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Landslide susceptibility mapping using AHP method in Yadak-Tevil watershed, NE Iran

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Abstract: Landslides often occur at specific area under certain topographic and geologic conditions. In recent year, the population growth and the expansion of settlements over hazardous area have increased in the Kopet-Dogh Basin in NE Iran. The Kopet-Dogh formed as an intercontinental basin in NE Iran and SW Turkmenistan, and contains more than 6000 m of Mesozoic and Cenozoic sediments. Landslides form major natural hazards in hilly train in the area, and caused extensive damages to road, human dwellings and agricultural lands. The mountainous terrains such as Yadak-Tevil watershed area in Kopet-Dogh mountain physiographic province are characterized by steep slopes, fractured and folded, and high relative relief weathered rocks. In this study a landslide susceptibility map of Yadak-Tevil watershed was prepared using the Analytical Hierarchy Process (AHP) with the help of Geographical Information Systems (GIS). Data gathering and data access are two important aspects in the case of devising GIS based methodologies for landslide susceptibility mapping. In the present study seven factors namely, lithology, distance from fault, distance from drainage, slope, slope aspect, land use and distance from road were considered to be the main contributory factors for landslides. The study area was classified into five classes of relative landslide susceptibility, namely, very low, low, moderate, high, and very high. Results of this study show that the analytical hierarchy method is precise method for evaluation of landslide potential due to the use of binary comparison affecting factors and considering numerous factors for landslide evaluation at the same time in comparison to the other prevalent method. The results indicate that the percentage of high hazard class is 67 percent in AHP method.