Planning of the diversion channel for flood mitigation by using river analysis simulation model in Pasak`s river basin THAILAND

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The study of diversion channel planning for flood mitigation in agricultural land particularly for paddy field was carried out on the upper Pasak River Basin in Phetchabun Province, Thailand.

Mathematical simulation model for river analysis system (HEC-RAS) was applied for the estimation of main hydraulic parameters of its river channel and used for the appropriated sizing of the river's diversion channel in order to reduce flood depth over its floodplain during inundated season. Existing hydrological data based on daily recorded during flood period was collected. The results found that the Manning roughness coefficient (n-value) as for the main hydraulic parameters of the river channel and its riverbank were found rather high of 0.055-0.095 and 0.060-0.100, respectively. The discharge capacity of its river channel at the bankfull level was only 133 cu.m/s.

Therefore, most every 2 years of flood event caused by overbank flow larger than 150 cu.m/s was found. Flood events in 1997, 2001, 2002 were chosen for the calibration and verification the model with the inundated depth of 1.5, 1.7, 2.4 m, ponding time of 23, 9, 37 days, peak discharge of 155, 160, 189 cu.m/s, and return period of 4.5, 5.4, 15.3 years, respectively. The appropriated sizing of the diversion channel's cross-sectional area for the capacity of 50 cu.m/s was based on the result by using HEC-RAS and safe for flood lost in agricultural area with the return period of 15 years. Flood depth could be reduced from previous peak levels with 1.23, 0.98, 0.49 m in 1997, 2001, 2002, respectively.