SMALLHOLDER RUBBER REHABILITATION PROJECT

SMALLHOLDER RUBBER REPLANTING IN SRI LANKA: TRENDS, PROBLEMS, AND FACTORS INFLUENCING THEIR DECISIONS

RESEARCH STUDY NO. 72

JUNE 1986

AGRARIAN RESEARCH AND TRAINING INSTITUTE,
114, Wijerama Mawatha, Colombo 7.

SRI LANKA

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FOREWORD.

The Rubber Replanting Subsidy Scheme was introduced by the Government in 1953 with a view to encourage rubber producers to replant their uneconomic rubber plantations. For about 10 years after the introduction of this scheme there was a record increase in the area replanted. However, declining trends were observed after the first decade in all sub-sectors such as the state-owned estates, private estates and the smallholdings. This has happened in spite of the revision of subsidy from time to time. Worst affected was the smallholding sub-sector where the low rate of replanting resulted in an increase of uneconomic rubber stand and a reduction in the productivity.

In 1981, the Smallholder Rubber Rehabilitation Project was introduced by the Ministry of Plantation Industries with financial and technical assistance from the International Development Association. The main objective of the project was to accelerate the smallholder rubber replanting programme in the main rubber growing districts of Ratnapura, Kalutara and Kegalle.

The Ministry of Plantation Industries at the instance of the IDA commissioned the Agrarian Research and Training Institute to evaluate the project. Under the evaluation plan of the ARTI, a baseline survey to analyse the pre-project situation and two other indepth studies were identified. The present report on 'Smallholder Rubber Replanting in Sri Lanka: Trends, Problems and Factors Influencing their Decisions' is one of them. This study was undertaken to examine the current status of the overaged rubber smallholdings and to identify the socio-economic and administrative constraints that affect smallholders' decision in replanting. The report discusses in detail the government's replanting policy and examines the performance of the sub-sectors over the past 3 decades in relation to government policies, production costs and prices. Current status of old rubber and various socio-economic problems and constraints are also discussed. The report has made certain far reaching

recommendations which will be of use to policy-makers and implementing agencies working towards the development of the smallholder rubber sector.

The Co-ordinator of this study was Mr. W G Jayasena, Research and Training Officer of ARTI. He was responsible for the planning of the field survey, data collection and its analysis. Dr. H M G Herath, Lecturer in Agricultural Economics, University of Peradeniya, functioned as a consultant to the study. This final report is a product of their joint effort. My thanks are due to both of them and also to others who helped in this survey for their valuable contribution.

T B Subasinghe
Director - ARTI

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Finally, we appreciate the valuable comments and constructive criticism made on the draft report by the Secretary, Ministry of Plantation Industries, Mr. T P G N Leelaratne, Rubber Controller, Dr. A S Weeraratne Director, ASD and Dr. A de S. Liyanage, Acting Director RRISL.

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LIST OF ABBREVIATIONS

ARTI	- Agrarian Research and Training Institute
ASD	- Advisory Services Department
ad	- Acres
CDC	- Commonwealth Development Corporation
CPD	- Commodity Purchase Department
GSD	- Gramasevaka Division
GOSL	- Government of Sri Lanka
ha	- Hectare
IDA	- International Development Association
JEDB	- Janatha Estates Development Board
Kg.	- Kilogram
LDO	- Land Development Ordinance
MPC	- Ministry of Plantation Industries
RCD	- Rubber Controller's Department
RRIC	- Rubber Research Institute of Ceylon
RRISL	- Rubber Research Institute of Sri Lanka
RRSS	- Rubber Replanting Subsidy Scheme
RIMP	- Rubber Industry Master Plan
SLSPC	- Sri Lanka State Plantation Corporation
SRRP	- Smallholder Rubber Rehabilitation Project

CHAPTER 1

INTRODUCTION

1.1 The Setting

Perennial cash crops such as tea, rubber and coconuts form an important source of revenue in many developing countries including Sri Lanka. These crops have long periods of immaturity and sometimes take upto ten years or more to reach economic yield levels. They generally experience declining productivity with advancing age. Thus periodic replanting of senescent stands is necessary to raise and maintain productivity and income levels from these crops. The replanting cycles for these crops however, are different. In Sri Lanka for example, fifty and sixty year replanting cycles have been recommended for tea and coconuts respectively while a thirty three years replanting cycle has been recommended for rubber.

Replanting of a perennial crop involves considerable investment. In rubber it involves felling, uprooting, clearing, holing and use of soil conservation measures which are labour intensive activities. In addition to labour inputs, other inputs such as planting materials, fertilizer etc. are required if replanting is to be completed satisfactorily. Farmers' investment ability has thus an important bearing on the replanting decision, particularly amongst smallholders. The problem is further exacerbated by having to forego whatever the incomes they get. Thus a detailed study of the costs involved, effects of incentives and the problems associated with them is necessary to ensure satisfactory replanting of perennial crops.

1.2 The Rubber Replanting Problem in Sri Lanka

When rubber was first introduced into Sri Lanka in the latter part of the 19th century, it was grown only on large estates (mainly British owned). In 1900, 1750 acres of rubber were reported. Both acreage and output continued to expand until the 1930s, after which the rate of growth slowed down. There was also a considerable and a growing number of smallholders by the 1940s. In 1942, Sri Lanka was the main supplier of rubber for the allied war effort. During this period producers were encouraged to tap to the maximum and even exhorted to slaughter tap upto 20 percent of the area in order to receive a replanting grant of 45 pounds (₹ 45) per acre.

The period after the 1940s constituted a turning point in the history of the rubber industry in Sri Lanka. Some of the early plantings were now becoming old, and the slaughter tapping introduced during the war left a decadent industry with a considerable amount of rubber already overaged by the 1940s.

Although the need for replanting appeared imperative after the 1940s, no specific policy existed to systematize it. The replanting undertaken was the result of the enterpreneurship of individual estates, and for many, replanting remained a secondary activity. The first signs of a serious lapse in replanting was manifested by the Whitelaw-Perera Commission, which estimated that nearly 175,000 acres (70,850 ha) were already uneconomic by 1947. By 1950 only about 8 percent of Sri Lanka's total rubber had been replaced since 1934.

In 1953, the government of Sri Lanka introduced a rubber replanting subsidy scheme (RRSS) to encourage rubber producers to replant their uneconomic rubber. The government expected to replant about 15000 acres or 3 percent of the rubber area annually. The subsidy includes a cash payment which covers a considerable amount of replanting costs and the provision of inputs such as planting materials and fertilizer. Despite the availability of the subsidy which was increased from time to time over the years, the rate of replanting both in estates and smallholdings has fallen below the minimum replacement rate over the past thirty three years except for a few years.

The failure of the replanting programme resulted in an increase in the area overdue for replanting. The Department of Rubber Control (DRC) has estimated the old rubber stand to be about 213,000 acres by 1978. (People's Bank, 1980).

The Rubber Master Plan Study estimated that the privately owned and managed rubber lands of 102,000 acres were beyond a state of economic exploitation (CDC, Vol. V. 1979). The study also reveals that the old rubber stand has become an acute problem for all size groups. Approximately 23-26%, 19-25% of the rubber area belonging to state estates, privately owned estates and smallholdings respectively, need immediate replanting. Numerous problems such as inadequate replanting subsidy, inadequate supply of inputs, slow and cumbersome administrative procedures relating to the subsidy scheme have been attributed as some of the reasons for poor replanting of rubber during the past 2-3 decades.

1.3 The Smallholder Rubber Rehabilitation Project (SRRP)

The Smallholder Rubber Rehabilitation Project (SRRP) was conceived as a medium term programme to improve the smallholder sector of Sri Lanka's rubber industry. This project was launched in 1981 by the government of Sri Lanka (GOSL) with financial and technical support from the International Development Association (IDA) and was scheduled to be implemented in the Ratnapura, Kalutara and Kegalle districts over a five year period beginning from 1981. These three districts are located in the lowland wet zone of south west Sri Lanka and represents the best rubber growing districts of the country accounting for 68% of the island's total rubber acreage (see map 1). The master plan study reported that 24.6% to 30.0% of rubber in the three districts are overaged and needs to be replanted immediately. (CDC, vol. V 1979). The broad aim of this project is to increase Sri Lanka's future rubber production through its support to the rubber replanting scheme designed to clear the backlog of overaged, low yielding, smallholders and private estate rubber. In a nutsnell, the following activities are envisaged in the project.

1. to replant 46436 acres (18,800 ha) with high yielding rubber on about 27,000 smallholdings over a five year period beginning from 1981 ;

2. to provide facilities to improve smallholder rubber processing standards to upgrade rubber quality ;

3. to assist research activities geared towards the development of smallholder rubber ;

4. to provide technical assistance for training field officers to strengthen field activities such as extension ;

5. to develop improved procedures for administration of the replanting subsidy scheme.

For small rubber growers, the socio-economic conditions such as size of holding, income levels, sources of income, land ownership etc. also affect the replanting decision. Smallholders postpone their replanting frequently, due to various reasons and some postpone their replanting even after the replanting permits are received. Their specific problems influence this type of behaviour. Thus understanding the smallholders decision making process in replanting and how various factors influence their replanting is very important in the formulation and effective implementation of policies and programmes relating to rubber replanting schemes and the SRRP.

However, very little research has been done in understanding the decision making process of smallholders. One study attempted to interpret farmers' replanting responses within a multiperiod profit maximization model and discuss the relevance of this type of approach in

understanding investment behaviour (Jayasuriya and Carrad, 1977). Another study presented an analysis of the replanting decision of a sample of rubber smallholders in Sri Lanka, and investigated the relevance of conventional investment decision criteria for understanding small farmers' long-term decisions (Jayasuriya, et.al 1981). These studies, however, have been limited to an analysis of only the smallholder decision making process. But, understanding the smallholders' current problems and various reasons for the postponement of replanting is very important to accelerate the replanting among smallholders. This study thus attempts to analyse in detail the smallholders replanting decision and their current problem.

1.4 Objectives of the Study

The specific objectives of this study are ;

a) to evaluate the progress of the RRSS with special reference to the smallholder Rubber Rehabilitation Project (SRRP) and to identify problems and constraints which affect the proper implementation of this programme;

b) to examine the current status of overaged rubber smallholdings;

c) to study and identify the factors that affect smallholders' decisions in replanting their old rubber stand, and

d) to provide a better understanding of the smallholder replanting process to the planners and implementing agencies.

1.5 Methodology of the Study

This study has two aspects namely an overall general analysis and an empirical analysis of the current status of overaged rubber and the decision making behaviour of the rubber smallholders coming under the SRRP.

1.5.1 Overall Analysis

The overall analysis is conducted on the basis of the data available from published literature, official records supplemented by communications with personnel of the Rubber controller's Department (RCD) and the Rubber Research Institute of Sri Lanka (RRISL)

1.5.2 Empirical Analysis

The empirical analysis was done by conducting a field study in the Ratnapura, Kalutara and Kegalle districts. The survey was done to collect data on the nature of overaged rubber and the way that various factors influence the decision making process of smallholders in replanting.

For the field survey, 180 rubber smallholders including few estate owners (between 10-50 acres) who owned old rubber aged 30 years or above, were selected from the Ratnapura, Kalutara and Kegalle districts comprising 60 smallholders from each district. These farmers, however, had rubber 20-30 years of age which the farmers have decided to replant. Therefore, even these areas were included in the field study. A multi-stage random sampling method was adopted in selecting sample.

Thus, in the first stage 10 primary sampling units (GS Division) which represent the highest number of rubber smallholdings, were chosen from each district. In the second stage, 10 secondary sampling units (villages), comprising one village from each GS division were chosen. In the final stage 60 old rubber owners (6 from each village) were selected at random. The same sampling procedure was adopted for all three districts to select 180 farmers. The distribution of sample households by districts and holding size is given in table 1.1.

The register of rubber holdings available at the Rubber Controller's Department was used for the selection of primary sampling units. At the time of survey a list of village level old rubber owners was not available. Therefore, the villages were first selected from the village list maintained by the cultivation officers of the selected GS divisions. The sample farmers were then selected from the list of old rubber owners prepared by the same cultivation officers for each of the selected village. This study which is also conducted by the Agrarian Research and Training Institute (ARTI) supplements two previous studies done by the ARTI on the socio-economic conditions of rubber smallholders in Sri Lanka and the Innovation Receptivity and Adoption in Rubber Small Holdings of Sri Lanka.

