

EXPLORING THE CARBON SEQUESTRATION POTENTIAL OF GUINEA GRASS IN ABANDONED LANDSCAPES IN THE INTERMEDIATE ZONE OF SRI LANKA

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The urgent need to mitigate climate change has heightened the importance of identifying effective carbon (C) sequestration methods. Vegetations along roadsides and in abandoned landscapes offer significant potential for C sequestration and storage, in addition to providing various environmental benefits. Despite its prevalence as an invasive weed, the C sequestration potential of Guinea grass (*Megathyrsus maximus*) remains inadequately studied. The objective of this study was to evaluate the C sequestration capacity of Guinea grass in different ecozones within the Intermediate zone of Sri Lanka. Four sites namely *Kuliyapitiya*, *Mawathagama*, *Nikaweratiya*, and *Wariyapola* were selected based on rainfall variability. An initial cut was made to assess the existing above-ground C storage, followed by above-ground biomass harvesting at intervals of two, four, six, and twelve weeks. The C conversion factor (0.47) was used to quantify C storage of dry biomass. A repeated mixed model was used to compare sites and harvesting frequencies. The 12-week cutting interval exhibited the highest mean C accumulation across all sites at 231.35 g m⁻², whereas the 2-week interval showed the lowest at 9.63 g m⁻². Intermediate intervals of 4 and 6 weeks resulted in moderate accumulation of 36.92 g m⁻² and 84.48 g m⁻², respectively. *Wariyapola* recorded the highest carbon accumulation (499.34 g m⁻²) with the 12-week cutting frequency, surpassing the initial C storage of 259.44 g m⁻² at the same site. At *Kuliyapitiya*, the initial C storage of 278.24 g m⁻² was achieved by both the 6-week and 12-week cutting intervals, depicting variabilities in C sequestration among different ecozones. The *Mawathagama* site showed the lowest C sequestration. On average, these abandoned landscapes have a potential sequester of 9.25 t ha⁻¹ per year, under a 12-week cutting interval. Returning harvest residues to the soil could further enhance long-term carbon sequestration.

Keywords: Abandoned landscapes, Carbon storage, Cutting intervals, Ecozones, Roadsides