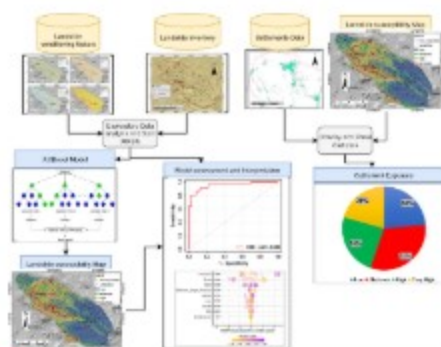


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Assessment of Landslide Susceptibility and Settlement Exposure via Geospatial Techniques in Bulambuli District, Eastern Uganda



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Andrew Mulabbi

School of Education, Uganda Christian University, Mukono, Uganda

John Calvin Esagu

Faculty of Science, Kyambogo University, Kampala, Kyambogo, Uganda

Gertrude Akello

Faculty of Arts and Humanities, Kyambogo University, Kampala, Kyambogo, Uganda

Remigio Turyahabwe

Faculty of Science and Education, Busitema University, Tororo, Uganda

Abstract

Landslide susceptibility is a significant concern in Elgon County, Uganda, particularly during the rainy season. This vulnerability is attributable to several factors, including steep slopes, fertile soils, and dense settlements on volcanic ridges. Landslide susceptibility maps are important in mitigating the risk particularly at the local level. The objectives of this study were 1) to model landslide susceptibility via an interpretable machine-learning model, 2) to identify the most influential factors for landslide susceptibility in the study area, and 3) to assess the exposure of settlements to landslide risk. This study employed the XGBoost model trained on nine conditioning factors via GIS data. Exposure analysis was performed through the zonal statistics and spatial overlay of the landslide susceptibility map with the settlement footprint data and classified into four risk exposure classes. The results show that the XGBoost model attained an AUC of 0.9204, indicating its precision. The results further



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