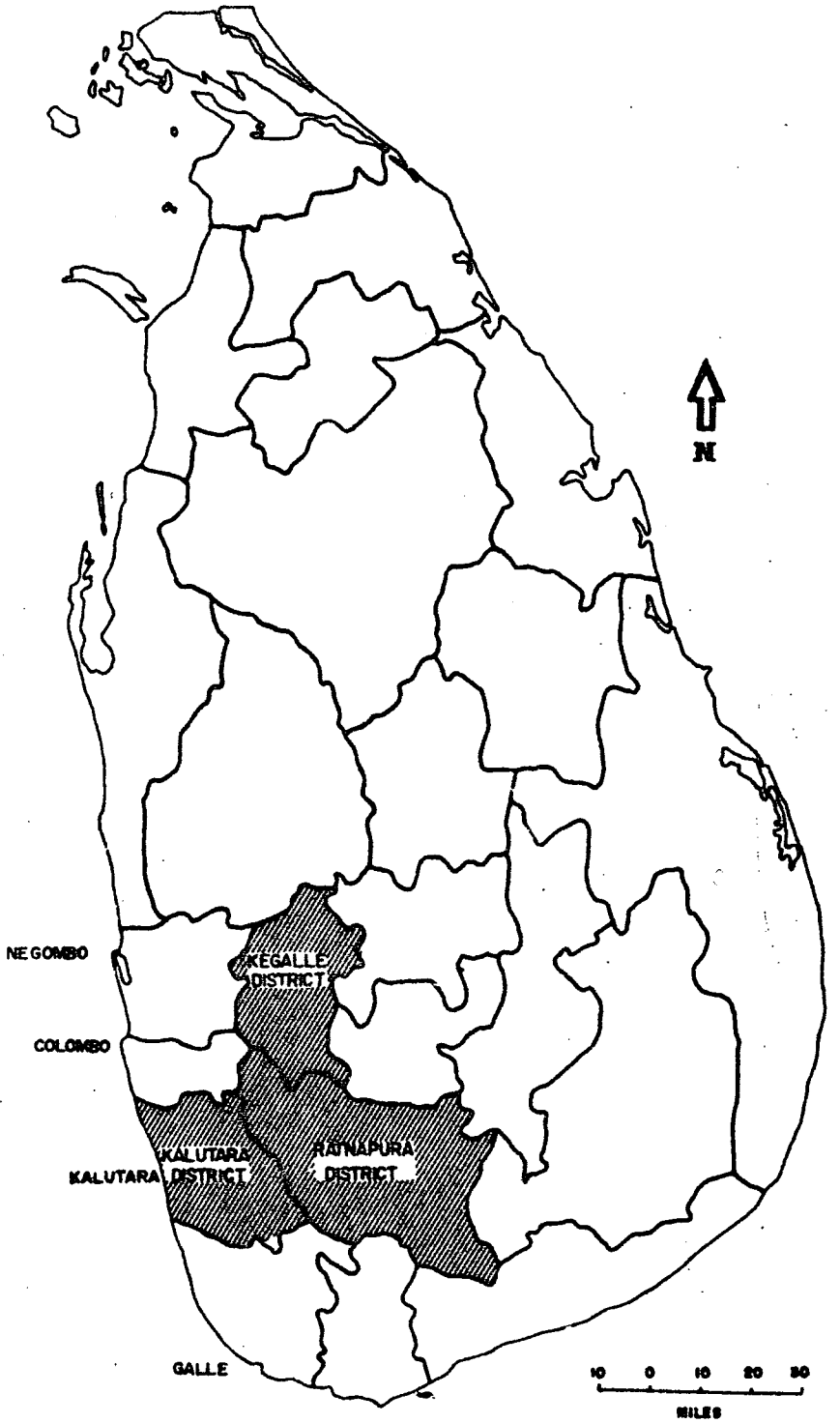
1.6 Limitations of the Field Study

The sample selected for the field study is not too large. However, from previous studies in the SRRP, it was noted that most rubber smallholders are reasonably homogeneous and a smaller sample will still reflect the general features with respect to replanting. Further, the field data collected are supplementary in nature to a large amount of secondary data available on replanting. The focus of the study is also narrow being only on the replanting decision of smallholders and hence a smaller sample was felt to be adequate.

Table 1.1

Distribution of Sample Households by Districts and Holding Size

Holding Size (acres)	Ratnapura	Kalutara	Kegalle	Total
Below 1	06	11	02	19
1 to below 2	13	14	25	52
2 to below 4	23	21	18	62
4 to below 10	14	12	13	39
10 to below 50	04	02	02	08
TOTAL	60	60	60	180



Map. I. LOCATION OF THE PROJECT AREA

CHAPTER 2

Rubber Replanting : Policy, Performance and Problems

2.1 Introduction

The 1953 Rubber replanting Subsidy Scheme (RRSS) is a notable policy innovation introduced into Sri Lanka's rubber industry. The main aim of the RRSS was to assist producers to replant their overaged rubber holdings. The programme was in operation for about three decades and it is appropriate to review the progress in replanting and examine the impact of the RRSS and other factors on replanting.

2.2 The Rubber Replanting Subsidy Scheme

A subsidy was considered necessary since replanting of rubber involves costs which may sometimes be prohibitive particularly for smallholders. Besides, replanting of rubber results in deferment of present incomes which may also be a serious disincentive for replanting. The replanting subsidy scheme was thus, introduced to overcome these constraints and to encourage replanting. The subsidy rates introduced under this scheme for the three holding size categories, the large estates (above 100 acres), medium estates (10-100 acres) and smallholdings (below 10 acres) are given in table 2.1. The subsidy rates were revised from time to time and for smallholdings, the subsidy in 1985 is approximately ten times what was paid in 1953. It is noticeable that there was a difference in the amount of the subsidy paid to the large estates, medium estates and smallholdings until 1974. Since then the rate of subsidy paid to the different categories of producers is the same. The subsidies are disbursed in seven instalments and the different amounts paid in each instalment for the smallholding are given in

Appendix table 2.1. In addition to cash payment, the RRSS provides planting material, and fertilizer if the farmers request whose costs are set off against the subsidy payment. The purchase of planting material and fertilizer from the scheme is, however, not compulsory and rubber farmers can purchase them from outside agents.

Table 2.1

Rubber Replanting Subsidy Rates 1953-1984

(Rupees/Acre)

Effective Date	Large Estates (above 100 acres)	Medium Estates (10-100 acres)	Smallholdings (below 10 acres)
01.05.1953 -	700	900	1,000
01.11.1961 -	1,000	1,100	1,200
01.11.1965 -	1,400	1,500	1,500
07.06.1974 -	2,000	2,000	2,000
16.11.1977 -	3,000	3,000	3,000
16.11.1978 -	4,000	4,000	4,000
01.09.1979 -	5,000	5,000	5,000
15.11.1979 -	6,500	6,500	6,500
13.11.1981 -	7,500	7,500	7,500
15.03.1983 -	9,000	9,000	9,000
18.06.1985 -		10,000	10,000

Source: Rubber Controller's Department, Colombo, Sri Lanka.

To obtain a replanting subsidy, the rubber land must be registered with the Rubber Control Department (RCD) for which the following conditions must be satisfied.

1. Farmers should have a clear title to prove his ownership. If the title is claimed by inheritance, the applicant is required to obtain certification from the Grama Seveka as to the boundaries, extent and content of the land.

2. If the title is claimed through purchase, gift, lease or government permit, then right of the deeds or LDO permit is required.

Farmers who have registered their rubber land in the RCD are qualified to apply for the subsidy when required. To obtain the subsidy, however, farmers have to prove ownership and if there are co-owners, their consent must be taken. Once the above conditions are satisfied, application for subsidies are further scrutinised to ensure that the altitude of the rubber land is below 365m, the land is suitable for rubber cultivation, the area is a monocrop rubber planting and that the rubber is more than twenty years of age. When all these conditions are satisfied a replanting permit is issued by the Rubber Controller.

2.3 Progress in Replanting

Information relating to the progress of replanting of rubber during the 1953- 1983 period is summarised in Table 2.2

Table 2.2

Progress in Rubber Replanting by Large Estates, Medium Estates and Smallholdings, 1953-1983

Item	Large Estates (above 100 acres)	Medium (10-100 acres)	Smallholdings(below 10 acres)	Sri Lanka
Target area (acres)*	248837.8	148114.9	210692.3	607645.0
Actual replanted area 1953-1983(acres)	182141.5	90561.4	147309.6	420012.5
Backlog (acres)	66696.3	57553.5	63382.7	187632.5
Percent Replanted (1953-1983)	73.1	61.1	69.9	69.1
Percent backlog	26.1	38.8	30.1	30.9

Source: Calculated from records from the Rubber Control Department
Note : *Area expected to be replanted during 1953-1983, at 03% annual replanting rate.

Data in Table 2.2 indicate that the replanting amongst the different groups has been far below targets. The backlog has been above 25 percent in all three groups. The target of 3 percent of the acreage expected to be replanted every year was almost never achieved as can be seen in Table 2.3. Table 2.3 shows that the large estates, medium estates and the smallholders have replanted less than 3 percent of the acreage for 30, 27 and 21 years respectively during the 1953-1984 period. It was below two percent for 21, 19, and 08 years respectively for the large estates, medium estates and smallholders respectively.

Table 2.3

Number of years according to the achievement of specific replanting rates, 1953-84.

Replanting rate %	Large estates	Medium estates	Smallholdings	Sri Lanka
3 and above	02	05	11	11
2 to 2.9	09	08	13	10
Below 2%	21	19	08	18

The annual extent replanted by the large estates, medium estates and smallholders given in Table 2.4 confirms that replanting had been uneven and often below target in most years. (see figure 1). Some of the factors that may have produced the above trends are discussed below for the three producer groups.

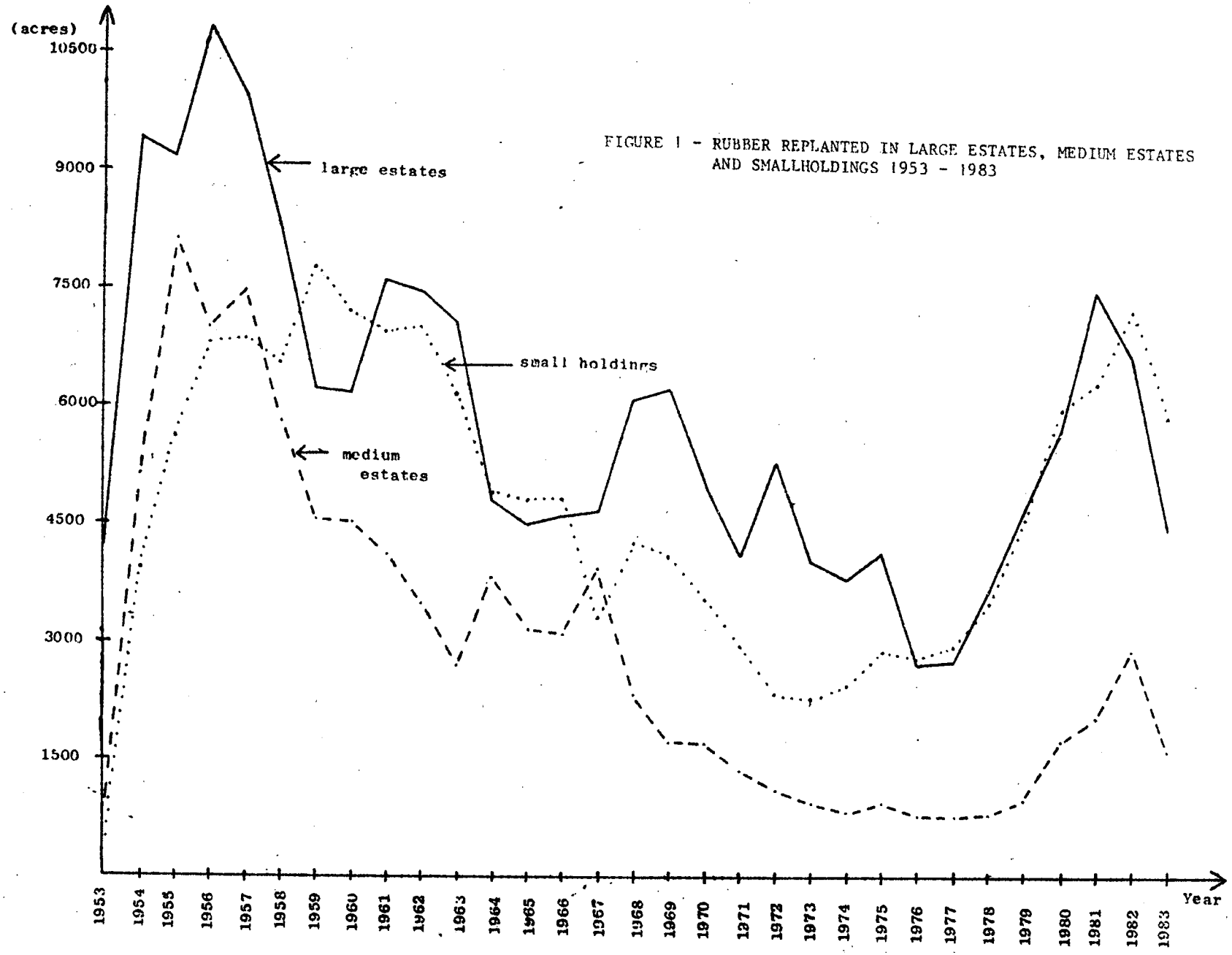


FIGURE 1 - RUBBER REPLANTED IN LARGE ESTATES, MEDIUM ESTATES AND SMALLHOLDINGS 1953 - 1983

2.3.1 Replanting by Large Estates (above 100 acres)

Replanting figures given in Table 2.4 show that from the inception of the RRSS in 1953 upto 1956 there has been a significant improvement in the replanting rate by the large estates over 100 acres. In 1956, large estates recorded a replanting rate of 3.3% which is above the 3 percent annual replanting target. The subsequent period is one of gradual decline in the extent replanted for the large estates excepting a slight increase in 1961 and 1962. The period 1964-1978 recorded less than 2 percent replanting rate. In general, however, during 1953-63 replanting rate has been above 2 percent except for one or two years. The lowest of 0.9 percent was recorded both in 1976 and 1977. Since 1978, there has been an upturn in the extent replanted by the large estates. One could surmise several factors that may have produced this trend in replanting. The threat of nationalization, changes in ownership, fluctuating rubber prices may all have extracted their toll in the replanting effort. In the large estate sector, foreign ownership was still considerable. A classification of ownership of rubber land is given in Table 2.5. The foreign owned properties are mainly referred to as companies in Table 2.5. It indicates that foreign ownership was very high in the large estate sector in 1934 and 1959. There has been gradual reduction of foreign ownership of rubber estates since then. In 1964 only 14 percent of the rubber was under the control of foreign interests, mainly U.K. (sterling) companies. An important feature during the 1953-56 period in addition to the subsidy which facilitated replanting is the relative absence of institutional uncertainty which is frequently overlooked. From 1956 to 1959 the replanting rate of large estates fell dramatically. A factor of great significance that discouraged replanting by large estates was the climate of uncertainty created by government threats to nationalise foreign assets, restriction of foreign investment and land ceilings. The effects of these measures would have impinged more heavily on the foreign estates than the medium estates and the smallholders. However, the foreign estates has the advantage of mobility of their capital. This institutional uncertainity and mobility of capital caused substantial under investment in rubber replanting and movement of capital elsewhere. It is worth noticing that the rubber prices remained favourable during this period.

