

Supporting Disaster-Resilient Digital Infrastructure in Asia-Pacific Region



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In disaster prone regions as across the Asia-Pacific, resilient digital infrastructure is essential to ensure that lifesaving warnings reach people in time. This was the central focus of the Regional Workshop on Resilient Infrastructure for Effective Early Warning Dissemination, convened in September 2025 by the International Telecommunication Union (ITU) and the International Research Institute of Disaster Science (IRIDeS), Tohoku University, with the support of Japan's Ministry of Internal Affairs and Communications (MIC), in Sendai, Japan.

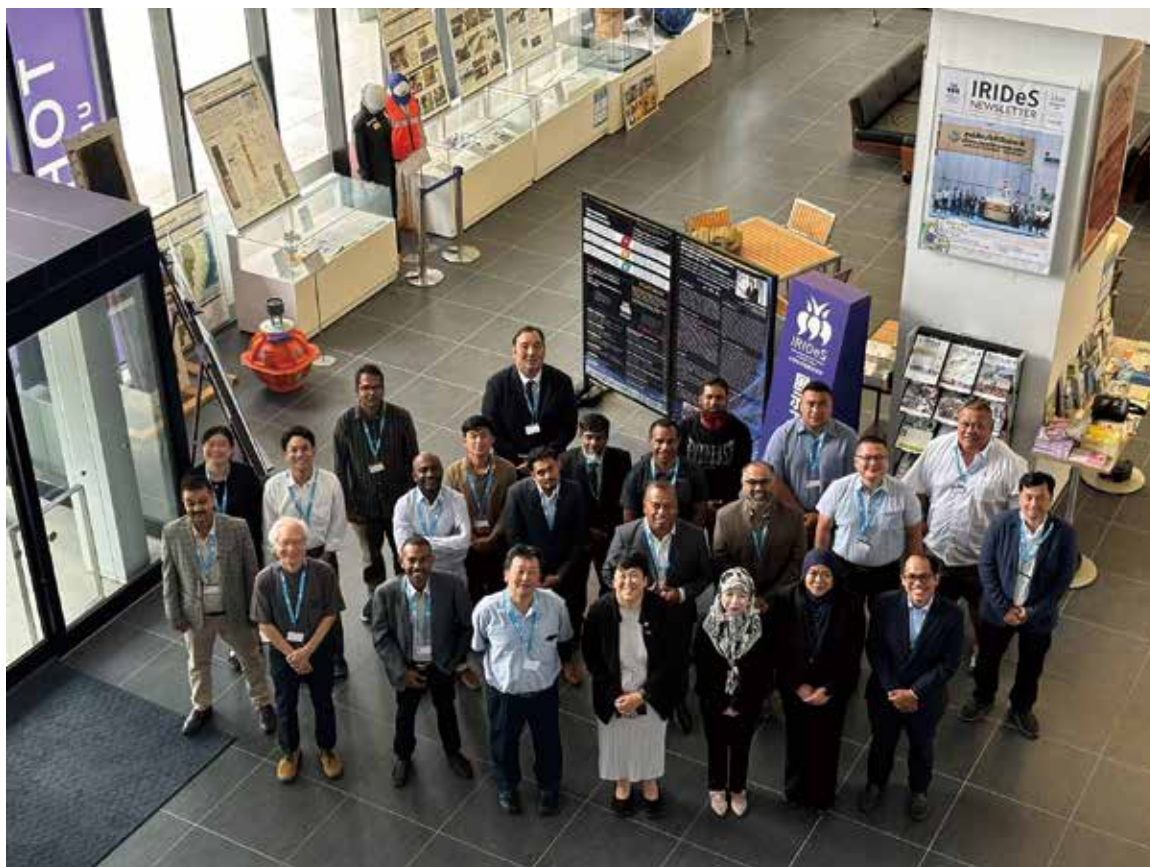
Sendai carries profound relevance for disaster risk reduction. The city was one of those severely impacted by the 2011 Great East Japan Earthquake and tsunami, making it a powerful setting to reflect on how technology, policy, and preparedness translate

into real-world resilience.

The workshop brought together policymakers, regulators, disaster management agencies, network operators, and technical experts from across the Asia-Pacific region. Discussions focused on how robust, redundant, and interoperable ICT networks can support early warning systems. The workshop also illustrated how Japan's experience is being translated into structured regional cooperation through a long-standing partnership between MIC Japan and ITU on resilient ICT infrastructure in Asia and the Pacific.

Japan's national experience was highlighted as a practical reference. The J-Alert system demonstrated how automated, multi-channel warning dissemination—using satellite and

■ **Figure 1: Participants at the International Research Institute of Disaster Science (IRIDeS), Tohoku University.**



terrestrial networks—can deliver alerts directly to the public without manual intervention, even outside working hours. Advances such as impact-based tsunami forecasting showed how warnings can evolve from simple alerts into actionable information for emergency response.

These operational lessons are being translated into regional cooperation through the long-standing partnership between MIC Japan and ITU. The collaboration has strengthened policy frameworks, institutional capacity, and national abilities to deploy resilient ICT infrastructure and early warning communications, directly contributing to the Early Warnings for All initiative.

An early warning system combines hazard monitoring, risk analysis, communication networks, and public preparedness so that timely and understandable alerts reach people at risk. A key emphasis of the workshop was ensuring that warnings are delivered reliably, rapidly, and inclusively.

Cell Broadcast was highlighted as a critical tool to achieve this objective. Unlike SMS, Cell Broadcast enables authorities to send

area-specific alerts simultaneously to all mobile phones connected to nearby base stations, including during periods of network congestion. Participants emphasized that appropriate policy and regulatory support is essential for its effective implementation.

Hands-on learning was reinforced through study tours and site visits, allowing participants to observe resilience measures in practice. These included visits to the National Institute of Information and Communications Technology, NTT DOCOMO's disaster-recovery facilities in Sendai, drone-based early warning demonstrations along the coast, and the Arahama Elementary School preserved as a site of remembrance from the 2011 tsunami.

Participants consistently highlighted that no single technology can guarantee complete coverage. Countries emphasized the importance of hybrid approaches that combine mobile networks, broadcasting, satellite systems, and community based channels, alongside strong policy mandates, regional cooperation, and capacity building for officials and communities.

■ Figure 2: Emergency response coordination room of NTT



■ Figure 3: Knowledge sharing by experts from NTT DOCOMO



■ Figure 4: Knowledge sharing by experts from NTT DOCOMO



■ **Figure 5: A scene from Arahama Elementary School, a reminder of the 2011 tsunami’s impact and the community’s recovery.**



■ **Figure 6: A diorama model of earthquake remains at Arahama Elementary school.**



The workshop ended with a study tour to Arahama Elementary School, located near the Pacific coast, which was struck by the 2011 tsunami and accommodated more than 300 local residents. It was followed by a demonstration of automated disaster-alert drone system of Sendai City.

Held in Sendai—a city shaped by disaster and recovery—the workshop reinforced a shared regional commitment to building resilient, inclusive, and standards-based digital infrastructure so that early warnings reach everyone, everywhere.

■ **Figure 7: Group Picture during visit to NICT Sendai Center**



Figures: To be credited to ITU