



Enhancement of National Resilience against Natural Disasters

Realizing "No fail-to-escape" and "Rapid Restoration of wide area economic activities"

In order to realize "Society 5.0 for Disaster Management" (a society that can autonomously respond to disasters as best it can by integrating virtual and real spaces in the event of a disaster), as well as "no fail-to-escape" and "rapid restoration of wide area economic activities," we will research and develop new technologies to enhance national resilience and implement them in the national government and municipalities. As a result, we will be able to support disaster response operations in the aftermath of major earthquakes and volcanic disasters in addition to wind and flood disasters that are becoming more severe due to climate changes.



Program Director

HORI Muneo

Director-General, Research Institute for Value-Added-Information Generation (VAiG), Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

Profile

Professor HORI graduated with a degree in civil engineering from the University of Tokyo Faculty of Engineering in 1984. In 1987, he was awarded a Ph.D. in applied mechanics and engineering sciences from the University of California, San Diego. His earlier career included positions as senior assistant professor at the Tohoku University School of Engineering and assistant professor at the University of Tokyo Faculty of Engineering. He was appointed professor at the University of Tokyo Earthquake Research Institute in 2001, and head of LsETD in 2012, two positions he holds presently. He has also served as leader of the Computational Disaster Mitigation and Reduction Research Unit at the RIKEN Center for Computational Science since 2012. He specializes in applied mechanics, earthquake engineering, and computational engineering, and his main research topics include the application of high-performance computing to earthquake engineering. Incumbent from 2019.

Research and Development Topics

1. Development of "Integrated System to support Evacuation and Emergency Response Activities"

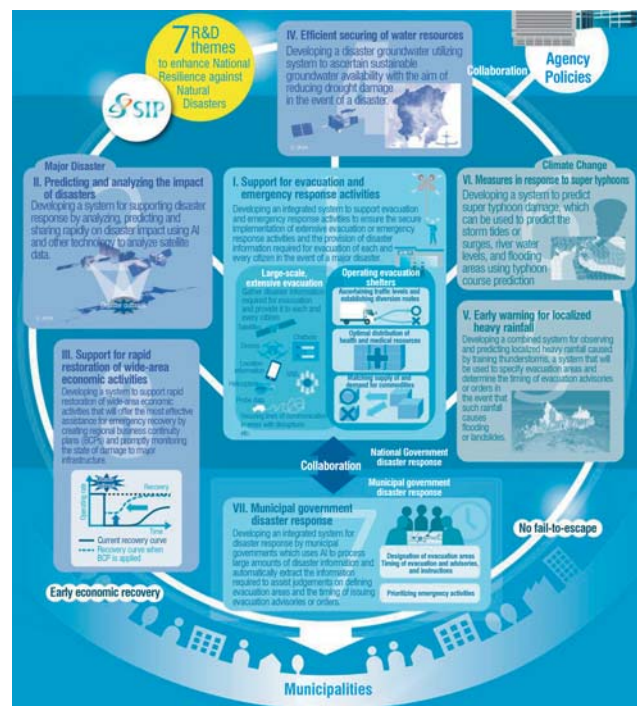
Guaranteeing the evacuation of each and every citizen by supporting national government extensive evacuation and emergency response activities

- Technologies that enable the national government to use a variety of information to ascertain social dynamics at the time of a disaster, and to promptly observe, analyze, and interpret the state of damage using satellites, etc., in the national government's disaster prevention activities.
- Prediction technology to ensure the necessary lead time and accuracy required to ensure extensive emergency responses, evacuation activities, and other such measures across a region in the event of a super typhoon and localized heavy rainfall.

2. Development of "Integrated System for Municipal Government Disaster Response"

Successfully providing support for judgments regarding evacuation advisories and orders by municipal governments

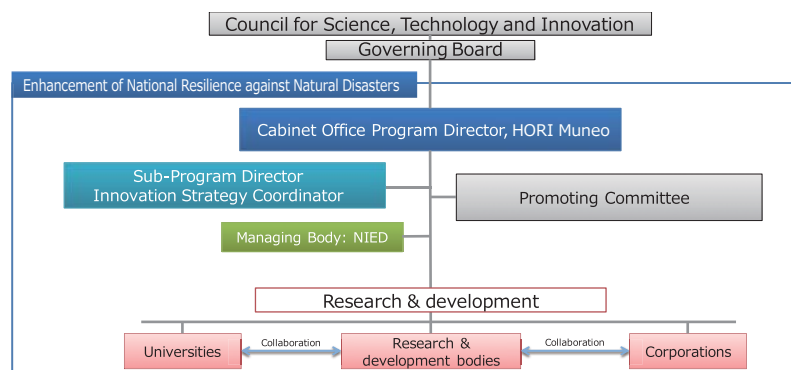
- Data processing technology to quickly analyze a wide variety of information and to automatically extract the information required to make judgements on the specification of evacuation areas and the timing of issuing evacuation advisories or orders.



Implementation Structure

The Program Director (PD) assumes overall responsibility with assistance from the Sub-Program Director (SPD), with assistance from the innovation strategy coordinator (Strategy C) for social implementation and commercialization.

The National Research Institute for Earth Science and Disaster Resilience (NIED) serves as the managing corporation. A promoting committee composed of the PD, SPD, Strategy C, and related governmental organizations, etc., will make necessary adjustments to conduct research and development on the subject, while universities, national research and development bodies, and private corporations, etc., will facilitate research and development and social implementation.



