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Advancing Landslide Monitoring in Tbilisi city and Imereti Region (Georgia): Integrating Tiltmeters, Piezometers, GPS and Geospatial Technologies

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This scientific exploration focuses on advancing landslide monitoring in the capital city of Tbilisi, Georgia and in Imereti Region village Gomi. By combining geotechnical monitoring systems, including tiltmeters and piezometers, with cutting-edge geospatial technologies such as digital elevation model (DEM) and aerial photography, our study aims to provide a comprehensive understanding of landslide dynamics in these diverse landscapes.

The integration of tiltmeters and piezometers facilitates real-time monitoring of ground movements and pore pressure changes, offering valuable insights into the evolving geotechnical conditions. A robotic S9 Trimble apparatus is installed in the capital city of Tbilisi, which gives accurate movements level, as well as directions. Coupled with the analysis of digital elevation model and aerial photos, research explores the topographical and morphological factors influencing landslide susceptibility.

The findings from Tbilisi and Gomi serve as case studies for urban and regional landslide hazard assessment. The study's strength lies in the integration of tiltmeters and piezometers, offering real-time monitoring of ground movement and groundwater fluctuations. Advanced geospatial technologies, such as satellite imagery and GIS, complement these measurements by providing a spatial context for landslide-prone areas. The combination of these methods enables a holistic approach to landslide risk assessment, considering the dynamic interplay of geological, climatic, and topographic factors.

In conclusion, this research makes a valuable contribution to landslide risk assessment in Tbilisi and Imereti Region Gomi. By addressing the geographic, geological, and climatic nuances of the region and integrating tiltmeters, piezometers, and advanced geospatial technologies, the study enhances our understanding of landslide dynamics and supports the development of targeted risk mitigation strategies tailored to the unique conditions of this area.