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Abstract

Applications and comparison of landslide susceptibility models along KKH and CPEC in North-Pakistan

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Abstract:

Karakorum highway (KKH) in Pakistan which was opened for public in 1979 has been facing serious instability issues since its inauguration. Many segments of the KKH in north-Pakistan which runs parallel to sub-parallel to CPEC remains blocked every year due to landsliding and the KKH segment which passes through upper and lower Kohistan districts (about 150 kms) are the most unstable section. A comprehensive landslide inventory of this segment within a buffer zone of 8 kilometers along both sides of the highway was prepared using GAOFEN-I satellite images followed by selective field check. A total of 1340 landslides were identified including debris flows, rock falls, rock slides, debris slide. Next, thirteen thematic layers were prepared including slope, aspect, plan-curvature, prof-curvature, NDVI, relative relief from DEM; rainfall and PGA based on data from Pakistan Meteorological Department (PMD); lithology, distance to faults based; distance to streams; distance to roads on maps taken from Geological Survey of Pakistan (GSP) as well as from personal observations. All these thematic layers were used to generate landslide susceptibility maps using different models including Frequency Ratio (FR), Logistic Regression (LR), Information Vale (InV) and Weights-of-Evidence (WoE) models. Results of all these models were compared and it was found that the Weight-of-Evidence (WoE) model is most suitable model in the study area have success rate of 86.5 % and the prediction rate of 82.5 %. This study would be very helpful to engineers and policy makers of the KKH and CPEC as well as for researcher having the similar interest along these highways in particular and in other mountainous areas in general. In addition to this, findings of this study would be beneficial for construction of two mega hydropower dams which lie within the study area.

Biography:

JAVED IQBAL has completed his PhD at the age of 30 years from Institute of Geology and Geophysics, Chinese

Academy of Sciences, Beijing, China in 2014. He worked as Assistant Professor and Head of Department of Earth Sciences in the Abbottabad University of Science and Technology, Pakistan during 2018-2018, and later jointed Department of Geology, the University of Haripur, Pakistan. Currently he is a Post-doctoral fellow under Chinese Prestigious fellowship program (PIFI) in the Institute of Mountain Hazards and Environment, Chinese Academy of Sciences, Chengdu, China, since April 2018. He has published more than 30 papers in reputed journals and worked in several national and international projects.

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