

Fatah Masthawee 2014: Application of Artificial Neural Networks (ANNs) and FY-2E Satellite Image for Rainfall Estimation in Thailand. Master of Science (Watershed and Environmental Management), Major Field: Watershed and Environmental Management, Department of Conservation. Thesis Advisor: Mr.Piyapong Tongdeenok, Ph.D. 106 pages.

The objectives of this research were estimate brightness temperature from remotely sensed data as FY-2E satellite, and evaluate rain rate amount by using Artificial Neural Networks (ANNs) model. The brightness temperature belong to satellite wave length were limiting parameter in ANNs model and correlated with automatic rainfall field recording data. The percentage error and root of the mean square error (RMSE) were employ to calibration and validation approach. The data were compile during 1 July to 31 December 2010 and bands resolution within FY-2E were used as IR1, IR2, WV and IR4 for find out brightness temperature.

The results showed that the average monthly brightness temperature highest appeared in winter season and lowest was in rainy season due to the wetness of land cover affected to decrease surface temperature. The relationship between brightness temperature and rain rate were no significant in every region of Thailand due to rainfall amount were cause from various factors and atmospheric condition. The ranged of correlation between rainfall estimation and observation was moderated to high as 58 – 99 percentage which high correlation in heavy rainy period and moderately showed in dry period. The model calibration and validation were found that the relationship seem to be low with ranged 29.96 to 40.72 of parameter error and 29.07 to 45.62 of RSME respectively.

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