IISEE Newsletter

Aug 29, 2025

Number 230

International Institute of Seismology and Earthquake Engineering BRI Japan

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Chiba Prefecture Study Trip

Observation of a Site Liquified by the 2011 Earthquake

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(Earthquake Engineering Course)
UNAN Managua, Nicaragua

Introduction

On January 31, the 2024-2025 Regular Course of the Disaster Management Master's Program visited the site in Chiba City affected by liquefaction during the 2011 Great East Japan Earthquake. The main goal of this study trip was to learn about the Crisis Management Center at Chiba City Hall and the solution implemented as a countermeasure against soil liquefaction phenomena.

Crisis Management Center at Chiba City Hall

As part of the program on this study trip, we visited the Crisis Management Center at Chiba City Hall. The Crisis Management Center has been established to build a rapid emergency response and crisis management system in the event of a disaster and to collect, analyze, share, and provide information necessary for disaster countermeasures. In this location, we could learn about the facilities indoors and how they work. We saw the stakeholder coordination office, the operation room, and the disaster countermeasures headquarters meeting room. The first is used for liaison staff—dispatched from the national and prefectural governments and external organizations—to gather, collect information, and request support from dispatching agencies. We visited the Operations Room, where data is organized and analyzed to guide decision-making and share necessary details for disaster response. We also saw the Disaster Countermeasures Headquarters Meeting Room, where the general manager, deputy general manager, and staff make key decisions related to disaster response.

Groundwater level lowering method – Project Implementation

We received a crucial introductory lecture titled "Lecture on the approach against liquefaction by Chiba City." This lecture was imparted by Chiba City Hall technical personnel. The speaker provided an overview of Chiba City, emphasizing the characteristics of the land reclamation area of Mihama-ku. He also talked about the damage caused by the Great East Japan Earthquake in the Mihama-ku area (road and sewer damages).

With this background, technical personnel introduced the groundwater level lowering method applied in the Isobe 3 and Isobe 4-chome districts with an area of 12.9 ha and 7.1 ha, respectively. This method includes different steps: 1) sheet piles installed around the area's perimeter to block groundwater from flowing into the area; 2) collection and drainage pipes installed under the road to collect groundwater; 3) A submersible pump facility was installed downstream to pump groundwater outside the area. This method enhanced the soil condition, increasing the non-liquefaction layer.

A demonstration experiment was conducted on a facility layout before the construction, considering the geological status and monitoring the settlement with auscultation devices (water level observation hole, differential settlement gage, piezometer, ground height observation shaft). The settlement was monitored for about eight months, and the result showed that the ground surface suffered settlements of around 1.14 and 1.51 cm.

The groundwater level decrease was made gradually due to the possibility of an impact on houses from differential settlement if the groundwater level drops rapidly. So, the groundwater level initially located at -1.2 m was decreased in stages: 30 cm in the first two months, 50 cm in the next two months, and so forth until -3 m depth. Allowable ground settlement and ground inclination were considered. There was no incline or settlement greater than allowable values impacting the building.

The one-year observation results in the Isobe 4-chome district (model district) reveal settlements lower than 10 mm, a stable groundwater level decrease, and no increment of water pore pressure.

During the stage of verification of project effectiveness, the ground surface displacement during re-liquefaction was improved due to the lowering of the groundwater level inside the districts. Also, vertical displacement from the lowering of the groundwater level converged during the observation period, and no harmful differential settlement was observed from the lowering of the groundwater level.

Finally, we visited the construction site. We were able to see the implementation of this project and the effectiveness of this application.

Personal Comment 1 - Crisis Management Center

This is the first time I've seen a facility like this. I strongly believe in protecting human life, and local governments need this infrastructure to respond to problems quickly. From this experience, I've learned the importance of local governments being well-organized to save lives when a catastrophe occurs. Early response, monitoring, and rapid decision-making are extremely important factors, and this type of facility helps reduce response times. Learning about this type of facility is extremely valuable because—like many countries in the region—Nicaragua also suffers from natural disasters. Experiences like this help me contribute ideas for developing countermeasures against such events.

