

Ecosystem Services of Homegarden Agroforestry in Jaffna Peninsula

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Homegarden agroforestry systems is an integrated land management and multifunctional system that provides ecosystem services, namely provisioning, regulating, cultural and supporting. As in other areas of the country, homegarden agroforestry has received little attention from policy makers and research institutes. Hence, study was carried out in Jaffna peninsula in dry zone area of Sri Lanka to assess the ecosystem services of homegarden agroforestry. Participant observation, interview of householders, measuring and collection of biodiversity data, photographing and sketching the structure of homegardens and focus group discussion were approached to obtain the meaningful decision on ecosystems services. In samples of 125 homegardens, a total of 5,920 individuals for flora were assessed from 58 families and 135 species. Mean value of Shannon-Wiener diversity index (H), Simpson diversity index (D) and evenness (E) for the floristic component were 1.72 ± 0.04 (0.2-2.95), 0.78 ± 0.12 (0.27-1) and 0.81 ± 0.01 (0.12-1.19), respectively, revealed that the homegardens had medium, equally distributed floral diversity in Jaffna homegardens. A total of 754 individuals for domestic fauna were identified from 19 species and 12 families, H, D and E were 0.21 ± 0.03 , 0.16 ± 0.03 and 0.22 ± 0.03 , respectively, revealed that faunal component had low species diversity and not equally distributed among the homegardens. Mean above ground carbon stock was 40.51 ± 3.67 (235.71-0.33) Mg C ha⁻¹. Provision of fruits was high with mean of 2,996 kg per ha and nuts from coconut was 1,444 nuts per ha. Mean production of milk from goat and cattle were 0.44 and 1.09 litre per day per animal, respectively. Mean volume of producible trees and poles were high accounted as 36.68 and 2.12 m³ per ha per homegardens, due to high species density. Annual mean production of fodder for livestock was 875.99 ± 395.4 kg per ha, revealed that about 3.68 % of feed requirement could be met for livestock. There were more than 30 medicinal plants including trees, shrubs and vines used in ethno medicine. Annual mean income from both plants and animals was Rs. 20,369 per year per homegarden. Host per pollinator and pollinators per host were high in bees and mango, respectively. The temperature and shade was medium-cool and medium-high, respectively in inside the homegardens, revealed that tree canopy play a key role to regulate the environment. Different conservation practices on soil, water, nutrient and biodiversity was medium, low-medium, medium and low, respectively. Homegarden provides the habitat for flora and fauna including decomposer to support the ecosystem services. Attractive landscape features, scientific advancement and research need to be addressed for cognitive development through the process of replacement, substitution, expansion and management in the peninsula.

Keywords: Agroforestry, Ecosystem Services, Homegarden, Jaffna Peninsula