 Great East Japan Earthquake (Tohoku)

- Key facilities now seismically reinforced
- Better coordination between governments and agencies
- Quicker response
- However there were challenges with information sharing
- Key infrastructure, especially ICT, still vulnerable to disruptions

- Develop an information sharing system for all of Japan
- Develop robust ICT network
- Consolidate effective risk communication for local communities

Pictures: Satoru Nishikawa

Challenges in managing disaster information

At the disaster response site

- Shortage of manpower
- Limited time to refer to manuals
- Mismatch of procedures
- Reliance on "paper and pen" info

At the Emergency Operations Center

- How to grasp the disaster situation
- What information is needed for decision making
- How to manage rescue and recovery?

Source: NIED

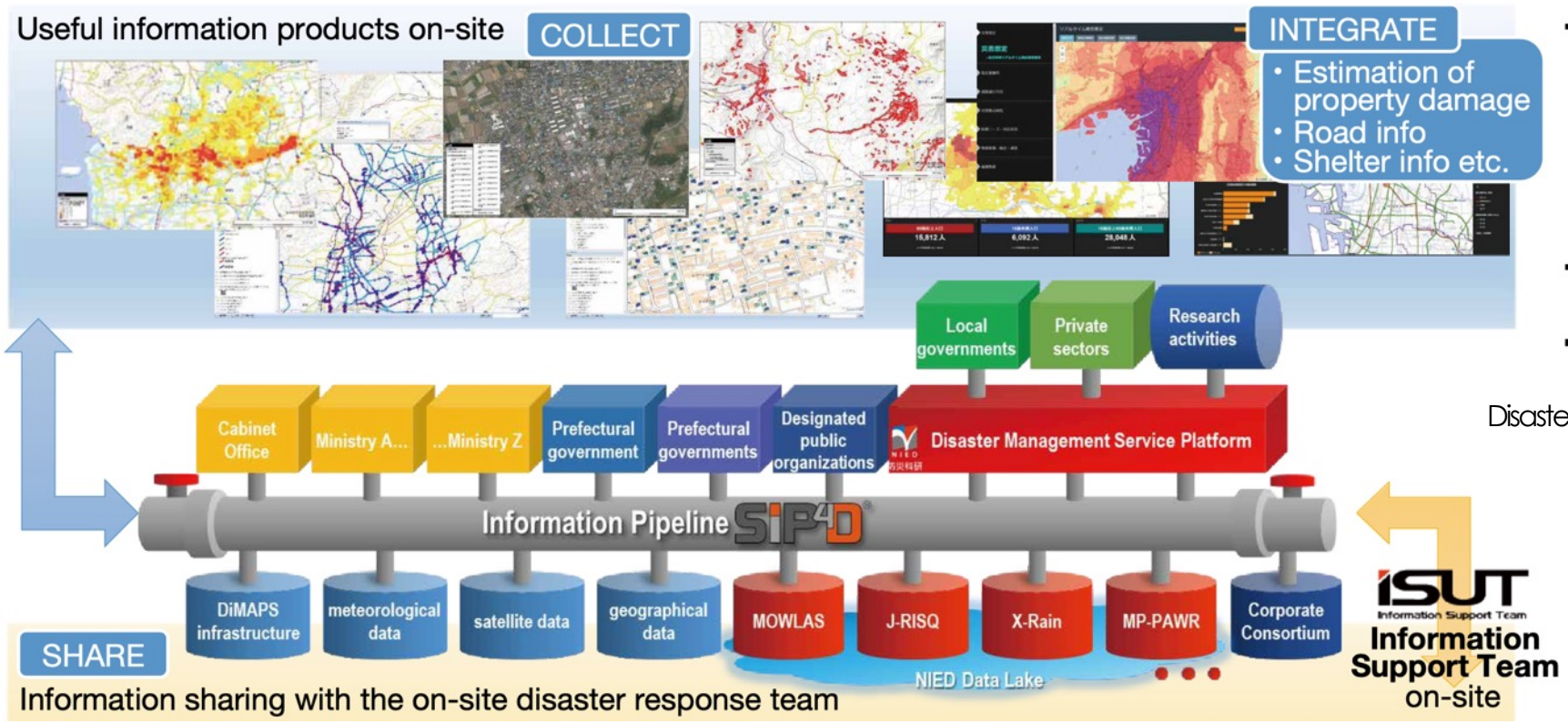
What is Data Sharing?

