

Landslide Susceptibility Mapping Using Logistic Regression Analysis and GIS Tools

Abolghasem Akbari, Fadzil Bin Mat Yahaya, Mahmoud Azamirad, Mohsen Fanodi

Faculty of Civil Engineering & Earth Resources, University Malaysia Pahang Lebuhraya Tun Razak 26300
Gambang, Kuantan, Pahang, Malaysia

ABSTRACT

Landslide is a major threat in many regions with humid climate condition. In recent years, this phenomenon has been accelerated by human activities mainly by rural and urban development projects. This research integrates the GIS tools and multivariate regression analysis for landslide susceptibility modeling (LSM) in north of Iran. To map the landslide susceptibility, ten potential independent variables were selected as effectual factors, including geological formation, terrain elevation, terrain slope and aspect, proximity to roads, proximity to faults and proximity to main rivers, soil unit, land use and annual rainfall. A GIS-database was developed containing all variables for the study area. Previous records of landslides in the study area were mapped based on inventory reports, satellite image processing and field survey using handheld GPS. The slope, proximity to roads, elevation, aspect and soil units was found to be the most effective factors in landslides respectively. Five other factors had no significant effect on landslides in this region. Landslide susceptibility map was then generated based on multivariate regression equation in a raster GIS environment and classified in five susceptibility classes. About 11.16% of the study area has very low susceptibility, 40.36% has low susceptibility, 32.37% has moderate susceptibility, 12.90 % has high susceptibility and 3.23 % has very high susceptibility.

KEYWORDS: Landslide, Multivariate regression, GIS, SPSS