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1990 – 2015

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Mapping forest and woodland loss in Swaziland: 1990 - 2015

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ABSTRACT

Forests and woodlands are a very important part of the global ecosystem through their provision of ecosystem goods and services. However, conversion to other land uses is one of the biggest threats to their existence. Remote sensing presents opportunities for monitoring such changes over wide and inaccessible areas including those areas that have no field data. In this study, we use the Carnegie Landsat Analysis System-lite (CLASlite) software and Landsat imagery to make the first spatially explicit national estimate deforestation in Swaziland. This was compared with deforestation data derived from the Global Forest Change (GFC) dataset for the period 2000-2014. The CLASlite analysis identified an estimated 46,620ha of forest and woodland lost between 1990 and 2015 resulting in a mean deforestation rate of 1,704ha yr⁻¹. The GFC dataset, on the other hand, indicates a mean deforestation rate 1,563ha yr⁻¹ when excluding forest regrowth. Validation of the results based on multi-year Google Earth and Landsat imagery indicated that both approaches are feasible for monitoring deforestation. The GFC data captured more forest loss within the dense plantation and wattle forests whilst underestimating deforestation within natural forests and woodlands. Although there are inter-annual variations, the rate of deforestation is generally increasing and widespread in many parts of the country mainly concentrated in the eastern half of the country and a few western parts where agriculture (particularly sugarcane), human settlements and other infrastructure developments are dominant land uses. Acacia and broadleaf savanna are being depleted at higher rates with up to 8.1% of forest area lost since the year 2000. Forest policies and legislation need to be reviewed to respond to the observed trends and patterns with a focus on forest conservation, climate change mitigation and adaptation.

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