

Land use induced land cover changes and future scenarios in extent of Miombo woodland and Dambo ecosystems in the Copperbelt province of Zambia

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Abstract

The pattern of Miombo woodland conversion to other land uses and the attendant impacts on vital Miombo ecosystems such as dambos is not well understood. Using the Copperbelt province of Zambia as a case study, we assessed the spatio-temporal patterns of Miombo woodland and dambo conversion to other land uses between 1984 and 2016 and predicted the changes to 2050. The effects of land use land cover change (LULCC) on the extent of Miombo woodlands and dambos was determined by intersecting layers of croplands, settlements, plantations, grasslands and barelands on woodland and dambo pixels. Prediction of future LULCC was done using the land change modeller (LCM) in TerrSet. It was observed that in the period between 1984 and 2016, woodlands decreased by 17.9% while dambos increased by 4.9%. The two classes were predicted to lose 26.4% and 2.0%, respectively, by 2050. Conversion to cropland was the highest contributor to woodland loss, accounting for 57.5% of total loss by 2016, and projected to reach 67.6% by 2050. Similarly, establishment of cropland was shown to result into 53.5% (2016) and 58.9% (2050) of loss of dambos. Expansion of croplands caused a decline in woodlands and dambos. Therefore, sustainable agriculture should be adopted.