Table 2.4

Replanted Rubber Area and Annual Replanting Rates in Sri Lanka; 1953-1984

Year	Large estates (over 100 ac.)		Medium estates (10-100 acres)		Smallholdings (below 10 ac.)		Sri Lanka	
	Extent	replanting rate %	Extent	replanting rate %	Extent	replanting rate %	Extent	replanting rate %
1953	4347.2	1.2	990.4	0.6	464.3	2.6	5801.9	0.8
1954	9410.7	2.7	5127.7	3.5	3924.8	2.1	18463.2	2.8
1955	9166.1	2.7	8136.1	5.5	5609.3	3.0	22911.5	3.7
1956	10806.2	3.3	7014.8	6.5	6772.7	3.7	24593.7	3.7
1957	9941.7	3.0	7484.1	4.8	6812.2	3.7	24238.0	3.7
1958	8272.0	1.5	5824.2	3.7	6550.4	3.4	29646.0	3.1
1959	6187.3	1.9	4567.0	3.9	7782.9	4.0	18537.3	2.7
1960	6165.1	1.9	4539.8	2.8	7192.6	3.7	17987.5	2.6
1961	7619.9	2.3	4137.2	2.6	6935.7	3.6	18692.8	2.7
1962	7474.2	2.3	3492.5	2.2	6992.9	3.5	17959.6	2.7
1963	7074.0	2.2	2694.7	1.7	6150.3	3.1	15919.0	2.4
1964	4799.2	1.5	3853.2	2.5	4905.4	2.4	13557.8	1.8
1965	4500.3	1.4	3173.9	1.1	4833.7	2.4	12507.9	1.9
1966	4609.0	1.4	3131.9	2.0	4843.6	2.4	12584.5	0.6
1967	4665.8	1.4	3917.4	2.5	3302.3	1.5	11885.5	0.6
1968	6103.3	1.9	2353.9	1.5	4282.9	2.1	12740.1	1.9
1969	6226.8	1.9	1748.7	1.1	4112.5	2.0	11088.0	1.8
1970	4999.2	1.6	1709.2	1.1	3534.5	2.0	10242.9	1.5
1971	4132.3	1.3	1365.9	0.8	2983.7	1.4	8481.9	1.2
1972	5285.8	1.7	1109.0	0.7	2351.4	1.1	8746.2	1.2
1973	4053.2	1.4	926.2	0.5	2299.5	1.0	7278.9	1.1
1974	3806.2	1.3	837.3	0.5	2437.8	1.1	7081.3	1.1
1975	4186.6	1.5	931.1	0.5	2865.2	1.3	7982.9	1.2
1976	2721.9	0.9	780.5	0.4	2796.0	1.2	6298.4	0.9
1977	2734.2	0.9	773.1	0.4	2959.0	1.3	6466.3	0.9
1978	3685.2	1.4	790.4	0.6	3495.0	2.0	7970.6	1.4
1979	4742.4	1.7	965.7	0.6	4589.2	2.1	10297.3	1.5
1980	5705.7	2.0	1719.1	1.0	6007.0	2.7	13431.8	2.0
1981	7538.4	2.7	2047.6	1.2	6330.6	2.8	15916.6	2.4
1982	6691.2	2.4	2913.3	1.7	7274.1	3.1	16778.6	2.5
1983	4490.4	1.6	1605.5	1.0	5918.1	2.6	12014.0	1.8
1984	4389.0	1.6	1831.0	1.1	7444.0	3.2	13664.0	2.0
Total	186530.5		92392.4		154753.6		433676.5	

Source: Rubber Controller's Department, Colombo, Sri Lanka.

In 1970-1977 period, the climate of uncertainty further exacerbated due to the promulgation of land reform measures. In 1972, the government introduced the land reform law which specified a land ceiling of 50 acres. (see Land Reform Law of 1972).

Under the Land Reform Law of 1975, company owned lands were nationalized. The rubber lands owned by sterling and rupee companies were also vested in the state under this programme and those lands were managed by the state agencies since then. The total rubber land area vested in the state under these reform laws of 1972 and 1975 were about 177398 acres. Thus, the ownership was changed and 37 percent of the rubber land came under the state. The change in ownership along with uncertainty resulted in further reduction in replanting.

Table 2.5

Sri Lanka's Rubber Acreage by Ownership Category, 1934, 1959, 1969 and 1979.

Ownership Category	1945		1959		1969		1979	
	Acreage	%	Acreage	%	Acreage	%	Acreage	%
Company Estates								
Sterling Companies	145000	23	88458	13	80335	12	-	-
Rupee Companies	100000	16	88590	13	89350	13	-	-
Total	245000	39	177048	26	169665	25	-	-
State Estates	-	-	-	-	-	-	191937.2	37
Individually Owned Estates								
Non Sri Lankans	76000	12	16156	02	15772	02	-	-
Sri Lankans	160000	26	283906	42	229891	42	77474	15
Total	236000	38	300062	45	295663	44	77474	15
Smallholdings								
Less than 10 acres	140000	23	191068	29	208617	31	246923.4	48
Total (Sri Lanka)	621000	100	668178	100	673965	100	515434.6	100

Source : Rubber Controller's Department and Master Plan Study, Vol.v,1979

Another important scenario during the 1964-1975 period which had an important bearing on the level of replanting is the increase in the cost of production and a decline in the prices of rubber. The organizational structure of large estates was such that they tended to have a high level of fixed cost. They have a manager or a superintendent and also maintained a resident labour force. Wage costs represented the major cost item of rubber production. Some minimum housing, social and other amenities had to be provided for such labour. Hence, there was some inflexibility amongst large estates in making adjustments in their labour structure in response to the fortunes of the industry. Thus, at a time when smallholders or even small estates might be able to dispense with labour in response to changing prosperity of the industry, the large estates would still have to carry a heavy labour force. The result was the erosion of profitability of rubber in most estates. It is noted that by the end of 1950 most estates were earning less than the economic rate of return (Ramachandran, 1963). Thus rates of return from rubber would have declined at a time when higher rates of return were desired than under normal circumstances due to the atmosphere of uncertainty. The inevitable response was a sharp reduction of investment by the large estates. Thus the policy of nationalization ran counter to the interests of the rubber industry and negated whatever the benefits that would have been generated by the subsidy. After 1978, replanting in the estate sector began to improve due mainly to government policies which created a more favourable investment climate.

2.3.2 Replanting by Medium Estates (10-100 acres)

The replanting pattern of medium estates was satisfactory upto 1959. From 1954-1959, the replanting rate was above 3 percent. These estates showed a decline in their replanting behaviour from 1959 upto about 1970. A short decline in replanting in the medium estates is discernible since 1970. This can be attributed to the land reform laws introduced since 1972. Under the Land Reform Act of 1972, a 50 acre ceiling was enforced and all the lands above 50 acres were vested in the state. This change may have changed ownership and created uncertainty amongst the medium estates and replanting would have declined. In fact, the replanting rates appeared worst in this group during the 1971-1979 period.

Profitability considerations may also have become important for this group as well. There were cost escalations and declining prices in the late 60s and early 70s. These trends eroded much of the profitability obtained by the medium estates which resulted in a sharp decline in the replanted acreage from 1968.

It is also possible that some of these medium estates undertook investment elsewhere. Some of the policies adopted by governments would have made investment in the rubber industry less attractive. This was especially so for measures that were adopted in order to promote the growth of more traditional export crops like cocoa, coffee and spices. They were made more attractive by government policies and it is possible that they attracted capital away from the rubber industry. The higher prices of the other crops and also the declining prosperity of the rubber industry were further incentives for the shift over. The replanting appears satisfactory again after the 1980s and this can be attributed to more positive policies by the government, specifically the introduction of the SRRP.

2.3.3. Replanting by Smallholdings (less than 10 acres)

In contrast to the large and medium estates where replanting declined from the latter part of 1950s, the smallholders' replanting pattern had been high and consistent until about 1963. This may perhaps be due to a slow rate of decline in profitability for this group. Rubber is easy to grow and its maintenance is easier. When the holding is small most farmers can use family labour for working in their rubber holding. Even when hired labour is employed, the cash costs are relatively small and fluctuate with the price when compared with the expenses of the estates which have to provide housing and other facilities for their labour at stipulated wages and remunerate labour at minimum rates. Nor are the smallholders burdened by income and profit taxes which absorb about one third to one-fifth of the profits of sterling companies and the large estates. The factors which could cause institutional uncertainty for the large estates would not affect the smallholders.

Even amongst the smallholders, a notable decline is apparent during the 1971-1979 period. May be the profitability affected their replanting as well because of very serious decline in price. From 1980, however, replanting rate has increased noticeably. This increase may be due to the operation of the SRRP.

2.4 Problems in the Rubber Replanting Subsidy Scheme (RRSS)

The above trends indicate that a subsidy by itself cannot arrest a general deterioration of the industry. However, by virtue of the significance as a long standing government innovation the nature of the RRSS is further investigated in this section in order to identify its strengths and weaknesses.

Several problems were noted in the structure and operation of the RRSS. An estimate of replanting costs in 1981 showed that the subsidy covered only about 62 percent of the replanting costs per acre. The study also showed that the first instalments cover only 42.2 percent of the costs incurred in the first stage (Jayasena and Herath, 1982). The first stage involves mainly felling and clearing the trees. The first instalment is generally paid after these operations are completed. Since felling involves forfeiture of incomes, the farmers are compelled to use their labour on alternative income generating activities. The lack of any capital initially makes hiring of labour difficult. The farmer has to supplement 57.8 percent of the costs. To do this at a time when he had to forgo even existing avenues of revenue may pose problems which may affect replanting.

The costs involved in the second stage is the highest and only 43.6 percent of these are met in the subsidy. The amount that the farmers have to supplement is fairly high in absolute terms and perhaps beyond the capacity of many rubber farmers excepting the farmers with larger holdings. The subsidy meets the capital requirements at most other stages. The provision of cash at these stages is basically for maintenance of the established stand. The amount of labour required in the latter stages has come down to about half of what is required in the first year. Thus, there is greater ability on the part of the farmer to supplement this labour from the family itself. It has also been suggested that in the first stage, some income is obtained by selling timber. This was also unrealistic for farmers where the rubber holding is located in remote areas. The logistical problems involved are overwhelming. Most holdings are not easily accessible and transport of rubber is very cumbersome. A very recent estimate shows that only about 75% of the cost are met by the subsidy (Dissanayake 1984).

Another problem in the RRSS is the need to register the rubber holding with the Rubber Control Department. The subsidy is paid only to registered rubber holders. Registration itself is very dilatory and some farmers still experience delays for about 9-10 months in registering their rubber lands. These delays occur due to lack of required information about such lands and somtimes lack of acceptable title deeds. However, these farmers are not entitled to the subsidy until their rubber holdings are registered. These delays involved in registration can affect the progress in replanting.

Farmers have also experienced delays in obtaining replanting permits. Data in Table 2.6 which was obtained from a previous study confirms this observation. These delays would have contributed to a decline in replanting.

Table 2.6

Number of Farmers Requested for Replanting Permits, Number of Permits Issued and Delay Experienced

District	Total respondents	Number requesting permits	Number of permits issued	Delay (months)
Ratnapura	47	17	09	13
Kalutara	36	18	09	12
Kegalle	30	14	07	14

Source : Socio-Economic conditions of Rubber Smallholders in Sri Lanka, ARTI Colombo, Sri Lanka, 1984, p.92.

2.5 Rubber Prices

It was noted that the decline in replanting has not been arrested by the continuous operation of the RRSS. The decline in prices along with increased costs eroded profitability of rubber and this factor could have a profound influence on replanting behaviour. Price of rubber has been generally declining until about 1974 (Table 2.7). No special price policy prevailed to shield producers from the ill effects of price declines and fluctuations. Thus, unless stable and high prices can be guaranteed to producers it is difficult to encourage them to invest in rubber. Sporadic increases in the price of rubber may not compel a farmer to undertake any replanting since rubber is a long term investment and long term stability is desired by any rational producer. The price itself may not be the determining factor and it may be the profit margin and the profit margins have gradually eroded due to marked increases in costs including that of labour (Table 2.7). The continuous decline in replanting even after the price has shown an increase since 1975 is evidence of the importance of the profit margin.

Table 2.7

Average Rubber Prices (Colombo market price), (Rs./Kg.)

