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APPLICATION OF GIS IN REGIONAL ECOLOGICAL RISK ASSESSMENT OF WATER RESOURCES

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Abstract

The regional ecological risk assessment of water resources has spatial, nonlinear and stochastic characteristics. GIS technology can handle large volumes of spatial information, conduct spatial analysis and spatial data management operations. It visually displays the distribution trend of environmental factors and the relationship between topology and regional water ecological risk pattern. This paper presents the five stages of the application of GIS in the regional ecological assessment of water resources and establishes a GIS water environmental risk information database. A hierarchy water resources risk assessment index system has been set up using the AHP method. The composite index method is used to estimate the size of ecological risk. The water risk value is divided into five levels which are the low-risk areas, lower-risk areas, medium-risk areas, higher risk areas and high-risk areas, respectively. For example, through the spherical model fitting and assembly analysis of GIS, the variations and divisions of water risk and their influencing factors in the Shaanxi Province, China, can be better described and analyzed. Therefore, GIS can be employed as a better tool to reflect the spatial distribution of water environmental quality. Accordingly, it can be used to quantitatively study the water resource risk, and to reflect the spatial variation of the water resource risk. Moreover, early warning of water resources utilization can be given, thus providing a basis to improve and enhance the water resources risk management and scientific decision-making.

Key words: application GIS, risk assessment, water resources

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