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Extent and Rate of Deforestation in West Bugwe Central Forest Reserve, Uganda

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Abstract

Forests play an important role in supporting social wellbeing and livelihoods. Forests and forest cover over most of sub-Saharan Africa is being cut down (deforestation) or converted into other vegetation or other land cover forms (degradation). Knowledge on the status of forest cover and how it has been changing is vital for developing the appropriate restoration and other management strategies. Detailed assessments of land cover change at local scales, and assessments of the factors that lead to the change, are lacking for much of Uganda. We showcase methods to fill this gap by offering a case study combining GIS and key informant surveys to assess local trends in West Bugwe Central Forest Reserve (WBCFR). Our findings show that the forest in WBCFR has been extensively and rapidly deforested and degraded by humans due to a number of poverty related drivers. We used Remote sensing and Geographic Information Science (GIS) techniques to map and quantify the LCC in WBCFR for the period 1986 to 2016. We obtained Landsat images (MSS 31/03/1986, TM 02/04/1995, ETM +06/03/2006 and OLIS/TIRS 11/04/2016) from USGS Earth explorer. We used supervised classification in ERDAS IMAGINE 2014 with support of ground truth data and the land change modeler in TerrSet 18.2 to analyse the pattern of land cover change. We also used household survey, key informant interview, and focus group discussions to determine the drivers of land cover change. Our results indicate that the forest in WBCFR has declined by over 82 % from 1,682 ha to 311 ha since 1986. Forest cover has decreased at an average annual rate of 1.2 % and shrubland has increased 1.5 % per year. The wetland has also been extensively degraded and drained, as with the forest much of the former wetland is now shrub land. Key informants indicated that the key drivers that have led to this change are poverty, population growth and associated harvesting of woody products for subsistence and income generation. Re-afforestation is needed to reverse forest loss. Alternative sources of fuel should be encouraged to reduce pressure on WBCFR.

Keywords: Drivers, land cover change, land-use change