Year	Crepe Rubber No. 1	Sheet Rubber No.1	Cost of Production	Profit Margin Crepe Rubber	Profit Margin Sheet Rubber
1955	-	2.82	-	-	-
1957	-	3.19	-	-	-
1957	-	2.99	-	-	-
1958	-	2.05	-	-	-
1959	-	2.64	-	-	-
1960	-	2.73	1.65	-	1.08
1961	-	2.23	1.61	-	0.62
1962	-	2.16	1.55	-	0.61
1963	-	1.98	1.63	-	0.35
1964	-	2.05	1.63	-	0.42
1965	-	2.01	1.61	-	0.40
1966	2.66	1.96	1.60	1.06	0.36
1967	1.92	1.74	1.57	0.35	0.17
1968	2.45	1.96	1.58	0.87	0.38
1969	2.56	2.29	1.57	0.99	0.72
1970	2.47	2.01	1.52	0.95	0.49
1971	2.49	1.74	1.62	0.87	0.12
1972	1.96	1.78	1.69	0.27	0.07
1973	3.99	2.59	2.18	1.81	0.41
1974	4.45	2.82	2.31	2.14	0.51
1975	3.10	2.88	2.44	0.66	0.44
1976	6.07	4.34	2.97	3.10	1.37
1977	5.12	4.53	3.75	1.37	0.78
1978	7.80	6.92	4.84	2.96	2.08
1979	14.08	9.12	6.50	7.58	2.62
1980	10.04	10.72	8.20	1.84	2.52
1981	11.12	10.07	8.92	2.20	1.15
1982	11.13	10.43	9.73	1.40	0.70
1983	16.95	14.66	10.05	6.90	4.61
1984	16.53	14.94	11.20	5.33	3.74

Source : Administration Reports of the Rubber Controller, Annual Reports of the Central Bank of Ceylon and the Economic Review, January, 1980.

2.6 Replanting Progress under the SRRP

The annual area and rate of replanting in the Kalutara, Kegalle and Ratnapura districts are given in Table 2.8. These three districts come under the SRRP referred to in Chapter 1. The study of replanting in these three districts will provide an idea on the progress of the SRRP. The trends in replanting in the three districts appear to be broadly very similar to the trends in replanting observed earlier for large estates, medium estates and smallholdings. Thus the district trends will not be discussed in detail.

The focus here is on the replanting trends after the initiation of the SRRP in the three districts. Since 1977, the replanting rate in all three districts was improving mainly due to the favourable investment climate created by government policies and perhaps the higher prices. Since 1981, the rate of replanting in the three districts accelerated and for all three districts replanting exceeded 3 percent which was the annual target rate of replanting in the 1953 subsidy scheme, and the Kegalle district recorded a 6.8 percent replanting rate in 1982. It is also clear that replanting amongst the smallholders is higher than either the large or the medium estates particularly in the Kegalle and Ratnapura districts. These improvements can be attributed to the SRRP.

In addition to the accelerated replanting observed in the SRRP area, the standard of upkeep of the replanted area also appears to have improved. This is particularly so with respect to application of fertilizer given in table 2.9. This table shows that there is a substantial increase in the fertilizer distributed during 1981-1984. The distribution of planting materials given in Table 2.10 also shows a secular increase in the planting materials distributed in all three districts.

Table 2.8 REPLANTED RUBBER AREA AND ANNUAL REPLANTING RATES BY HOLDING SIZE AND DISTRICTS - 1953-1983

Year	KALUTARA DISTRICT						KEGALLE DISTRICT						RATNAPURA DISTRICT					
	Estates over 40 hectares		Estates between 4-40 hectares		Smallholdings below 4 hectares		Estates over 40 hectares		Estates between 4-40 hectares		Smallholdings below 4 hectares		Estates over 40 hectares		Estates between 4-40 hectares		Smallholdings below 4 hectares	
	Extent (ha)	Replanting rate %	Extent (ha)	Replanting rate %	Extent (ha)	Replanting rate %	Extent (ha)	Replanting rate %	Extent (ha)	Replanting rate %	Extent (ha)	Replanting rate %	Extent (ha)	Replanting rate %	Extent (ha)	Replanting rate %	Extent (ha)	Replanting rate %
1953	894	2.3	181	2.1	96	0.5	563	1.6	38	0.4	21	0.1	218	1.0	86	0.7	12	0.1
1954	840	3.3	254	3.0	894	5.3	1132	3.1	376	4.1	301	2.0	551	2.6	304	2.5	155	1.8
1955	696	2.7	485	5.6	635	3.7	1292	3.4	438	4.8	594	4.0	710	3.4	517	4.3	228	2.6
1956	824	3.4	529	5.4	840	4.9	1336	3.8	606	6.2	751	5.0	632	3.2	528	4.0	228	2.3
1957	856	3.6	602	6.1	948	5.5	1404	3.9	604	6.1	589	3.9	742	3.8	701	5.3	200	2.1
1958	820	3.4	942	9.3	278	1.6	820	2.3	346	3.5	1411	9.2	702	3.6	384	2.9	192	2.1
1959	1136	4.7	470	4.6	647	3.7	595	1.7	480	4.7	936	6.0	461	2.3	326	2.4	197	4.0
1960	657	2.7	395	3.8	709	4.0	740	2.1	426	4.2	1012	6.5	434	2.2	334	2.5	375	2.3
1961	694	2.9	362	3.5	961	5.4	902	2.5	355	3.5	467	4.6	563	2.9	346	2.6	229	2.5
1962	840	3.5	254	2.5	894	4.9	1016	2.9	355	3.5	799	4.9	467	2.4	368	2.7	256	3.2
1963	548	2.3	365	3.5	689	3.7	962	2.7	272	2.7	726	4.3	509	2.6	192	1.4	328	3.0
1964	284	1.1	119	1.1	358	1.9	671	2.0	519	4.8	606	3.6	471	2.3	404	3.2	319	3.0
1965	332	1.4	169	1.6	415	2.2	650	2.0	350	3.3	596	3.4	396	2.0	416	3.3	319	1.8
1966	245	1.0	58	0.5	641	3.4	743	2.2	290	2.7	473	2.7	310	1.5	151	1.2	194	1.3
1967	520	2.1	202	1.9	338	1.8	470	1.4	145	1.3	393	2.2	443	2.2	214	1.6	143	1.6
1968	648	2.7	187	1.8	509	2.7	730	2.2	265	2.4	479	2.7	411	2.0	277	2.1	184	1.8
1969	557	2.3	133	1.2	435	2.5	814	3.1	177	1.8	532	3.0	444	2.5	169	1.4	178	1.6
1970	540	2.3	168	1.6	331	1.8	970	2.3	168	1.8	477	3.4	424	2.5	198	1.8	146	1.4
1971	507	2.1	117	1.1	322	1.8	477	1.8	119	1.2	419	2.4	241	1.3	198	1.8	148	1.4
1972	735	3.1	123	1.2	306	1.7	735	2.8	85	0.8	306	1.7	349	1.9	197	1.3	166	1.6
1973	475	2.0	88	0.8	200	1.1	576	2.2	111	1.1	451	2.5	257	1.4	119	1.3	84	0.8
1974	400	1.7	79	0.8	200	1.1	385	1.5	96	1.0	353	2.1	392	2.4	109	1.0	175	1.9
1975	329	1.4	75	0.7	277	1.5	497	2.0	97	1.0	367	2.2	180	1.1	65	1.0	103	1.1
1976	338	1.4	73	0.7	467	2.6	339	1.3	79	0.8	255	1.4	117	0.7	98	0.8	111	1.1
1977	409	1.7	72	0.7	344	1.9	429	1.6	89	0.9	360	2.0	127	0.7	72	0.6	104	1.0
1978	408	1.7	107	1.0	343	1.9	602	2.3	78	0.8	459	2.6	81	0.4	45	0.3	198	1.5
1979	443	2.0	103	1.0	606	3.1	756	2.6	110	1.0	677	3.6	166	0.9	55	0.4	154	1.3
1980	213	0.9	113	1.0	993	2.9	988	4.3	207	2.0	755	3.8	446	2.7	227	1.8	432	4.0
1981	1293	6.2	163	1.5	700	4.0	1090	4.5	197	2.2	830	5.5	194	1.1	183	1.7	413	4.1
1982	692	3.2	308	3.0	810	5.0	1006	4.3	772	3.1	1113	6.8	281	1.7	241	2.2	372	3.6
1983	439	2.0	166	1.6	606	3.7	825	3.5	172	2.0	923	5.5	197	1.2	181	1.7	372	3.6
1984	-	-	90	0,8	482	2.9	-	-	68	0.8	668	4.0	-	-	140	1.3	369	3.6
Total	18313		7552		17274		24535		8490		19101		11916		7842		7084	

Source : Rubber Controller's Department, Colombo, Sri Lanka.

Table 2.9

Fertilizer Distribution Under SRRP - 1981 to 1984
(Metric Tons)

Year	Ratnapura	Kalutara	Kegalle
1981	18.05	26.14	29.21
1982	102.57	163.59	182.76
1983	253.96	414.90	461.50
1984	503.20	750.84	896.15

Source : Ministry of Plantation Industries

Table 2.10

Disribution of Planting Materials Under SRRP, 1981-1984
(number of plants)

Year	Ratnapura	Kalutara	Kegalle	Total
1981	181601	369031	329483	880115
1982	178746	470003	361284	101003
1983	238087	409762	520475	116834
1984 S/W season	120511	240390	536644	897545

Source : Ministry of Plantation Industries, Colombo, Sri Lanka.

The special provisions made under the SRRP particularly with respect to fertilizer and planting material distribution where they are brought to the village level distribution points may have resulted in the above trends. In the 1953 subsidy scheme, planting materials and fertilizer were distributed through the Commodity Purchasing Depot (CPD). Farmers had to collect the materials themselves but this method was unsatisfactory due to delays in the distribution of fertilizer. Farmers also had to transport the fertilizer from the depots which are sometimes located a considerable distance away. Thus the real costs in terms of time and uncertainty in obtaining fertilizer in this scheme was high and many farmers would have been discouraged from obtaining fertilizer from the CPDs. Also, in the previous scheme fertilizer could be obtained from any source which could have even led to misuse since an adequate check on this cannot be made.

Under the SRRP, fertilizer is distributed by ASD officers and the material is brought to convenient places in the village for the farmers and sometimes even to the house itself. Although at the inception of SRRP, farmers could buy fertilizer from outside, the convenience of getting it from the ASD with the new changes introduced, more farmers were willing to obtain fertilizer from ASD. Since 1984, purchase of fertilizer was made compulsory for all subsidy recipients. These changes would have made distribution of fertilizer and planting materials more efficient, accounting for the progress seen above.

Although a notable progress of the SRRP is seen especially in replanting and the 1953 subsidy targets have been exceeded, the target of the SRRP itself has not been achieved except in some years. This is apparent in the data in Table 2.11 which gives the target and the actual rubber area replanted. In 1981, the actual replanted acreage has even exceeded the target in all three districts and for Kegalle district, this is seen even in 1982 and 1983. In Kalutara and Ratnapura districts, replanting is below the target after 1982, and is below 50 percent in most cases.

Another important observation is that the composition of the planting materials distributed did not match the target under the SRRP. The SRRP envisaged planting 40 percent of the area with PB 86 and 60 percent with RRIC clones. However, Table 2.12 shows that in general more than 95 percent of the material distributed is PB 86. There is a very serious mismatch between the targets and achievements in this respect.

Table 2.11

Replanting Targets of the SRRP and Actual Replantings (ha)

Project Year	Area to be replanted	Kalutara		Ratnapura		Kegalle	
		Target	Actually replanted	Target	Actually replanted	Target	Actually replanted
1981	1619.00	809.7	863	404.8	596	404.8	1027
1982	2833.09	1214.5	1118	809.7	613	809.7	1885
1983	4048.05	2024.3	772	1012.1	553	1012.1	1095
1984	4048.04	1821.8	572	1012.1	509	1214.5	736
1985	3238.07	1457.4	-	809.7	-	971.6	-
Total	15788.08	7327.7		4048.4		4412.7	

Source : Ministry of Plantation Industries.

The main problem in achieving the targets appear to be the non availability of planting material. The RCD depends on the Janata Estate Development Board (JEDB) and the Sri Lanka State Plantation Corporation (SLSPC) for planting materials. Although they were expected to provide these materials, they have been unable to supply these in adequate quantities. This is a serious constraint which may compel many farmers to even postpone replanting. The problem is availability of any planting materials and with respect to the RRIC clones, the problem is even worse.

Some administrative problems remain in processing applications although the performance is much better under the SRRP. Data in Appendix table 2.2, table 2.3, and 2.4 show that the percent area for which permits are issued is lower than that for which permits are requested. For example, in the Ratnapura district, for the 10 acre holdings, permits were issued for 76.3, 85.2 and 71.3 percent of the area for which permits were requested in 1982, 1983 and 1984 respectively. Also the area for which permits are issued are not always replanted (see Appendix table 2.2, 2.3 and 2.4). This has been a problem right from the inception of the scheme in 1953 and appears to remain even under the SRRP. In some years the extent replanted is less than 50% of the area for which permits are issued.

Table 2.12

Distribution Pattern of Rubber Clones to Replanters Under the SRRP 1981-1983

Types of rubber clones distributed	1981	1982	1983	1984	1981	1982	1983	1984	1981	1982	1983	1984
PB 86	98.6	98.0	90.7		100.0	77.6	93.6		96.6	98.4	97.2	
RRIC 100	-	-	2.4		-	17.8	-		-	-	0.6	
RRIC 101	1.4	0.1	0.8		-	1.0	-		0.7	-	0.9	
RRIC 102	-	-	0.2		-	-	-		-	-	-	
RRIC 103	-	1.9	5.9		-	3.6	6.4		2.7	1.6	0.8	
RRIC 121	-	-	-		-	-	-		-	-	0.5	

Source : REO's records, Advisory Services Department

There may be other problems which are specific to individuals. Some farmers reported that shortages of labour and management personnel result in the postponement of replanting. These can be elucidated only from a field study. The results of such a study are reported in chapters 3 and 4.

