

## **CONSERVATION IMPLICATION OF HOMEGARDEN AGROFORESTRY SYSTEMS: A STUDY OF THE KNUCKLES PERIPHERY**

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### **Introduction**

The study presented in this paper was conducted with the objective of identifying the conservation implications of the homegarden agroforestry systems. This study was conducted in a mosaic of villages located in the periphery of the south-eastern part of Knuckles, namely, Kosdanda, Batalla and Kalugala. The study revealed that traditional agroforestry systems enriched with cash crops and valuable tree species are inherent to the area. Homegardening is a prominent agroforestry system with highly diverse trees and crop species appearing as small forest gardens. Efforts made by the villagers in developing homegardens show their interest in reducing as far as possible dependence on the forest.

### **Materials and methods**

The primary data was collected using participatory methods and field observations. A questionnaire survey was used to cover 70 households in Kalugala GN division to collect information on species, agroforestry benefits and conservation implications. The structure and composition of homegardens were measured through a grid survey (20 m x 20 m) and field observations were also recorded. A 1km long transect with 20m width was used in Kalugala to identify the changes in spatial distribution of forest species across different land use systems. This data were analyzed under the distance analysis. Qualitative data mainly focused on these aspects with species composition; biodiversity conservation, Soil and water conservation and conservation contribution to the local food culture of homegarden agroforestry.

### **Field data and analysis**

Field data revealed that villagers maintain both forest and non-forest species in their homegardens. In the 70 homegardens, 35 common forest species were widely distributed. Over 91% of forest species are used as timber, 97.1% are used as fuel

wood and 62.7% for medicinal purposes. Field data show that, when compared with the work done in Peak Wilderness, the forest species maintained by the villagers are low in the study area. The forest fringe communities in the Peak Wilderness maintain 200 tree species and many of the species are of fuel wood value. (Wickramasinghe, 1993). Figure 01 shows the pattern of using the widely spread species.

11 non-forest species are used as timber and fuel wood. A detailed analysis was carried out of three homegarden through a grid survey. The summary identified that 17 tree species and crop species are in first homegarden, 23 in the second, and 28 in the third, mainly of food crops and cash crops to a great extent. All the three homegarden plots have kitul palms and Kududaula, which are used for fuel wood. Homegardens contain trees and crops of different physiological characteristics. The multilayer structure is an outstanding feature.

Transect analysis shows the following characteristics between forest edge to paddy fields. 11 forest species exist, closer to forest edge and the total number of trees is 94. 18 forest species exist in homegardens and the total number is 84. 13 forest species exist in the highland area and the total is 27. These tree species are used for many purposes. This data shows more forest trees are distributed in homegarden and highland area other than in the forest edge.

Distance analysis of the spatial distribution of forest tree species revealed the following

- Forest species tend to increase with the distance from the forest to non-forest area
- Density of forest trees reduces with the distance from the forest
- Socio-economic value of forest trees increases with the distance

Diversified forest species are in non-forest land areas, including the homegarden and highland area. Density of forest species is low in non-forest lands because it has integrated with non-forest species. Socio-economic functions of forest species in non-forest lands and indicates their position in the survival of the farmers.

### Discussion

#### Bio-diversity conservation

Conservation of forest species in non-forestland is the main conservation measure in this area and it helps to reduce pressure on the forest. Many of the forest species are found naturally germinating in non-forest land. The village homegarden systems help to conserve the natural eco-system in non-forestland. It has many variety of trees and crops and helps to conserve bio-diversity, plants and also conserve the genetic materials in a sustainable manner.

#### Water and soil conservation

This crop integrated multilayer composition helps to conserve water and soil. Tree species density is very high and it helps to maintaining broad canopy and increase soil fertility. The residues of trees consistently provide organic matters to the soil are helping to increase organic activities.

#### Conservation of local food culture

The local people maintain the forest species to sustain their local food culture including dietary preferences. In addition, food crops such as vegetable, fruit, spices,

green leaves and serials are integrated in the system for food security. Most of the meals are prepared with harvests obtained from the homegardens. Seasonal variations in food availability and composition is quite significant. Kitul income helps to purchase food. Therefore, homegarden agroforestry systems help to conserve local food habits in a sustainable way.

### Conclusion

Village agroforestry practices depend on local innovations, which are transmitted from generation to generation. Homegardens are the most diversified system and it gives more benefits to rural survival and helps reduce forest dependence in peripheral communities that are living around the forest area maintain types of agroforestry systems in a sustainable manner. Village farmers prefer to live with a green environment and their most valuable resource is dense tree cover around the house and in their homegardens.

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### References

Wickramasinghe A (1993). Multiple uses of forest trees by rural communities. *Proceedings Fourth Regional Workshop on Multipurpose Trees, MPTS Research Net Work*, Faculty of Agriculture, Peradeniya.

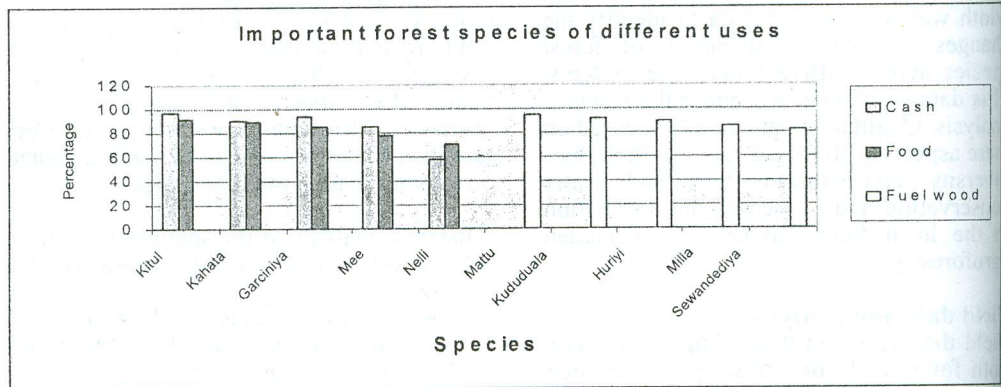


Figure 1.