Exit Strategies

☑ Participation by related organizations—organizations where the relevant measures will be implemented—from the initial stages of development in order to ensure reliable social implementation

Guaranteeing social implementation by starting out with a clear vision of how measures will be implemented and ensuring that organizations where the measures will be implemented participate from the initial stages of research and development in anticipation of rapid restoration to ensure that a wide range of user needs.

☑ National government operation of a system to support national government decision-making and ensure that citizens are able to evacuate as they should

Ensuring an integrated system for assisting evacuation and emergency response activities to support national government decision-making, by having the Cabinet Office operate the necessary functions required by the national government for emergency response activities, etc. in anticipation of rapid restoration through collaboration with related organizations, in addition to each ministry, agency or other such organization running their respective systems for enhancing responses in the event of natural disaster.

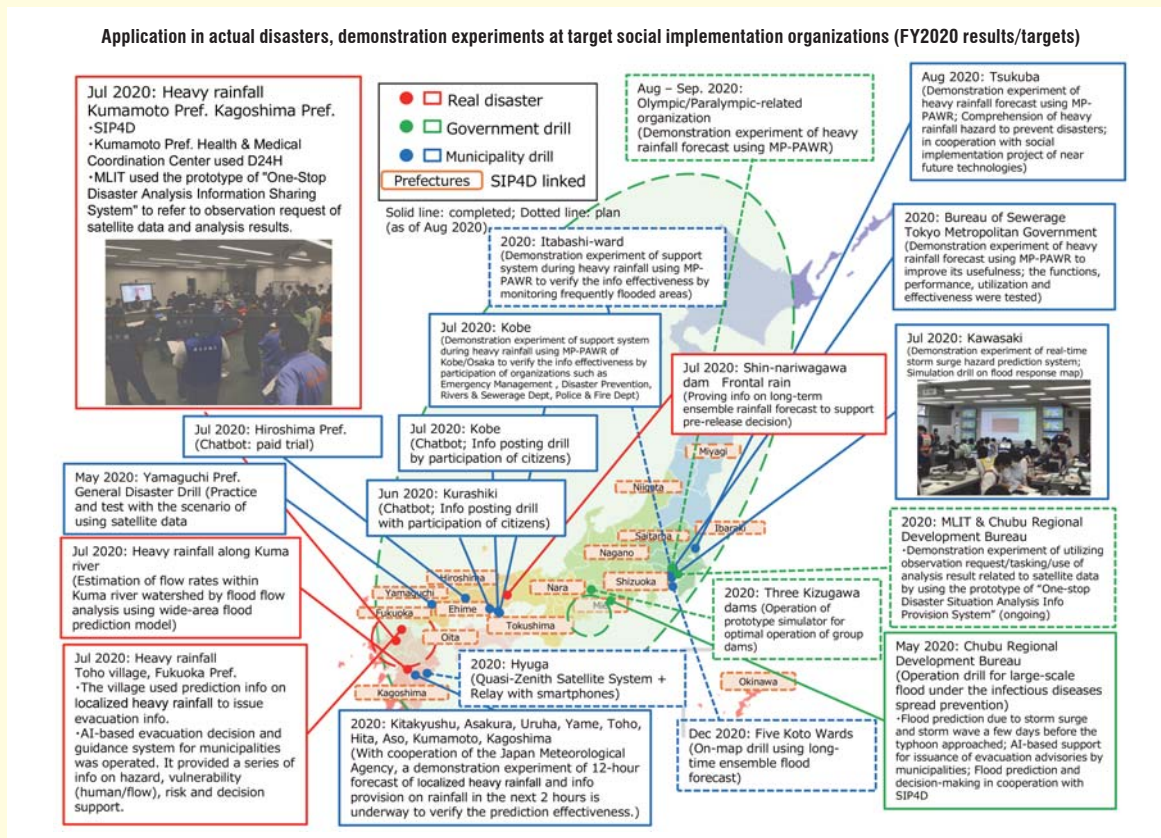
☑ Facilitation of the introduction to municipal governments of a system to support decision-making by municipal governments at the front line of disaster response

Using the renewal of the existing system as an opportunity to facilitate the introduction of an integrated system for municipal government disaster response, aimed at supporting decision-making by municipal governments.

Past Milestones and Anticipated Outcomes

Past milestones – Application in actual disasters, demonstration experiments at target social implementation organizations

- The prototypes of various systems have been developed and introduced in cooperation with regions with high disaster potential. In addition to that, we are working to increase awareness and permeation of our R&D efforts by applying them to actual disasters even in the course of R&D for verification and evaluation, while contributing to the activities in disaster sites.



Anticipated Outcomes – Contributing to ensuring the safety and security of citizens against future major disasters

- Encourage proactive evacuation behavior and aim to achieve "No fail-to-escape" by providing a wide range of forecast information at an appropriate time and range on super typhoons several days in advance and providing half-a-day advanced forecast of localized heavy rainfall.
- Enable the national government to take quick and effective initial actions with the aim of significantly reducing damage by making various satellite observation data available in real time for the target areas where assessment of the situation is required in the event of a major disaster.
- Realize a society in which disaster victims can return to normal life as quickly as possible in the event of a disaster by providing the information on available groundwater supplies to ensure a stable water supply for medical services, etc., as well as by enabling rapid restoration of the wide-area economic activities through coordination among related organizations based on the road restoration priority information.