CHAPTER 3

Current Situation of Overaged Rubber in the Project Area.

3.1 Introduction

In the previous chapter, the various policies that were in force to encourage replanting and the trends observed amongst the different producer groups were discussed. The analysis was essentially from the macro view which deals with how the rubber sector as a whole responds to certain selected variables of importance. There are many other factors that affect replanting at individual level that cannot be observed from any secondary source of information. There are important interactions amongst these variables. A study of these factors and their interactions supplement the analysis presented previously. An empirical study was thus conducted to shed some light on these factors. The field study has two objectives namely a study of the current situation of overaged rubber in the project area and the factors that influence the decision making process with respect to rubber replanting. This chapter presents some of the important socio-economic characteristics of the smallholders surveyed and the current situation of averaged rubber particularly the age distribution, and the distribution of the overaged extent according to clones, yield levels and registration condition.

3.2 Socio Economic Characteristics of the Sample Farmers

The general demographic characteristics of the sample of farmers selected for the field study are given in Table 3.1. The average family size is 5.5 and the average number employed per family is 1.5. The dependency ratio is high being 41 percent.

Table 3.1

Demographic Characteristics of the Sample Farmers

Average Family Size	5.5
Average number employed/family	1.5
Average labour force/family	3.9
Dependants/family	1.6
Dependency Rate %	41.0

Table 3.2 provides data on the distribution of sample population by main activity. The data refer only to the occupation of the household heads. Working as an agricultural operator or labourer appeared to be the main form of employment. Nearly 33.4, 26.3 and 36.2 percent of the rubber holders worked as agricultural operators in the Ratnapura, Kalutara and Kegalle districts respectively. The second important category is working as agricultural labourers and is reported by 23.3, 12.3 and 15.2 percent of the farmers in the Ratnapura, Kalutara and Kegalle districts respectively. Agriculture is a substantial source of employment and income for most farmers in the three areas. White collar jobs and some self-employment were also evident amongst the farmers. Self employment is mainly in crafts such as masonry and carpentry.

All the farmers in the sample had their own holdings of rubber and also small holdings of paddy, coconuts and other mixed crops.

The average size of rubber holding both mature and immature given in Table 3.3 shows that the extent of mature rubber is quite high in all size classes in comparison to immature rubber. The distribution of the mature and immature rubber area by number of parcels and average size is given in Table 3.4

Table 3.2

Distribution of Household Heads According to Main Occupation

Occupation	Ratnapura		Kalutara		Kegalle		Total	
	No.	%	No.	%	No.	%	No.	%
Agricultural Operator	20	33.4	15	26.3	29	48.3	64	36.2
Agricultural Labour	14	23.3	07	12.3	06	10.0	27	15.2
Non Agricultural Labourer	04	06.7	-	-	-	-	04	02.3
White collar jobs	02	03.3	05	08.8	07	11.7	14	07.9
Skilled Labourers *	01	01.7	03	05.3	01	01.7	05	02.8
Self Employment **	05	08.3	06	10.5	03	05.0	14	07.9
Land Proprietor/ Contractor	-	-	01	10.8	03	05.0	04	02.3
Too old to work	14	23.3	20	35.0	11	18.3	45	25.4
Total	60	100.0	57	100.0	60	100.0	177	100.0

Note: * Mason, Carpenters etc.
** Traders

Table 3.3

Rubber Area Owned by Sample Farmers

Holding Size (acres)	Immature extent (acres)	Mature extent (acres)	Total extent (acres)
Below 1	0.50	11.43	11.93
1 to below 2	6.79	59.63	66.42
2 to below 4	20.00	138.88	158.88
4 to below 10	41.40	157.76	199.16
10 to below 25	4.50	68.90	73.40
25 to below 50	-	90.75	90.75
Total	73.19	527.35	600.54

The average number of mature rubber parcels held by the smaller size groups (below 2 acres) is generally one. The number of parcels in other size groups generally show a slow increase. Number of parcels however, is an important variable influencing replanting. Having only one parcel of rubber implies that when this is replaced the farmers forgo all incomes from rubber and sometimes there may be a general reticence to replanting due to this reason.

Table 3.4

Average Number of Rubber Parcels and the Average Size of Rubber Holding by Size Group

Holding Size (acres)	Immature Rubber		Mature Rubber		Total Rubber	
	No.of parcel	Size of holdings	No. of parcel	Size of holdings	No.of parcel	Size of holdings
Below 1	0.1	0.02	1.0	0.6	1.1	0.6
1 to below 2	0.2	0.1	1.1	1.1	1.3	1.2
2 to below 4	0.3	0.3	1.7	2.2	2.1	2.5
4 to below 10	0.9	1.2	2.2	4.3	3.1	5.5
10 to below 25	1.0	0.8	3.6	11.4	4.6	12.2
25 to below 50	-	-	1.5	45.3	1.5	45.3
Total	0.4	0.4	1.5	2.9	1.9	3.3

In addition to rubber, most farmers also grow other crops such as coconuts, paddy and mixed crops. The growing of several crops by smallholders is a strategy adopted to minimize risk and also adopted due to variations in land quality. The number of parcels and the average extent under each of these crops is given in Table 3.5. In comparison to the size of the rubber parcel the average size of land for other crops appear to be generally lower excepting for paddy. The presence of several crops imply the use of capital and labour resources towards a number of crops, and this may result in the neglect of rubber at certain times.

Table 3.5

Average Number of Parcels and the Average Size of Agricultural Holding by Size Groups

Holding Size	Paddy		Coconut		Mixed Crops		Cinnamon	
	No. of parcels	Size of holdings	No.of parcels	Size of parcels	N.of holdings	Size of parcels	No. of parcels	Size of holdings
Below 1	0.7	1.0	0.2	0.2	0.3	0.4	0.05	0.05
1 to below 2	0.7	0.7	0.2	0.2	0.4	0.4	-	-
2 to below 4	0.8	0.9	0.3	0.3	0.5	0.6	0.06	0.01
4 to below 10	1.1	1.6	0.4	0.5	0.5	0.7	0.05	0.3
10 to bleow 25	1.3	3.1	1.5	1.3	0.7	0.4	0.1	0.2
25 to below 50	0.5	1.0	-	-	-	-	-	-
Total	0.8	1.1	0.3	0.3	0.4	0.5	0.03	0.1

The distribution of household income is given in Table 3.6. The average monthly income of the farmers is directly related to farm size. The average household income increases with increase in farm size. The cropwise distribution of income given in Table 3.7, shows that if only agricultural income is considered, rubber still forms the most important source even for the smallest farmers. Non-agricultural income is also quite an important proportion particularly for the smaller size groups. Nearly 61.1% of the income of the farmers in the below 1 acre size group come from non agricultural sources.

Table 3.6

Average Household Income Derived from all Income Sources

Size of Holdings	Average Annual Income (Rs.)	Average Monthly Income (Rs.)
Below 1	16480	1373
1 to below 2	18876	1573
2 to below 4	28402	2367
4 to below 10	35666	2972
10 to below 25	54845	4570
25 to below 50	225634	18803
Total	28533	2378

Table 3.7

Percentage Distribution of Household Income by Income Sources

	Rubber	Paddy	Other agriculture	Non-agriculture
Below 1	14.5	11.6	12.3	61.6
1 to below 2	25.4	15.2	16.0	43.4
2 to below 4	25.4	7.7	8.1	58.8
4 to below 10	39.6	13.5	7.6	39.3
10 to below 25	57.5	13.1	5.1	24.3
25 to below 50	70.6	03.7	-	25.7
Total	32.0	10.7	8.9	48.4

3.3 Characteristics of Overaged Rubber

The distribution of rubber area earmarked for replanting by farmers is given in Table 3.8. It is apparent that although farmers having 30 year old rubber were selected most of them possessed rubber which is twenty years and above which they had decided to replant. The replanted extent represents the area felt to be needing replanting by the farmers themselves. The percentage area to be replanted is inversely related to farm size with the percentage area decreasing with increase in farm size except the 20 to 50 acre size group where 100% of the mature area has been identified as the area to be replanted.

Table 3.8

Overaged Rubber Area Decided to be Replanted by Farmers

Holding Size	Total Rubber extent (ac)	Extent decided to be replanted(ac.)	Percentage extent decided to be replanted
Below 1	11.93	11.43	100.0
1 to below 2	66.42	54.06	90.7
2 to below 4	158.88	101.86	73.3
4 to below 10	199.16	103.26	65.5
10 to below 25	73.40	38.57	55.9
25 to below 50	90.75	90175	100.00
TOTAL	600.54	399.93	75.8

It is also important to note that 90.7% to 100.0% of the mature rubber owned by below 2 acre size group are uneconomic and identified as an area to be replanted.

Table 3.9 gives the age distribution of the rubber earmarked for replanting by the owners. Rubber over 35 years comprises 14.8 percent and that between 31-35 accounts for 20.4 percent. If we take the government recommendations of 33 years as the age at which replanting should be done, it is apparent that about 35 percent of the rubber is overaged. A notable point however, is that a substantial amount of rubber (65%) recognised as needing replanting is between 20-30 years old. This indicates that a substantial amount of rubber has become uneconomic by 20 years and the officially recognised 33rd year replacement age is totally inconsistent with the real features of the industry. The presence of rubber which is uneconomic by 20 years of age should not be surprising when the actual field practices amongst rubber farmers are examined. Several studies have highlighted the lack of adequate attention and over exploitation of rubber by a majority of the farmers (Jayasena and Herath, 1984 A, 1984 B). The main reason for the advancement of senescence is the adoption of intensive tapping systems early in the life of the rubber tree. Previous studies indicate that half spiral daily systems of tapping are adopted by 69.0, 78.0 and 67.2 percent of the farmers in the Ratnapura, Kalutara and Kegalle districts respectively (Jayasena and Herath, 1984 A). It was also found that intensive tapping systems threatens to reduce the economic life of about 48.8% in the smallholder rubber (Jayasena and Herath 1984B). Viewed from this perspective a very grievous deterioration is obvious with larger extents of uneconomic rubber and the replanting effort has become a double imperative.

The distribution of overaged rubber, by different clones is given in Table 3.10. It shows that the proportion of clonal and unselected seedlings rubber is very high, amounting to 56.6 percent for all holding size categories. Clonal rubber which is considered as a high yielding variety, was distributed among rubber growers during the 1940's and even after 1953. Unselected seedlings is low yielding than clonal rubber and was introduced into Sri Lanka in the early stages of the industry. However, these two old varieties are still dominant among all size groups according to the survey results. Seedling rubber alone represents 26-50 percent of overaged rubber area. Appendix Table 3.1 provides information on the districtwise distribution of old rubber area by clones. It shows that 57.9 and 13.4 percent of the rubber to be replaced in the Ratnapura district are unselected and clonal rubber varieties respectively. In the Kalutara district about 31.4 and 40.7 percent of the rubber to be replaced respectively are unselected and clonal. But, in Kegalle district only about 14.3 and 11.8 percent of overaged rubber are under clonal and unselected rubber respectively. Thus, it is seen that in the Ratnapura, and Kalutara districts there is a more serious replanting problem than in Kegalle district. The larger percentage of clonal and unselected rubber in the above two districts may be due to slower replanting during the 1953-84 period. According to the replanting figures given in Table 2.8 the replanted extent under the three holding size categories, large estates, medium estates and smallholdings, in the Kalutara and Ratnapura districts, appear to be lower than the extent replanted in the same holding size categories in Kegalle district. If we take smallholdings alone, about 19101 hectares (47179.4 acres) of smallholdings in Kegalle district have been replanted over the past 32 years. But only about 17274 and 7084 hectares (42667.7 and 17497.4 acres) of smallholdings have been replanted in Kalutara and Ratnapura district respectively. Thus, the existence of a large percentage of unselected seedlings in the above two districts, can be explained by the slow rate of replanting. These overaged rubber areas should be given priority under the replanting scheme.

Generally, the yeild levels of the rubber tree declines with age, particularly after about the 20th year of tapping. Although farmers could obtain a certain amount of latex until uprooting the trees, the yields cannot be considered profitable even if farmers continue to tap. Thus, yield has become an important indicator which shows the urgency of replanting. Table 3.11 shows the present yield levels of overaged rubber owned by sample farmers. The average yield levels in 62.4 - 71.2 percent of the old rubber area in the three districts is below 300 kgs/ac/yr. It is also important to note that the yield levels in about 28.8 - 32.7 percent of the overaged rubber area earmarked for replanting by farmers themselves, ranged between 301 - 450 kgs/ac/yr, which is higher than in the previous group, but yet uneconomic when we compare farmers' incomes and cost of production.

As mentioned earlier farmers should register their rubber lands in the Rubber Controller's Department to be entitled to the replanting subsidy. However, a substantial amount of rubber lands are still not registered. According to the registration information given in table 3.12 about 11.9 percent of overaged rubber area has not been registered in the Rubber Controller's Department. In some holding size categories, unregistered rubber area is as high as 20 percent.

Table 3.9

Distribution of Overaged Rubber Area According to Age Groups (extent in acres)

Holding Size (acres)	Age Groups 20-25 extent	26-30 extent	31-35 extent	36 above	Total acreage
Below 1	4.75 (45.6)	3.75 (32.8)	0.54 (4.7)	2.39 (20.9)	11.43 (100.0)
1 to below 2	28.0 (51.8)	12.75 (23.6)	6.80 (12.6)	6.51 (12.0)	54.06 (100.0)
2 to below 4	46.05 (45.2)	15.0 (14.7)	14.06 (13.8)	26.75 (26.3)	101.86 (100.0)
4 to below 10	49.38 (39.1)	33.38 (32.3)	11.25 (10.9)	18.25 (17.7)	103.26 (100.0)
10 to below 25	20.00 (51.8)	13.07 (33.9)	-	5.5 (14.3)	38.57 (100.0)
25 to below 50	-	42.00 (46.3)	48.75 (53.7)	-	90.75 (100.0)

Note: Percentages are given in parentheses.

