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Investigating the impact of land use change on river flows
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The study was carried out in the Nyangores catchment located between 35.78° E and 0.43° S in southwest Kenya. This study utilized remote sensing and geographical information system (GIS) tools, and hydrological and ground-truth studies to investigate the spatio-temporal information on the status of land use/ cover changes and corresponding hydrological variability at the sub catchment level and evaluate the impacts of these changes on hydrological regime of the catchments over the period of study. Integrated Land and Water Information Systems (ILWIS) was used to classify the Land sat images of 1986 and 2006. Agricultural land increased by 80%, forest reduced by 53.01%, savanna reduced by 73.79% and tea reduced by 86.6%. Base Flow Index Program was used to separate the flow so as to ascertain the changes in the contribution of the sub surface flow over the period of study. Statistical analysis was also performed on the flow data to calculate the Excess Flow Volume generated due to land use change. The results shows that the base flow index of 1986 was 0.710 and 2006 base flow index is 0.606 indicating increase in runoff and reduction in base flow due to degradation in the headwater. The Excess Flow Volume for the period's preceding massive deforestation was found to be increasing indicating that Land use change has contributed to changes in stream flows. The study has shown that human activities have resulted in changes in flow regime of Nyangores River. This calls for integrated approach in land use policies.