



Flash flood modeling in semi-arid region, using simulation of rainfall and runoff by HEC-HMS, to runoff estimate in a montagne watershed, case of Ghdat watershed high Atlas Morocco.

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High Atlas regions of Morocco are often subject to flash floods, and are constantly undergoing major human and material damage because of the heavy floods facing, this is linked to several factors that contribute negatively to the occurrence of violent and devastating floods.

In the Tensift watershed, the frequency of past floods and their future predictions require a critical consideration of flood risk. In fact, the frequency of floods is increasing because of climate change, for which modeling of the hydrological behavior of watersheds is inevitable when one is interested in issues related to the management of water resources.

The Ghdat sub-basin, a tributary of the left bank of the Tensift basin, is located in the center-west of Morocco, around the city of Marrakech, is a mountainous catchment area of 142 Km² which is an upstream sub-basin of the Tensift, is characterized by a semi-arid climate downstream and sub-humid on upstream. In this sub-basin only a few studies have been conducted to understand floods process while the vulnerability to floods is high. One of the most important tools for assessing the intensity of these floods is the modeling of rain events.

The purpose of this study is to simulate rainfall – runoff in the Ghdat watershed through the employing of HEC-HMS model. The frequency storm is used for the meteorological model the SCS-curve number is selected to calculate the loss rate and SCS-unit hydrograph method have been applied to simulate the runoff rate.

After calibration and validation, the simulated peak discharges were closed with observed values, the Nash Sutcliffe efficiency coefficient was 90.2%, which indicated that the hydrological modeling results are satisfying and accepted for simulation of rainfall-runoff. According to these results obtained the model HEC-HMS, proved that is effectiveness in the modeling of extreme events in semi-arid regions, this favor to the combination of the two under-modeled SCS-curve number and SCS-unit hydrograph used during the during calibration.

Keywords: flash flood, calibration, flood modeling, HEC-HMS, validation, Ghdat.