

Title: **Combining probabilistic socio-economic and biological information by Bayesian networks - fisheries and environmental experiences**

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Abstract: In this paper, we review our experiences in combining cross disciplinary, probabilistic information by Bayesian networks. They seem to be potential tools in combining the optimization orientated economic modeling tradition to the somewhat different traditions of sociological sciences and further to the empirically orientated biological approaches. Calculus is based on Bayesian approach, utilizing conditional probabilities which can be estimated by e.g. different types of models, data learning and expert knowledge, depending on the information available. The local calculus makes the use of even very complicated models relatively fast and the graphical interfaces of available software packages increases the probability that the stakeholders understand and adapt the probabilistic scientific information provided and the role of uncertainty in decision making. Construction of models that test alternative causal structures (important e.g. in ecosystem approach to fisheries management) in a decision analysis context is relatively easy. On the other hand, methodology does not allow loops in model structures, and in complicated models the assessment procedure of expert knowledge can be a very demanding task. We review the experience obtained, and demonstrate the most recent bio-economic modeling approaches made in fisheries and in water quality modeling.