Personal Comment 2 - Groundwater level lowering method – Project Implementation

From a technical point of view, the project meets all the characteristics of an engineering solution provided to the people to save their houses. In this case, the land reclamation area, the higher water level, the presence of a liquefied sand layer, and the shaking from the quake severely damaged the structures and population.

The disaster management program applied in this case considered the articulation and participation between Chiba City Hall and Chiba University. The background, project design, monitoring, and implementation were crucial to getting a good result. The solution applied to the liquefaction problem is innovative and original, and the most important thing is that people feel happy because this problem was solved.

I want to express my gratitude to City Hall authorities and technical personnel for the time invested in showing us the importance of this project. I also want to thank Dr. Nakai for his essential contributions to this project. I am interested in how university researchers participate in solving society's problems. In my opinion, the University and Research Institutes play a fundamental role in developing disaster management policies.

This study trip has been crucial to the strengthening of our knowledge. All this experience will be shared with my students at the National Autonomous University in Managua, Nicaragua.

Thank you very much for this opportunity.

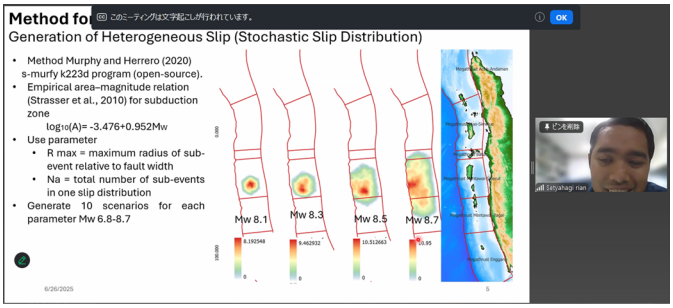
Interim Presentation of the Individual Study

By Saeko Kita, Chief Research Scientist, and Mai Ito, Senior Research Engineer

On June 19, the interim presentation for the Earthquake Engineering course was held at the IISEE hall in a hybrid format, with five participants reporting on the progress of their master's report research. One participant conducting individual study at a distant university joined online. On June 28, the interim presentation of the individual study for the Seismology and Tsunami disaster mitigation courses was also held at the IISEE hall in a hybrid format. Seven students gave their presentations either in person or online, and some university supervisors attended remotely. Prof. Tamura from GRIPS and Dr. Tsuji were also present. The participants will continue their research toward completing and submitting their master's theses by July 28.

Grope Photo(E-course)

Noe-san (S-course, Costa Rica)



Rian-san (T-course, Indonesia)

Report on Kansai Study Trip

THE GREAT HANSIN-AWAJI EARTHQUAKE:

A JOURNEY THROUGH TRAGEDY AND RESILIENCE

DIMARUCUT John Edel
（IISEE Training Course "Strengthening Seismic Disaster Risk Reduction Countermeasures for Critical Buildings"）

The Kansai Study Trip was an insightful and rewarding experience that significantly broadened my understanding of earthquake engineering and disaster risk reduction.

Our visit to the Disaster Reduction and Human Renovation Institution offered a powerful look back at the Great Hanshin-Awaji Earthquake (the 1995 Southern Hyogo Prefecture Earthquake). The facility presented stories filled with the devastating impact of the disaster, personal memorabilia from those affected, the recovery process, and the resilience of the Japanese people. We were fortunate to hear firsthand from a survivor who shared his traumatic experience and how he later contributed to rebuilding his community, a truly moving story.

Memorabilia of the affected people of the Great Hanshin-Awaji Earthquake

Preserved Nojima Fault

Another highlight was our visit to the Nojima Fault Preservation Museum, where we observed the exposed surface rupture caused by the Great Hanshin-Awaji Earthquake. I am impressed by the preservation efforts and the way the museum educates the public, particularly the students who happened to be there at the same time. A memorable part of this visit was experiencing a short virtual reality simulation of the earthquake, which gave us a sense of its intensity.

