Thesis Title   Comparative Study of Soil Loss Estimation by

Universal Soil Loss Equation (USLE) and Runoff Plots

at Nan Watershed Area, Northern Thailand.

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ABSTRACT

Comparative study of soil loss estimated by using Universal Soil Loss Equation (USLE) and runoff plots of Nan watershed area at Nan Watershed Research Station, Amphoe Wiangsa, Nan Province was carried out during 1990 to 1992 in 14 runoff 4×20 m^2 plots with various types of landuse on soil type of Tha Yang/Lat Ya Series Association with 17.5 percent slope at elevation of 500 m. above mean sea level. Rainfall erosivity factor (R) in USLE, Cropping management factor (C), Soil erodibility factor (K) from nomograph including soil erodibility factor from up and down hill continuous fallow on bare soil plots have also been computed. The results of the above-mentioned study are as following:

The appropriated rainfall erosivity factor (R) in USLE is EI_{30} index which being the highest correlation coefficient value (r) of 0.653 followed by index KE>1 and AI_m of 0.607 and 0.470 respectively. Soil erodibility factor (K) from up and down hill continuous on bare soil plots (0.01) is lower than value estimated by nomograph (0.37).

Cropping management factors (C) in mixed deciduous forest, swidden area, upland rice field, soybean, corn growing plots, and 3-year teak plantation are 0.587, 0.031, 0.495, 0.441, 0.369 and 0.170 respectively.

The amount of soil loss estimated by using Universal Soil Loss Equation (USLE) with soil erodibility factor from nomograph is about 104 times greater than those in runoff plots. By using soil erodibility obtained from up and down hill continuous fallow on bare soil plots, the estimated amount of soil loss computed by using USLE is only 2.72 times higher than value recorded from the existing sample plots. However, the correlation of computed soil loss from USLE formula (X) and actual soil loss (Y) is $Y = 0.012 X - 0.206$ (r= 0.722)

In this situation, if we suppose to use the USLE formula for predicting soil loss, it is better to use soil erodibility factor obtained from the field instead of from nomograph