

### Prospects of homegarden agroforestry in conservation of biodiversity and increasing of carbon stock in Jaffna District

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Jaffna is a heavily urbanized district of Sri Lanka with a natural forest cover of 0.03% of total land area. This study was carried out in Jaffna district to assess the biodiversity and carbon stock of homegarden agroforestry which contribute to 33% of land total area of the district<sup>1</sup>. Data were collected from a field survey of randomly selected homegardens. A total of 5,920 individual flora from 58 families and 135 species were assessed. Mean value of Shannon diversity index (H), Simpson diversity index (D) and evenness (E) for the floristic component were  $1.72 \pm 0.04$ ,  $0.78 \pm 0.12$  and  $0.81 \pm 0.01$ , respectively and revealed that the floral diversity of the homegardens was equally distributed with medium species diversity. A total of 825 individual domestic fauna from 19 species and 12 families were identified. Mean value of H, D and E for domestic fauna were  $0.21 \pm 0.03$ ,  $0.16 \pm 0.03$  and  $0.22 \pm 0.03$ , respectively and revealed that faunal diversity was not equally distributed and had low species diversity. Mean above ground carbon stock was  $41 \pm 4$  Mg C per ha. Small sized homegardens had a significant positive correlation with above ground carbon stock due to high number of trees. Age of the homegardens did not influence the carbon stock and number of tree species. In addition to the floral component, there were 11 live fence tree species identified in the homegardens<sup>2</sup>. Prevalence of palm crops, fruit crops and live fenced species were high<sup>3,4</sup>. About 53% of the homegardeners had involved in rearing of domestic faunal species. Future perspective of the homegardens should focus to enrich the genetic diversity and increasing the carbon stock in the yard for resilience to climate change<sup>1,5</sup>. Based on the above results, it can be concluded that Jaffna homegardens were a versatile multi-functional system designed for beneficiaries in the district.

**Keywords:** Agroforestry, Biodiversity, Carbon stock, Dry zone homegarden, Sri Lanka.

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