

Event Based Flash Flood Simulation at Sunamganj using HEC-HMS

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Abstract

North East (NE) region of Bangladesh including Sunamganj, Habiganj, Netrokona, Kishoreganj and Brahmanbaria are highly vulnerable to flash flood. A major portion of matured Boro crops of the Haor region was washed away by a sudden flash flood in 2004 and 2010 by causing huge loss for the farmers. Also, in 2016, heavy rain has triggered flash flood in vast areas of Sunamganj causing damage to standing Boro crops. A strong and dedicated early warning system of flash flood forecasting with a considerable leading time for NE region is needed to decrease this enormous. In this study, a hydrological model of the Upper Meghna river basin with a drainage area of about 70000 km² has been set up using HEC-HMS under a research project on Developing Flash Flood Early Warning System, capacity Building and Knowledge Management for the Haor Region of Bangladesh. This is a part of Haor Infrastructure and Livelihood Improvement Project (HILIP). As an initial attempt, discharge at Sunamganj (Station ID: SW269) station have been used to simulate flash flood event which occurred during 14-22 April, 2016 by using rainfall of Cherrapunjee and Shillong station. For this event based simulation, SCS curve number method has been used to estimate runoff volume. It has been found that discharge at Sunamganj station was increased from 315 cumec to 915 cumec between 14 to 18 April, 2016-time period. Also, 195 mm per day rainfall at Cherrapunjee triggered the flow at Sunamganj station and from model around 3000 cumec discharge was found at that station. The simulated discharge has shown a quite similar pattern of 2004 and 2010 discharge for Sunamganj station. Further calibration of this model using observed flow of April 2016 for this station can make more improvement of this model. Also, after calibration and validation of discharge for other forecasting points in NE region and using real time precipitation data, this basin model may be used as tool for flash flood forecasting.

Key words: Hydrological model, flash flood, HEC-HMS, SCS curve number.

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