

Working together to create resilient and sustainable water regions

ICHARM's efforts over the past 20 years have unfolded during a period in which climate change and the resulting intensification of water-related disasters have become globally recognized, alongside significant advances in related sciences and technologies. During this time, ICHARM has developed flood models and enhanced them with water-energy budget and sediment-driftwood transport functions, and has coupled these models with atmospheric general circulation models. Through coordination with DIAS, developed at the University of Tokyo, these models have enabled ICHARM to provide many countries with early warning information for floods and droughts, as well as assessments of climate change impacts. Drawing on insights from disaster event reviews, we have also contributed to enhancing community disaster preparedness by developing methods for training standard operating procedures (SOPs) and visualization tools that allow users to experience flooding virtually. To implement these scientific achievements in society, ICHARM has strengthened capacity development by accepting experts from the meteorological, river management, and crisis management sectors of developing countries into our master's and doctoral programs. Over the past 20 years, 226 students have graduated from these programs and returned home to serve as leaders in their respective countries. Furthermore, as the secretariat of the International Flood Initiative (IFI), ICHARM has supported several countries in establishing the "Platform on Water Resilience and Disasters," which brings together various disaster management sectors nationwide to promote inter-sectoral cooperation. ICHARM has been expanding this framework across Asia and Africa.

To address the complex challenges we face worldwide, it is essential to take a holistic view of the entire water problem, collaborate with all stakeholders, and avoid fragmentation. Such an approach will enable us to advance daily water use, conserve the water environment, and enhance resilience to, and reduce the risks of, water-related disasters during extreme events in a seamless, integrated manner, while recognizing the interconnectedness of each element. Going forward, it will be indispensable to establish practical governance structures that support the balanced development of social common capital — namely, the natural environment, social infrastructure, and institutional capital — in the context of climate change. Increasing strategic investment based on this interconnectivity will also be necessary, and this can be achieved by making such investment more attractive for committed engagement and funding.

To promote these activities, we will strengthen the following:

1. Development of a system for integrating and sharing scientific and experiential knowledge across various fields, connecting everyday life with extreme times and enabling all stakeholders to reflect this knowledge in their actions.
 - 1) Promote collaboration with research fields related to quality of life, social issues and the environment, developing integrated models in the process.

- 2) Continue to challenge ourselves to utilize new technologies such as XR and AI more actively, while improving existing technologies such as hydrological models based on physics. Return the results to society in a way that makes them easier to implement.
2. Promotion of science that quantifies and visualizes not only direct benefits and harms but also economic spillover effects and hidden liabilities.
 - 1) Advance scientific and technological capabilities to virtually experience extreme events and utilize past experiences to inform future actions.
 - 2) By providing evidence through economic evaluation methods in collaboration with the economic sector, we will promote the participation of all stakeholders and present sustainable development methods, including proactive investment in hazard preparedness.
3. Support capacity development to promote the science-policy interface, as well as the creation of systems that enable communities, countries and regions to implement capacity building independently.
 - 1) Beyond simply "teaching," we will actively learn from best practices and build a two-way learning environment and community where both teachers and learners grow together.
 - 2) We will further strengthen online and e-learning methods, establish diverse learning formats including practical training aimed at solving local issues, and respond to learning needs worldwide.
 - 3) We will enhance human resource development by leveraging the alumni activities of GRIPS and ICHARM.
 - 4) We will further strengthen our collaboration with the Ministry of Land, Infrastructure, Transport and Tourism and the Public Works Research Institute, integrating and packaging technologies and knowledge for deployment.

Furthermore, ICHARM launched the three new courses in 2026 — "Water and Sanitation," "Water and Poverty," and "Water and Peace." These courses address the fundamental challenges underlying water-related disasters, while also highlighting challenges that can be addressed through improving resilience and response capabilities to water-related disasters. ICHARM aims to further promote collaboration in research and capacity building in these fields to achieve comprehensive solutions to water-related problems. To realize these goals in society, ICHARM will expand the "Platform on Water Resilience and Disaster" project and initiate concrete activities involving all stakeholders in water-related fields. In addition, ICHARM will scale this new framework beyond the national level to the community level and regional levels, including transboundary river basins, cultural spheres, and geophysical common spheres.