Study of Vulnerability Evaluation for Geo-hazards Bearing Capacity, Qingchuan County, China

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Abstract：Vulnerability assessment of geological disasters is an important part of disaster risk assessment. The vulnerability of geo-hazards bearing capacity directly determines the severe of geological disasters and its corresponding quantitative assessment of vulnerability is key. This paper presents the index system of the vulnerability for geo-hazards bearing capacity, including four indexes and nineteen sub-indexes. Four indexes are life index, material index, ecological environment index and social economy index. A case study has been performed in Qingchuan County, China. The township units and administrative village units are used as basic unit in GIS, both TOPSIS model and Weighted Sum model are adopted to evaluate the vulnerability of geo-hazards bearing capacity in this area. Five vulnerability levels are classified, i.e. high vulnerability level, relatively high vulnerability level, moderate vulnerability level, relatively low vulnerability level, and low vulnerability level. Comparative study of these two models indicates that the results derived from the two models are consistent as a whole. 73 percent of the area have the same vulnerability level while 27 percent of the area differ with a gap of one vulnerability level. In the areas of high, low vulnerability levels derived by the two models are quite consistent with each other. The agreements between two models in relatively high and medium level are 86% and 73% respectively, while in relatively low vulnerability level was slightly worse (54%).