- During a disaster or other crisis, various organizations work simultaneously
- Without information sharing, each organization responds to the disaster based on their own information
- Leads to differing levels of situational awareness
- Disaster response becomes less effective
- The goal of data sharing is to build a common situation awareness of the disaster, between multiple organizations, as quickly as possible
- This is easy to say, but difficult to achieve

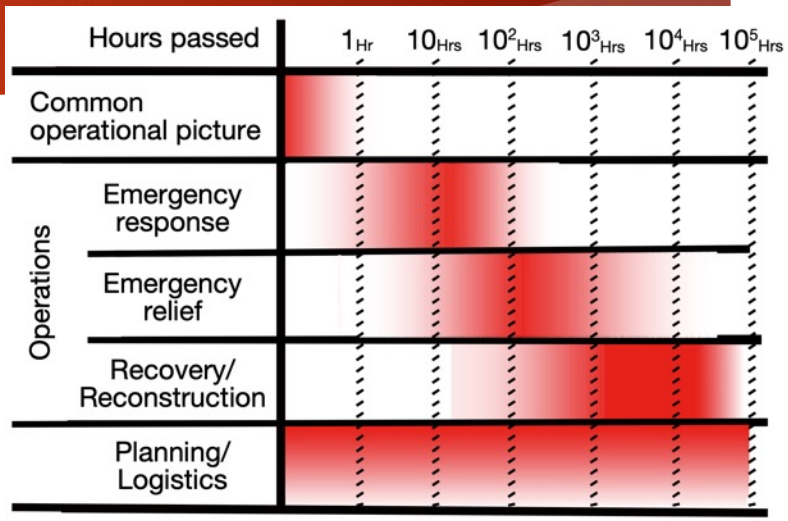
Source: NIED

Shared Informationl Platform for Disaster management SIP4D

Ready to use information and products



Reduces burden of information aggregation



Disaster response activities need appropriate information.

