Geophysical Research Abstracts, Vol. 9, 08422, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08422

Hydrology and Land Cover changes of the Nyando River Catchment, Kenya

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ABSTRACT

The demand on available resources has significantly altered our environment. Studies concerning the anthropogenic impact on the environment (particularly land cover change) in Lake Victoria basin are in their infancy. This study analyses the process of human induced landscape transformation on Nyando river catchment ($3517Km^2$) in the Lake Victoria basin and the effect on the Winam Gulf. Hills, scarps, plateaus and a plain area characterize the watershed. The spatial and temporal change patterns of land use were quantified by interpreting remote Sensing (RS) data and used a geographical information system (GIS). Landsat images (1973, and 2000) were used to classify the catchment into five land use classes: bare ground, water body, agricultural land, dense forest and sparse forest using supervised classification in ENVI. During the last 32 years, the vegetal cover was altered drastically with increasing population pressure (both human and animal), agricultural activities and wood extraction, results have shown that the area covered by dense forest has reduced while the area covered by sparse forests, agricultural land and likewise bare ground (which includes eroded areas) has increased. Time series data (1960- 1998) at the river mouth reveal increasing seasonal difference and decreasing annual trends of stream flow. Despite the decreasing vegetation cover, the annual flow has a decreasing trend due to water abstraction and channeling. Sediment plume on the Gulf has increased upto 20km into the Lake, during this period.

KEYWORDS: Land cover, RS, Hydrology, Kenya