Fis Tool, a Fuzzy Inference System
for dealing with very uncertain criteria in environmental management

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Abstract

Many times multi-criteria environmental management is faced with huge uncertainties on data. The knowledge gap is then such that few or no data are available from past experience. Bayesian techniques are therefore of no use in this case: the only recourse is calling in experts for obtaining data on *very uncertain criteria*. A methodology based on fuzzy logic has been developed for gathering and aggregating experts' opinions on such criteria evaluations. This approach has been used in practice for evaluating nuclear projects for which there is today no or limited industrial experience, like accelerator-driven 4th generation nuclear reactors, decommissioning of nuclear power plants, and high-level radioactive-waste repositories. The methodology is presented along with the Fuzzy Inference System software *Fis Tool* (presently in its version 2.09) which has been developed with the support of the International Atomic Energy Agency (IAEA) in Vienna as a user-friendly interface for gathering and processing experts' opinions on the costs of such long-term nuclear projects. It is thought that the approach can be used as well for evaluating very uncertain criteria in different fields of environmental management.

Keywords:
Very uncertain criteria, Expert's opinions, Fuzzy inference system, Fis Tool