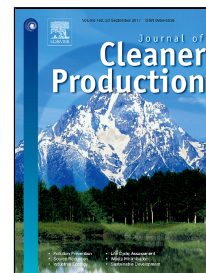


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Two-stage interval stochastic chance-constrained robust programming and its application in flood management

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Abstract:

Today, flood diversion is a useful strategy of flood management that is used to mitigate damage from flooding throughout the world. This study developed two-stage interval stochastic chance-constrained robust programming for flood diversion of flood management under multiple uncertainties by integrating chance-constrained programming and robust programming into two-stage stochastic programming. The new model can resolve problems of system uncertainties and difficulties of trade-offs between the system economy as well as system stability. The proposed approach is especially useful for obtaining an optimum flood mitigation scheme with the minimum cost and an acceptable risk under complex uncertainties.. In addition, the advanced method was also used to test a hypothetical case study of flood diversion planning. The results indicate that desired flood diversion schemes with lower costs and acceptable risks under complex uncertainties could be achieved. In conclusion, this study proposed a new method for flood management and meanwhile it could efficiently handle problems of independent uncertainty as well as trade-offs between economy and stability in flood management system which were hardly deal with by current methods.

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