

Determination of nutrients in stream-water and deposited sediment
from various types of land use at SERS.

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ABSTRACT

The determination of nutrients in stream-water and deposited sediment from three types of land use; dry evergreen forest (Huay Wanasart), old clearing area (Huay Tayoo) and swidden area (Huay Nakhem) was carried out at Sakaerat Environmental Research Station (SERS.) during June, 1979 to 1980. Stream-water and deposited sediment was collected at 3rd week of each month for analysing the concentration of ammonia and ammonium ($\text{NH}_3\text{-N}^+$, $\text{NH}_4^+\text{-N}$), nitrate ($\text{NO}_3^-\text{-N}$) and phosphate ($\text{PO}_4^{3-}\text{-P}$) ions.

The results indicated that the concentration of $\text{NH}_3\text{-N}^+$, $\text{NH}_4^+\text{-N}$, $\text{NO}_3^-\text{-N}$ and $\text{PO}_4^{3-}\text{-N}$ in stream-water and deposited sediment from the swidden area had the largest variation, smaller in the old clearing area and the smallest in the dry evergreen forest. The average annual concentration of $\text{NH}_3\text{-N} + \text{NH}_4^+\text{-N}$ stream-water drained from the swidden area, the old clearing area and the dry evergreen forest were 33.06, 31.10 and 9.91 $\mu\text{g/l}$ respectively. The average annual concentration of $\text{PO}_4^{3-}\text{-P}$ in stream-water drained from the swidden area, the clearing area and the dry evergreen forest were 6.19, 3.12 and 1.96 $\mu\text{g/l}$ respectively. The average annual concentration of $\text{NO}_3^-\text{-N}$ in stream-water drained from 3 various land uses showed the different pattern from those nutrients, i.e. highest in the dry evergreen forest (7.00 $\mu\text{g/l}$), a little lower in the swidden area (6.78 $\mu\text{g/l}$) and the lowest in the old clearing area (1.42 $\mu\text{g/l}$).

The average annual concentration of those nutrients in deposited sediment from the mentioned three subwatersheds were found that the $\text{NH}_4^+\text{-N}$ and $\text{NO}_3^-\text{-N}$ were highest in deposited sediment derived from the old clearing area (80.68 and 44.57 mg/l respectively) lower

in the swidden area (62.04 and 25.71 mg/l respectively) lowest in the dry evergreen forest (60.90 and 20.45 mg/l respectively). The concentration of $\text{PO}_4^{3-}\text{-P}$ in deposited sediment was highest in the dry evergreen forest (2.40 mg/l), lower in the swidden area (1.40 mg/l) and the lowest in the old clearing area (1.42 $\mu\text{g/l}$).

It was clear that the land that used for agriculture and swidden area could effect somewhat degree of quantity on the mentioned nutrients in stream-water. However, the stream-water from these study areas can be utilized for drinking and for other activities without toxicity if the activities in each area still going on within this limit.

This study revealed that changing the land use from natural forest into land for agriculture and swidden area would effect in quality of water, which may be deteriorate if practicing without conservation measures. Hence, protection of deforestation and introduction of the suitable agricultural practices so that quality water resource could be in good condition forever.