SIMULATION NUTRIENT LOAD UNDER CLIMATE CHANGE CONDITION AND DEFORESTATION SCENARIOS IN PHU LUONG WATERSHED, VIET NAM

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TÓM TẮT:

The purpose of this paper is to apply "Soil and Water Assessment Tool (SWAT)" model to simulate the impacts of climate change and deforestation on nutrient (nitrogen and phosphorus) yield from Phu Luong watershed in Northern Viet Nam. Among the three climate change scenarios B1, B2 and A2, which represented low, medium, and high levels of greenhouse gas emission respectively, were set up for Viet Nam. The B2 scenario was selected for this study. Two land use scenarios (S1-2030 and S2-2050 which converted 4.43%, and 13.40% forest-mixed land into agricultural land, respectively) were formulated by combination with climatic change in SWAT simulation. In B2 climate change scenario, mean temperature increases 0.7 oC (2030) and 1.3 oC (2050); annual rainfall increases 2.1% (2030) and 3.80% (2050) with respect to baseline scenario. The results showed that monthly Nash-Sutcliffe coefficient of Efficiency (NSE) ranged from 0.81 to 0.96 and percent bias (PBIAS) ranged from -7.88 to 9.38. Additionally, SWAT simulation results also showed that climate change and deforestation caused significant percentage of changes in total N and P loads within Phu Luong watershed.