The walkthrough of the Akashi-Kaikyo Bridge was a once-in-a-lifetime experience. It offered valuable insights into advanced bridge engineering technologies, innovations, and construction challenges since the Great Hanshin-Awaji Earthquake occurred during its construction period. It also showcases the advanced health monitoring systems and maintenance procedures of one of the longest suspension bridges in the world. Since I am also a bridge engineer, walking beneath the bridge and climbing to the top of the pylon was not only unforgettable but deeply meaningful to me.

A view at the top of Akashi-Kaikyo Bridge Pylon

I am sincerely grateful to the Japan International Cooperation Agency (JICA) and the International Institute of Seismology and Earthquake Engineering (IISEE) for this once-in-a-lifetime opportunity. It greatly enriched my understanding of seismic engineering and technologies and their real-world applications. I especially appreciated the museum visits, which emphasized how community education and engagement play a vital role in disaster preparedness and recovery. I look forward to applying the knowledge, technologies, and experiences gained on this trip to support my department and contribute to improving disaster resilience in my country.

Group photo at Akashi-Kaikyo Bridge

IISEE Training Course "Strengthening Seismic Disaster Risk Reduction Countermeasures for Critical Buildings" Closed

By IISEE

On July 16, we held a closing ceremony for the IISEE Training Course "Strengthening Seismic Disaster Risk Reduction Countermeasures for Critical Buildings", which started on May 23.

The ceremony was held at JICA Tsukuba. After congratulatory speeches by Mr. Takahashi, Director General of JICA Tsukuba, and Dr. Fukuyama, President of the Building Research Institute, each participant received certificates of completion from both institutes. At the ceremony, Ms. ETTAOUNATI Hanae, a participant from Morocco, gave a speech on behalf of the nine participants.

Mr. TAKAHASHI Makoto,
Director General,
Tsukuba Center, Japan
International Cooperation Agency

During the training period, the participants attended the lectures with great enthusiasm, learned the standards for maintaining the functionality of buildings, and the measures to be taken before and after a disaster. They also created an action plan to be utilized in their home countries. Through site visits, they were able to exchange opinions and deepen their acquaintance with Japanese engineers.


Dr. FUKUYAMA Hiroshi,
President of BRI

We expect the participants to use the knowledge they learned in Japan to contribute to the mitigation of earthquake damage and disaster prevention measures in their home countries. We hope that they will also continue international exchanges with Japanese engineers and researchers they met through this training program.

We would like to express our gratitude to the lecturers for their cooperation in this training program and to all those who supported us during the site visit.

Speech for Closing Ceremony

16 JULY 2025

ETTAOUNATI Hanae
（IISEE Training Course "Strengthening Seismic Disaster Risk Reduction Countermeasures for Critical Buildings"）

Dr. Hiroshi FUKUYAMA, President, Building Research Institute

Mr. Makoto TAKAHASHI, Director General, JICA Tsukuba,

Honorable Guests,

Overseas Participants and Everyone,

On behalf of all the participants of the 2025 training course on "Strengthening Seismic Disaster Risk Reduction Countermeasures for Critical Buildings," I would like to express our deepest gratitude for the opportunity to take part in such a rich and inspiring program, organized by JICA and the Building Research Institute (BRI), including its International Institute of Seismology and Earthquake Engineering (IISEE).

Over the course of two months, we have benefited from high-quality lectures delivered by distinguished professors, researchers, and technical experts from leading Japanese universities and institutions, as well as from enriching site visits. These included learning about seismic design for critical buildings, retrofitting techniques, and tsunami countermeasures, as well as observing some of the world's most advanced earthquake testing facilities — including the impressive full-scale shaking table at E-Defense, the largest of its kind in the world.

