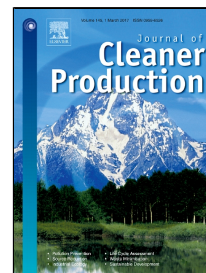


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# A Research on the Application of Fuzzy Iteration Clustering in the Water Conservancy Project

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**Abstract:** Water conservancy project bidding involves many aspects including nature, society, economy, and environment. In water conservancy project bidding evaluation, both quantitative and qualitative indexes are involved; moreover, different targets are often incommensurable and compete with each other. Scientific decision-making in bidding evaluation is key to linking the stages of project bidding; selecting an appropriate contractor is not only conducive to improving the project quality, but also helpful to achieve the goal of saving on investments. This paper intends to study the problem of multi-target group decision-making in project bidding processes via the use of the mathematical method of fuzzy clustering. Bidder 3 is finally chosen as the most suitable contractor for the construction of this project by determining the score matrix and index weight vector of the four bidders concerned. Results have indicated that the aforementioned method is more reasonable and reliable; thus, the bidding evaluation decision is more scientific.

**Key words:** fuzzy clustering; fuzzy mode recognition; iteration; project bidding; bidding evaluation

## 1. Introduction

In 1965, Professor Zadeh at the University of California published the famous paper, 'Fuzzy Sets' in which the theory of a multi-valued set was formally proposed (L. A. Zadeh, 1965). This theory had broken through the classical set theory by Descartes at the end of the 19th century, laying the foundation for the fuzzy theory. With the publication of a research report on fuzzy logic by Barclay and Marinos in 1966 (Barclay, 1966), and another research report on fuzzy reasoning by Zadeh in 1975 (L. A. Zadeh, 1975), fuzzy theory has become a hot subject. Zadeh was mainly accredited with the unification of fuzziness and mathematics. Fuzzy mathematics seeks to deal with fuzzy things previously deemed indescribable in mathematics with precise mathematical methods, because absolute precision is almost impossible in the real world, and what is possible is only to reduce the so-called inaccuracy to an insignificant level. According to Zadeh, it is not the job of mathematics to accommodate for fuzziness at the expense of rigorousness, but rather to penetrate mathematical methods into the "forbidden zones" of the fuzzy phenomenon, i.e. to let mathematics draw from the advantage of human brains in the recognition and judgment of fuzzy

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