Potential surface runoff from various land use patterns at Sakaerat Environmental Research Station, Ampur Pak Thongchai, Nakhonratchasima.

KASEM CHUNKAO, NIPON TANGTHAM, SAMAKKEE BOONYAWAT, WICHA NIYOM and SITTHICHAI TANTANASARIT.

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ABSTRACT

Four small watershed at the SERS namely: Huay Wanasart (1.45 sq.km; covered with dry evergreen forest), Huay Kokped (2.01 sq.km; covered with dry dipterocarpforest), Hauy Pae and Hauy Namkhem (13.5 sq.km; mix land use) and Huay Tayoo (0.31 sq.km; old clearing), were employed to study the stream flow characteristics of various land use patterns. The investigation had been carried out since May 1978 through December 1982 Current meter and 120–V-Notch weirs with recording staff gage used for stream flow measurement.

The results show that in 1978, which was the wet year, the average potential of surface runoff for the mentioned watershed was 38,000, 1,200, 304,000 and 466,000 cubic meters per square kilometer per annum respectively. In 1979 when the druoght occurred in this area with an annual rainfall of 837.3 mm., the annual flow was estimated to be 21,000; 700; 9,000; and 59,000 cubic meter per squarekilometer for the mentioned watersheds respectively. Flow characteristics in 1980 to 1982 with supposed to be the best representative for this study area indicate the average annual surface runoff at 35,000; 1,000 ; 56,000 and 223,000 cubic meters per square kilomater for Hauy Wanasart, Hauy Kokped, Hauy Namkhem and Hauy Tayoo respectively. Based on average to be about 3.08, 0.09, 4.92 and 19.60 percent for the said watershed respectively.

Annual flow period of each watershed was indicated at Hauy Wanasart as perennial stream, Hauy Pae about 8-11 months (May – January), Hauy Tayoo about 4-7 months (May-November). In generally, the annual flow period of this watershed area is 4 months(September through December), and water flow showed occasionally after a large rainstorm at Hauy Kokped. Unfortunately, when the drought occupied the area in 1979, the flow period was shortened and found that flow period at Huay Pae is about 5 months (April-May and September-November) 4 months for Huay Tayoo (April-May

and September-October), and water still flows continuously at Huay Wanasart, but stream water found once in a while at Huay Kokped as similar as the normal situation in this area.

Lagtime of all type of land use was approximated to be about 18 hours for Huay Wanasart, 6 hours for Huay Pae, 90 minutes for Huay Tayoo, and 30 minutes for Huay Kokped. The lag time estimated for the whole area at the SERS was roughly about 69 houre and 30 minutes. The quantity of rain water plays the essential influence on the variation of lag time. Anteceoent rainfall and consecutive time of rian shortage showed a in significant role in flow phonomona.

Analysis of physical soil properties also indicated that high content of stone, gravel, and sand; but quantity of silt and clay, high amount of macroperes and a lot of cracks between rocks, and the distribution of rock outcrop especially in the dry-dipterocarp forest. Cause the rain which falls in the SERS yield very small amount of stream water. Large amount were lost by leakage into underneath of the ground as well as some of them may transfer into sky.