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APPLICATION OF THE AGRO-HYDROLOGIC SWAT MODEL ON THE TAABO RIVER BASIN (CÔTE D'IVOIRE) TO EVALUATE THE EFFECT OF THREE VEGETATIVE FILTER STRIP SCENARIOS ON STREAMFLOW AND NUTRIENT

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Abstract

Côte d'Ivoire is one of the world's leading producers and exporters of agricultural products. Unfortunately, the multiplicity of stakeholders in this sector and the absence of legislation and regulations have contributed to the pollution of the various hydro systems, particularly those of Taabo river basin. The purpose of this study was to assess the ability of the Soil and Water Assessment Tool (SWAT) model to test the applicability of three vegetative filter strips scenarios to minimize nutrient loads downstream of the emission fields. The model calibration (1982-1986) and validation (1987-1990) were performed for daily time periods using mathematical algorithm Sequential Uncertainty Fitting, version 2 (SUFI-2) included in the SWAT-CUP software. SWAT model produce a good simulation performance because it offered realistic simulations of streamflow both in calibration ($NS \geq 0.67$ and $R^2 \geq 0.68$) and validation ($NS \geq 0.6$ and $R^2 \geq 0.6$). Then, three scenarios of vegetative filter strips in sensitive sub-basins were examined. The implementation of these vegetative filter strips could have a positive impact on nutrient flows. Nevertheless, scenario 2 with a ratio of, field area and vegetative filter strip of 50, appears to be the most suitable for the agro-climatic conditions of the Taabo river basin.

Keywords: Côte d'Ivoire, modelling, nutrient, SWAT, Taabo river basin, vegetative filter strips

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