Zonation of landslide hazards based on weights of evidence modeling along Tehran-Chalos Road Path, Iran

Abstract

In this study, GIS and remote sensing (RS) technology were applied to investigate zonation of the landslide hazards of the Tehran-Chalos road path in the north of Iran. Several affecting parameters of the occurrence of landslides were analyzed. The factors contributing to the hazard in an area can usually be identified, results of the investigations frequently being presented as a landslide hazard zonation (Lhz) map which reveals zones of similar risk of landslide occurrence. Tehran-Chalos road path is one of the susceptible areas to landslides in Iran. In this particular area, several landslides were occured. Landslides caused damage or disturbance to villages, farmlands and road, intensification of the superficial erosion and as a result an increment in rate of transportation of sediments. The method of landslide zonation used in this study was established upon simple grid unit. The causative factors include lithology, hydrology, elevation, drain distance to river, tectonic and seismotectonic, slope angle, human activities and distribution of plant. They are derived from geological map, Spot imagery data and Digital Elevation Model based on RS and GIS technology. For each grid unit, the incidence of land sliding and an assessment of the contributory factors were recorded in terms of a surface percentage index. A computer program was written to calculate the Lhz for each unit. It was also used to prepare the Lhz map. The study of the area has been classified into five categories of relative landslide hazard, namely, very low, low, moderate, high and very high. As a result, it can be concluded that 7% of this particular area has a high or very high landslide hazard.