

CARBON SEQUESTRATION POTENTIAL OF HOME GARDENS IN RESETTLEMENT AREAS: A CASE STUDY OF RESETTLED VILLAGES IN VAVUNIYA DISTRICT IN SRI LANKA.

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Home gardening is a traditional agroforestry system that significantly mitigates climate change through carbon sequestration. Therefore, this study evaluated the potential role of home gardening systems in reducing the negative environmental impact of forest destruction during resettlement in Vavuniya district, focusing on their capacity for carbon sequestration. Primary data on diameter at breast height, the height of the trees, and plant species count were collected from 46 dry zone home gardens and 11 forest patches (20 X 20 m) in *Salalihinigama* and *Periyakulama* in Vavuniya district. Above-ground carbon stock (AGCS) and plant species diversity were calculated using the allometric equation and the Shannon winner index (SWI). As per the results, SWI ranges from 0.69 to 2.28 with a mean value of 1.402 ± 0.05 for home gardens, and from 1.49 to 2.19, with a mean value of 1.9 ± 0.06 for natural forests. The dominant fruit crops include banana, *Musa* sp. (78%), mango, *Mangifera indica* L. (74%), guava, *Psidium guajava* L. (76%), and cashew *Anacardium occidentale* L. (48%). The dominant vegetables are chilli *Capsicum frutescens* L. (61%), eggplant *Solanum melongena* L. (37%), and moringa, *Moringa oleifera* Lam (30%). Ginger, *Zingiber officinale* (17%), pepper *Capsicum* spp. (37%), and turmeric, *Curcuma aromatica* (65%) were among the spice crops found. Further, it was revealed that AGCS in the home garden (32 Mg C ha^{-1}) was significantly less ($p < 0.05$) than that of forest patches (99 Mg C ha^{-1}). Therefore, it is essential to enhance the carbon sequestration ability of home gardens by integrating the appropriate perennials such as coconut, and mango, jackfruit, moringa, cashew, teak to strengthen the climate mitigation ability, agrobiodiversity, and economic viability of the home garden system in the resettlement areas.

Keywords: Agroforestry, Carbon Sequestration, Climate Resilient Home Garden, Resettlement, Species Diversity.