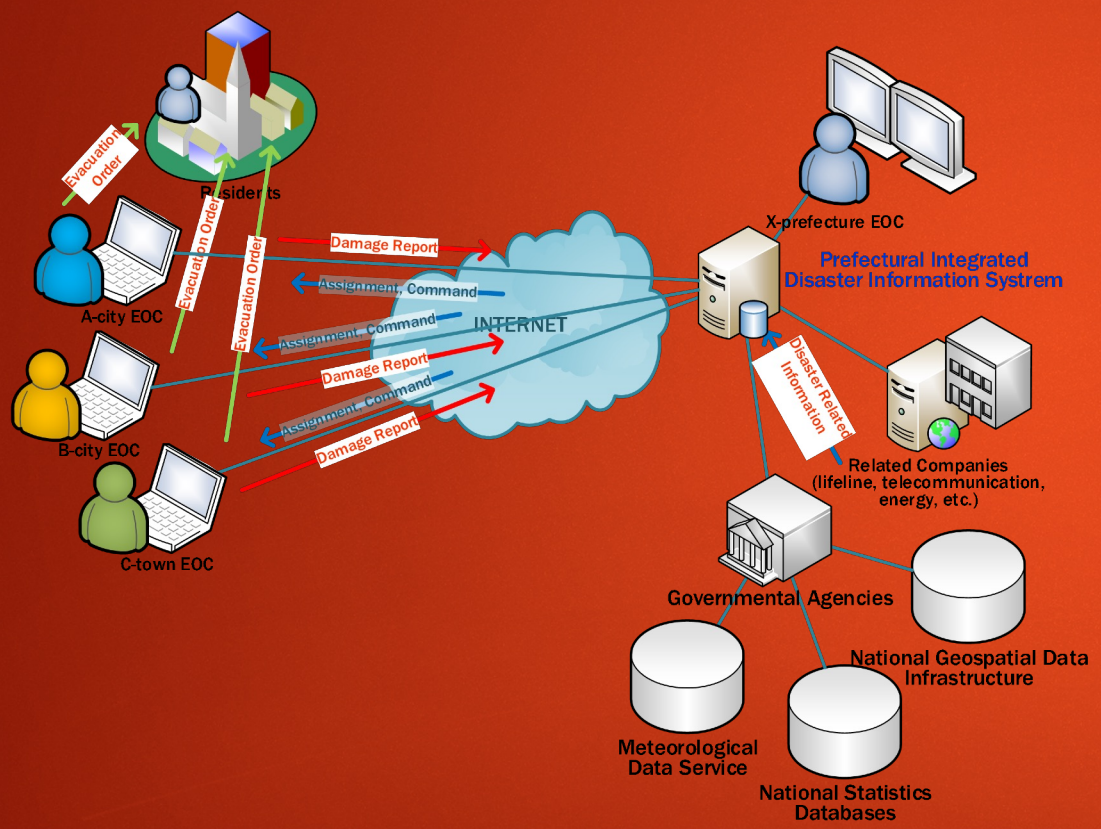
Disaster Preventing Information: Hazard maps, Evacuation maps, etc.

Damage Situation Information: Collapsed buildings, Casualties, Damaged infrastructures, etc.

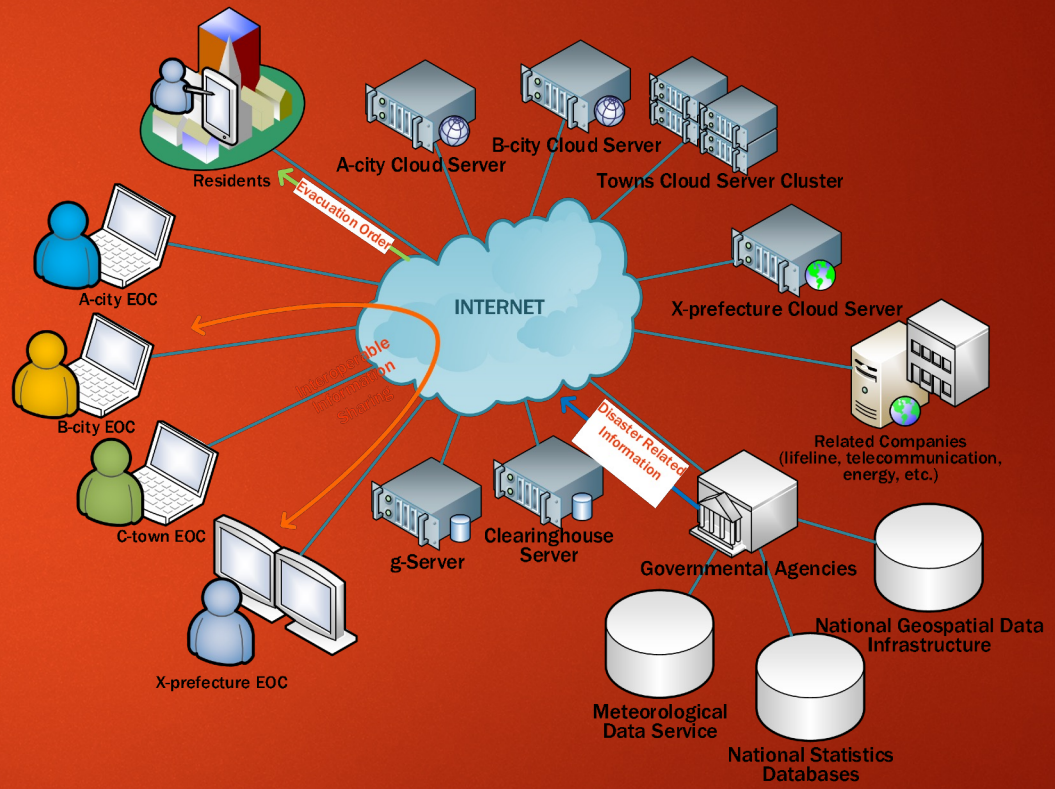
Evacuation and Shelter Information: Location of shelters, Evacuees, Logistics, Water supply, etc.

