

## Variability of Unsaturated Hydraulic Conductivities of Landslide Risky Soils in Uva Province of Sri Lanka

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Localized slope failures resulting in massive landslides can occur during the rainy season in the central highlands of Sri Lanka. The objective of this research was to measure and assess the variability of the field hydraulic conductivities using a minidisk tension infiltrometer. The selected sites were located in Uva Wellassa University of Sri Lanka, *Haputale*, *Haldummulla*, and *Meegahakiula* which are located in the Uva province of Sri Lanka. Using the minidisk infiltrometer, infiltration rates were measured for soil depths of 0-5, 30-35, and 60-65 cm under suction levels of -3, -2, -1, and -0.5 cm. Soil core samples were collected to measure bulk densities of respective soil depths while the soil textural class was identified using the simple method of feeling by hand. The field moisture content was measured using the oven-dry method. Sieve analysis was performed to identify particle size distribution and coefficient of uniformity. Field hydraulic conductivity values were calculated using infiltrometer readings with respect to each suction rate and soil texture class for all three depths. Textural classes of tested soils were identified as clay loam to sandy clay loam and the coefficient of uniformity value is ranging from 4.4 to 6.8. The gravimetric moisture content of soil samples ranged from 0.021 to 0.233 g g<sup>-1</sup> for all sites and bulk density ranged from 1.0 g cm<sup>-3</sup> to 1.5 g cm<sup>-3</sup>. The highest unsaturated hydraulic conductivity  $6.9 \times 10^{-5} \text{ m s}^{-1}$  was observed in *Meegahakiula* soil at -0.5 cm suction at a gravimetric moisture content of 0.212 g g<sup>-1</sup> for 60-65 cm depth. The lowest hydraulic conductivity  $1.0 \times 10^{-6} \text{ m s}^{-1}$  was observed in the Uva Wellassa University site at -3 cm suction at a gravimetric moisture content of 0.040 g g<sup>-1</sup> for 0-5 cm depth. Identifying relationships between hydraulic conductivity and the soil properties individually and developing prediction equations to demarcate landslide risky areas are expected to be done in the future.

**Keywords:** Slope failure, Hydraulic conductivity, Suction, Minidisk infiltrometer

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