Environmental Engineering and Management Journal

March 2014, Vol.13, No. 3, 699-712
http://omicron.ch.tuiasi.ro/EEMJ/

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A ROBUST INEXACT TYPE-2 FUZZY SETS LINEAR OPTIMIZATION PROGRAMMING FOR IRRIGATION WATER SYSTEM MANAGEMENT UNDER UNCERTAINTY

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Abstract

This research introduces a new Robust Interval Type-2 Fuzzy Set Linear Programming (R-IT2FSLP) model to manage irrigation water resources. This method improves upon previous interval fuzzy bound models by allowing uncertainties presented as multiple fuzzy boundaries. It creates additional degrees of freedom and enable direct modeling of uncertainties within an optimization framework. It more explicitly reflects the system's uncertainties under the fuzzy membership function. The more of R-IT2FSLP method improves upon previous solution by embedding a Robust Two-Step algorithm (RTSM), which guarantee the feasibility of solutions. Compared with formal optimal methods of water systems, the solution of this optimal methodology is to see how applicable it is to irrigation water systems under uncertainty. In case study of this paper, it is clear that the R-IT2FSLP model can provide improved results to support Decision Makers (DMs). It solves problems of fresh water scarcity in irrigation systems.

Key words: decision support, fuzzy boundaries, irrigation water systems, uncertainty

Received: April, 2012; Revised final: May, 2013; Accepted: June, 2013