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Identifying land use and land cover dynamics in the Koga Catchment, Ethiopia, from multi-scale data and implications for environmental change

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This study analyses the 60 years land cover and land use changes and the implications on environmental change of the Koga catchment located in North Western Ethiopia. The data used include 1:50,000 scale aerial photographs, Landsat MSS, TM and ETM images, and ASTER images together with ground truth data collected through fieldwork survey and community elders' interview. Historical aerial photographs are an important source of data for long term land cover change analysis and have high spatial resolution for detailed land use and land cover classification, though do not provide such good spectral resolution as satellite images. Many land use land cover change studies are based on comparing the changes generated from data with different spatial scales and resolutions which makes the comparison difficult. This study applied image fusion techniques to bring the data sources in to a relatively similar scale for better land use and land cover classification. This bridged the gap of the different spatial scales of the different data sources and also produced images with relatively better spectral resolution than the aerial photographs and better spatial resolution for some of the satellite images for improved land use and land cover change detection.

It has been discussed by different researchers that land use and land cover change is increasingly being recognized as an important driver of environmental change in all spatial and temporal scales and current rates, extents and intensities of changes far greater than ever in history. This is especially true in the African context due to over dependence on primary resources. This study quantified the land use land cover changes and analyzed the implications on environmental change.