Recovery Status Information: Recovery of lifelines, food supplies, roads, telecommunications, etc.

Typical "Integrated Disaster-Information System"



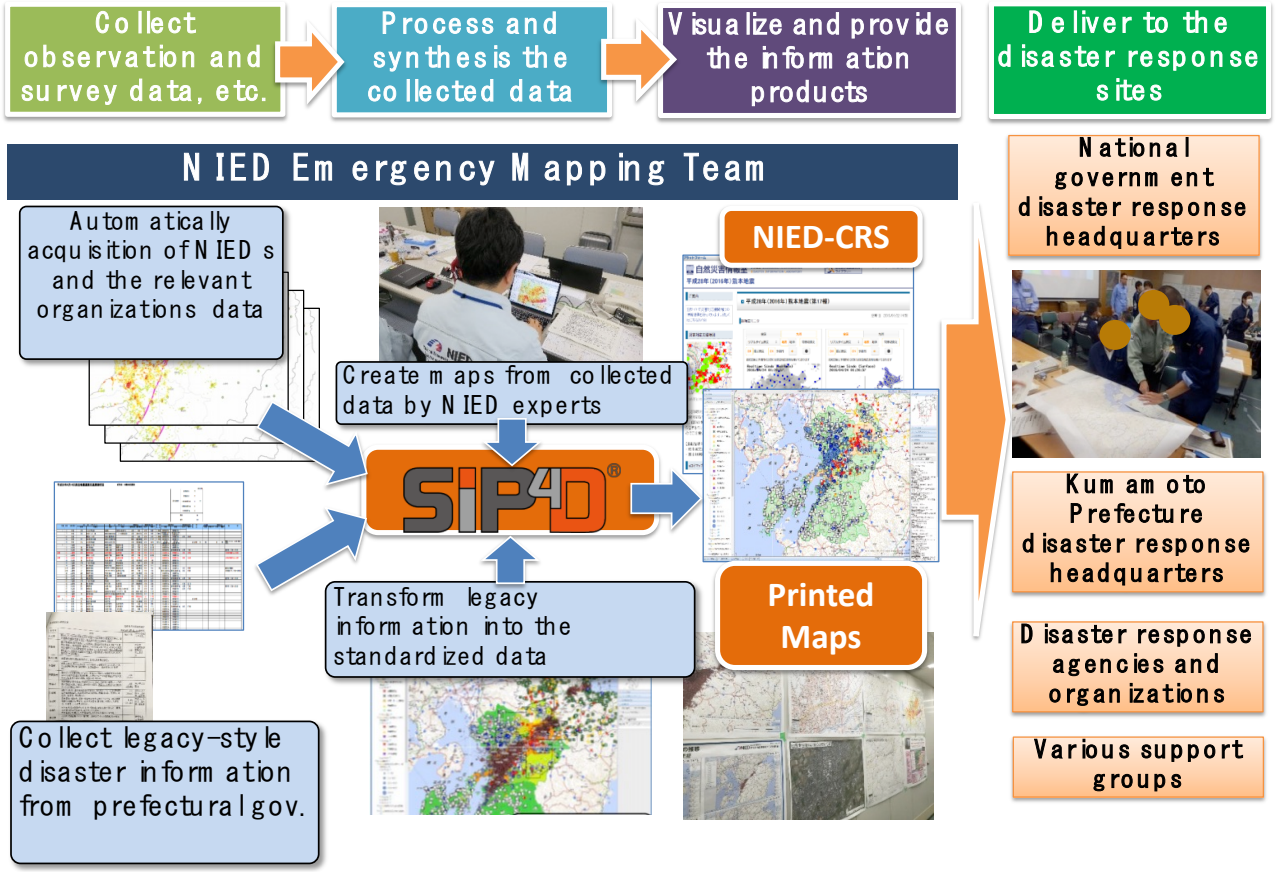
Distributed Interoperable Disaster-Information System



