

## **Estimation of flash flooding runoff and hazards, using mathematical models, Case study (Aswan city)**

### **Abstract**

This study demonstrates the possibility of estimating the peak flood discharge and runoff in dry land that do not have flood measure stations, Using mathematical models to estimate the peak discharge.

Study aims to quantification of the flash flooding flow, by using mathematical models, in the absence of hydraulic monitoring stations of runoff, based on three of mathematical models, where each of them depends on a number of variables in the estimation of runoff, and these models are; Rational Method (CIA), Snyder Method and Soil Conservation Service Method(SCS).

Studying Lag Time, founding clear variations; increasing values of Lag time in the Snyder model for large basins areas, while semi similar values were founded in the rest of the models, also the small basins areas had convergent values in the three models, referring to the fact that these models are valuable in determination of Lag Time values of the basins area less than 100 km<sup>2</sup>.

Studying concentration time of the basins, large differences were existed in the values of large basins areas by models (Snyder, CIA), and semi-agreement in the values of the Concentration time for the rest of the basins, while in Snyder model for determination of the discharge rates of the small basins areas revealed high values which are not equivalent with the basins areas.

Finally, the study concluded that, the Snyder model fit for estimation of the flow rates of the large basins Area, while the models (CIA, SCS) give equivalent results in the basins less than 100 km<sup>2</sup> for the three variables, referring to their importance in the studying of the floods, taking in consideration the division of drainage basins more than 100 km<sup>2</sup> into secondary basins when using (CIA) Form to give more accurate results.

Soil Conservation Service (SCS) represented the best mathematical models, to be adopted on many variables( morphometrical or hydrological) in addition to land uses, so it can be used as a universal model in the floods studying ,especially as the most of the hydrological information systems programs depend on this model for many variables measurement.