

## **IMPACTS OF COMMUNAL FUELWOOD EXTRACTION ON LIDAR-ESTIMATED BIOMASS PATTERNS OF SAVANNA WOODLANDS.**

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### **Abstract**

Approximately 54% of rural households in South Africa continue to use wood as their main source of energy, mainly for cooking and heating. The provision of biomass by savanna woodlands is thus of considerable value to rural households and therefore the sustainable management of this ecosystem service is essential to energy security and poverty alleviation. Strong dependence on fuelwood and resulting high levels of extraction has raised concerns about a looming “fuelwood-crisis” at local and national scales. This study used airborne Light Detection and Ranging (LiDAR) from the Carnegie Airborne Observatory (CAO) to estimate the supply of above-ground woody biomass (hereafter referred to only as biomass), over 25 000 ha of sample sites in the Lowveld of South Africa. The objectives of this study were (i) to compare LiDAR-derived biomass between communal areas and neighbouring conservation areas, (ii) to investigate disturbance gradients in biomass around settlements in communal areas, and (iii) to investigate the sustainability of various future scenarios of fuelwood consumption, using a village-specific, supply-and-demand model based on LiDAR-derived biomass maps and socio-economic data.