Nepalese Engineers Association, Japan (NEAJ)

A report on the third cluster program on

Sharing Geotechnical Academic Research and Professional Experience

Organized by:

5th Executive Committee of NEAJ

October 2nd, 2021

A WEBINAR ON 'SHARING GEOTECHNICAL ACADEMIC RESEARCH AND PROFESSIONAL EXPERIENCE'

The webinar on 'Sharing Geotechnical Academic Research and Professional Experience' organized by the 5th executive committee of NEAJ was held on 2nd October, 2021 via Zoom. This webinar is the third of its type of the cluster program initiated by the 4th executive committee of Nepalese Engineers Association, Japan (NEAJ), where the first webinar on Structural Planning and Design, and the second webinar on Architectural Planning and Design were successfully accomplished on 17th January, 2021 and 31st July, 2021 respectively. In this webinar on 'Sharing Geotechnical Academic Research and Professional Experience', there were three presentations, with two from students based on their academic research and one from experience of professionals. The schedule and the invitation information of the webinar is shown below:

NEAJ Webinar on
Sharing Geotechnical Academic Research and Professional Experience
11:15-12:30 JST/ 08:00-09:15 NPT, 2nd October (Sat), 2021

Zoom Link:
Meeting ID:
Passcode:
Registration link for participation:

PROGRAM
11:15 Opening Remarks
Dr. Kabir Shakya, NEAJ President
11:20 Brief Explanation of this Program
Er. Binod Shrestha, NEAJ Treasurer

11:25 Part One: Academic Research Works (Each 10mins Presentation, 10mins Discussion)

1. Seismic Liquefaction risks in the critical facilities of the Kathmandu Valley, Nepal.
   Er. Prabin Acharya (Presentation based on M.Sc. in Geotechnical Engineering, IOE, Pulchowk Campus,Department of Electricity Development, Government of Nepal

2. Geotechnical Sesimic Isolation using Polymer Grouts.
   Er. Aavash Ghimire, Graduate Scholar at Tokyo Institute of Technology, Department of Civil Engineering (Focus on Geotechnical Research).

11:45 Part Two: Professional Experience (Each 15mins Presentation, 10mins Discussion)

3. Construction of Jointed-Timber Piles in soft ground of Saga, Japan.
   Dr. Sailesh Shrestha (Presentation based on his experience as a research engineer in Kyushu Piling Company), Adjunt Senior Lecturer at General Sir John Kotewala Defence University, Faculty of Technology, KDU)

12:15 ~ Virtual Nomikai (Virtual Party)

Presentation of Academic Research:
The abstracts of the presentations of academic research are shown below.

Presentation 1:

Title: Seismic Liquefaction risks in the critical facilities of the Kathmandu Valley, Nepal.

Presenter*: Er. Prabin Acharya (Presentation based on M.Sc. in Geotechnical Engineering, IOE, Pulchowk Campus,Department of Electricity Development, Government of Nepal*

Abstract: Kathmandu Valley lies in an active tectonic zone and earthquakes are common in the region. The most recent was the 2015 Gorkha, Nepal earthquake, measuring 7.8 Mw. Past earthquakes caused soil liquefaction in the valley with severe damages and destruction of existing critical infrastructures. As for such infrastructures, the road network, health facilities, schools, and airports are considered. A liquefaction susceptibility map of Kathmandu Valley has been developed. This map was obtained by computing the liquefaction potential index (LPI) for several boreholes with SPT measurements and clustering the areas with similar values of LPI. Moreover, the locations of existing critical infrastructures were reported on this risk map. Therefore, it was noted that 42% of the road network and 16% of the airport area are in zones of very high liquefaction susceptibility, while 60%, 54%, and 64% of health facilities, schools, and colleges are in very high liquefaction zones, respectively. This indicates that most of the critical facilities in the valley are at serious risk of liquefaction during a major earthquake and therefore should be retrofitted for their proper functioning during such disasters.

