Assessment of fire induced landcover changes on soil loss in Sehlabathebe catchment: the case of Qacha's Nek district, Lesotho

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Lesotho's rangelands are under severe pressure of inadequate management and rapid loss of productive and very fertile soils derived from mineral-rich basalt rock which has over the years sustained palatable grass species such as *Themeda trianda*. Degradation of the natural grazing lands of Lesotho is largely due to changing land use patterns due to uncontrolled burning (MFLR, 2014). The fires are anthropogenic and practiced by herd boys as a form of initiating early growth of grass. This study is aimed at investigating the land cover changes that have occurred in Sehlabathebe Catchment with reference to the occurrence and severity of the uncontrolled fires. This was achieved by mapping frequently burnt areas from 2002 to 2014 using MODIS burnt fire product satellite data. The severity of the fire was also investigated using the Normalised Burn Ratio Index and land cover change detection was undertaken using ENVI software. Soil loss due to reduction in vegetation cover was calculated using the RUSLE Model for the years 2000, 2007 and 2014 before and after the fires. The spatial and temporal mapping indicated that fires are most frequent in lower elevations on the south eastern side of the catchment during the dry season. The severity Index indicated that areas in the south eastern part of the catchment experience severe burns. Land cover change detection indicated a decrease in the Afromontane grasslands by 0.5% in the lower altitude. The 2000 average soil loss before fire was 14.92 ton/ha/yr whereas that after the fire was 27.12 ton/ha/yr. 2007 exhibited an increase with 28.4 ton/ha/yr before fire and 28.2 ton/ha/yr after the fire. The 2014 soil loss before fire 3.9 ton/ha/yr and after fire 5.8ton/ha/yr.