

# Landslide susceptibility mapping validated by deformation: a case study of Gilgit segment of North of Pakistan

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**Abstract:** The geological conditions along the Karakoram Highway are extremely complex, with crisscrossing valleys and severe river cutting. Historical and ancient landslides and debris flows are well developed; There are still a large number of potential landslides along the highway that are difficult to identify. Potential landslides have a certain critical height, deformation without damage or damage without landslide, and pose a risk to the safe operation of highways. It is of great practical significance to carry out the identification and monitoring of potential landslides along the highway. Traditional landslide susceptibility mapping are static, without considering the change of the susceptibility mapping considering the activity of historical, ancient and potential landslides.. In this paper, one of the most serious nodes of disaster along the Central Karakorum Highway, Gilgit segment, North of Pakistan, is selected as the study area, and the landslide surface deformation rate monitored by the Interferometric Synthetic Aperture Radar (InSAR) small-baseline set technique developed using interferometry is used to represent the landslide activity, and the landslide susceptibility mapping is performed based on a logistic regression model. Based on the logistic regression model for landslide susceptibility assessment, the results of landslide activity and landslide susceptibility assessment are further coupled to obtain a comprehensive landslide susceptibility assessment map. The results of this study can help disaster prevention and mitigation on the Karakorum Highway.