



Application of Soil and Water Assessment Tool (SWAT) Model to Estimate Water Budget in a Mine Area in Western Turkey

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Efforts to understand and to quantify precipitation and its partitioning into runoff, evapotranspiration and recharge in mine areas are often troubled due to changed land use and topography. Soil and Water Assessment Tool (SWAT) is a comprehensive, semi-distributed model that requires large number of input parameters to predict the effects of varying soil and land use over long period of times on water, sediment and agricultural chemical yields. In this study, SWAT is used to estimate recharge amount in a mine area in Western Turkey. Land use map, soil classification map and Digital Elevation Model (DEM) were input to the model. Daily precipitation, temperature, relative humidity, wind speed and solar radiation data have been processed on monthly time scale. Evapotranspiration, surface runoff, infiltration, lateral flow and recharge are the outputs. Hargreaves method is chosen to calculate evapotranspiration and initial results show that nearly 80% of the precipitation is lost via evapotranspiration. Model calibration and sensitivity analysis were performed with SWAT-CUP tool and the model was calibrated against measured monthly discharge between 2008-2012. Analysis results show that model is quite sensitive to curve number assigned for runoff calculation and soil depth. This model application shows that SWAT can be useful tool to estimate the water budget in mine areas.

Keywords: SWAT, SWAT-CUP, Water Budget, Turkey