

ABSTRACT

Influence of Land Use Activities on Riparian Vegetation, Soil and Water Quality: An Indicator of Biodiversity Loss, South West Mau Forest, Kenya

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Watershed and riparian areas of Mau Forest Complex in Kenya are experiencing increased threats due to unsustainable land use activities geared towards economic growth amidst growing population. This study was carried out to examine effects of land use activities on riparian vegetation, soil and water quality along two major rivers (Chemosit and Kipsonoi) of South West Mau Forest (SWMF). Land use activities adjacent to these rivers and biodiversity disturbance on the riparian zone were identified and underpinned to changes on Total Nitrogen, Total Phosphorous, Potassium, Sulphur, Cadmium, Copper, Lead, Total Suspended Solids and soil Organic Carbon. Three sampling sites designated (upstream, midstream and downstream) were identified and established along each river as guided by existing land use activities represented by forest, tea plantation and mixed agricultural farming respectively. At each sampling site, a 200 m × 50 m section was systematically marked on each side of the river bank; the longest side being parallel to the river flow and divided into three belts transects each 20 m × 50 m, spaced 70 m apart. Six distinct land use activities (indigenous forest, food crop, tree and tea farming, livestock keeping and urban settlement) were identified as the major land use activities in SWMF. Plant species richness decreased and overall riparian disturbance increased from upstream (intact canopy with native vegetation) to mid-stream and downstream as epitomized by the structure, biodiversity disturbance resulting from extensive and intensive farming, intrusion of exotic species to livestock grazing and urban settlement. Variation among sampling sites in Total Suspended Solids, pH, Total Nitrogen, Phosphorus and Potassium were associated to different land use activities along the riparian zone. Total Nitrogen and water pH showed significant sensitivity to land use changes ($p < 0.05$). Put together these results indicate loss of biodiversity, riparian disturbance hence a need to adopt environmental-friendly land use planning and sustainable farming systems in SWMF.

Keywords: Mau Forest, Riparian Vegetation, Kenya