Study of Fuzzy Pattern Recognition for Reasonable Allocation of Regional Water Resources based on the Entropy Coupling Model using the Fuzzy Analytic Hierarchy Process (FAHP)

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At present, the difficulty in the reasonable allocation of regional water resources is the problem of how to allocate the total amount of available water resources to each sub-region according to the principles of sustainability, efficiency, fairness and difference. This difficulty is mainly reflected in determining the weights of various evaluation indexes and accommodating the fuzziness and randomness of the reasonable allocation of regional water resources in sub-regions. In this paper, we propose a new model EFPR-FAHP to determine the allocation amount of water resources in each sub-region based on the integration of the information entropy principle, the fuzzy pattern recognition model and the improved Fuzzy Analytic Hierarchy Process based on the Accelerating Genetic Algorithm. The results show that, when using EFPR-FAHP to allocate regional water resources, the mathematical and physical concepts are clear, and the method is simple, clear and commonly used. The calculation result is objective and reasonable. EFPR-FAHP is a method of total amount allocation from qualitative to quantitative integration, and it has application value in the fields of regional water resources and environmental management.