

A semi-distributed water balance model for Walayar sub basin using SWAT model

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Received : 25.01.2014; Revised : 05.03.2014; Accepted : 17.03.2014

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■ **ABSTRACT** : Groundwater is a dynamic and replenishesable natural resource but in hard rock terrains availability of groundwater is of limited extent. In India, 65 per cent of the total geographical area is covered by hard rock formations. In this study, a spatially semi distributed water balance model was developed to simulate mean monthly hydrological processes using land use, soil texture, topography, and hydrometeorological data as input parameters in the Walayar sub-basin, a semiarid region of Tamil Nadu in India. The spatially and temporal semi-distributed water balance modelling system provided the framework, containing code to simulate all major hydrological processes, including actual evapotranspiration estimates, to simulate the impacts of climate change in Walayar sub-basin, Tamil Nadu, India, under historical (1983–2012). The water balance model is developed using SCS – CN (Soil Conservation Service – Curve Number) model to derive the runoff component and FAO-PM (Food and Agriculture Organization – Penman Monteith) model to derive the evapotranspiration component spatially and temporal with the help of remote sensing and GIS techniques. The results of the study indicate that the overall rate of groundwater recharge is predicted to decrease as a result of climate change. The higher intensity and frequency of precipitation will also contribute significantly to surface runoff, while global warming may result in increased evapotranspiration rates. While many previous climate change impact studies have focused on the temporal changes in groundwater recharge, our results suggest that the impacts can also have high spatial variability.

■ **KEY WORDS** : Climate change, Water balance, SWAT model, Ground water recharge

■ **HOW TO CITE THIS PAPER** : Balathandayutham, K. and Mayilswami, C. (2014). A semi-distributed water balance model for Walayar sub Basin using SWAT model. *Internat. J. Agric. Engg.*, 7(1) : 198-202.