

## Estimation of Above Ground Biomass in Sinharaja Forest Reserve, Using Sentinel Images

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### Abstract

This research aimed to explore the potential of remote sensing techniques in estimating Above Ground Biomass (AGB) values over the Sinharaja forest area in Sri Lanka. Sentinel-1&2 satellite images were used to extract AGB values, and the accuracy was validated using field measurements. Statistical analysis including correlation and regression analysis were employed to investigate the relationship between the estimated AGB values and field measurements. The results revealed a strong positive correlation between Sentinel-1 Estimated AGB and field-calculated AGB, while the correlation between Sentinel-2 Estimated AGB and field-calculated AGB was relatively weak. Non-linear regression analysis was also conducted to explore the relationship between the AGB values, which revealed a quadratic relationship between Sentinel-2 Estimated AGB and field-calculated AGB. Non-linear regression analysis was not conducted between sentinel-1 and field-calculated AGB data. Because there was strong positive correlation. This study conducted an annual analysis of above-ground biomass (AGB) along Neluwa, Lankagama, and Deniyaya roads within Sinharaja Forest. By comparing AGB values from 2018 to 2022, significant decreases were observed in 2019, indicating a critical year for deforestation activity. These findings provide valuable insights for conservation efforts and measures to mitigate further forest degradation and protect the ecosystem. The study suggests that remote sensing techniques can be used as a reliable and cost-effective method to estimate AGB values in dense forest areas, particularly when field measurements are difficult to obtain. However, higher resolution multispectral satellite images or advanced techniques can be used for more accurate results. Overall, the study provides valuable insights for forest management and conservation practices.

**Keywords:** *AGB, Deniyaya, Lankagama, multispectral, Neluwa, Sentinel, Sinharaja*