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# International Research Activities

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## 1 International research activities in the NILIM

The NILIM is promoting international research activities based on the following three pillars.

### (1) Technical contribution to domestic policies:

The NILIM forms networks with overseas governmental organizations to collect information on the examples of advanced technologies and disasters and reflect the results in proposing domestic policies, developing technical standards, etc. in order to carry out its fundamental activities.

### (2) Technical cooperation for developing countries:

Using the knowledge and lessons learned from maintenance activities, disaster response, etc. for domestic public facilities and results of researches reflecting them, the NILIM supports local governments of developing countries in the countermeasures etc. for high-level technical issues they are faced with.

### (3) Overseas deployment of infrastructure systems:

Using the knowledge learned from the formulation of technical standards, manuals, etc. that support important policy development in Japan, the NILIM addresses "promotion of the international standardization of domestic technical standards" and "ensuring the consistency between domestic and overseas standards" to contribute to the smooth overseas development of domestic technologies.

## 2 Main international research activities in FY2019

Representative cases are introduced as follows from the international research activities implemented in FY2019 based on the three pillars stated in 1 above.

### 2.1 Conclusion of a research cooperation memorandum with the Bundesinstitut fuer Bau-, Stadt- und. Raumforschung (BBSR) in Germany

Three organizations, BBSR in Germany, Building Research Institute, and NILIM, signed a memorandum for research cooperation in the fields of building, housing, and city on April 10, 2019. (Photo 1). The following themes are planned for cooperation.

- (1) Energy saving in houses and non-housing buildings (including improvements)
- (2) City planning and housing policy
- (3) Utilization of BIM in building-related operations and procedures
- (4) Prefabricated houses and industrialized houses

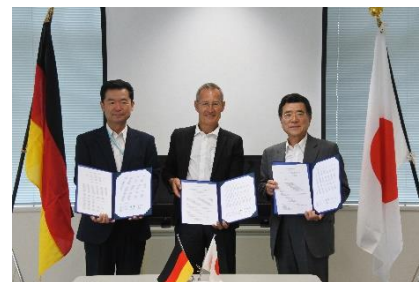


Photo 1 Execution

### 2.2 Release of English version PR video and exhibition at CECAR8

The NILIM's promotion video in English version was created for overseas researches, engineers, etc. (Photo 2). The video mainly introduces themes of the NILIM's overseas activities including joint researches with overseas research institutes and support of response to natural disasters in addition to the outline of NILIM. The video was published at the exhibition booth of the Civil Engineering Conference in the Asian Region (CECAR8), held in Tokyo in April 2019 and then released on the English website of the NILIM.



Photo 2 Promotion video

### 2.3 Conclusion of a memorandum with the Vietnam Road Authority

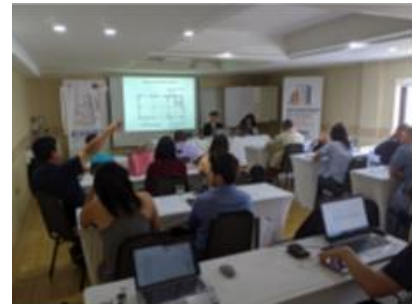
A memorandum was signed between the Directorate for Roads of Vietnam (DRVN) and the NILIM concerning a joint research on road bridges. This joint research aims to maximize the research results of both countries by sharing information and damage examples concerning the design, construction, and maintenance of road bridges in Japan and Vietnam. Under this memorandum, the NILIM is going to hold the Japan-Vietnam Bridge Workshop from FY2020 for the issues common to Japan and Vietnam.

#### **2.4 Disaster Risk Reduction Training Program for Latin America and the Caribbean with Chile**

The NILIM provided technical cooperation as follows to JICA's project "Disaster Risk Reduction Training Program for Latin America and the Caribbean" <sup>2)</sup>, commonly called "KIZUNA Project."

