TAPPING SYSTEMS ADOPTED BY SMALL GROWERS OF TALIPARAMBA TALUK AND ITS IMPACT ON YIELD OF RUBBER

By

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DISSERTATION

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DECLARATION

I hereby declare that this dissertation entitled "**Tapping systems adopted by small growers of Taliparamba Taluk and its impact on yield of rubber**" is a bonafide record of research work done by me and that this dissertation has not previously formed the basis for award to me of any degree, diploma or other similar titles of any other University or Society.

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CERTIFICATE

Certified that this dissertation entitled "**Tapping systems adopted by small growers of Taliparamba Taluk and its impact on yield of rubber**" is a record of research work done independently by **Sri.V.Raghu Raman** under our guidance and supervision and that it has not previously formed the basis for the award of any degree or diploma to him.

We the undersigned members of the Advisory Committee of Sri.V.Raghu Raman, a candidate for the **Post Graduate Diploma in Natural Rubber Production**, agree that the dissertation may be submitted by him in partial fulfilment of the requirements of the diploma.

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INTRODUCTION

Rubber is one of the most vital product that has become inevitable in human life in the modern world. Natural rubber is extracted from the latex of the rubber tree (para rubber), *Hevea brasiliensis*, which is the only commercially exploited species of the genus *Hevea* of Euphorbiaceae family. This tree is widely and extensively planted as the commercial source of natural rubber in tropical Asia, Brazil etc. It is a native of Brazil and was introduced to tropical Asia in 1876 with the seeds brought from Brazil by Sir Henry Wickham.

In India *Hevea* was introduced during 1902. Until recently rubber was grown mainly in Kerala and Kanyakumari district of Tamil Nadu which are known as traditional rubber growing areas of the country. Rubber is also grown in South Western parts of Karnataka State, Andaman and Nicobar islands and now it has been successfully introduced to North Eastern States.

In the early periods of introduction of rubber plantation, there were only large plantations extending over hundreds of acres. But since the implementation of land ceiling act, in which plantation crops like rubber, coffee, tea etc. were exempted, land owners in the hinter lands switched over to establish plantations like rubber.

As such, the hinter lands of Kannoor district has become one

of the important rubber producing centres. The rubber holdings were established either by replanting or by new planting. The planting materials used are high yielding clones such as RRII 105, GT 1, RRIM 600 etc.

The plantations are to be managed, maintained and exploited in a scientific way so as to obtain optimum returns. In large estates, maintenance and exploitation are carried out as per the scientific recommendations. But in most of the small holdings the situations are not alike. In a cross section of the growers we can see the small holders adopting widely varied agricultural practices. Major set of growers have adopted or responded to the advices and innovative methods disseminated through the extension wing of the Rubber Board. However, quiet a lot of growers are yet to adopt modern scientific technologies in the case of cultural operations and in exploitation methods. It is, therefore felt necessary to evaluate the extent of scientific practices adopted and the reason for non adoption of the same by the growers. In the present study two villages of Taliparamba taluk namely Alakode and Payyavoor were selected since they could represent the rubber growing tract of Kannoor district. The main objective of the study include detailed investigation on the exploitation system and the methods adopted by the farmers so as to obtain steady higher yields. The findings of this investigation may help in formulating and implementing a reoriented extension service scheme to produce better result.

REVIEW OF LITERATURE

Natural rubber is natures most versatile vegetable product which has multifarious uses. There is hardly any segment of life which does not make use of rubber based materials. This vital raw material possess immense strategic importance and its unique property is indispensible. The para rubber tree thrives well in a wide range of soil with sufficient drainage. It requires a warm humid equable climate and a fairly distributed annual rainfall of 1500 mm to 2500 mm (Wyllie and Ferreira, 1907; Edgar, 1958). According to Schulter (1956) the genus *Hevea* shows much morphological variability and is found in a wide range of ecological riches. It is a deciduous tree that sheds leaves usually during the beginning of drought season. Depending upon the clone and environment wintering occur either partially or completly (George *et al.*, 1967). Refoliation and flowering follow wintering.

