

Hydrological Modelling to Identify Critical Erosion Areas in Geshlagh Dam Basin

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Abstract : A basin sediment yield refers to the amount of sediment exported by a basin over a period of time, which will enter a reservoir located at the downstream limit of the basin. The Soil and Water Assessment Tool (SWAT, 2008) was used to hydrology and sediment transport modeling at daily and monthly time steps within the Geshlagh dam basin in north-west of Iran. The SWAT model and Geographic Information System (GIS) techniques were applied to evaluate basin hydrology and sediment yield using historical flow and sediment data and to identify and prioritize critical sub-basins based on sediment transport. The results of this study indicated that simulated daily discharge and sediment values matched the observed values satisfactorily. The model predicted that mean annual basin precipitation for the total study period (413 mm) was partitioned in to evapotranspiration (36%), percolation/groundwater recharge (21%) and stream water (25%), yielding 18% surface runoff. Potential source areas of erosion were also identified with the model. The range of the annual contributing erosive zones varied spatially from 0.1 to 103 t/ha according to the slope and land use at the basin scale. Also the fifteen sub basins create the 60% of the total sediment yield between the all (102) sub basins. The results of the study indicated that SWAT can be a useful tool for assessing hydrology and sediment yield response of the watersheds in the region.

Keywords : erosion, Geshlagh dam, sediment yield, SWAT

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