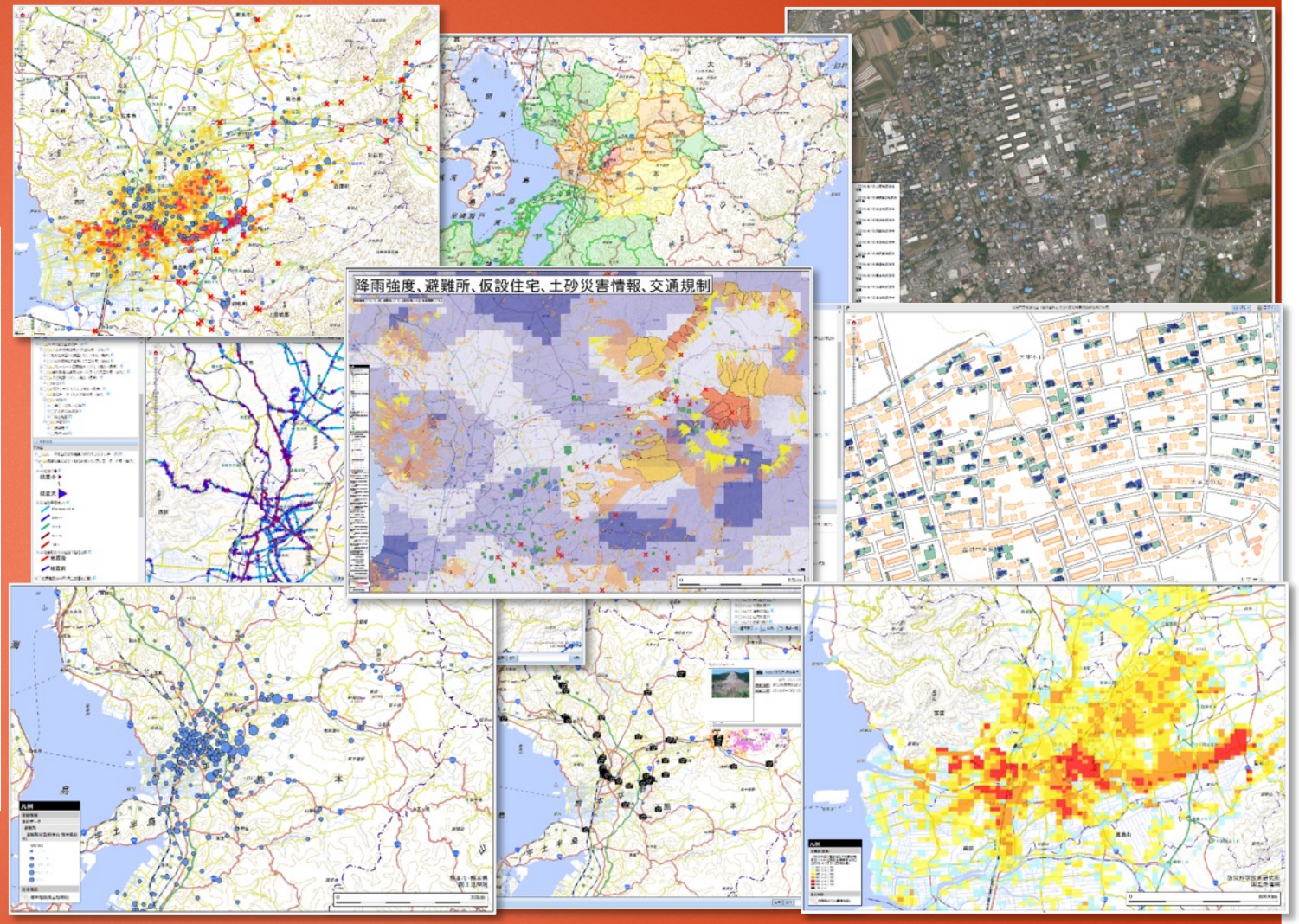
Source: NIED

SIP4D's first mission: the Kumamoto Earthquake, 2016

- SIP4D's first mission was to provide information support for the Kumamoto Prefectural Government at the Kumamoto Earthquake in 2016.
- NIED dispatched a total of more than 800 employees to the Kumamoto Prefectural Government to provide support, and produced more than 600 layers of maps, which were provided to the disaster response organizations.



More than 600 layers developed for disaster response



Source: NIED

Towards an International Standard for Disaster Information Sharing

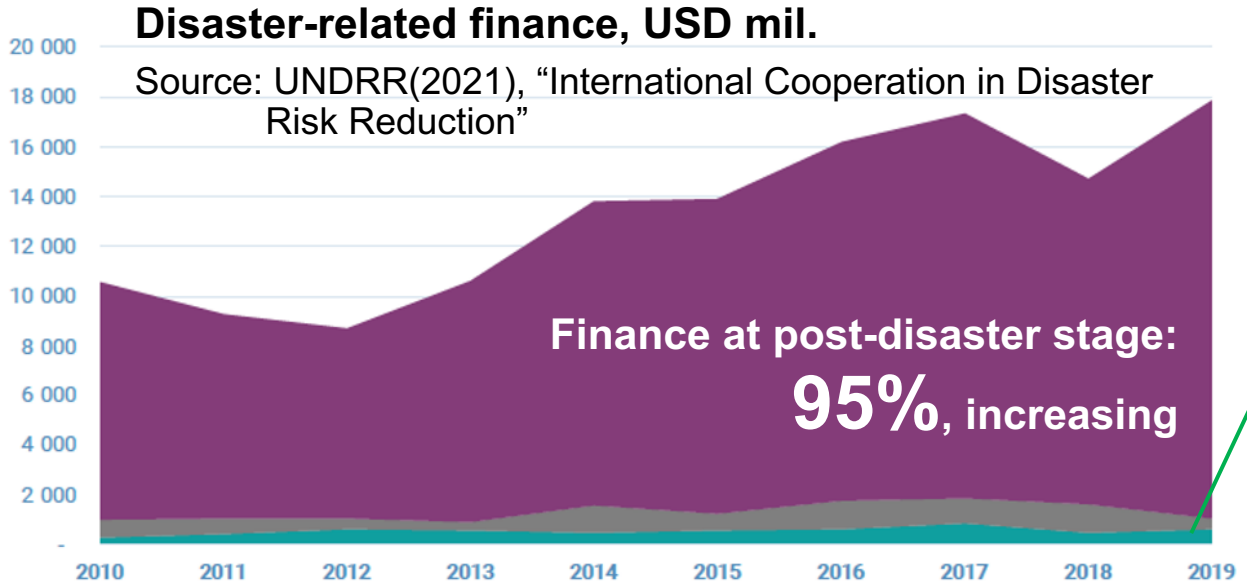
- Based on experiences from past disasters Japan's SIP4D system promises quick, efficient, and standardized hazard data sharing that allows governments to better predict and respond to natural hazards
- Development of a new Disaster information Sharing that can be applied more globally
- This requires input from multiple countries, various hazard risks, and various socio-economic situations
- If interested, please contact us and your country's national standards body

Prospective standards

2. RISK FINANCING

Development of a New ISO standard for DRR investment is to start

- SFDRR priority 3 calls for **investment in disaster risk reduction for resilience.**
- Japan's new proposal of **ISO standard on Disaster Risk Finance** coming soon.
- Finance will **incentivize** borrower's **pre-disaster investment in DRR**.



