

WEBINAR TALK ON NATURE-BASED SOLUTIONS FOR ENHANCING INFRASTRUCTURE RESILIENCE UNDER CLIMATE VARIABILITY



SPEAKER:

ASSOCIATE PROFESSOR VIROON KAMCHOOM

25 SEPTEMBER 2025, THURSDAY



5.00PM - 7.00PM

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SYNOPSIS

The pressing need to mitigate the environmental impact of infrastructure development has driven research into sustainable, nature-based solutions. These solutions leverage the mechanical and hydrological benefits of vegetation and present a promising approach for reducing carbon emissions while enhancing infrastructure resilience, particularly in regions prone to climate-induced slope instability. This presentation investigates the role of vegetation in promoting slope resilience, focusing on the challenges associated with living materials, particularly the growth and decay phases of plant root systems. Recent experimental studies, including centrifuge modeling and field tests, have demonstrated that root systems significantly improve the shear strength of soils and mitigate desiccation cracks and extreme fluctuations in soil moisture, which are crucial for maintaining slope integrity during climate variations. The findings highlight vegetation's potential to offer long-term, low-maintenance solutions with ecological benefits, such as enhanced biodiversity and carbon sequestration, while mitigating climate impacts, reducing costs, and improving infrastructure safety and serviceability.

SPEAKER'S PROFILE

Dr. Viroon is an Associate Professor in the Civil Engineering department and head of the Excellent Centre for Green and Sustainable Infrastructure at KMIL. His research focuses on developing sustainable solutions to enhance infrastructure resilience against extreme weather events and climate change. His work is supported by funding from the Thailand Research Fund, the National Natural Science Foundation of China, and other international agencies. He has received fellowships from Hong Kong and the Scottish government, facilitating cross-disciplinary research collaborations in the UK. He has co-authored publications in high-impact international journals, co-applied for patents, and strong track record of academic-industrial collaboration. His expertise has contributed to major infrastructure projects across East and Southeast Asia, including Hong Kong's third airport runway, the Bhumibol Dam water diversion tunnel, the Khlong Thawiwatthana drainage tunnel, the Sirikit Dam rehabilitation, etc. He played a key role in establishing Thailand's first commercial-scale geotechnical centrifuge, enabling advanced simulations of soil-structure interaction, disaster mitigation strategies, and sustainable construction innovations. Dr. Viroon has delivered keynote lectures at conferences organized by the Indonesian Society for Geotechnical Engineering, the Engineering Institute of Thailand, and leading universities such as IIT Roorkee, Hohai University, and Nanyang Technological University. He is a member of the Thai Geotechnical Society and serves as a nominated member of ISSMGE Technical Committees TC104 and TC106.