

MULTIOBJECTIVE LAND USE PLANNING MODEL FOR INTERCROPPING IN SMALL RUBBER HOLDINGS : A COMPROMISE PROGRAMMING APPROACH

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A multiobjective land use planning model for one hectare farm was developed using the compromise programming approach. Maximization of gross margin and family labour employment as well as minimization of hired labour and capital borrowing were the objectives used and the activities (crops) included were banana, tapioca, yam, colocasia, turmeric, ginger and cowpea. The compromise set of farm plans showed gross margins ranging from Rs.15691 to Rs. 21250 per ha where different weights were assigned to the four objectives.

Key words : Compromise programming, Intercropping, Land use planning, Rubber, Small-holdings.

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INTRODUCTION

Intercropping, in general, offers advantages of reduced risk, improved use of factors of production, greater agricultural yield per unit of land and a more even use of household labour over the agricultural cycle (Vandermeer, 1989). Apart from these advantages, intercropping can supplement the income as well as the food requirements of the household. The experiments conducted at the Rubber Research Institute of India have demonstrated the feasibility of growing intercrops during the initial three years of rubber planting (Mathew *et al.*, 1979). The rationale for intercropping in rubber is that about 75 per cent of the total area is not effectively occupied by the roots of the main crop, when the rubber trees are under three years old (Ismail and Arshad,

1988). The intercrops reported to be grown in rubber producing countries during the initial years of rubber planting include tapioca, upland rice, banana, ginger, turmeric, yam, pineapple, sugarcane, vegetables, maize and tobacco (Wan and Chee, 1976; Krishnankutty, 1979; Chandrasekara, 1984; Sreenivasan *et al.*, 1987; Rajasekharan, 1989).

In each intercropped smallholdings in Kerala either one or a combination of intercrops are planted based on the resource constraints and various objectives of the farmers. The decision making in land use planning for intercropping requires identification and explicit definition of the objectives, under a set of resource constraints. Farm level planning involves financial objectives such as profit maxi-