

Rapeepong Lertwattanakul 2014: Assessment of Soil Loss in the Upper Ping River Basin. Master of Engineering (Water Resources Engineering), Major Field: Water Resources Engineering, Department of Water Resources Engineering. Thesis Advisor: Associate Professor Nuchanat Sriwongsitanon, Ph.D. 154 pages.

This research aimed to evaluate soil loss in the Upper Ping River Basin (UPRB) using the Revised Universal Soil Loss Equation (RUSLE). There are six factors involved in the equation consisting of: (1) rainfall erosivity factor (factor R), (2) soil erodibility factor (factor K), (3) slope length factor (factor L), (4) steepness factor (factor S), (5) land management factor (factor C), and (6) support practice factor (factor P). The factors L and S were evaluated together since the required data are related, while the factor P was omitted by specifying as 1. Data used for an application include: (1) average annual rainfall depth at 61 stations located within the study basin and its surroundings, (2) soil particle size, (3) Digital Elevation Model (DEM) and (4) land cover.

The results showed that the average soil loss rate in the UPRB is approximately 3.71 tons/hectare/year. The maximum rate is around 6.59 tons/hectare/year evaluated at the Lower Mae Cham sub-basin according to its high LS value (only lower than the Upper Mae Cham and Mae Tang sub-basin), which is the most dominant factor affecting the soil loss rate. Mae Kuang sub-basin shows the minimum rate of around 1.75 tons/hectare/year because of its lower LS values compared to other sub-basins. Moreover, an investigation of the influence of each factor on soil loss rate at each sub-basin of the UPRB was also carried out in this study. The results show that factors C and LS have higher effects on soil loss rate than factors R and K. However, factors R, K and LS cannot be changed because these factors are the natural characteristics of the basin. Therefore, only factor C was investigated for its variation in this study for finding soil loss rate reduction measures for the UPRB. The study results show that once the factor C was reduced to the value of 0.0320 (a minimum value evaluated at Mae Tang sub-basin), soil loss rate would reduce to be 2.13 tons/hectare/year which is around 50% less than the normal rate. Various measures are needed to improve soil conservation practices which are needed to be carried by related central and local government agencies as well as land owners to be able to overcome the target quickly and successfully.

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