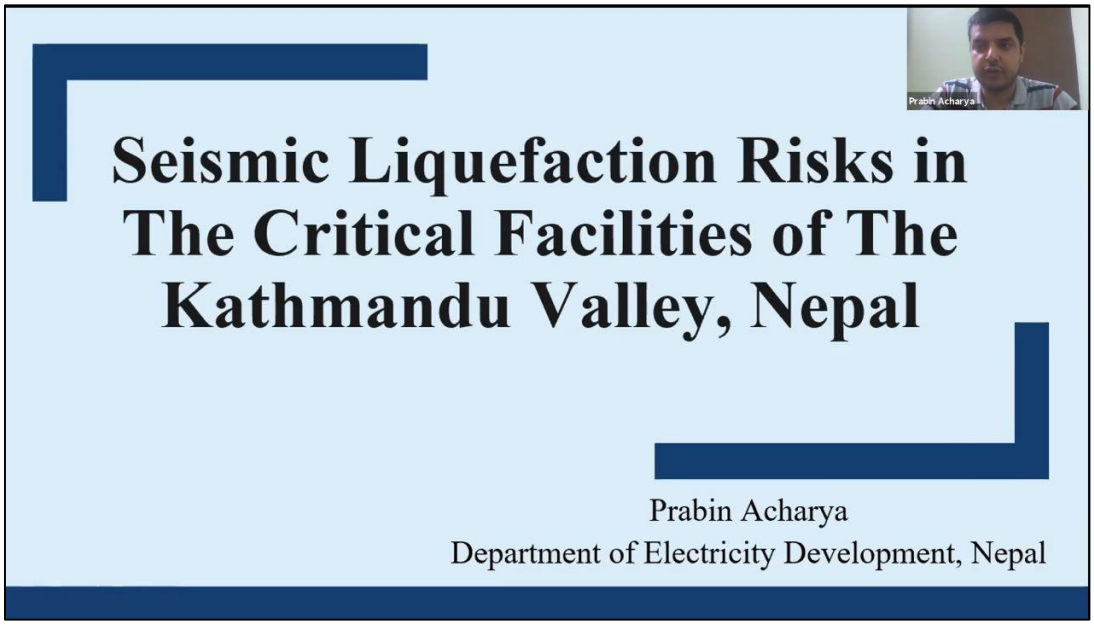

Fig. 1. A picture of the presentation made by Er. Prabin Acharya related to his academic research.

Presentation 2:

Title: Geotechnical Seismic Isolation using Polymer Grout.

Presenter*: Er. Aavash Ghimire, Graduate Scholar at Tokyo Institute of Technology, Department of Civil Engineering (Focus on Geotechnical Research).*

Abstract: Traditionally, seismic isolation is a flexible or sliding interface positioned between a structure and its foundation for the purpose of decoupling the motions of the ground from that of the structure. In recent years, novel seismic isolation methods have been proposed, in which the flexible or sliding interface is in direct contact with geological sediments and the isolation mechanism primarily involves geotechnics. One of the materials that can be used for this purpose is acrylate acid magnesium (AA-Mg) Polymer. These polymers when mixed with sand can give the mix high flexibility, large elastic range, and high strength; the mix has been proposed around underground structures to create a cushion for dissipating seismic energy, and decrease the seismic forces acting in the underground structure. The research is in progress to understand basic mechanical behavior of the mix and also its dynamic properties. Once the behavior is understood through lab testing, numerical simulation and further centrifuge modelling can be done to prove the efficiency of acrylic polymer-soil mix in geotechnical seismic isolation.

Fig. 2. A picture of the presentation made by Er. Aavash Ghimire related to his academic research.

Presentation of Professionals:
The abstracts of the presentations of professionals are shown below.

Presentation 1:

Title: Construction of Jointed-Timber Piles in soft ground of Saga, Japan.

