

OPTIMIZATION OF RUBBER BASED FARMING SYSTEMS AT BATUMARTA TRANSMIGRATION AREA, INDONESIA

Population pressure in Java and sparse inhabitation outside Java has caused imbalanced use of resources such as land and labour. Transmigration programme, which is integrated within agricultural development, can be used as an alternative to overcome the problem. To achieve a normal standard of living in Indonesia, a minimum income of US \$ 1500 per year per family is essential (Arifin *et al.*, 1987). Attainment of this target depends on the availability and optimum utilisation of resources such as land, commodities and labour.

The transmigration areas in Batumarta are dominated by red yellow podzolic soil, 155 m above mean sea level with a rainfall of 2700-3100 mm per year. Soil fertility is generally low and land development through integrated farming system would be appropriate. However, the integrated farming system developed in Batumarta transmigration areas are not remunerative (Muharminto *et al.*, 1985). Hence this study was carried out in Batumarta transmigration area, Ogan Komering Ulu District, South Sumatra province to develop a remunerative farming system under different resource constraints.

Data were collected by interviewing farmers. Sample size was 10 per cent of the population. Linear programming method was used for data analysis with objective function for maximisation of revenue. The

model can be mathematically represented by equation (1) and (2).

(1) Objective function

$$\text{Max. } Z = \sum_{j=1}^n \sum_{i=1}^m R_{ij} A_{ij}$$

(2) Constraints

- a. Land or area : $\sum_{j=1}^n \sum_{i=1}^m A_{ij} \leq TA$
- b. Capital : $\sum_{j=1}^n \sum_{i=1}^m C_{ij} \leq CA$
- c. Labour : $\sum_{j=1}^n \sum_{i=1}^m L_{ij} \leq FL$
- d. Income / year : $\sum_{j=1}^n \sum_{i=1}^m N_{lij} \geq \text{Rp } 2\,683\,500$
- e. $A_{ij} \geq 0$

where :

- Z : Maximised farm revenue,
- R_{ij} : Revenue from commodity i in year j,
- A_{ij} : Area for commodity i in year j,
- C_{ij} : Capital used for commodity i in year j,
- L_{ij} : Labour for commodity i in year j,
- N_{lij} : Net income from commodity i in year j,
- TA : Total land available,
- CA : Capital available,
- FL : Family labour available and
- Rp : Indonesian rupiah

There are two transmigration areas in Batumarta, Transmigration Project I with