Table 3.10

Overaged Rubber Area According to Clones (extent in acres)

Holdings Size (acres)	Budded extent	Clonal rubber extent	Unselected seedlings	Total extent
Below 1	4.00 (35.9)	3.50 (30.6)	13.93 (34.4)	11.43 (100.0)
1 to below 2	27.51 (51.9)	12.50 (23.0)	14.05 (26.0)	54.96 (100.0
2 to below 4	31.05 (30.5)	22.00 (21.6)	48.81 (47.9)	101.86 (100.0)
4 to below 10	45.88 (44.40	26.13 (25.3)	31.25 (30.3)	103.26 (100.0)
10 to below 25	23.07 (59.8)	14.00 36.3)	1.50 (3.9)	38.57 (100.0)
25 to belwo 50	42.00 (46.2)	2.75 (4.2)	45.00 (69.6)	90.75 (100.0)
TOTAL	173.51 (43.4)	81.881 (20.5)	144.54 (36.1)	399.93 (100.0)

Table 3.11

Overaged Rubber Area According to Yield Levels

Average yield (Kgs.ac.yr)	Ratnapura (acres)	%	Kalutara (acres)	%	Kegalle (acres)	%
0 - 100	3.75	4.1	15.80	20.1	3.00	2.3
101 - 200	17.00	18.7	13.00	16.5	16.45	12.8
201 - 300	44.01	48.4	20.28	25.8	67.25	52.2
301 - 450	18.00	19.8	21.75	27.7	4.79	7.6
450	8.25	9.1	7.75	9.9	32,32	15.1
Total	91.00	100.0	78.58	100.00	128.81	100.0

Table 3.12

Overaged Rubber Area According to the Registration Condition

Holding Size (acres)	Registered total No.	Extent(ac) Percent	Unregistered Number	Extent Percent
Below 1	10.43	91.3	1.00	8.7
1 to below 2	43.06	79.7	11.0	20.3
2 to below 4	82.30	80.7	19.56	19.3
4 to belot 10	87.26	84.5	16.00	15.5
10 to below 25	38.57	100.0	-	-
25 to below 50	90.75	100.0	-	-
TOTAL	352.37	88.1	47.56	11.9

The replanting subsidy is not available for unregistered area and hence these areas may not be replanted even though overaged. The non registration may be due to problems of land ownership etc. and hence the method of registration needs to be re-examined in the light of these findings.

This chapter focussed mainly on the characteristics of overaged rubber. The observation that much of the above 20 year old rubber is earmarked for replanting also indicates the need to renew the replanting cycle of 33 years. The next chapter examines some of the other factors that influence rubber replanting decisions.

CHAPTER 4

The Smallholders Replanting Decision

4.1 Introduction

The replanting decision that rubber smallholders face is intrinsically a more complex one than decision making in annual crops. In the case of rubber, decision makers are faced with a long term investment decision. Most documented studies of farmer decision making examine the farmers short term decision making process with little research into the factors affecting long term decisions. Also most studies focus on the influence of one or two factors at a time rather than the myriad of factors that could affect smallholder decision making. Also aggregative studies similar to what is presented in Chapter 2 tend to mask important factors and patterns in individual investment behaviour which are needed for policy purposes. In this chapter we present an analysis of the replanting decision of the sample of smallholders selected for the field study with special focus on the factors affecting individual behaviour.

4.2 The Replanting Decision

A rubber smallholder having overaged rubber essentially faces several alternative decisions. The farmers can replant their old rubber stand either with rubber or alternative crops (annuals or perennials). They can also sell or abandon the land. The preferences of farmers to some of the important alternatives are given in Table 4.1. Table 4.1 shows the future course of action farmers envisage for their overaged rubber by holding size. It is clear that a majority of the farmers still opted to stay with rubber and plan to replant the old stands. This was reported by 87 percent of the farmers. The results also show that the preference to replant with rubber is uniform across different size classes although a weak positive relationship between holding size and replantings was noticed.

Those who have not decided to replant at least immediately wish to continue tapping. This group amounted to about 10 percent and was the second most important alternative envisaged. Only a few farmers amounting to 3.3 percent reported plans to shift to other crops. A minority of farmers (2.8 percent) has not yet decided on the future course of action they intend to follow with respect to their overaged rubber. No farmer reported abandoning or selling of land. This indicates the importance farmers attach to possessing some land which in many cases is the main source of livelihood. The preference to continue with rubber is quite an important finding. It indicates that if appropriate and correct measures are taken to improve the industry, they should generally produce very desirable results. Previous studies, however, have shown results contrary to the above findings. A study by Jayasuriya (1981) similar to the above showed that a large number of farmers amounting to nearly 25 percent have indicated a willingness to shift over to other crops both in the lower and higher income brackets. The same study also reported selling and abandoning land as a course of action envisaged by some although the percentage is small.

The future use of overaged rubber land examined in Appendix Table 4.1 by income classes tend to show a very close parallel to the results obtained when the decisions by holding size were examined. This is quite expected because farm size in many peasant communities reflect to a large extent the income earning opportunities and can be taken as surrogated for income.

The above analysis indicates replanting with rubber to be the strategy of farmers. The reasons for such a response are given in Table 4.2. Table 4.2 shows that contrary to expectations easy maintenance and protection was the most important reason for farmers, preferences to continue with rubber. This was reported by 57 percent of the farmers who have decided to replant. This was also the most important reason for many size classes. Rubber once mature will continue to yield even if the upkeep is low. It is very resilient to changes in the environment and hence, the risk factor is minimal unlike in annual crops where regular care is necessary to ensure the growth of the crop. The risk of theft is almost non existent in rubber and these virtues serve it as an ideal crop for many farmers.

Table 4.1

Number of Percentage of Farmers According to Future Use of overaged Rubber Land by Holding Size

Holding Size (acres)	Future Use of Overaged Rubber Land					
	Replanting with rubber	Continue tapping	Abandon land	Plant other crops	Sell land	Not yet decided
Below 1	15 (78.9)	02 (10.5)	-	01 (5.2)	-	01 (5.2)
1 to below 2	44 (93.5)	05 (9.6)	-	01 (1.9)	-	02 (3.8)
2 to below 4	58 (93.5)	05 (8.0)	-	-	-	01 (1.6)
4 to below 10	31 (86.1)	05 (8.0)	-	03 (8.3)	-	01 (2.7)
10 to below 25	05 (83.3)	04 (8.0)	-	01 (16.6)	-	-
25 to below 50	01 (50.0)	01 (16.6)	-	-	-	-
TOTAL	154 (87.0)	18 (10.1)	-	06 (3.3)	-	05 (2.8)

Note: Percentages are given in parentheses.

The second important reason for preferring to replant with rubber is the unsuitability of land for other crops. Rubber is usually found in difficult terrain and is usually grown in hilly areas where annual crops requiring regular and clean weeding, frequent working of soil etc. cannot be successfully grown. Thus the range of crops that could be grown in rubber land is limited. Rubber has the versatility to be grown even in difficult land and hence enjoys preference over the other crops. Moreover the farmers are familiar with rubber and this factor also sometimes affect their decisions.

Table 4.2

Percentage of Farmers According to the Reasons for the Decision to Replant with Rubber

Holding Size (acres)	Reasons for the decision to replant with rubber								
	1	2	3	4	5	6	7	8	9
Below	26.6	46.6	26.6	06.6	13.3	53.3	40.0	40.0	13.3
1 to below 2	13.6	27.2	40.9	06.8	15.9	25.0	52.2	09.0	-
2 to below 4	22.4	27.5	37.9	17.2	10.3	67.2	46.5	22.4	01.7
4 to below 10	22.5	29.0	19.0	09.6	-	58.0	54.8	16.1	03.2
10 to below 25	40.0	40.0	40.0	-	40.0	20.0	20.0	20.0	20.0
25 to below 50	100.0	100.0	-	100.0	100.0	-	-	100.0	100.0
TOTAL	27.2	30.5	33.7	11.6	11.6	57.0	48.0	19.4	03.2

Reasons

1. Can obtain a high price in the future
2. Can obtain a high yield
3. Steady income
4. Land value will rise
5. Children will benefit in the future
6. Easy to maintain and protect
7. Land is unsuitable for other crops
8. Neighbouring farmers planted rubber on their lands.

Steady income is another reason for preferring rubber. Nearly 34 percent of the farmers reported this reason. Unless bad weather interferes or tapping had to be stopped due to wintering, some income could always be obtained even if low by a farmer who has a rubber crop. Steady income is of paramount importance for smallholders whose income levels are generally low and loss of income may sometimes even mean starvation. Thus rubber possesses the ideal characteristic desired by smallholders namely steady income which appears to be an important characteristic for all holding sizes.

Expectations of higher yields and higher prices came as the fourth and the fifth important reason respectively. Replanting rubber will provide the opportunity for rubber farmers to obtain a higher yield in the future not only by having a young plantation but also by having the opportunity to introduce new technology in the form of new high yielding varieties. Expected prices will also influence investment in rubber. It was, however, found lower down in the scale. For long term crops, price expectations are formed on the basis of past prices. The lower importance accorded to price expectations may be due to the lower rubber prices that persisted for decades in the past. However, the other factors discussed earlier seem to overweigh the price effect and even when price is low, a substantial percentage of the farmers are willing to replant.

It is worth noting that income related reasons, such as price and even the subsidy did not appear high in the scale of reasons given by smallholders for replanting rubber. The subsidy was cited as a reason by 19.4 percent of the farmers. It is also important to emphasize that the reasons are not mutually exclusive and that several factors together impinge on the smallholders replanting decision.

The reasons for replanting with rubber are presented for different income groups in Appendix Table 4.2. The picture is similar to what was observed earlier for different size classes. The relative positions of the different reasons were almost the same. Easy maintenance and protection emerged as a main reason for replanting with rubber and was reported by 88 percent. Unsuitability of land for other crops was reported by 48.0 percent and steady income by 34.0 percent.

4.3 Factors Causing Delay in Replanting

In spite of the willingness of most rubber farmers to replant their overaged holdings, numerous factors act as constraints thereby delaying replanting. Some of the factors causing delay are given in Table 4.3 by holding size. (Also see Appendix Table 4.3). Table 4.3 shows that the necessity to maintain family incomes is a strong influence delaying replanting. This was reported by 32.4 percent of the farmers in all three districts. This factor appeared equally important in almost all size classes. The importance of maintaining family incomes is quite understandable in peasant societies with low income levels. Rubber may be an important source of income which they are unable to forgo and hence replanting is generally postponed. Thus the deferment of incomes is the most important reason that delays replanting and it implies that an effective replanting policy should accommodate this factor if rapid results are to be realised.

The second important reason is the non registration of rubber land and was reported by 25.3 percent of the farmers. As discussed in Chapter 1, registration is a necessary pre-condition for obtaining the subsidy and hence non registered rubber land cannot be replanted. Non registration may be due to various problems such as lack of clear titles or ownership disputes. This may also be due to delay experienced in the registration procedure itself. Nevertheless, non registration appears to be a serious problem affecting almost all size classes.

There are different categories of ownership in rubber. The relative importance of these different categories amongst rubber smallholders in the Ratnapura, Kalutara and Kegalle districts could be understood from data in Table 4.4. Table 4.4 shows that 74.2, 61.8 and 88.5 percent of the overaged rubber land are sole owned. Joint ownership accounted for 10.8, 10.2 and 6.8 percent of the land in the Ratnapura, Kalutara and Kegalle districts respectively. An important category in the Kalutara district is the encroached category comprising 26.2 percent. The different land ownership types (excepting sole ownership) create numerous problems such as non registration which either result in a delay or total abandonment of replanting.

Table 4.3

Percentage of Farmers According to the Reasons for Delay in Replanting

Holding size (acres)	Reason 1	2	3	4	5	6	7	8	9	10	11	12	13
Below 1	13.3	-	06.6	26.6	26.6	26.6	13.3	13.3	06.6	-	-	-	-
1 to below 2	27.2	09.0	06.8	22.7	18.1	36.3	09.0	-	04.5	-	-	02.2	02.2
2 to below 4	25.8	12.0	08.6	27.5	20.6	36.2	20.6	-	-	03.4	03.4	-	-
4 to below 10	29.0	12.9	06.4	19.3	12.9	29.0	19.3	-	-	-	-	-	-
10 to below 25	20.0	20.0	40.0	20.0	-	-	40.0	-	-	-	20.0	-	-
25 to below 50	-	-	-	-	-	-	100.0	-	-	-	-	-	-
TOTAL	25.3	11.6	08.4	24.0	18.1	43.4	17.5	01.2	01.9	01.2	01.9	00.6	00.6

Reasons

1. Land not registered
2. Current yield acceptable
3. Price attraction
4. Ownership problems
5. Permit not yet received
6. To maintain family income
7. Shortage of family labour
8. Old cultivation surrounding the land
9. Lack of interest because land is too small
10. Subsidy is not sufficient to replant
11. No investment ability to replant
12. Hope to replant in the near future
13. Govt. decided to get their land for the Development Project

Table 4.4

Overaged Rubber Stand According to Land Ownership

	Ratnapura		Kalutara		Kegalle	
	Extent (acres)	%	Extent (acres)	%	Extent (acres)	%
Sole Owned	125.03	74.2	60.53	61.8	116.36	88.5
Jointly Owned	18.25	10.8	10.00	10.2	08.95	6.8
LDO/Encroached	10.50	6.2	25.56	26.2	04.75	3.6
Leased in	-	-	1.75	1.8	1.50	1.1
Temple Land	09.75	5.8	-	-	-	-
Nindagam	5.00	3.0	-	-	-	-
TOTAL	168.53	100.0	97.84	100.0	121.56	100.0

Table 4.5 illustrated some of the land problems encountered as a result of the particular type of land ownership. As can be seen in Table 4.5 difficulty in getting the consent of co-owners has been a significant problem in cases of joint ownership. This is reported by 41.2, 46.2, and 71.3 percent of those reporting various land problems in the Ratnapura, Kalutara and Kegalle districts respectively. Encroached land is also a problem in replanting. Most encroachers have no permits and obtaining a permit for encroached land is a cumbersome procedure. These farmers are not entitled to government assistance even if they wish to replant. This problem is particularly serious in the Kalutara district which reported 26.2 percent of encroached land. Lack of clear titles also appeared to be a problem for 17.6, 15.4 and 28.6 percent of the farmers in the Ratnapura, Kalutara and Kegalle districts. (also see appendix Tables 4.4, 4.5 and 4.6).

