

Preface

This current book is an attempt to reveal some aspects of hydrologic processes affected in water components separation in a water supply catchment by the application of soil and water assessment tools (SWATs) in Iran. The SWAT model is a continuation of nearly 30 years of modeling efforts conducted by the USDA Agricultural Research Service. Modeling is the main approach to the separation of water components' in catchment outlets with diverse soils, land use, and slopes. Most models are not useful for this purpose. The utilized empirical model performs successfully only within a calibrated range. Lumped conceptual models cannot also be used to predict the impacts of land use change on catchment hydrology. Because these models treat the catchment as a single unit, they ignore the tremendous heterogeneity of hydrological responses resulting from the spatial and temporal variability of climate, topography, soils, and vegetation.

One of the principal motivations for the development of distributed, physically based models was to predict the impacts of land use change. Physically based models can, in principle, overcome many of the deficiencies associated with lumped conceptual models through their use of parameters that have a physical interpretation and through their representation of spatial variability in the parameter values. Therefore, a simple GIS interface physically based and computationally efficient distributed model needs to be chosen for the evaluation of the effects of land use change on water components' separation on catchment hydrology and water balance. It has been found that most of the distributed or physically based hydrological and water quality models from developed countries are not suitable to be directly used in developing countries due to both a lack of data and different climatic conditions. The SWAT model is utilized extensively in advanced countries for investigating the impacts of land use change on water balance but has not yet been widely adopted in Iran despite being regarded as having a very good potential for such a purpose. The successful application of this model to this particular catchment will highlight the potential success of its application to other catchments in Iran.

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Separation in Iran

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