

ASSESSMENT OF INTEGRATED SURFACE WATER-GROUNDWATER A CASE STUDY AT PERLIS RIVER BASIN, MALAYSIA

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Abstract

The purpose of this study is to improve a simultaneous simulation of surface water and groundwater interaction to assess the implications for water management and propose primary solution approaches. The MIKE SHE model is performed for the Perlis river basins during 2016–2023. The results demonstrate that the model provides the overall water balance for Perlis river Basin. About 69% of the water returned to the atmosphere through the evapotranspiration for Perlis river, this value includes the water that evaporated from the soil and transpired through the plant. The evapotranspiration was high because of the major area is covered by agricultural and forest. About 2.22% and 2.82% of the precipitation was infiltrated and percolated respectively. The water that was able to infiltrate mainly return to the river via base flow. The canopy and snow were 0 while overland storage changes for Sungai Perlis are 7.26% of the precipitation and the total amount of error from the model was 0 indicating a satisfactory model performance. So it can be said that precipitation, evapotranspiration, infiltration and river/aquifer interaction were the main governing factors in the overall water balances. The net or actual recharge for the simulation period for Sungai Perlis Basin is 22 mm calculated from the net recharge/discharge. It is apparent from the water balance component that the major source of recharging groundwater is deep percolation from UZ to SZ which is comprised of rainfall recharge.

Keywords: surface water, groundwater, water balance, MIKE SHE, surface water and groundwater interaction.