Viharagam, Devalagam and Nindagam represent properties given to temples and other places of religious worship. Often the extent of land given to these institutions are high and many farmers use such land by rendering some services to the religious places. Sometimes the farmers also give a share of their output to the institutions. Most often the land is under the head of the religious institute who should give his consent which is not forthcoming always due to various reasons sometimes even personal feuds. Thus one head of a temple can stop or delay replanting in a large extent of rubber.

Data in Table 4.6 illustrate this problem well. The Nedum Vinara in the Ratnapura district has about 1625 acres of rubber land distributed in different areas as given in Table 3.6. The estimated area of overaged rubber needing replanting is about 600 acres. However, the different owners find it difficult to get consent from the high priest and hence replanting is unnecessarily delayed. This shows that one person can thwart the replanting of rubber in as hign as 600 acres and highlights the seriousness of the problem.

Table 4.5

Number and Percentage of Farmers Reporting Various Types of Land Problems Relating to Overaged Rubber Land

	Problem	Ratnapura		Kalutara		Kegalle	
		No.	%	No.	%	No.	%
1.	Difficult to obtain the consent of the co-owners	07	41.2	06	46.2	05	71.4
2.	Encroached land	-	-	05	38.4	-	-
3.	No clear title	03	17.6	02	15.4	02	28.6
4.	Viharagam Land	05	29.4	-	-	-	-
5.	LDO Land (on permit)	-	-	-	-	-	-
6.	Nindagam Land	01	05.9	-	-	-	-
7.	Leased Out	01	05.9	-	-	-	-

Table 4.6

Total Rubber Extent Owned by Nedum Vihara
(Ratnapura District)

Area	Extent in acres
Dumbara Mana	260
Mahawala Watta	105
Minipura Dumbara	160
Dumbara Gama	95
Ketepola	460
Umangedara	100
Palliovita	25
Udapasgama	210
Debada Kanda	210
Total	1625

Total area to be replanted - 600

Source : Cultivation Officer, Dumbara Division, Ratnapura

Several other reasons were also observed for delay in replanting. Nearly 18.1 percent of the farmers reported delay in the receipt of permits as a reason. Farmers still appear to experience delays in receiving replanting permits which needs to be corrected. Shortage of family labour was also reported by 17.5 percent as a reason contributing to delay in replanting. Another reason for delay in replanting is the acceptability of current yields. This factor appeared to be directly related to farm size where the percentage of farmers with this reason increases with farm size. This can be expected because the intensive tapping systems practised by very smallholders might make most of their rubber uneconomic while rubber of the same age possessed by larger rubber holders might have acceptable yield levels due to less intensive and more regularised exploitation. Price did not appear to be an important factor delaying replanting for many farmers. Only 8.4 percent reported price being attractive and hence, delaying replanting.

The reasons for continuation of tapping by holding size and income class are given in Table 4.7 and Appendix 4.7 respectively. The main reason given by those who decided to continue tapping is the need to maintain family incomes. This was reported by 61.1 percent of the farmers. This showed a weak inverse relationship with farm size. Current yield being acceptable was also cited as a reason by 50.0 percent for continuation of tapping. This factor was also positively related to farm size. This may again be attributed to better exploitation of rubber by the larger sized holders. Price of rubber as a reason for continuation of tapping was given only by about 11.0 percent of the farmers. Thus price has not exerted an important influence either in delaying replanting or continuation of tapping.

Table 4.7

Number and Percentage of Farmers Decided to Continue Tapping by Reasons

Holding Size (acres)	No. decided to continue tapping	Reasons for Continuation of Tapping			
		Current yield acceptable	price attractive	to maintain family income	land not registered
Below 1	02 (100.0)	-	-	02 (100.0)	01 (50.0)
1 to below 2	05	01	-	05	-
2 to below 4	05	04 (80.0)	01 (20.0)	02 (40.0)	-
4 to below 10	04	02 (50.0)	01	02 (50.0)	-
10 to below 25	01	01 (100.0)	-	-	-
25 to below 50	01	01 (100.0)	-	-	-

Note: Percentages are given in parentheses.

4.4 Shift Over to Other Crops

Those who decided to plant other crops fell into a minority group comprising 3.3 percent. However, it may still be useful to examine the various reasons for their choice. Lack of family labour appear to be a main reason for shifting to other crops. Inability to obtain a good yield from rubber due to consistent rain was also cited by a few farmers. This is an important consideration even though the percentage reporting this factor is small. It implies that in areas where the rainfall is too high there may be a tendency for farmers to shift to other crops. The alternate crops reported were only tea and coconuts, the former being reported by 66.3 percent and the latter by 33.3 percent of the farmers who decided to plant other crops.

Tea is often selected by farmers on the expectation that a higher yield and hence a better income can be obtained in a short time. Suitability of land and weather also was the other reason for shifting to tea. The shifting to tea was reported by the higher income groups and thus income from the new crop appeared to be the dominant factor for this group.

The reasons for choosing coconuts indicate mainly the easy maintenance of the crop and the less labour intensive nature of the crop. Coconut is an important subsistence crop and is grown even in home gardens. Upkeep and maintenance is not demanding. The shift from rubber to only perennial crops is also interesting. This is usually because rubber land cannot easily be converted to land suitable for other short-term crops like paddy or vegetables and thus often a perennial crop is selected.

CHAPTER 5

Summary of Findings, Policy Implications and Recommendations

5.1 Introduction

This study on replanting of rubber is based on the analysis of published data available on replanting by large estates, medium estates and smallholders and also an analysis of 180 rubber smallholders selected from the Ratnapura, Kalutara and Kegalle dsitricts. There are limitations in understanding smallholder behaviour purely through an analysis of secondary data and hence the survey data supplements the deficiencies in the secondary data. There are various limitations in both due to inadequate recording, biases in reporting etc. However, within these limitations some broad trends are discernible which can be explained from the analysis. Some of the main trends and their causes, the factors that affect smallholder replanting decisions and their implications and recommendations are presented below.

5.2 Summary of Findings

1. The replanting rates of smallholders, medium estates and large estates during the 1953-1983 period has mostly been below the 3 percent target. The backlog in all three groups has been above 25 percent. Despite the subsidy, the effort at nationalization of estates affected replanting both in the large estates and medium estates in the early 60s. In the subsequent period price of rubber and also cost of production affected profitability which together with land reforms introduced, in 1972 and 1975, exacerbated the above trends.

2. There were problems associated with the RRSS. The subsidy never met the total quantum of costs of replanting. Further, due to problems such as non registration of lands many farmers were not entitled to a subsidy and hence replanting was not effected.

3. The replanting trends during 1981-1984 in the Ratnapura, Kalutara and Kegalle districts appeared to have accelerated in comparison to the previous years. This is due to the SRRP. The standard of upkeep particularly with respect to fertilizer use was high. Also improvements in the distribution of fertilizer and planting meterial was noted.

4. The field survey indicated that the mature rubber extent amongst many farmers is very high in comparison to the immature acreage.

5. Majority of the farmers indicated that most of the rubber 20 years and above, need replanting. This indicates an advancement of senescence. A large percentage of the rubber above 20 years of age is seedling and clonal rubber planted long time ago. The high percentage of seedling rubber is due to the backlog in replanting.

6. The registration of the overaged rubber appeared a very serious problem. Most holdings were not registered and hence not entitled to a subsidy.

7. The survey indicated that nearly 87 percent of the rubber farmers wish to replant their old stands again with rubber. Nearly 10 percent has decided to continue tapping. Shifting to other crops was reported only by a minority group of about 3.3 percent.

8. The main reason given for replanting with rubber and hence to remain in rubber is easy maintenance and protection of the crop. Suitability of land and weather was reported as the second reason and steady income rated as the third for replanting with rubber.

9. The most important reason for delaying replanting is the need to maintain family incomes. Non registration of land was the second important factor delaying replanting.

10. Non registration appeared to be due to problems such as encroachments, LDO land, Viharagam and Devalagam; and land disputes.

11. Nearly 10 percent of the farmers preferred to continue tapping mainly to maintain family incomes.

5.3 Implications and Recommendations

1. It was stated earlier that the replanting under the SRRP was satisfactory. Despite the initial successes, a drop in replanting is noticed in the subsequent years under the SRRP. The main problem in achieving the targets appear to be the unavailability of planting materials. The RCD depends on the JEDB and the SPC for planting materials. Although they were expected to provide these materials, they have been unable to supply these in adequate quantities. Also the SRRP could be considered a failure in terms of the composition of planting materials distributed. The target of 60 percent RRIC clones was never achieved. The RRIC clones were used in less than 5 percent of the acreage. It is thus imperative that a great effort be expended in obtaining the planting materials of the right kind so that progress in replanting will not be frustrated. Dependence on private dealers for planting materials might affect the quality of materials distributed and the RCD should make arrangements to obtain their own planting materials from reliable sources.

2. Some delay in processing applications is still observed although some improvements are seen under the SRRP. The changes envisaged within the RCD in computerising the processing of applications for expenditure disposal do not appear to have got off the ground. It is necessary to take steps to expedite processing of applications by introducing the proposed computerisation technologies so tnat any further delays in the future are minimized.

3. The non registration of land appears to be a very serious problem. Non registration is mainly due to problems of ownership. In the case of joint ownership, getting the consent of co-owners is a difficult problem. Also a substantial amount of encroachments and LDO land were present. The farmers do not have permits for these and obtaining a permit is very cumbersome or dilatory. Viharagam, Devalagam and other land belonging to religious places also have ownership problems. The head of the religious institute owns the land and the farmers use the land. However, for replanting, the owner of the land should give the consent and this may not always be forthcoming due to various reasons. Thus, land problems and non registration appear to be a very serious constraint in disbursement of subsidies and hence replanting is delayed. It is necessary to either introduce a kind of reform which confers ownership of land to farmers with clear titles to that they will then be entitled to the subsidy and other assistance programmes. Alternatively, the procedure in the replanting subsidy should be altered so that other forms of documentation such as certification by the Assistant Government Agents (AGA) are made acceptable for the assistant programs. If these changes can be brought about, a substantial number of farmers will become eligible for the subsidy.

4. The study also indicated that most farmers wish to replant and thus opted to remain in rubber. The main reason for this is the easy maintenance, lower risk, and steady income. Just as much as steady income is a good characteristic for farmers to accept rubber, steady income also perforce compels these farmers not to replant for fear of loss of incomes. Loss of current income is a major factor delaying replanting. A greater success could be achieved if some mechanism to supplement their incomes during the replanting period can be introduced. Inter cropping which was introduced earlier does not seem to have satisfactorily solved the problem. This also indicates that clones with shorter immaturity periods would be more readily accepted by farmers. The degree of success at the RRISL in breeding varieties with shorter maturity period is not yet known, but appears to be indispensable to the success of the industry.

5. The survey also indicated a grievous deterioration of the industry with a substantial proportion of the rubber over 20 years old needing replanting. Although in general rubber is recommended to be replanted when 33 years old, there is a need to revise this estimate in the light of the above finding. The subsidy is available for over 20 years old rubber and thus a 3 percent target is unrealistic.

