CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

After considering of the foregoing discussion of results which are described in Chapter V, the following conclusions can be drawn :

6.1.1 The magnitude of the annual flood usually increases with the increase in size of the basin area, except in some cases when the effect of the orographic condition and other physical characteristics of the basin exert a greater influence.

6.1.2 Each studied factor influencing the flood flow in the Mae Klong river (among them : basin area, shape number, drainage density and the slope of the main stream) usually exerts the effect which is interelated with the effects of the other factors. This shows that their effects on the flood flow are only approximate.

6.1.3 Among the four basin characteristics used in this study, the basin area and the slope of the main stream are the two main factors affecting the flood flow at any return period in the Mae Klong river. The shape number and the drainage density exert lesser influence than the

basin area and the slope of the main stream. The drainage density is the factor least affecting the flood flow.

6.1.4 The relationship between the annual flood at T-yr. return period (Q_T), the basin area (A), the shape number (S_n), the drainage density (D) and the slope of the main stream (S) can be shown by the equation

$$Q_T = K A^{n_1} S_n^{n_2} D^{n_3} S^{n_4}$$

where K, n_1 , n_2 , n_3 and n_4 are the constants for a particular year of return period. These constants for the return period of 2, 2.33, 5, 19, 20, 50, 100, 500 and 1000 years are given in Table 4.4.1 - 4.4.9.

6.1.5 The relationship between the basin area, the slope of the main stream, the lengths L and L_c can be shown by the equation

$$A = 1.14443 \left(LL_c / \sqrt{S} \right)^{0.633}$$

where A = basin area in sq.km.

S = slope of the main stream

L = length of the main stream in km.

L_c = length in km. along the stream from the outlet to a point nearest the centroid of the basin

6.2 Recommendations

Based on this investigation, the hydrologic knowledge about the runoff in the Mae Klong basin is improved and increased, but still inadequate. Further investigations should be carried on as follow :

6.2.1 Study the effect of the rainfall in the Mae Klong basin on the flood flow at any return period.

6.2.2 Study an enlarged exponential equation of the annual flood at T-yr. return period by including the lengths L and L_c, and possibly with an exclusion of the shape number and the drainage density. By these, the form of the equation of a multiple regression line will be

$$Q_T = K A^{n_1} S^{n_2} R_T^{n_3} L^{n_4} L_c^{n_5}$$

where A = basin area

S = slope of the main stream

R_T = annual daily maximum rainfall at T-yr. return period

L = length of the main stream

L_c = length along the stream from the outlet to a point nearest the centroid of the basin

K, n = constants for a particular year of return period

6.2.3 Study the unit hydrograph of the flood flow in the Mae Klong river, by considering the hydrograph characteristics such as the peak flood discharge, the flood arrival time and the time base of hydrograph. Each hydrograph characteristics should be found in the term of the basin characteristics, and may be expressed in the following forms :

$$t_p = k_1 \left(LL_c/S \right)^{n_1}$$

$$t_b = k_2 \left(LL_c/S \right)^{n_2}$$

$$q_p = k_3 \left(A/t_p \right)^{n_3}$$

where A = basin area

L = length of the main stream

L_c = length along the stream from the outlet to a point nearest the centroid of the basin

S = slope of the main stream

t_p = flood arrival time or time to peak

t_p = time base of hydrograph

q_p = peak flood discharge

k,n = constants for the basins of similar hydrologic characteristics.