



Multi-factor Constrained Information Analysis Method for Landslide Hazard Risk

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Landslide hazard cause enormous damage to human life, property, and the environment. The most effective way to mitigate the effects of landslides is to evaluate the risk of the landslides, and take measures to avoid the loss in advance.

Various factors should be considered for the landslides' risk assessment, so the assessment has great complexity and uncertainty. According to landslides, the multiple factors constrained method for landslides risk assessment was proposed at the same time, which with three step to carried it out, first using the GIS technology to divide the analysis grid as the base analysis unit, second, according to the available information, slope, lithology, faults, landuse, etc. as the multiple evaluation factors, finally, based on years of landslides in the observed data, the risk assessment analysis of landslides were realized with of multiple factors constrained assessment model, which the weight value of every factor was determined by the information model.

The region of Gongliu was selected as the experimental area which located in Xinjiang Ili River basin and the altitude of 600 to 4000 meters, with the special terrain characteristics of long at the east to west, narrow at north to south. The unique topography characters is the abundant rainfall which causing frequent landslides. By selecting 500m * 500m as an analysis grid which covering the whole study area, based on the multiple factors constrained method for the landslides risk assessment, a comprehensive assessment of the landslides risk in this region were computed out, and the landslide hazard classification map was realized at the end.

From the experimental results of the statistical perspective, the proportion of landslide hazard point is 94.04% at a little high risk and high risk areas. And the proportion of 4.64% at the low risk zone, 1.32% at the most low risk zone. The results showed a high probability of landslides at high level of the assess region, which showed that landslides risk assessment method is effective, and can provide information support for the government and the public in terms of hazard prevention.