Second Lecture by

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Ground Water is More Important in Triggering Landslides than so far Supposed

Abstract

Discussion on coseismic landslides has been so far based on the relationship between the load and the resistance as conventional soil mechanics supposed. In contrast, this presentation attempts to shed more light on the water effects on slope instability from different directions. First, the recent experiences are introduced in which ground water triggered or aggravated the extent of landslide; both coseismic and nonseismic examples are taken. Second, the deterioration or decay of geomaterials undergoing water action is introduced, thereby showing that the material properties of concerned slopes are damaged with time. Third, the risk of melting glacier in the course of climate warming is touched upon. Note that snow avalanche was triggered by the Gorkha earthquake in Nepal with devastating effects on the local community. Moreover, there was a chain of hazard in the recent time in which glacier melting triggered a huge landslide, the landslide mass formed a natural dam, the natural dam breached and initiated a debris flow, and the debris flow traveled hundreds of km downstream and caused flood disaster. This suggests a risk of compound disaster. It is a pity that the present state of engineering cannot handle the difficult situation except demonstrating people hazard maps, recommending them not to live in potentially hazardous areas. However, the hazard maps have problems as well such as overestimation and underestimation of the risk of natural disasters.

About the Speaker

Ikuo Towhata is Professor Emeritus in the University of Tokyo, Japan. Also, worked at the University of British Columbia, Vancouver, the Asian Institute of Technology in Bangkok, and the Public Works Research Institute together with Univ. Tokyo. Presently he serves as Chair, Professional Image Committee of ISSMGE. Earlier he served as a Professor in the University of Tokyo from 1994 – 2015. He also served as a Distinguished visiting professor at IIT Bombay: July – December 2016 and the Life Fellow of the Indian Geotechnical Society. He received several prestigious awards namely 1998-1999 Shamsher Prakash Research Award, USA, of Soil Dynamics, 2005 Heritage Lecturer, International Conference on Soil Mechanics and Geotechnical Engineering, 2018 Shamsher Prakash ISET Award 2018 for Significant Contribution in Geotechnical Earthquake Engineering, the Indian Society of Earthquake Technology, December 2018, 2019 Ishihara Lecturer, TC203 on earthquake, International Society for Soil Mechanics and Geotechnical Engineering, 7th Int. Conf. Earthquake Geotechnical Engineering, Rome, Japanese Geotechnical Society awards: best paper award twice, research contribution award, and technical development awards, Japan Society of Civil Engineers: Book publication award: Geotechnical Earthquake Engineering (2008) publ. from Springer. He served as Vice President for Asia, International Society for Soil Mechanics and Geotechnical Engineering for the term 2013 to 2017 and President of the Japanese Geotechnical Society from 2014 to 2016. He published 500 research articles in international journals and conference proceedings.