Optimization and Simulation Models Applied in Engineering Planning and Management

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Abstract : Mathematical simulation and optimization models packaged within interactive computer programs provide a common way for planners and managers to predict the behaviour of any proposed water resources system design or management policy before it is implemented. Modeling presents a principal technique of predicting the behaviour of the proposed infrastructural designs or management policies. Models can be developed and used to help identify specific alternative plans that best meet those objectives. This study discusses various types of models, their development, architecture, data requirements, and applications in the field of engineering. It also outlines the advantages and limitations of each the optimization and simulation models presented. The techniques explored in this review include; dynamic programming, linear programming, fuzzy optimization, evolutionary algorithms and finally artificial intelligence techniques. Previous studies carried out using some of the techniques mentioned above were reviewed, and most of the results from different researches showed that indeed optimization and simulation provides viable alternatives and predictions which form a basis for decision making in building engineering structures and also in engineering planning and management.