

Rainfall and Flood Forecast Models for Better Flood Relief Plan of the Mae Sot Municipality

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Abstract : This research was conducted in the Mae Sot Watershed whereas located in the Moei River Basin at the Upper Salween River Basin in Tak Province, Thailand. The Mae Sot Municipality is the largest urbanized in Tak Province and situated in the midstream of the Mae Sot Watershed. It usually faces flash flood problem after heavy rain due to poor flood management has been reported since economic rapidly bloom up in recently years. Its catchment can be classified as ungauged basin with lack of rainfall data and no any stream gaging station was reported. It was attached by most severely flood event in 2013 as the worst studied case for those all communities in this municipality. Moreover, other problems are also faced in this watershed such shortage water supply for domestic consumption and agriculture utilizations including deterioration of water quality and landslide as well. The research aimed to increase capability building and strengthening the participation of those local community leaders and related agencies to conduct better water management in urban area was started by mean of the data collection and illustration of appropriated application of some short period rainfall forecasting model as the aim for better flood relief plan and management through the hydrologic model system and river analysis system programs. The authors intended to apply the global rainfall data via the integrated data viewer (IDV) program from the Unidata with the aim for rainfall forecasting in short period of 7 - 10 days in advance during rainy season instead of real time record. The IDV product can be present in advance period of rainfall with time step of 3 - 6 hours was introduced to the communities. The result can be used to input to either the hydrologic modeling system model (HEC-HMS) or the soil water assessment tool model (SWAT) for synthesizing flood hydrographs and use for flood forecasting as well. The authors applied the river analysis system model (HEC-RAS) to present flood flow behaviors in the reach of the Mae Sot stream via the downtown of the Mae Sot City as flood extents as water surface level at every cross-sectional profiles of the stream. Both models of HMS and RAS were tested in 2013 with observed rainfall and inflow-outflow data from the Mae Sot Dam. The result of HMS showed fit to the observed data at dam and applied at upstream boundary discharge to RAS in order to simulate flood extents and tested in the field, and the result found satisfied. The result of IDV's rainfall forecast data was compared to observed data and found fair. However, it is an appropriate tool to use in the ungauged catchment to use with flood hydrograph and river analysis models for future efficient flood relief plan and management.

Keywords : global rainfall, flood forecast, hydrologic modeling system, river analysis system

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