Multi-site and multi-approach sediment transport modeling in tropical watersheds

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Land degradation and poor watershed management have been the major factors that led to severe soil erosion and hence sedimentation in receiving water bodies and reservoirs. The environmental impacts of sediment transport and loading is highly pronounced in tropical watersheds where rainfall is erratic and torrential and soil and conservation measures are poor. In this study, a soil erosion, sediment yield and transport modeling were conducted in three tropical watersheds in Ethiopia and Kenya. Field plot experiment, model development and evaluation were conducted. The impact of land use, rainfall intensity and slope were evaluated at plot and watershed scales. Three models (WEPP, SWAT and Erosion 3D) were tested and compared. The results indicate that the models performed differently with Erosion 3D and WEPP performed better in sediment load simulation. In the absence of the observed sediment data, sediment rating curves developed and validated were useful and are promising.

Keywords: Sediment flux, Sediment modeling, Erosion 3D, SWAT, WEPP, Tropical watersheds