2.1 Laticifers in *Hevea*

The latex and laticifers in *Hevea brasiliensis* are mainly distributed in the phloem region. Latex can be considered as a specialised form of cytoplasm. The yield of rubber tree depends upon the volume of latex collected and its dry rubber content. Yield also depends upon the number of latex vessels. Gomez *et al.* (1972) studied 112 clones and found that nearly 40 per cent of the latex vessel rings are distributed within 1 mm from cambium. The vessels are

arranged in regular rows almost parallel to the cambium in concentric rings (Gomez, 1982). The bark thickness in budded plants is fairly uniform along the tree trunk (Dijkman, 1951). The dry rubber content of latex for a given system of tapping and environment is a clonal characteristic determined by the biosynthetic capacity of that cultivar. The volume of latex collected is influenced by the tapping system, parameters and the environmental factors governing them.

2.2 Exploitation of latex

The objective of tapping as stated by Maclaram (1913) was to get as much latex as possible from the tree with the smallest bark incision without affecting the health of the tree. Baptist (1962) defined an ideal tapping system as one which can give the highest yield at the lowest tapping cost, satisfactory growth and bark renewal and the lowest incidence of tapping panel dryness. But there is hardly any tapping system best suited to all cultivars under all conditions (Abraham, 1966).

The tapping has been described as controlled wounding of bark. It involves the removal of a thin shaving of bark at regular intervals on the same slopping cut so as to open the latex vessels and allow free flow of latex. A tapping system comprises of many factors like length, number and direction of cut, frequency of tapping days, period of rest and its relative intensity (Guest, 1939).

Sharples and Lambourne (1924) first reported the use of full

spiral daily tapping, alternate daily and third daily frequencies in the studies on tapping panel dryness. Spangler and Mc Indoe (1949) reported that the long cut system virtually girdles the tree as the phloem tissues are severed resulting in a drop in latex yield and poor girthing. Later the reduced spiral system were tried for exploiting latex (Knecht and Martinean, 1965). Half spiral alternate daily tapping (½S d/2) is considered as the standard system (Ng *et al.*, 1969; Wismala ratne, 1973).

A single half spiral cut tapped either on alternate or third daily are the generaly accepted tapping systems. These systems have shown to give satisfactory yield with minimum incidence of dry trees. A complex combination of cuts, frequencies, punctures and alternating excision and incision methods as in Puncture tapping and the micro-x system were studied and reported by different scientists (Abraham and Tayler, 1967a, Tupy 1973a, Ping *et al.*, 1978, Sethuraj *et al.*, 1975, Sulochanamma and Sethuraj 1980, Sulochanamma *et al.*, 1988 and Sulochanamma *et al.*, 1990).

The importance of slope of tapping cut was worked out by de Jong (1919). Studies also showed that 25° slope in seedlings and 30° slope in bud grafts resulted in additional yields. de Jong (1919) also showed that increased yield upto 8 per cent was obtained if the tapping cut inclined from upper left to lower right instead of reverse. The height of opening is worked out by Ng *et al.* (1972) and Abraham and Ismail Hashim (1983). The height at 175 cm, 150 cm and

125 cm did not have much difference in yield. Therefore the height at 125 cm is taken for opening the trees for tapping after considering the practical convenience of tappers to do the tapping operations. A skilled tapper is required for doing efficient exploitation by cutting maximum number of latex vessels without wounding the cambium for a given length of the tapping cut (Gomez *et al.*, 1972).

2.3 Yield stimulation

The use of plant hormones to get more latex was proposed by Chapman (1951) and de Jong (1953). Yield increases due to stimulant application (de Jong, 1955). More detailed studies were done on yield stimulation by many workers (de Jong, 1955; Blackmann, 1960; Levandowsky, 1961; Abraham and Tayler, 1967b; Pee and Abraham, 1971; Abraham *et al.*, 1972; Ping *et al.*, 1973; Abraham, 1977; Abraham *et al.*, 1986). The lace application or grove application methods are easier and cheaper with less yield fluctuations. With the introduction of yield stimulant such as ethephon the shorter cuts and puncture tapping were experimented upon (Abraham *et al.*, 1968a; Abraham, 1970; Sulochanamma *et al.*, 1980; Sivakumar *et al.*, 1983a; Lukman, 1983).

Shorter cuts for double cut tapping on high and basal panels were studied by Chittenden (1931) and Sulochanamma *et al.* (1988). Controlled upward tapping was also experimented upon by many workers (Ping *et al.*, 1976; RRII unpublished). The downward tapping on high panel has a certain disadvantage like drop in yield and formation of bark island (Ismail Hashim *et al.*, 1981a). Controlled upward tapping

with the modified long handled gouge knife has no such disadvantage.

