

## **ASSESSMENT OF RIPARIAN BUFFERS FOR PROTECTING STREAMS FROM SMALL AND LARGE SCALE AGRICULTURAL DEVELOPMENTS IN KENYA**

E.W. Tollner\* and Herbert Ssegane

Department of Biological and Agricultural engineering  
University of Georgia  
Athens, Georgia USA  
btollner@engr.uga.edu; 706-542-3047

This research is part of a USAID project to protect Fisheries in Lake Victoria, the World's second largest source of fresh water from Agricultural Pollution. Sedimentation, nutrient runoff, and biomass burning have induced rapid eutrophication of Lake Victoria, leading to decreased productivity in the lake's fishery industry. The project site is the Nzoia river basin (Moiben watershed) where soil erosion degrades the land and drains millions of fertile soil into Lake Victoria. Documented studies show that river Nzoia contributes the most sediment loading to Lake Victoria from the Kenyan catchment mainly because of its high discharge of  $118\text{m}^3/\text{s}$  (48% of the total). The total suspended solids contributed by Nzoia are in the magnitude of 2,504,367 tonnes/year. The project evaluates the impact of streamside cultivation on water quality using GoogleEarthPro as a remote sensing tool for monitoring and extracting basin characteristics, the Universal Soil Loss Equation (USLE) for erosion prediction, and Environment Protection Agency (EPA) - Sediment Delivery Ratio (SDR) for predicting sediment yield. Typical maps are shown in Figure 1. Both the USLE and the EPA-SDR models are developed using TK Solver program. Several study sites have been analyzed with varying riparian width (0 – 300m) and a riparian cover percent of 5% - 75% of the respective catchment areas. Results for a typical analyses are shown below. Also a predominantly row crop agriculture (Sugar cane production) zone was considered. Typical results of the investigation are shown in Table 1 for one of several sites investigated. The preliminary project findings indicate that Agricultural pollution appears not to be a significant problem now, but could become so with time in the cane production region; a socially workable strategy for implementing riparian zones may be to increase the nominal 30 m thickness but allow local use of the riparian zones. Industry and municipal waste pose a far greater danger to the fishery than the Agricultural Pollution; and Google Earth Pro appears useful for initial surveys.