Abstract   This paper aims to resolve four non-cooperative generic water disputes using the Graph Model approach for conflict resolution. Therefore, a Decision Support System (DSS) has been utilized integrating multiple-criteria decision analysis, stability analysis, and uncertainty analysis using the info-gap technique. The DSS has been applied to four different non-cooperative water conflict including: (1) ground-water common pool; (2) environmental problem between two countries; (3) river conflict dispute between two countries; and (4) sustain-able development game. The DSS demonstrates four stability concepts, including Nash Stability (R), General Metarationality (GMR), Symmetric Meta-rationality (SMR), Sequential stability (SEQ) to illustrate how results differ with regard to the stability concepts. After classifying the preferences of stakeholders, the DSS recognized the most stable solution, considering the potential actions and counteractions of all stakeholders. Consequently, solution robustness was tested under the uncertainty related to stakeholders' perspective, under non-cooperative attitudes. When there are no sufficient details about the conflict and what decision to be prepared, the DSS proved to be useful in modeling complex disputes, determining most robust solution, and examining the effect of uncertainty.

Keywords   water disputes; generic conflict resolution; graph model; decision support systems; and multiple criteria decision analysis.