Study of Plant Species Composition, Stratification Structure, and Tree Species Diversity of Home Gardens in Belipola (Up Country Intermediate Zone), Sri Lanka

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Abstract

Home garden is a sustainable land management system that could be of great utility in ecosystem with both plant biodiversity and biomass. The present study was conducted in Belipola village situated in Welimada region (Intermediate Zone, Up-country) with the aims of identification of plant species, stratification structure and the tree plant diversity. The area was divided into three groups according to the topographic arrangement as steep (>30% slope), moderate (10%-30% slope) and flat land (>10% slope). Six home gardens were selected by simple random sampling method for each topography hence eighteen home gardens were evaluated. Plant species in the home garden were identified and classified into different categories such as uses, origin of species and growth habit. Stratification structure of home gardens was determined and schematic diagrams were drawn by using the physiognomic formula. Tree species were determined when the breast height diameter of a plant is greater than 5 cm. The diversity of tree species was calculated using the Shannon Weiner index. There are 297 plant species were identified in home gardens and out of them 69, 63, 108, 32, 20 and 5species were determined as trees, shrubs, herbs, climbers, grasses, and ferns, respectively. When considering the origin, 213 species were identified as exotic species while 72 were identified as native species where 8 endemic plant species were also detected. Further, 107 species were identified as food sources while 10, 5, 31, and 25 species were mainly used as timber, firewood, medicinal plants, species for biodiversity improvement, Ornamental purposes, and miscellaneous uses, respectively. The Shannon wiener index of home gardens ranged from 1.53 to 3.10 and mean value was 2.35. However, it is not significantly different among the topographies of home gardens. Result of an architectural analysis of the canopy in the home gardens reveals that the good structure can be found in steep slope home gardens in the study area. High tree species diversity, layered canopy configurations and compatible species admixtures could be the most conspicuous characteristics of a home garden in the region. Hence, there is a large potential in the home gardens to enhance the forest cover of the Intermediate zone of up country, Sri Lanka.

Keywords: Home garden, Plant Biodiversity, Stratification structure, Tree species diversity

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