



Application of SWAT Model and Copula-based Uncertainty Analysis to Estimate Reservoir Inflow - A Case Study of Shimen Reservoir

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The rainfall patterns in Taiwan are unevenly distributed in time and space. In recent years, this phenomenon has become more serious because of climate change, and the distribution of water resources has become a major problem for the government. Therefore, it is necessary to establish a reservoir inflow estimation model based on the rainfall runoff model and related hydrological data. The research area of this paper is Shimen Reservoir, which is an important reservoir in northern Taiwan. It is mainly responsible for agricultural water, public water, power generation and flood control. Due to its importance in the northern part of Taiwan, understanding the inflow of the reservoir will help to optimize the allocation of water resources. However, the upstream data of the reservoir, such as soil, land use, rainfall, etc., have input uncertainties; the parameter uncertainty in hydrological model will also affect the estimation. Therefore, this study expects to establish a reservoir inflow estimation model that well performance and considers uncertainty to solve the problem of water resource allocation. This study will use SWAT (Soil and Assessment Tool) as the estimation tool for the inflow of the upstream catchment area of the reservoir; secondly, use copula to construct the multivariate distribution of rainfall between the upstream stations; and after considering uncertainty, establish an inflow estimation model. It is hoped that this model will support water related business and disaster prevention work.