



Bayesian Network for Water Supply and Risk of Scarcity in Catchment of Shihmen, Taiwan

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Integrated water resources model is the key for effective management between water supply and demand. But water managers and decision-makers face challenges high uncertainty derived from significant rainfall discrepancy between wet and dry seasons, difficulties in developing new water resources, serious sedimentation in reservoirs, increases in water demand, limited data information in water supply system and so on in catchment of Shihmen. Bayesian network (BN) is a good tool for probabilistic reasoning under uncertainty. It can integrate both quantitative and qualitative data under data-limited conditions in the graphical model. Thus, we aim to develop BN model for quantifying the risk of water scarcity from upstream to dam under the uncertainty conditions. The uncertainty factors including rainfall, surface runoff, water level of dam, reservoir operation rules, and other parameters of rainfall-runoff model. And we expect to implement: (1) analyzing sensitivity of uncertainty factors between environmental flows and dam (2) estimating of dam inflow and water supply in next of few weeks (3) quantifying of insufficient risk on the reliability of water supply system.