Title : Landslide Susceptibility Model Using Soil Mechanical Properties at Ban Mae Na, Mae Na Toeng Subdistrict, Pai District, Mae Hong Son Province .

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ABSTRACT

This study developed a landslide susceptibility model for Ban Mae Na, Mae Hong Son Province, Thailand, based on soil mechanical properties. The study area, covering 50 square kilometers in the Mae Na Toeng Subdistrict of Pai District, is characterized by steep terrain prone to landslides that threaten lives, property, and infrastructure. Fifteen soil samples were collected and analyzed for various geotechnical properties. Analysis revealed that soil stability correlates positively with shear strength parameters, specifically cohesion and internal friction angles. Particle size distribution analysis demonstrated that areas with higher gravel and sand content exhibit greater stability, while regions dominated by clay and silt are more susceptible to landslides, particularly under saturated conditions. Atterberg limits testing indicated moderate to high Plastic Limit (PL) and Liquid Limit (LL) values, suggesting potential soil strength reduction and phase transition during water accumulation. A Geographic Information Systems (GIS)-based Landslide Susceptibility Index (LSI) was developed, identifying high-risk zones characterized by elevated clay content and low internal friction angles. The model's reliability was validated through Area Under Curve (AUC) analysis, confirming its high predictive accuracy. This validated model provides a foundation for future landslide risk assessment and mitigation strategies in the region.

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