Impacts of forest conversion on nitrogen cycling in northeastern Thailand.

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ABSTRACT

Three small-watersheds at the Sakaerat Environmental Research Station (SERS) in northeastern Thailand which covered by dry evergreen forest (DEF), swidden area (SA) and agriculture mixed with dry evergreen forest (ADEF), were employed to study the impact of land use changes on N-cycling. The cycling of N in each watershed ecosystem was described based on the budget of NH_4-N in input-rainfall, and output-streamflow. The intrasystem cycling was determined from the NH_4-N in throughfall, stemflow, amount of total nitrogen in litter and in soil profile. Stability of watershed ecosystem reflecting degree of forest disturbance was evaluate from the net gain or loss of N of each watershed. Results indicated that annual amount of NH_4-N in input-rainfall was 1.564, 5.015 and 9.945 kg/ha, and in output-streamflow was about 0.058, 0.078 and 0.223 kg/ha for the DEF, ADEF and SA ecosystems respectively. The storage of nitrogen in each ecosystem was thus found to be about 1.507, 4.937 and 9.722 kg/ha/annum respectively. Annual amount of N in intrasystem cycling was largest in SA ecosystem followed by DEF and ADEF ecosystem. It can be, therefore, theoretically said that watershed which covered by DEF has the strongest ecosystematic stability followed by those areas covered by ADEF and SA respectively. This study confirmed that changing the land from natural forest into land for agriculture and/or left it as swidden area could more or less affect on N-cycling which consequently contribute to the pollution of stream water.