The knowledge we gained through this program is highly relevant, given that all participating countries are exposed to seismic hazards. Recent devastating earthquakes in these countries have highlighted the urgent need to strengthen resilience through improved building practices, updated regulations, and better preparedness at all levels. The insights, technologies, and policy approaches shared during this training will greatly support our efforts to enhance seismic safety and reduce disaster risks.

Beyond technical knowledge, this program has been an eye-opener to the Japanese spirit of discipline, resilience, and respect for life safety. We have seen how science and policy are integrated to reduce disaster risks and ensure the continuity of communities. The Japanese approach to risk management—based on prevention, innovation, and community awareness—is something we aim to adapt and apply in our own national contexts.

We especially appreciate the efforts of all the coordinators, professors, and support staff, who made our stay smooth, pleasant, and productive. Your dedication, kindness, and availability created a supportive environment that made it easy for us to focus, learn, and exchange ideas. We are grateful for your hard work behind the scenes.

As we return to our home countries, we carry not only valuable knowledge but also a renewed sense of responsibility. We hope to apply what we learned and strengthen cooperation between Japan and our countries in the field of disaster risk reduction. We also hope that this program continues in the future, and that other professionals will have the same opportunity to benefit from Japan's expertise and generosity.

Thank you very much once again to JICA, IISEE, BRI, and all those who contributed to this exceptional program.

Arigatou gozaimasu.

Final Presentation held on July 31st and August 1st

By Dr. Yushiro Fujii, Director of IISEE

We held the final presentation sessions of the individual studies for the 2024-2025 Regular Course over two days from July 31. The final presentation sessions were conducted jointly by the three courses: Seismology, Earthquake Engineering, and Tsunami Disaster Mitigation, where the participants presented the research findings from their master's reports.

On the day before the presentation (July 30), an earthquake measuring M8.8 struck Kamchatka, and tsunami warnings and advisories were issued along the Japanese coast. We were concerned for the participants who were receiving individual training outside the BRI and were returning to Tsukuba that day, but fortunately, none were caught up in the transportation disruptions, and all returned safely to Tsukuba. We were delighted that all 12 participants were able to join on-site on the day of the presentation. Additionally, we would like to thank the supervisors from outside the BRI who were able to join online.

Both days featured excellent presentations and lively question and discussion sessions, making for highly fulfilling final presentation sessions. I would like to take this opportunity to express our heartfelt gratitude to the supervisors, advisors, and staff for their cooperation. We would also like to thank Mr. Katayama, the former Program Director of the GRIPS DMP Program, and Mr. Tamura, the current Program Director, for their remarks on the first and second days, respectively.

To all participants, by the time this newsletter is published, you will have completed your master's reports and synopses and will be heading off on the study trip to the Tohoku region with a bright and cheerful feeling. While it has been extremely hot in Japan lately, please take care of your health and keep up the good work until the end.

(Short Report) Tsukuba Chibikko Hakase 2025

By IISEE

Every year, during the summer vacation period for elementary and junior high school students (about 40 days), the event "Tsukuba Chibikko Hakase (Tsukuba Little Doctor)" is held to allow them to visit research institutes and other facilities in Tsukuba City and enjoy learning.

During the event, the International Institute of Seismology and Earthquake Engineering (IISEE) exhibited and explained a model of the deep underground structure of the Pacific Ocean and the surrounding areas of the Japanese archipelago.

On July 23, two IISEE researchers gave a lecture to students about the characteristics of earthquakes and how buildings shake. Each participating student made a model of a building using straws and styrene boards to see how buildings shake differently depending on the shape of the model they made and the type of earthquake motion.

We hope this event will help children to think about a future filled with dreams and hopes.

Contact Us

The IISEE Newsletter is intended as a go-between for IISEE and ex-participants.
We encourage you to contribute reports and articles to this newsletter. Please let us know your current activities in your country.
We also welcome your co-workers and friends to register on our mailing list.

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