Estimation of groundwater recharge in limestone aquifer using an improved soil moisture balance method: A case study in Jaffna district

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Abstract

Estimation of recharge is extremely important for proper management of groundwater systems. The main purpose of this paper is to study the possibility of estimation of potential recharge in limestone aquifer as a case study in Thirunelvely and Kondavil area of Jaffna district, Sri Lanka using an improved soil moisture balance model (SAMBA). This model was used to estimate the groundwater recharge for a permanent grass and a commonly cultivated vegetable crop chilli for the years 2007 and 2008 for which soil properties, crop characters and climatic conditions were considered. The new concept of near surface soil moisture storage was included in the model and it is used to represent continuing evaporation on the days following heavy rainfall even though the soil moisture deficit is high. Uncertainties and variation in parameter values were explored using sensitivity analysis. The potential recharge resulted from the model was compared with the real field conditions of actual recharge which was derived from the water table fluctuation method.

Keywords

Soil Moisture Balance, Recharge, Limestone

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