Presenter*: Dr. Sailesh Shrestha (Presentation based on his experience as a research engineer in Kyushu Piling Company), Adjunt Senior Lecturer at General Sir John Kotewala Defence University, Faculty of Technology, KDU)*

Abstract: The pile load tests were conducted in the soft clay with high compressibility and lower shear strength with depths until 10–30 m in the Saga lowland, Japan. Generally, single-timber piles (STP) were used as the pile foundation of the small-scale buildings in this area. However, differential settlements were experienced in these buildings. To overcome the problems, the tip of the timber piles was required to reach supporting stratum at greater depth. In order to reach the stratum, the timber piles were connected with several joints. Until then, there were methods to calculate the bearing capacity of STP. However, there was no detailed study to describe the bearing capacity and its mechanism of the jointed-timber piles (JTP). Based on the several pile load test results, the bearing capacity evaluation method has been proposed for the JTP in terms of bearing capacity coefficients α and β. It was confirmed that the second limit resistance forces were higher than the bearing capacity evaluated with the proposed method, including the reduction effect of joints, length/diameter ratio.

Fig. 3. A picture of the presentation made by Dr. Suraj Pradhan related to his professional experiences.

Participants:
On average 20 participants fully attended the webinar and participated actively during the questions and answers session. Equal numbers of participants from Nepal and Japan attended and showed much interest on the information and knowledge shared in this webinar. Several feedbacks, comments and suggestions for such future program was obtained from the participants.

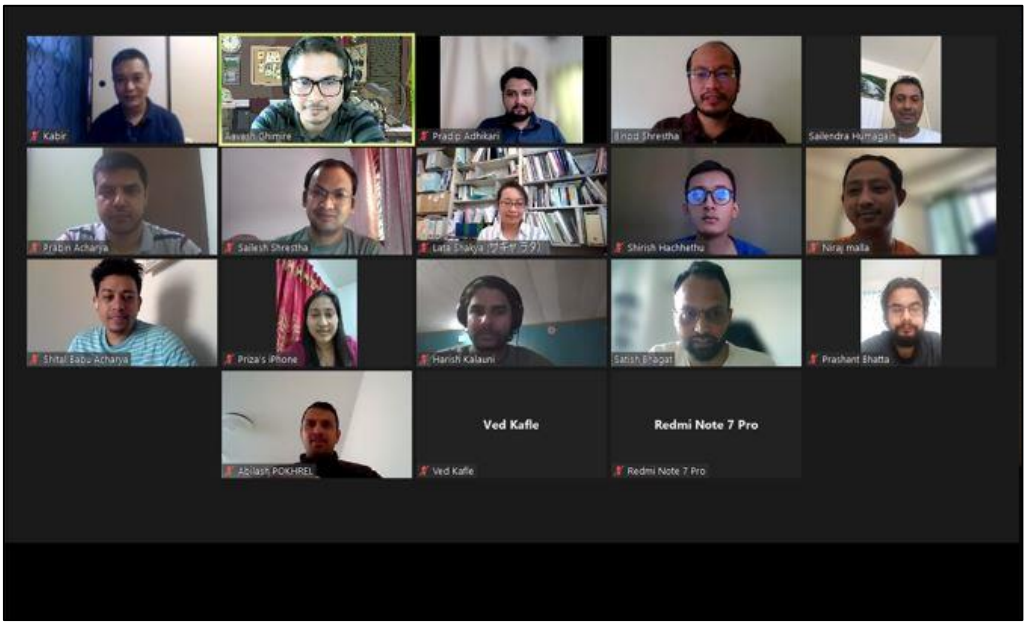

Fig. 4. Group photo during the program

Virtual Nomikai:
A virtual *Nomikai* (*Japanese culture of drinking after some event or occasion*) was done with the active discussion regarding the questions and comments on the presentations made on this webinar. Professional also shared their interesting experiences to the participants. Students who have queries regarding their research were also discussed openly. Virutal Nomikai and the program was ended with thanks message to all the participants and supporting hands for the successful accomplishment of Architecture Cluster program by the President of 5th executive committee of NEAJ.

