

ABSTRACT

This work assesses land cover changes on the Upper Runde sub-catchment, Zimbabwe, and associated effects on sedimentation rates and risks. The model was implemented using the common Geographic Information Systems tools. To achieve this objective, mean annual and monthly rainfall, as well as sediment data, were used (December 2016 and April 2017). Land use and land cover changes were assessed using time-series Landsat data acquired between the years 2000 and 2016. The Revised Universal Soil Loss (RUSLE) model was used to model sedimentation rates in the catchment. Land cover results showed that the catchment experienced significant ($\alpha = 0.05$) changes during the period of monitoring. For example, forests and woodlands decreased by 39% and 23% between 2000 and 2016, respectively. Sedimentation results indicated that the catchment had an average sediment load of 6272 mg/l as compared to the expected maximum of 3000 mg/l. RUSLE soil loss simulation results showed an increase in average soil loss from 1.2 ton/ha/yr. in 2000 to 1.7 ton/ha/yr. in 2016 and an increase in sediment yield by 19.2% from 3476 mg/l in 2000–4144 mg/l in 2016. Overall, the findings of this study demonstrate that the catchment experiences high sedimentation. Therefore, catchment sediment monitoring and soil conservation actions should be a priority..