

VEGETATION AND SOIL PROPERTIES OF KANDYAN FOREST GARDENS ESTABLISHED ON DEGRADED LANDS UNDER SETTLEMENTS

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Extensive clearing of natural forest cover and inappropriate land use systems have resulted in land degradation, especially in the Mid and the Up Country regions of Sri Lanka. These unproductive lands have been given to people and the Government has established settlements. With the establishment of new settlements, tree based agroforestry systems such as Kandyan forest gardens were established to rehabilitate the degraded environment. This research was conducted to study the improvement in vegetation and soil properties of Kandyan forest gardens, which were established in different time periods on degraded lands.

The study was carried out during 1999/2000 at several villages at Gangawate Korale Secretarial Division in the Kandy District, where lands were given to settlers at three different time periods; around 1940's (Oldest), 1960's (Middle aged), and late 1980's (newly established). Information on vegetation (species diversity, diameter of trees at breast height [dbh]) was gathered from 10 gardens per village. Three representative forest gardens were selected from each settlement and soil profiles were excavated and described and soil properties were analyzed.

With the age of the settlements, biological diversity, tree density, tree height and dbh and complexity of the vegetation structure increase. However, due to the extraction of timber and forest products, tree density and dbh were lower in some of the oldest settlements.

Soil profile descriptions revealed that the oldest home garden had six different soil horizons (A11, A12, A3, B2, B21t and B22t), while middle-aged garden had four horizons (A1, A3, B21, B21t). The newly established garden had three horizons (A1, A3, and B2t). Soil texture of these three gardens was similar. Both dry and wet soil aggregate stabilities in the soils of oldest garden were significantly higher than the other two gardens, and the newly established garden had the lowest values. Acidity of the soil in the newly established garden was significantly higher than other two gardens. Soil organic matter content was significantly higher (three times) in the oldest compared to the newly established garden.

The results indicated that, establishment of Kandyan home gardens in degraded lands improve vegetation diversity and productivity, soil properties and rehabilitate the site conditions with time.