

The Effect of Land Use Types on The Potential Erosion and Sediment Yield of The Mansahaban River Catchment, Ranau, Sabah

ABSTRACT

The effect of land use types on the potential soil erosion and sediment yield in a small catchment of the Mansahaban River, Ranau area was studied. The potential soil loss in the Mansahaban sub-catchment area was predicted using the Revised Universal Soil Loss Equation (RUSLE) erosion and the Modified Universal Soil Loss Equation (MUSLE) sediment yield model. The land use in the Mansahaban River sub-catchment can be grouped into five types, namely secondary forest, development, scrub, grassland, and paddy fields with area width of 1294.21, 9.24, 459.62, 80.20, and 1034.01 ha, respectively. The amount of predicted potential soil loss (A) using the RUSLE model in decreasing order under development area, grassland, scrub, secondary forest, and rice fields land use were of 701.20, 21.54, 12.55, 3.27, and 2.02 t ha⁻¹ yr⁻¹, respectively. Potential soil loss were classified as very low to very high. Sediment yield (SY) calculated using potential soil loss (A) multiplied by the sediment delivery ratio (SDR) showed values of 280.82, 6.78, 3.26, 0.76, and 0.48 t ha⁻¹ yr⁻¹, respectively, with a total amount of 291.30 t ha⁻¹ yr⁻¹. The amount of sediment yield (SY) calculated using the MUSLE formula were very low for all land uses total only at 3.67 t ha⁻¹ yr⁻¹. Development land use covered a small size but produces a high soil loss potential due surface exposure and lack of conservation measure. This study showed that conversion of forested land by opening the land without proper mitigation measure increase soil loss that reach the water body.