Agroforestry farming systems in the homesteads of 
Kerala, southern India

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Abstract. Kerala State on the southwestern coast of India in the tropical humid zone 
has a predominantly agricultural economy, a very high density of population and therefore 
high pressure on cultivable land. The farmers there undertake cultivation of an array of crops – tree crops, plantation crops, seasonals and biennials – all in intimate mixtures on the same piece of land around the homesteads. Farm animals and poultry and sometimes fisheries also are essential components of the system. The close association of agricultural crops, tree crops and animals in the homesteads represents an excellent example of sustainable and productive agroforestry homegardens. Optimum utilization of available resources of land, solar energy and technological inputs and an efficient recycling of farm wastes are important characteristics of the systems. This paper attempts to describe and evaluate the systems’ stability, productivity and sustainability, and identify its merits and constraints as well as research needs.

1. Introduction

Kerala State, which covers only 1.18 per cent of the total land area of India, supports over 3.5% of the country’s population (census of India, 1981). The State with an area of 38,963 sq. km has a population of over 25 million, amounting to a density of 655 persons/sq. km, the highest among Indian States [18]. In the coastal and midland areas, population density often exceeds 1500 persons/sq. km. A large majority of the population of the State live in villages and depends on agriculture for livelihood. Because of the high density of population, the size of farm holding is very small, ranging commonly from 0.02 ha to 1.00 ha. The farmers of the State usually undertake intensive farming involving a variety of crops on the limited area available in order to obtain food, fuel, fodder, timber and cash from the homesteads. The homesteads thus present an excellent example of the basic concepts of agroforestry homegardens [2]. Coconut palm is an important component of these homegardens, and some publications based on crop

combinations with coconut in the State have been brought out [8, 9, 13]. However, quantitative descriptions of woody components other than coconut and the homegarden systems involving them have seldom been attempted. In view of the importance of these components and systems of agroforestry homegardens in the livelihood of the people of Kerala, this paper attempts to describe the essential aspects of the structure and function of these farming systems and evaluate their potential for exploitation and development.

2. General description of the area

Kerala State is 580 km long, and lies between the Arabian Sea in the west and the Western Ghats in the east between 8°18' and 12°48' N latitudes and 74°52' and 77°22' E longitudes. It is broadest (120 km) in the middle, tapering to the northern and southern ends.

The land area of Kerala can be distinguished into three broad natural physiographic divisions, namely, ‘highland’, ‘mid-land’, and ‘lowland’, each running almost parallel to each other along the length. The mountainous land along the Western Ghats in the eastern side of the State is the ‘highland’; it is under forests interspread with small streams and the region accounts for 48% area and 15% population of the State. The palm-fringed coastal belt with its picturesque backwaters, running parallel to the Arabian Sea with almost level topography constitutes the ‘lowland’ (10% area and 26% population) and in between these two lies the ‘midland’ (42% area and 59% population) intersected by numerous rivers, small hills and valleys.

The State as a whole has a humid tropical climate, so that the growth of vegetation is regulated mainly by rainfall. The rainfall is bimodal monsoon; the South-West monsoon from June to August accounts for the major share of the total annual rainfall. The North-East monsoon from October to January is also agriculturally very important. The mean annual rainfall of the State is 2960 mm, with a mean annual number of rainy days of 126. Rainfall is distributed relatively more uniformly over the rainy seasons in the southern parts of the State as compared with the northern parts, as a result of the influence of both the south west and north-east monsoons. The mean annual temperature throughout the State is around 27°C, the peak temperatures being 29°C–31°C during March–May.

2.1 Soils:

The soils of the State have been broadly classified into four major classes, viz. Oxisols (50%), Inceptisols (25%), Entisols (20%) and Alfisols (5%). The major textural classes of Kerala soils and their general fertility status and physicochemical characteristics are given below [3, 5].

-- Laterite (Oxisols): are generally poor in N, P, K and organic matter, are acidic (pH 5.0–6.2) and well-drained, and respond well to management practices.