Additional Photos of the Webinar:

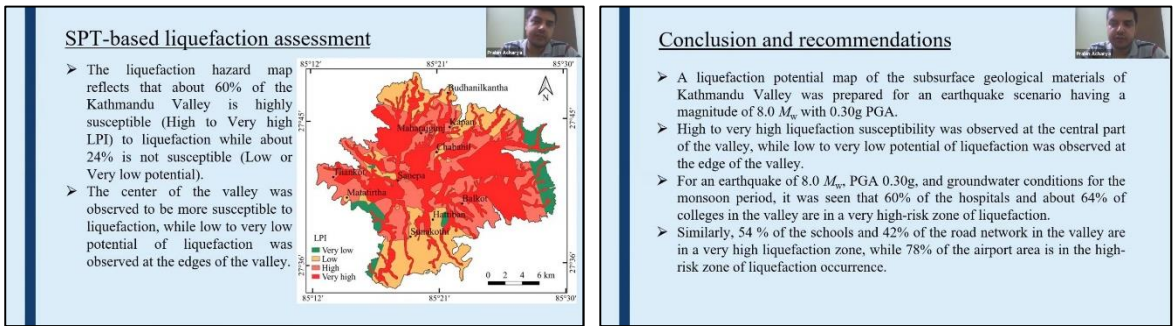

Fig. 5. Additional pictures of the presentation made by Er. Prabin Acharya

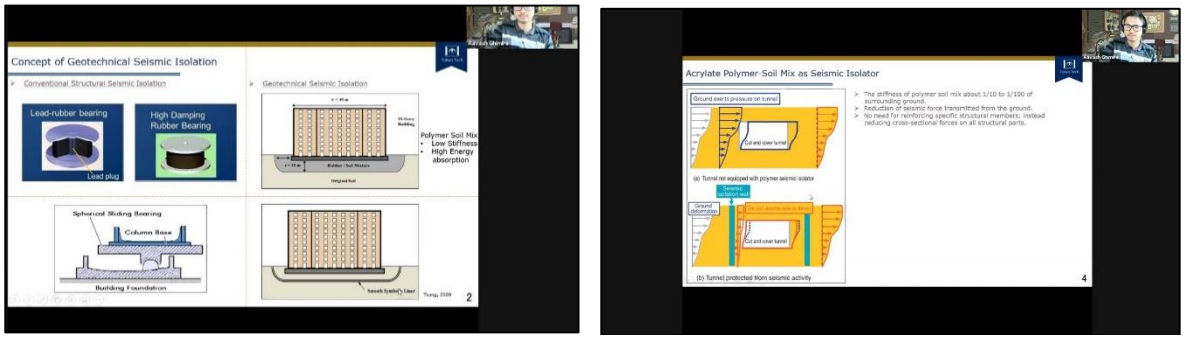

Fig. 6. Additional pictures of the presentation made by Er. Aavash Ghimire

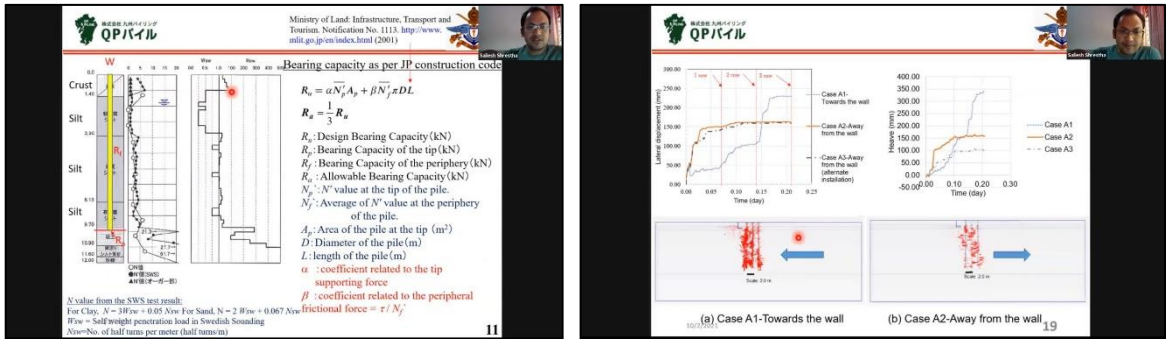

Fig. 7. Additional pictures of the presentation made by Dr. Sailesh Shrestha

Message from the 5th Executive Committee of NEAJ:

