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论文

基于Logistic回归和NFCA的水资源供需风险分析模型及其应用

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摘要:

我国城市水资源供需研究多从需水的角度考虑供需平衡,而忽略了供需风险的研究。针对这一问题,论文从危险性、暴露性和脆弱性的角度构建水资源供需风险指标体系,建立了基于Logistic回归和非线性模糊综合评价(NFCA)的供需风险分析模型。考虑供水的随机不确定性,以北京市为例,研究多种不同来水条件下的风险,结果表明:在1956—2007年的来水条件下,2020年固有风险均为一级风险;利用外调水和再生水后,现实风险中三级和四级风险占75%,一级和二级风险仍然占了25%。因此在降水量很小的情况下,水资源供需风险仍然处于较高水平。

关键词: 危险性 暴露性 脆弱性 水资源供需风险 Logistic回归 非线性模糊综合评价

Model for Risk Analysis between Supply and Demand of Water Resources Based on Logistic Regression and NFCA and Its Application

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Abstract:

In the studies of water resources supply and demand, supply and demand balance has received much more attention, but risk between supply and demand is little addressed. In this paper, the index system of risk between supply and demand is established from the viewpoint of threat, exposure and vulnerability. Based on logistic regression and nonlinear fuzzy comprehensive assessment, a model for risk analysis is developed. Considering the randomness of water supply, taking Beijing for example, risks under many different inflow conditions are studied. The results show that, all the inherent risks in 2020 are first grade in the inflow conditions of 1956 to 2007. After taking measures of reclaimed water reuse and South-to-North Water Transfer, the third grade and fourth grade risks accounts for 75%, with 25% of first grade and second grade risk. Therefore, risks are still high in the case of little precipitation.

Keywords: threat exposure vulnerability risk between supply and demand of water resources logistic regression nonlinear fuzzy comprehensive assessment (NFCA)

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