

Utilizing UAV, LiDAR, and Subsurface Geophysical Mapping Techniques for Comprehensive Landslide Monitoring in Sri Lanka

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SUMMARY

Landslides are devastating natural disasters that cause significant social, environmental, and economic impacts. In Sri Lanka, particularly in the tropical and mountainous regions of the middle of the country, landslides are common due to heavy rainfall and unsustainable practices maintained in human settlements. Recent advancements in remote sensing technologies, especially airborne laser scanning systems, have significantly improved spatial resolution and accuracy. These systems can now provide incredibly detailed surface models, making it easier to detect small surface features essential for landslide mapping studies. This study focuses on using Light Detection and Ranging (LiDAR) techniques for landslide detection and monitoring, to evaluate landslides, rock falls, and debris flows associated. Specifically, this research highlights the effectiveness of high-density ALS (Airborne LiDAR Scanning) data in extracting bare-earth features for identifying and characterizing landslides in the Bathgoda Landslide area in Haldummulla. The study also explored the use of geophysical technologies to investigate landslides. Furthermore, the research discussed the synergy between ALSs and geophysical methods in four key areas: survey planning, landslide investigation, landslide dynamics, and presenting results in GIS and CAD environments. Additionally, it examined how internal factors causing surface deformations can be monitored using a combination of UAVs, LiDAR, and geophysical techniques for more comprehensive landslide mapping.

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