

Comprehensive evaluation of water carrying capacity in Hebei Province, China on principal component analysis

ABSTRACT

Water is an important basic resource for social and economic development and also a necessity for the life and produce of people. The unbalanced development of water resources in Hebei Province of China and the obvious contradiction between supply and demand, affected by geography and natural environment change, has seriously influenced the Hebei village renewal process. This paper presents a comprehensive evaluation method of water carrying capacity—principal component analysis (PCA)—and constructs the evaluation index system of water carrying capacity in Hebei Province from water resources, water management, industrial development, agricultural development, social development, environmental protection, and other aspects. Based on the economic and water statistical data of Hebei province from 2009 to 2018, this paper adopts principal component analysis as an evaluation method to comprehensively evaluate the carrying capacity of water resources in Hebei Province across time and space. The results show that principal component analysis is an effective method for the comprehensive evaluation of water carrying capacity, which can reflect the local water carrying capacity objectively and comprehensively.