

## Research on risk assessment method for karst groundwater polluted by nonpoint source pollution in southern China

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**Abstract :** There are about 800000 km<sup>2</sup> carbonate formation, 3620 karst groundwater systems and 1806×108 m<sup>3</sup>/a karst groundwater resources in southern China, supplying water for about 50 million urban residents and more than 80 million rural population in 69 cities, south China. However, karst groundwater has been polluted with different degrees, which will threaten the water supply security in karst region. The risk assessment study of Karst groundwater pollution is greatly significant. According to a comprehensive and systematic analysis of karst hydrogeological conditions, characteristics of karst groundwater, characteristics of surface water and groundwater conversion, karst water pollution routes in Southern China, the risk of karst groundwater pollution is defined as " the occurrence probability of a certain groundwater pollution event in a specific region and a given time and the expected value of damage or loss caused by the event". The basic formula for estimating the risk of karst groundwater pollution is proposed as:  $R=p \times Q \times P \times PI$  (R— Risk of karst groundwater pollution, p— probability of pollution, Q—quantity of groundwater, P—price of water, PI—pollution index) . Through a large number of experiments, observations and tests, the pollution risk calculation parameters such as the pollution protection ability of surface soil, permeability coefficient and groundwater pollution index were obtained. Taking Guiyang, Guizhou Province, China as an example, the pollution risk of karst groundwater in Guiyang was quantitatively evaluated. Based on Guiyang's acceptance of groundwater value loss, the groundwater pollution risk in Guiyang is divided into four levels: low risk area, medium risk area, high risk area and extremely high risk area. The results of risk assessment would be used to guide the formulation of prevention and control measures for karst pollution in Guiyang more scientifically and reasonably.