

Future Changes of Flash Flood in the North East Region of Bangladesh using HEC-HMS Modeling

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Bangladesh has been formed as the greatest deltaic plain at the confluence of the Ganges, Brahmaputra and Meghna and is highly vulnerable to flash Flood. Flash floods may occur at North East region from the surrounding hilly areas for minimum two to three times in a year. In this region, Sunamganj, Habiganj, Netrokona, Kishoreganj and Brahmanbaria are highly affected by this phenomenon. Boro rice cultivation is severely interrupted during flash flooding.

Hydrologic models have emerged as a basic tool for studying real processes in a watershed hydrologic system and systems responding to various climatic forcing. To understand the consequences of Flash flood due to climate changes, hydrological study of GBM basin is required. In this study, as an initial project, a hydrological model of Upper Meghna river basin with drainage area of 70263 km² is developed using HEC-HMS. HEC-HMS is a semi-distributed hydrological model that can be used to simulate precipitation-runoff process for both event based and continuous precipitation. The Statistical parameters such as NSE, PBIAS are within range for calibration and validation. The model developed in the study can be used as a tool to understand the effects of human intervention and changed climatic condition on flash flood in the basin area. Effects of climate changes in North East region are simulated by running the model using the future precipitation data for RCP 8.5 scenario. By using real time precipitation data from WRF model run, this basin model may use as tool for Flash Flood Forecasting purpose.