Finance for pre-disaster prevention & preparedness: only 5%

Standardization needed

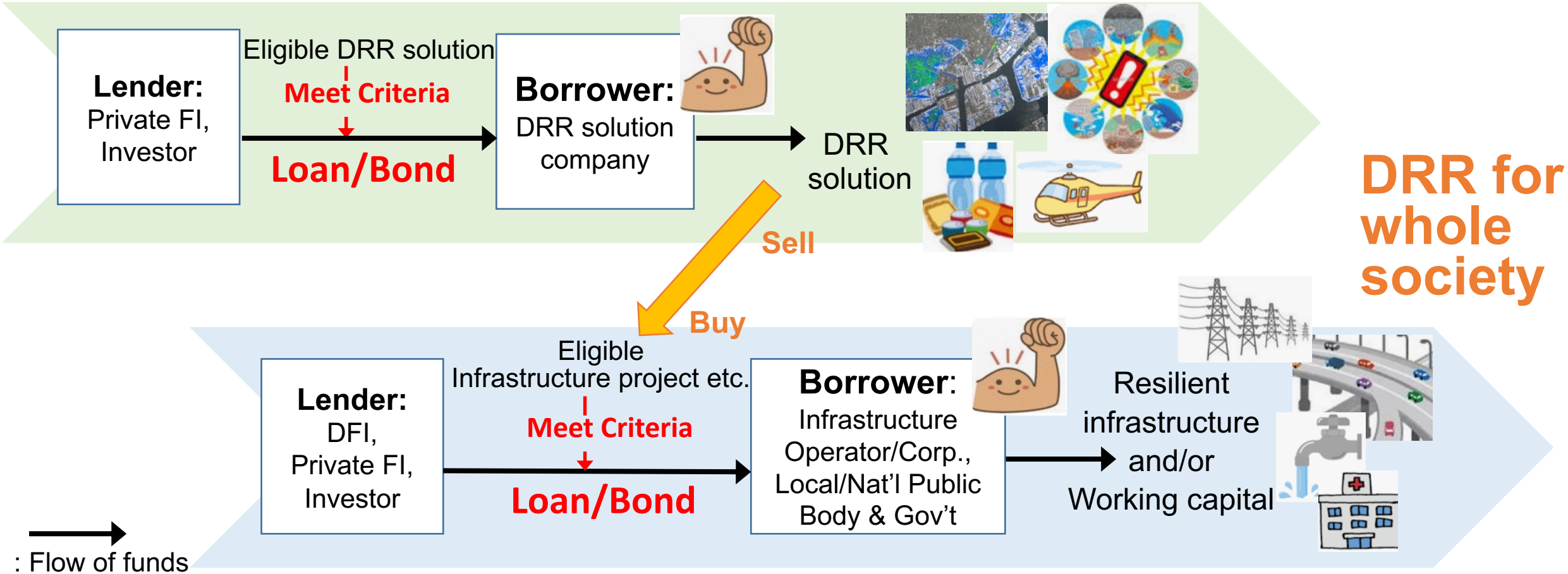
ISO expert registration started in Oct 2023.
Contact drr-finance@jeri.co.jp for details.