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APPENDIX TABLES

Appendix Table 2.1

Smallholder Rubber Replanting Subsidy Rates

Effective date	Rate of subsidy (Rs. per acre)	Number of Instalments and value of each instalment (Rs.)						
		1st	2nd	3rd	4th	5th	6th	7th
01-05-1953	1000/-	200/-	200/-	200/-	200/-	200/-	-	-
01-11-1961	1200/-	150/-	250/-	200/-	200/-	200/-	200/-	250/-
01-11-1965	1500/-	200/-	300/-	250/-	250/-	250/-	250/-	250/-
07-06-1974	2000/-	200/-	350/-	350/-	350/-	300/-	250/-	250/-
16-11-1977	3000/-	200/-	600/-	500/-	450/-	450/-	400/-	400/-
16-11-1978	4000/-	250/-	800/-	750/-	600/-	600/-	500/-	500/-
01-09-1979	5000/-	400/-	1000/-	1000/-	700/-	700/-	600/-	600/-
15-11-1979	6500/-	400/-	1500/-	1200/-	900/-	900/-	800/-	800/-
13-11-1981	7500/-	500/-	1900/-	1300/-	1000/-	900/-	900/-	1000/-
15-03-1983	9000/-	500/-	3000/-	1400/-	1100/-	1000/-	1000/-	1000/-
18-06-1985	10000/-	600/-	3500/-	1500/-	1200/-	1100/-	1100/-	1000/-

Source : Department of Rubber Control

Appendix Table 2.2

Applications Received, Permits Issued and Rubber Area Replanted 1965-1984

Ratnapura District

Year	Estates over 100 acres			Estates between 10-100 acres			Smallholdings below 10 acres		
	Extent for which applications were received (ha)	Percent area for which permits were issued	Percent of permitted area re-planted	Extent for which applications were received (ha)	Percent area for which permits were issued	Percent of permitted area re-planted	Extent for which applications were received (ha)	Percent area for which permits were issued	Percent of permitted area re-planted
1965	404	83.1	98.0	596	33.7	76.1	389	63.8	82.0
1966	515	93.3	60.1	362	95.4	41.7	379	71.0	51.6
1967	364	99.2	125.1	644	68.8	33.28	350	62.3	40.8
1968	642	100.0	64.0	514	83.2	53.9	902	59.8	36.5
1969	622	91.0	71.4	346	99.2	48.8	279	85.0	63.8
1970	487	100.0	87.2	556	82.3	35.7	413	63.3	35.4
1971	810	60.1	29.8	304	81.7	52.1	340	66.7	43.4
1972	408	91.4	85.7	334	57.4	47.0	281	52.3	58.9
1973	294	-	87.5	118	-	66.6	286	-	29.4
1974	310	-	126.5	281	-	38.3	408	-	112.9
1975	350	-	51.5	140	-	46.5	385	-	26.7
1976	259	-	45.1	209	-	46.7	266	-	41.6
1977	170	-	74.9	172	-	42.6	343	-	30.1
1978	293	86.7	27.5	252	45.8	17.7	486	51.3	32.5
1979	396	98.2	41.9	374	68.7	14.8	619	45.0	26.8
1980	472	79.9	94.4	347	90.8	65.3	789	59.5	34.7
1981	512	75.9	37.9	623	62.1	29.3	1149	63.4	35.8
1982	273	84.7	103.0	327	89.5	73.7	707	76.3	52.6
1983	323	80.0	61.0	436	96.1	41.4	752	85.2	49.4
1984	609	78.5	-	538	88.6	26.1	1091	71.3	35.1

Source : Department of Rubber Control

Appendix Table 2.3

Applications Received, Permits Issued and Rubber Area Replanted 1965-1984

Kalutara District

Year	Estates over 100 acres			Estates between 10-100 acres			Smallholdings below 10 acres		
	Extent for which applications were received (ha)	Percent area for which permits were issued	Percent of permitted area re-planted	Extent for which applications were received (ha)	Percent area for which permits were issued	Percent of permitted area re-planted	Extent for which applications were received (ha)	Percent area for which permits were Issued	Percent of permitted area re-planted
1965	468	85.3	70.9	326	58.1	51.8	1164	44.1	35.8
1966	529	86.4	46.3	357	67.1	16.3	923	60.9	69.4
1967	665	96.2	78.2	368	78.6	54.8	1194	53.7	28.2
1968	748	93.1	86.7	279	82.0	66.9	1046	49.6	48.6
1969	772	96.2	72.1	265	85.7	50.1	782	53.7	55.6
1970	685	98.3	78.8	196	69.7	83.2	940	48.0	35.2
1971	757	96.7	66.9	224	77.2	52.0	593	58.4	54.3
1972	531	95.3	138.3	157	78.3	78.3	428	47.6	71.3
1973	538	-	88.3	206	-	42.6	527	-	37.8
1974	586	-	62.1	204	-	38.4	646	-	30.9
1975	645	-	51.0	178	-	42.2	815	-	33.9
1976	619	-	54.6	164	-	44.5	755	-	61.8
1977	668	-	61.2	276	-	26.2	994	-	33.6
1978	859	59.6	47.4	209	66.8	51.1	1330	45.4	25.8
1979	913	93.8	48.4	525	47.9	19.5	1743	46.5	35.2
1980	109	81.5	19.4	265	82.2	42.9	1717	49.7	28.1
1981	823	90.2	152.3	533	54.6	30.5	1961	55.5	35.7
1982	704	90.3	98.2	547	69.1	56.3	1241	75.3	65.2
1983	379	99.2	115.8	404	88.4	41.0	1443	82.4	41.9
1984	551	89.4	-	445	80.4	20.2	1675	88.0	28.7

Source : Department of Rubber Control

Appendix Table 2.4

Applications Received, Permits Issued and Rubber Area Replanted 1965-1984

Kegalle District

Year	Estates over 100 acres			Estates between 10-100 acres			Smallholdings below 10 acres		
	Extent for which applications were received (ha)	Percent area for which permits were issued	Percent of permitted area re-planted	Extent for which applications were received (ha)	Percent area for which permits were issued	Percent of permitted area re-planted	Extent for which applications were received (na)	Percent area for which permits were Issued	Percent of permitted area re-planted
1965	1034	82.5	62.8	477	47.0	73.4	1266	43.5	47.0
1966	698	88.8	106.4	406	57.1	71.4	992	46.8	47.6
1967	932	99.8	50.4	903	59.7	28.9	1277	49.3	30.7
1968	992	89.7	73.6	486	63.5	55.2	1145	52.7	41.7
1969	1091	88.0	74.6	416	63.0	42.4	1089	58.7	48.7
1970	1005	100.0	56.7	403	-	41.6	1213	-	47.5
1971	1047	-	45.6	360	-	32.5	865	-	48.5
1972	752	-	97.8	230	-	36.9	632	-	48.3
1973	696	-	82.7	203	-	54.3	657	-	68.6
1974	651	-	59.2	261	-	35.6	884	-	39.9
1975	821	-	60.5	234	-	41.3	1098	-	33.4
1976	612	-	55.5	284	-	27.7	899	-	28.3
1977	821	-	52.2	203	-	44.0	1091	-	33.0
1978	612	58.4	65.6	321	41.9	24.2	1102	58.6	41.6
1979	821	92.2	75.9	321	58.9	34.4	1448	74.6	46.7
1980	927	61.0	88.6	359	61.0	57.8	1666	38.5	46.4
1981	996	83.3	96.7	577	98.6	34.1	2262	54.1	36.6
1982	1127	86.4	81.0	518	71.0	52.5	1391	84.0	79.9
1983	1241	93.3	94.0	330	70.7	52.1	2302	60.9	40.0
1984	827	78.9	-	543	55.5	12.6	1723	85.6	29.0

Source : Department of Rubber Control

Appendix Table 3.1

Overaged Rubber Area According to Rubber Varieties

(area in acres)

Holding Size (acres)	Ratnapura				Kalutara				Kegalle			
	Budded	Clonal	Unselected Seedlings	Total	Budded	Clonal	Unselected Seedlings	Total	Budded	Clonal	Unselected Seedlings	Total
Below 1	2.25	0.75	1.14	4.14	1.00	2.75	2.25	6.00	0.75	-	0.54	1.29
1 to below 2	8.26	2.90	3.75	14.51	4.50	7.25	3.80	15.55	14.75	2.75	6.50	24.00
2 to below 4	5.00	7.00	25.75	37.75	11.60	5.00	17.56	34.16	14.75	10.00	5.50	29.95
4 to below 10	12.88	4.50	20.50	37.88	8.75	15.63	7.75	32.13	24.25	6.00	3.00	34.25
10 to below 25	20.00	4.00	1.50	25.50	2.00	10.00	-	12.00	1.07	-	-	1.07
25 to below 50	-	3.75	45.00	48.75	-	-	-	-	42.00	-	-	42.00
Total	48.39	22.50	97.64	168.53	27.85	40.63	31.36	99.84	97.27	18.75	15.54	131.56
Percentage	2.87	13.4	57.9		27.9	40.7	30.4		73.9	14.3	11.8	

Appendix Table 4.1

Number and Percentage of Farmers According to Future Use of Overaged Rubber by Income Groups

Annual Income (Rs.)	Future use of overaged rubber 1	2	3	4	5	6
0 - 12000	54 (85.7)	07 (11.1)	-	01 (1.5)	-	03 (4.7)
12001 - 24000	45 (91.8)	02 (4.0)	-	03 (6.1)	-	01 (2.0)
24001 - 48000	31 (83.7)	06 (16.2)	-	-	-	01 (2.7)
48001 - 1,20,000	18 (85.7)	02 (9.5)	-	02 (9.5)	-	-
1,20,001 over	06 (85.7)	01 (14.1)	-	-	-	-
Total	154 (87.0)	18 (10.1)	-	06 (3.3)	-	05 (2.8)

Future use of overaged rubber

1. Replanting with rubber
2. Continue tapping
3. Abandon land (no replanting)
4. Plant other crops
5. Sell land
6. Not yet decided

Appendix Table 4.2

Percentage of Farmers According to the Reasons for the Decision to Replant with Rubber by Income Groups

Annual Income (Rs.)	No.decided to replant with rubber	Reasons for the decision to replant with rubber							
		1	2	3	4	5	6	7	8
0 - 12000	54	27.7	29.6	38.8	07.4	12.9	46.8	95.5	18.5
12001 - 24000	45	31.1	28.8	31.1	17.7	08.8	62.2	62.2	22.2
24001 - 48000	31	16.1	35.4	29.0	12.9	06.4	61.2	58.0	16.1
48001 - 1,20,000	18	27.7	27.7	33.3	-	22.2	61.1	39.5	16.6
1,20,001 over	06	90.0	27.7	33.3	33.3	16.6	83.3	33.3	33.3
Total	154	27.2	30.5	33.7	11.6	11.6	97.1	51.2	19.4

Reasons

1. Can obtain a high price in the future
2. Can obtain a high yield
3. Steady income
4. Land value will rise
5. Children will benefit in the future
6. Easy to maintain and protect
7. Land is unsuitable for other crops
8. Subsidy available

Appendix Table 4.3

Percentage of Farmers According to the Reasons for the Delay in Replanting by Income Groups

Annual Income (Rs.)	No. Decided to replant	Reasons for the delay in replanting with rubber							
		1	2	3	4	5	6	7	8
0 - 12000	54	37.0	07.4	07.4	27.7	12.9	35.1	09.2	5.4
12001 - 24000	45	20.0	08.8	06.6	15.5	15.5	37.7	15.5	6.6
24001 - 48000	31	25.8	16.1	06.4	35.4	19.2	32.2	28.1	19.2
48001 - 1,20,000	18	-	11.1	11.1	22.2	38.8	16.6	27.7	-
1,20,001 over	06	33.3	16.6	33.3	16.6	16.6	16.6	16.6	-
Total	154	29.3	10.3	08.4	24.6	18.1	32.4	17.5	07.4

Reasons

1. Land is not registered
2. Current yield is acceptable
3. Current price is attractive
4. Ownership probelms
5. Permit not yet received
6. To maintain family income
7. Shortage of family labour
8. Other (Land is too small, present is not sufficient, no investment ability, land has been acquired for a development project)

Appendix Table 4.4

Number and Percentage of Farmers Reporting Land Disputes
(Ratnapura District)

Holding Size (acres)	Type of land disputes 1	2	3	4	5	6	7
Below 1	02 (100.0)	-	-	-	-	-	-
1 to below 2	02 (75.0)	-	01 (25.0)	-	-	-	-
2 to below 4	02 (25.0)	-	02 (25.0)	04 (50.0)	-	-	-
4 to belwo 10	01 (33.3)	-	-	-	-	01 (33.3)	01 (33.3)
10 to below 25	-	-	-	01 (100.0)	-	-	-
Total	07 (41.1)	-	03 (17.6)	05 (29.4)	-	01 (5.8)	01 (5.8)

Type of land disputes

1. Difficult to obtain the consent of co-owners
2. Encroached land
3. No clear title
4. Viharagam land
5. LDO land (no permit)
6. Nindagam
7. Leased out

Appendix Table 4.5

Number and Percentage of Farmers Reporting Land Disputes - (Kalutara District)

Holding Size (acres)	Type of Land Dispute 1	2	3
Below 1	01 (50.0)	01 (50.0)	-
1 to below 2	03 (100.0)	-	-
2 to belwo 4	01 (16.6)	03 (50.0)	02 (33.3)
4 to below 10	01 (50.0)	01 (50.0)	-
Total	06 (46.2)	05 (38.4)	02 (15.4)

Type of land disputes

1. Difficult to obtain the consent of co-owners
2. Encroached land
3. No clear title

Appendix Table 4.6

Number and Percentage of Farmers Reporting Land Disputes - (Kegalle District)

Holding Size (acres)	Type of Land Dispute 1	2	3
Below 1	-	-	-
1 to below 2	03 (75.0)	-	01 (25.0)
2 to below 4	02 (100.0)	-	-
4 to below 10	-	-	01 (100.0
Total	05 (71.4)	-	02 (28.6)

Type of land disputes

1. Difficult to obtain the consent of co-owners
2. Encroached land
3. No clear title

Appendix Table 4.7

Number of Percentage of Farmers who Decided to Continue Tapping by Reasons and Income Groups

Annual Income (Rs.)	Reasons for continuation of tapping			
	Current Yield Acceptable	Price attractive	To maintain family income	Land not registered
0 - 12000	01 (14.2)	01 (14.2)	07 (100.0)	01 (14.2)
12001 - 24000	-	-	02 (100.0)	-
24001 - 48000	05 (83.3)	01 (16.6)	02 (33.3)	-
48001 - 1,20,000	02 (100.0)	-	-	-
1,20,001 over	01 (100.1)	-	-	-
Total	09 (50.0)	02 (11.1)	11 (61.1)	01 (9.5)