In the training seminar of "Technical capability reinforcement for public infrastructure (Quake-resistance standards for bridges)," held in August 2019, the NILIM gave a lecture about tsunami damage to bridges and countermeasures in Japan as well as results of analysis on the causes of the upper structure runoff. The NILIM also introduced Japan's knowledge about the resistance of bridges against earthquakes and tsunami to the personnel of Chilean Ministry of Public Works (MOP).

In the MOP-KIZUNA training seminar on "Earthquake risk management of buildings," held in November 2019, the NILIM gave a lecture about formulation of technical standards based on the past earthquake damage and future technical trends, structural design method of buildings for evacuation from tsunami, various seismic retrofit technologies, and examples for application of seismic retrofit using seismic isolation / control technologies (Photo 3).



**Photo 3 Lecture in the MOP-KIZUNA training seminar**

#### **2.5 Short-term dispatch of experts to the Sri Lanka Project for Capacity Strengthening on Development of Warning and Evacuation Measures for Landslide Risk Reduction in Sri Lanka**

In response to JICA's request for technical cooperation, the NILIM provided technical cooperation for the landslide warning / evacuation measures in Sri Lanka from October to November 2019. The NILIM conducted a hearing about the present situation from the central government agencies related to information issuance including Disaster Control Department and Weather Bureau, local government agencies, local residents of model sites, etc. Then, the NILIM made a discussion with the National Building Research Organization (NBRO), which controls sediment disaster countermeasures, about issues concerning warning rainfall standards in Sri Lanka, and gave advice on improvement measures.

#### **2.6 Cooperation in formulation of national harbor standards in Vietnam**

The NILIM provides cooperation under the "Memorandum for Cooperation in Formulation of National Technical Standards for Harbor Facilities (renewed on June 2017), which was signed in March 2014 between the MLIT and the Vietnam Ministry of Transport. Discussion for standard formulation has been made mainly in the workshop held between both countries. To date, the Ministry of Science and Technology of Vietnam officially enforced four parts of Vietnam national harbor standards (General provisions, Load and action, Material conditions, Construction / inspection standards), and the Vietnam Ministry of Transport, one part of the Ministerial standards (Breakwaters). In addition, the draft of two parts of the Vietnam National Harbor Standards (Foundation, Soil improvement) is under examination on the Vietnam side and is going to be enforced around the summer of 2020. In fiscal 2019, the remaining two standards (Mooring facilities, Maintenance) have been studied and editorial operation has been conducted jointly by both countries through the workshop held 6 times in total in Japan and Vietnam.

#### **2.7 Reflection of research results in ISO by Building Environment Division**

Part of the results of the research titled "Development of evaluation method of energy reduction effect by automatic control technology of building equipment, (2016-2018)" an itemized issue that has been implemented by the Building Environment Division, was issued as ISO 19455-1 in November 2019 and thus reflected in an international standard. <sup>3)</sup>

#### **2.8 Research presentation in the annual conference of the International Commission on Large Dams (ICOLD)**

In the symposium of the 87th annual conference of the International Commission on Large Dams <sup>4)</sup> in June 2019, the NILIM made an oral presentation about results of the research on seismic performance review of dams, titled "Effect of the fracture energy of dam concrete on the crack progress analysis of a concrete dam." Further, the NILIM attended the "Committee on Seismic Aspects of Dam Design" as a member and presented the proposal for amendment and addition to the new bulletin "Interpretation of earthquake record in dams" to be issued by the same Committee based on the results of analyzing earthquake observation records in Japan.

☞ See the following for details.

1) Website of the NILIM "International Activities"

<http://www.nilim.go.jp/lab/beg/foreign/kokusai/kokusaitekikatudou.htm>

2) Website of the JICA <https://www.jica.go.jp/project/chile/002/index.html>

3) Website of the ISO <https://www.iso.org/standard/70970.html>

4) Website of the 87th Annual Conference of the International Commission on Large Dams

<http://www.icold-cigb2019.ca/>