The puncture tapping system first reported by Wright in 1906 was revised in 1970's (Tupy, 1973a; Leong *et al.*, 1977). It was tried in the immature period one year prior to normal opening of the trees in India (Sulochanamma and Sethuraj, 1980).

Tapping on younger trees resulted in a greater retardation of girthing (de Jong, 1968). In order to minimise the ill effect the trees are opened for tapping after attaining a standard girth. Normally it is considered as having 50 cm girth at 125 cm height.

2.4 Tapping implements

Tapping implements are also very important in contributing to the successful adoption of a tapping system. There are various types of tapping knives for different methods of tapping according to the preference of tappers (Wright, 1906; Anon, 1965; Ping *et al.*, 1976; Ping *et al.*, 1979; Abraham and Anthony, 1980; Abraham *et al.*, 1980; Abraham and Md Sidek, 1985). The Jebong and Michie golledge knives are widely used in commercial exploitation of *Hevea* tree in India. The Jebong knife has been proven to be more effective which is being popularised by Rubber Board in India.

The concept of present method of tapping was first proposed by Ridley (1889). This method takes into account the specific characteristics of bark anatomy. A skilled tapper can do tapping sufficiently deep without injuring cambium. Dijkman (1951) considers

Ridleys invention as an important scientific discovery. Fertilizer application is also required to get good yield (Haines, 1929). Heavy nutrient drinage occurs especially when ethephon sitmulation is done. Hence adequate manuring for trees under intensive exploitation is needed (Pushparajah *et al.*, 1971).

2.5 Panel disease

Infection of tapping panel by fungi is a common phenomenon. This is related to the quality of tapping, climatic conditions and presence of unhygenic environment. The two major tapping panel diseases are black stripe and mouldy rot. The black stripe is caused by *Phytophthora palmivora*. The symptoms are, sunken discoloured areas just above the tapping cut. Brownish black under lying tissues are seen and the surface of the wood contains narrow vertical black stripes. Mouldy rote is caused by the fungus *Ceratocystis fimbriata* and it gives the characteristic mouldy appearance. Then necrosis of tapping cut and guide lines in the tapping panel are caused by another fungus *Fusarium solani*. Intensity of diseases vary with different clones. These diseases can be effectively controlled by the application of fungicide regularly (RRIM, 1965).

2.6 Economics of adoption of tapping systems

Economics of the tapping system have been worked out by various workers (Sharp, 1934; Guest, 1940; Sulochanamma *et al.*,

1992). In choosing the exploitation systems estates aim at the optimum production and profit which need not be the highest yield per ha. Generally the highest profit per ha is obtained at the highest yield per tapper. So the yield per tapper and yield per ha needs to be found in respect of each system of exploitation. Profitability of different tapping systems was worked out by Watson (1965). Ng *et al.* (1969) made an economic analysis on the various tapping systems and found that ½S d/2 was generally the best system and is more profitable than full spiral with stimulation.

MATERIALS AND METHODS

3.1 Selection of location

The present study was intended to evaluate the tapping systems followed by small growers of Taliparamba taluk and its impact on yield of rubber. Taliparamba taluk is in Kannur district and it extends from middle low lying areas in the west to the hill tracts of the western ghats in the eastern state border. Alakode and Payyavoor villages are situated in North east and Eastern directions respectively which are 30 to 40 kms from Taliparamba and rubber cultivation is mostly concentrated in these two villages. Hence the present study was concentrated in these two villages. The locations selected is represented in Annexure-I.

Over 90 per cent of the farmers are settlers from southern Kerala and majority of the population are engaged in the cultivation of rubber, coconut, cashew, pepper, arecanut etc. Rubber was known to this area since 1945 and now, majority of the farmers in these areas possess rubber either as small or medium sized units.

3.2 Selection of holdings

The records maintained at the Regional Office, Rubber Board, Taliparamba were utilised for selecting the units to be surveyed. It was initially programmed to survey 25 units under each of the clone

RRII 105 and GT 1 in each village. Since GT 1 population was comparatively less 9 units under GT 1 and 78 units under RRII 105 distributed in the two villages were selected for the study. Thus a total of 87 units were brought under the survey. Details of the units selected are given in Annexure-II.