We would like to thank all presenters and participants who participated actively and helped this program to achieve its objectives. The presentations gave us information about current research problems in Nepal and in Japan, and the discussions after each presentation were extremely fruitful. The enthusiasm from Dr. Surendra Tamrakar on providing information about Engineering seminars to be held in Kantipur Engineering College to the members of NEAJ is really appreciated, and it could help bind and create a platform on sharing information and technology to and from Nepal. We also would like to thank Dr. Sailesh Shrestha for giving his time and sharing his experiences that could be a motivation to our geotechnical engineers. The presentation from Er. Prabin Acharya highlighted the current risks of hazards in Kathmandu valley, and inspired a discussion about possible remediations. The presentation from Er. Aavash Ghimire was interesting, and gave us information about a noble way to isolate structures from Earthquake motions. Last but not the least, we would like to extend our sincere thanks to Dr. Lata Shakya for her enormous contribution and vision for the prosperity of NEAJ.

In future, several such programs will be conducted. A webinar on Information Technology, Electrical, and Electronic Engineers cluster program will be scheduled in near future. We will send the information through email soon. Please share the information to your friends and people that can help them get benefit of the shared knowledge and information through our regular webinars. More information could also be obtained from our homepage: http://www.neajc.org/ and facebook page: https://www.facebook.com/neajapan. If you have any suggestions and proposal for conducting future programs, please let us know. The 5th executive committee will be very happy to facilitate every activity within its scope.

Thank you.

Brief biographies of presenters:

Academic research work presentation:

Er. Prabin Acharya:

Prabin Acharya is working as an Engineer in the Government of Nepal for the last five years. He completed his Master's degree in Geotechnical engineering from the Institute of Engineering Pulchowk Campus in 2019 and a Bachelor's in civil engineering from the same institute in 2015. Prabin worked closely with the Chief Executive Officer of the National Reconstruction Authority during the post-earthquake reconstruction work in Nepal. His research interests are geotechnical earthquake engineering, soil dynamics, soil-structure interaction, geohazards (landslides), soil improvement techniques, artificial intelligence, disaster recovery, and reconstruction. Details of the background, education, and experience can be obtained from https://www.linkedin.com/in/prabin-acharya/.

Er. Aavash Ghimire:

Er. Aavash Ghimire is currently a Graduate Scholar pursuing Master's Degree in Civil Engineering Tokyo Institute of Technology, Japan. His research topic is focused on Geotechnical aspects of Civil Engineering including Geotechnical Earthquake, Liquefaction, Geotechnical Seismic Isolation, etc. He completed his Bachelor's Degree in Civil Engineering from Institute of Engineering, Thapathali

Campus in 2018, and was awarded MEXT Scholarship by the Japanese Governement for his graduate degree studies in Tokyo.

Professional experience presentation:

Dr. Sailesh Shrestha:

Dr. Sailesh Shrestha is currently Adjunt Senior Lecturer at Genral Sir John Kotewala Defence University, Faculty of Technology, KDU. His academic and working records are as follows:

Academic:

1. Bachelors Degree in Civil Engineering: Kathmandu Engineering College, TU (2005-2009)
2. Masters degree in Geotechnical Engineering: Asian institute of Technology, Thailand (2011-2013)
3. PhD degree in Geotechnical Engineering: Saga University, Japan (2013-2016)

Work experience:

1. Site Engineer, Nepal (2010-2011).
2. Lecturer/Research Fellow, Saga University (2016 Nov-2018 Sept).
3. Research Engineer, Kyushu Piling Company (2018 Oct -2021June).
4. Visiting Faculty, Kotelawala Defence University (2021 July-August)