Program Director Interview

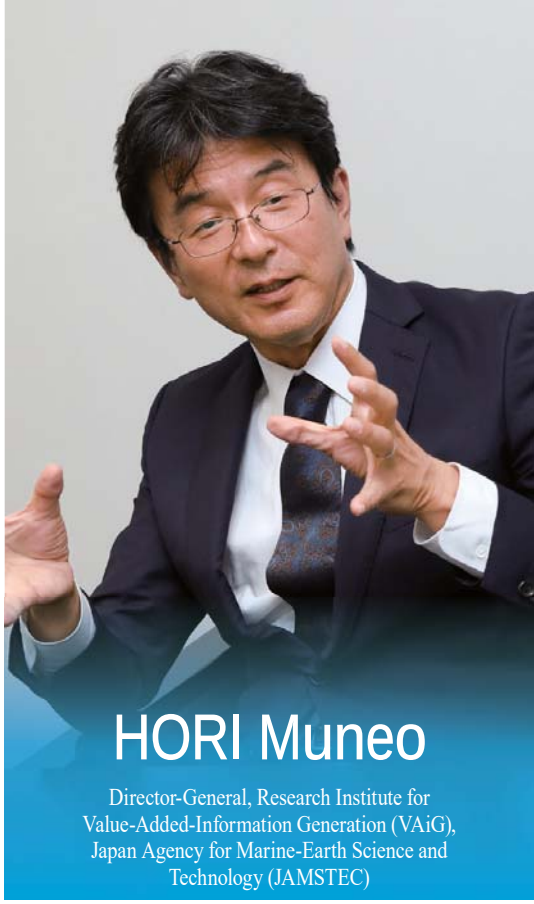
PD Interview

12 Leading Experts Who Accelerate SIP

National Resilience for New Normal

Requirements to prevent disasters while controlling infection

In addition to major earthquakes, recent frequent typhoons and heavy rainfall disasters, COVID-19 emerged as a new threat. To the extremely difficult challenge of preventing disasters while controlling infection, what solutions can be formulated? We interviewed PD HORI Muneo from the perspective of "national resilience".



HORI Muneo

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

Highly evaluated when implemented at disaster sites. Promote R&D for prevention of disasters while controlling infection.

Q: What is the concept of "resilience"?

PD: Simply put, it means "how fast you can recover after a disaster". Historically, Japan has focused more on prevention before disasters because of their high frequency and scale. SIP aims to improve resilience, which has not been focused on so much in Japan.

Q: Could you tell us the progress and outcomes of the whole program?

PD: This program consists of seven themes, and development of platform information systems is going well.

For typhoons No. 15 and No. 19 that hit Japan last year, an information system being developed by us was used experimentally to quickly provide information. I feel it was a great outcome that the system was used in the actual disaster sites and highly evaluated.

This year is the third year of the second session of SIP and the goal is to develop and demonstrate prototypes of the information systems. I hope they are used during emergency drills and at actual disaster sites this year to evaluate their effectiveness and discover issues to proceed to the fourth year and after.

The information systems we are developing can be classified into those for the central government and ones for municipalities. And cooperation with prefectural disaster prevention systems between central government and municipalities is also important. As the effectiveness of our information systems has been recognized, we started cooperation between prefectural systems and the central government's system. This year we will link 16 prefectural systems.

Another critical effort is "disaster prevention while controlling infection" as a countermeasure to COVID-19. When a disaster occurs during a pandemic, we have to think about how to operate shelters while avoiding the "Three Cs (closed space, close contact, and crowded place)". Infrastructures such as water supply and electricity supply work under ordinal conditions. However, when they are out of order during a disaster, infection prevention becomes more difficult. We will promote new R&D projects with which information linkage systems to prevent disasters work well and can be utilized for infection control.

Tailor-made support with disaster prevention CB Fast grasp of disaster situation with numerous satellites

Q: What kind of effects does resilience have on our lives?

