Development of Measured data Based Nomograph for Flood Warning System

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Both region and frequency of localized extreme rainfall (hourly rainfall 100mm) are increasing by climate change and geological effects. For this extreme event, the river basins are the most vulnerable where 85% of flood disasters are occurring every year. Specially, more than 90% of rivers flood disasters is occurred in the small river basins because its restoration ratio is relatively lower than both 70% of the local and 98% of the national rivers. But restoration projects for unmanaged small rivers may be finished by 2079 if budget is keep to amounts of 2019 continuously. In general, nonstructural measures like a flood warning system can be used for adaptation option as structural measures such as restoration projects may not easy with economic and environmental issues. This study developed the Small Stream Flood Warning System (SSFWS) support adequate response to reduce flood damages in the unmanaged small rivers. Developed system estimates channel depths and discharges by using measured based nomographs and rainfall data forecasted by the McGill Algorithm for Rainfall nowcasting using semi-Lagrangian Extrapolation (MAPLE). The nomograph is table type relationships between rainfall and discharges and depths which it is developed by measured data for two years from 2016 to 2017 in small rivers. In no proper rainfall case, only effective rainfall is considered to develop nomographs. This study also evaluated its estimating accuracy with discharges and depths data measured in 2018 flood season. The evaluation results show that estimating flow discharges and depth well represent the measured data. So, it is expected that measured data can be used for enhancing the SRFWS to estimate flow discharges and depths in the small streams.

Keywords : small stream test basin, small stream flood warning system, Nomograph, MAPLE estimated rainfall, effective rainfall