"By **enhancing partnerships with the private sector and capital markets**, we aim to mitigate perceived investment risks across all sectors **through** policy incentives, legislation, regulation, and **standards**."
(G20 DRR WG, July 2023)

Development of a New ISO standard for DRR investment is to start

New standard's Eligibility Criteria will enhance pre-disaster DRR, by **facilitating**:

- **"DRR solution" company to take loan**, and to commercialize the service.
- Infrastructure operator & Gov't to **invest for resilience by using "DRR solution"**.



DRR for whole society

How have DRR related standards been applied?

- As our group's deliverables are either very recent or still development, we can look at examples of how International Standards from other committees have been applied.
- ISO 22327 Guidelines for implementation of a community-based landslide early warning system
  - UN ECE Report
  - Initial trial of this standard
  - Utilized technologies that are accessible in developing countries
  - Adopted by 98 districts in 28 provinces in Indonesia, many that are exposed to hazard risk and facing socio-economic challenges
  - Saved 100 households in Aceh
  - Supported by University of Gadja Madah and financed by the Indonesian Government to help poorer areas
  - Also adopted by Myanmar

Conclusion

- International Standards provide guidelines communities can use to plan for disaster risk reduction
- Standards can help reduce costs, time, while improving logistics and transfer of technology
- Our two upcoming International Standards can help city planners integrate disaster risk reduction technologies into their infrastructure
- Two proposals for the future include disaster data sharing and disaster risk financing
- We are currently looking for global experts to join its development

End

F-8 Number of developing countries supported by international, regional and bilateral initiatives to strengthen their disaster risk reduction-related statistical capacity

G-1 (Compound) Number of countries that have multi-hazard early warning systems

G-2 Number of countries that have multi-hazard monitoring and forecasting systems

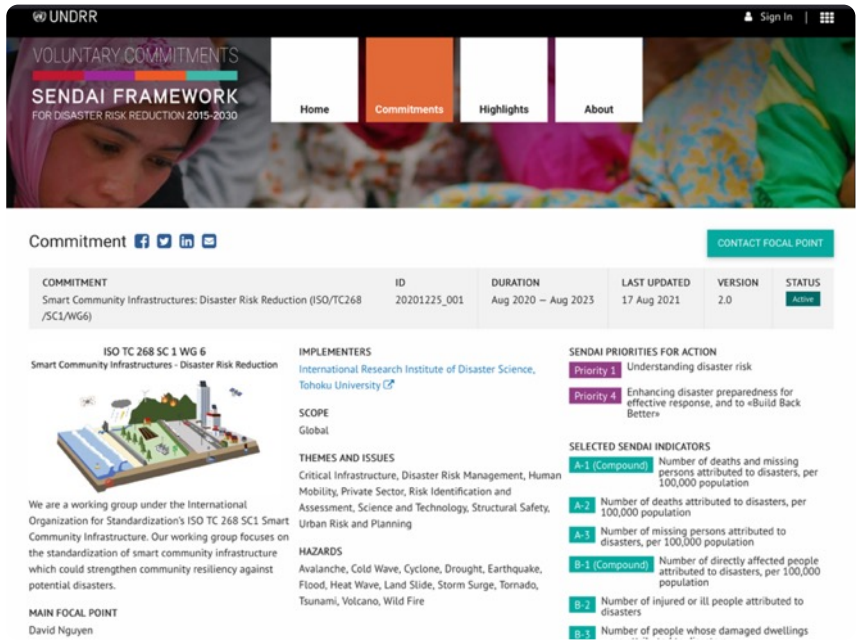
G-3 Number of people per 100,000 that are covered by early warning information through local governments or through national dissemination mechanisms

G-4 Percentage of local governments having a plan to act on early warnings

G-5 Number of countries that have accessible, understandable, usable and relevant disaster risk information and assessment available to the people at the national and local levels

G-6 Percentage of population exposed to or at risk from disasters protected through pre-emptive evacuation following early warning

SUSTAINABLE DEVELOPMENT GOALS



Check out our page on the UNDRR website

https://sendaicommitments.undrr.org/commitments/20201225_001

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