PD: We are demonstrating the "disaster prevention chatbot (CB)" providing optimal information for each person. For example, evacuation information provided to young children and elderly people is not always the same as the information provided to other people. The main role of the chatbot is to deliver tailor-made disaster information to each person. To realize this, AI accuracy to recognize languages and local place names should be improved. And that is a big challenge.

Also, we are developing technologies to grasp and share damage situation with numerous domestic and foreign satellites. This satellite utilization technology aims to produce satellite images within two hours after the occurrence of a disaster to analyze and share the data; it takes about two hours to set up a headquarters for disaster control by the governments and municipalities. The time limit of two hours is critical, and the governments and municipalities are very demanding about this, because if they fail to grasp the overall damage situation on time, the initial response by the headquarters is delayed.

However, it is almost impossible to produce and analyze satellite images within two hours using current technologies. Although we are developing the technologies with AI, etc., it is a big challenge to develop original AI dedicated for satellite images.

If the technology to grasp the damage situation immediately with satellites is realized, Japan will be a leader in the disaster support field ahead of other countries.

AI helps municipalities heads judge evacuation measures. Satellites will be the key to countermeasures against major earthquakes.

Q: AI is expected to play an important role in disaster prevention, isn't it?

PD: The information systems under development for municipalities mainly consist of four AIs: "AI to judge a disaster occurrence", "AI to judge each region's tolerability against the disaster", "AI to integrate the former two judgments to make an evaluation" and "AI to judge whether evacuation orders, etc., should be issued or not".

However, evacuation orders related to human lives should not rely only on AI. So, the system is merely a tool to help decisions by heads of municipalities, and AI itself will not issue an evacuation order. Some municipalities have less experience in large-scale disasters. And I hope the information system we are developing can help them.

Q: For which cases do you think the "system to analyze and share damage situation information provided by satellites" will be utilized in the future?

PD: First of all, it will play a major role in large earthquakes. In the case of wind and flood damage due to typhoons and heavy rain, disaster recovery is easier to plan, because the damage can be predicted to some extent based on the path of a typhoon and weather information.

On the other hand, earthquakes are difficult to predict and decisive countermeasures cannot be implemented. If the system to analyze and share damage situation information provided by satellites is realized, it can be also used to predict the collapse of buildings and geographical changes such as landslides after an earthquake.

Collaborating with the ministries and other SIP programs, prevent disasters in the new normal.

Q: For collaboration with the ministries, which is a feature of SIP, and efforts toward realizing social implementation in the future, how do you proceed with them?

PD: Not to mention the Cabinet Office (in charge of disaster prevention) and the Ministry of Land, Infrastructure and Transport, we collaborate with various ministries. For example, the Ministry of Health, Labour and Welfare is in charge of infection control in shelters during disasters, etc., while the Ministry of Public Management, Home Affairs, Posts and Telecommunications will be involved in recovery of telecommunication infrastructures.

For collaboration with the ministries, just sharing data stored with each ministry does not guarantee that we can get required information. It is required to process or combine data to derive the necessary information. The Ministry of Defense highly evaluated our information systems with processing and integrating capabilities. Thus, the systems are used for disaster drills of the Self-Defense Forces.

Q: For disaster prevention in the new normal, how will you proceed with your efforts in the future?

PD: There are mainly three points. The first one is to leverage the prediction technology called the "disaster dynamics analysis system" so that prefectures can call for support from the central government before it is too late. The second one is to leverage disaster prevention chatbots to understand people's health and make them available under infection control. The third one is to use infection simulation systems for disaster medical care. They are also useful for setting up shelters. I believe they will play important roles during infection control.

Data acquisition by the disaster preventing chatbots as well as implementation of pandemic simulations with data assimilation and future predictions by disaster dynamics analysis are new efforts featuring collaboration between the disaster prevention field and infection prevention field. To realize more rational evacuations, we will promote R&Ds adopting the new normal.