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## Integrated geophysical and bioengineering techniques to protect landslide hazards at the South and North of Thailand

**Desell Suanburi**

Kasetsart University, Thailand

Geophysical and bioengineering approaches were applied at two landslide risk sites i.e., Ban Natham, Suratthani province and Ban Phamub, Uttaradit province operating under the Chaipattana Foundation. The collapse of only one access road to Ban Natham community was happened on March 2011 while Ban Phamub area was damaged on May 2006. 2D resistivity imaging and seismic refraction surveys were introduced to investigate subsurface feature e.g., depth of top soil, fracture in bedrock and moisture zone, at the current access road at Ban Natham site and at highland mountain behind Ban Phamub community. Risk position can be identified as 20 m thick top soil (lose rock fragment) as low resistivity ( $\approx 20 \Omega\text{m}$ ) and velocity of 400 m/s. Slope stability management was attempted with flapped soil bag wall then infiltrating with native plant and vetiver grass. Various high risk places appears on highland mountain range behind Phamub community were recommended for warning system. Flapped soil bag wall and infiltrating with native plant and vetiver grass were created at downstream to conserve threat stream bank. Extended procedures were performed at Ban Phadeh School, Tak province where school buildings were damaged on 27 July 1912 by ground movement due to shallow thin clay seam saturated with water from heavy rain. Damaged zone have been improved by construction and vetiver grass planting. 2D resistivity and IP imaging and mapping techniques can locate clay seam portion (low resistivity  $< 10 \Omega\text{m}$  and IP  $> 10 \text{mv/v}$ ) inside the school area which will help in future land use management.

### Biography

Desell Suanburi has graduated Masters in Geophysics in 1994 from the Flinders University of South Australia. He is presently working as an Assistant Professor at Department of Earth Science, Faculty of Science, Kasetsart University. He is an Expert in applied Geophysics in groundwater and mineral resources, engineering foundation including geohazards. He is also working as a Committee of Research and Development for landslide protection on highland slopes project under the King's Royally Initiative landslide (the Chaipattana Foundation).

[desell@yahoo.com](mailto:desell@yahoo.com)**Notes:**