**Application of the swat model on the Kalaya river basin (north of Morocco)**

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**Abstract**

Water erosion is a complex and widespread phenomenon mainly in semi-arid countries due to the torrential nature of rainfall, their spatial variability and the heterogeneity of soils as well as the adverse impact of human activities. The main objective of this work is to develop an agro-hydrological model for the basin of Kalaya located north of Morocco and covering an area of 3838 ha.

In order to quantify the rate of sediment, and assess the risk of erosion in the area, the SWAT model (Soil and Water Assessment Tool) have been chosen in this study. This distributed model physically based, developed by Agricultural Research Services of the USDA, is largely used in such a study, because of the reliability of its results. SWAT operates on a continuous daily time step and requires a large spatiotemporal database constitute of the Digital Elevation Model, land use, layers pedological and its characteristics and daily meteorological data.

The input data will be prepared through SIG’s tools, as well as the ArcSWAT tool was integrated in ArcGIS software by a way to facilitate the use of the prepared data. In SWAT, the basin will be discretized into sub-basins, which are then further subdivided into hydrological response units (HRUs) with homogeneous land use, soil type and slope.

The planned results will be the stream flows and the concentration of sediments during the period of study, which should be calibrated with field measurements to optimize the parameters of the SWAT. A second phase is the validation that would be subsequently made by comparison the simulated results with the observed, but for another period different to that one of the calibration phase, by using the optimized parameters.

**Key words:** water erosion, agro-hydrological modeling, SWAT, watershed, north of Morocco.