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KEY WORD: RAINFALL-RUNOFF

CHUTIPHON PUKDEBOON : A MATHEMATICAL MODEL FOR RAINFALL-RUNOFF  
RELATIONSHIP IN A SMALL WATERSHED. ADVISOR : ASST. PROF. JACK ASAVANANT,  
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Rainfall-runoff relationship in watershed is very important in area development planning , especially for water- use activities and flood analysis. Runoff forecasting requires appropriate method with available data and watershed characteristics.

This study involves model representing mathematical relationship of rainfall-runoff in small watershed. The main objective is to seek appropriate model that is applicable to the study area. The upper part of Mae Tun watershed covering the area of approximately 503 sq. km. of Amphur Omkoi in ChiangMai Province is selected as a case study area. Procedure for conducting this study consists of collecting data, analyzing data, testing and verifying the model. Two different mathematical models are considered. The first one is the HEC-HMS model. It determines the relationship of rainfall-runoff by using functions of parameters and variables determined from physical characteristics of the watershed. The other is the Tank model. This model depends completely on the runoff data.

From the HEC-HMS model, it is found that the lump system with rainfall data from 3 stations is appropriate model for the runoff calculations according to the given rainfall data and the size of watershed. Under different rainfall intensity, two sets of input data for dry and wet periods are selected. The HEC-HMS model gives good results for long time simulation. This suggests that the model may be used for agricultural planning in the study area. On the other hand, the Tank model gives better results of peak flow rate in the short time simulation. This implication suggests the use of Tank model in flood forecasting. In summary, these two rainfall-runoff model can lead to future land-use development of this study area.