Assessment of Kandyan Homegardens Towards Enhancing Domestic Food Security, Biodiversity, and Ecosystem Services

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In this study, assessment of the existing level of food security, biodiversity, and ecosystem services was done using 20 Kandyan homegardens located in Peradeniya, Pilimathalawa, and Doluwa areas in the Kandy district. All homegardens were grouped into 3 as small (<0.04 ha), medium (0.04-0.09 ha), and large (>0.09 ha) considering the size of the homegarden. The biodiversity of homegardens was quantified using Shannon Wiener index, and it ranged between 2.02 and 2.74**.** Species richness was 52 species and ranged from 8 to 21 species among homegardens. There was no significant difference in species richness with the size of the homegarden (P>0.05). The abundance of the homegardens was significantly high (P<0.05) in medium and large homegardens compared to small homegardens. The evenness ranged between 0.76 and 0.97 irrespective of the size of the homegarden (P>0.05). The species density per hectare (range 24 - 813), and tree density per hectare (range 61 - 1500) were found to be significantly different with respect to the size of the homegarden (P<0.0001). There were 23 vegetables, 14 leafy vegetables, 25 fruits, 7 spices, and 13 herb species identified within the sampled homegardens. Some homegardens are rearing poultry and livestock. The above-ground (AGB) carbon stocks in sampled homegardens ranged from 4.4 to 100.7 Mg C ha^{-1} with a mean value of 36.5 Mg C ha^{-1}. The proportion of AGB carbon stocks compared to the total carbon stock was high in Jackfruit (*Artocarpus heterophyllus*). Different ecosystem services were also identified. Well-managed Kandyan homegardens ensure food security and ecosystem services, which can be adapted by poorly managed categories with identified species to achieve food security through an increasing number of species, introduction, and management of tree species.

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