3.3 Collection of data

The survey was conducted by inspecting the concerned plots and interviewing the growers. For this purpose, a questionnaire has been prepared. Holdings which were planted during the period between 1979 and 1985 were selected to represent the rubber growing areas of Taliparamba taluk.

Further details were collected with the help of the questionnaire which is provided as Annuexure-III.

3.3.1 General information

Details pertaining to the holding size, year of planting, planting materials used, cultural and manurial practices adopted etc. were collected. With respect to the disease management, common disease prevelent in the surveyed area were recorded. Based on the intensity of incidence it was ranked as low, medium and high. The management practices followed for each disease and the extent of recovery were recorded.

3.3.2 Systems of tapping followed

Height of opening and the girth of plants at opening hight were recorded for individual units. The standard of tappability adopted in each unit and the age at which specified standards were achieved. The type of cut, its length and slope, depth of cut, bark consumption and frequency of tapping were observed. Observations were also made for the special methods of tapping and use of yield stimulants.

3.3.3 Details of rain guarding

Type of rain guarding adopted and number of units, area and percentage under each type has been recorded. Number of additional tapping days obtained for units and area have been ascertained. The farmers willingness to rain guard and the constraints experienced if any were also recorded.

3.3.4 Processing methods

Processing methods were catagorised as sheet rubber, field latex, ammoniated latex and other forms. The method of processing adopted in each unit, its limitations and mode of disposal of the produce were also studied.

3.3.5 Limitations in adopting scientific methods

The reasons for the non-adoption of scientific methods in

exploitation have been assessed. For this purpose awareness of the grower as well as the worker in aspects like rain guarding, depth of tapping, slope of tapping cut economic constraints etc. have been discussed.

RESULTS AND DISCUSSION

The results drawn out from the data collected during the study are described and discussed in this chapter.

4.1 General information

4.1.1 Holding size

The holdings covered under the survey were catagorised into four groups and the area wise distribution of the holdings is presented in the Table 1. Maximum number of holdings belonged to the size group of 0.25 ha to 0.50 ha. On an average, the extent of units in the surveyed area was 0.51 ha for RRII 105 and 0.39 ha for GT 1.

Liberalised Plantation Development Scheme introduced by the Rubber Board attracted many marginal farmers who acquired small pieces of land by fragmentation of family property or otherwise also to plant rubber in order to get perpectual income. This might be the reason for the formation of large number of small holdings of rubber in the surveyed area.

4.1.2 Age of the plants

The year of planting for the holdings included under the survey extended from 1979 to 1985 (Table 2) i.e., the plants were of 9 to 15 years age. All the 78 units of RRII 105, were in the age group of 10 to 14 years whereas in the case of GT 1 most of the

Table 1. Area-wise distribution of holdings in the surveyed area

Extent in ha	RRII 105				GT_1			
	No. of units		Area in ha		No. of units		Area in ha	
	Alakode	Payyavoor	Alakode	Payyavoor	Alakode	Payyavoor	Alakode	Payyavoor
< 0.25	4	8	0.88	1.72	-	3	-	0.60
0.26 to 0.50	17	20	6.13	7.17	2	4	1.28	1.67
0.51 to 1.00	16	9	11.65	6.73	-	-	-	-
1.00 >	2	2	2.32	2.88	-	-	-	-
Total	39	39	20.98	18.50	2	7	1.28	2.27
Average	(78 units)		0.51		(9 units)		0.39	

Table 2. Age group of the holdings selected under the clones RRII 105 and GT_1

Year of planting	Age of plants (yrs)	RRII 105		GT_1	
		No. of units	Area (ha)	No. of units	Area (ha)
1979	15	-	-	2	0.87
1980	14	11	6.43	1	0.45
1981	13	5	2.80	-	-
1982	12	10	5.06	-	-
1983	11	20	11.81	6	2.22
1984	10	23	10.06	-	-
1985	9	9	3.36	-	-
Total		78	39.52	9	3.54

holdings (6 out of 9) were occupied with 11 year old plants. Hence tapping in the selected holdings were in progress in the 1st and 2nd panel.

4.1.3 Planting material used

Both budded stumps and polybagged plants were used in the selected holdings. Out of the total of 87 units, 46 (53%) were planted with polybagged plants and the rest with budded stumps. Holdings planted after 1982 are predominantly occupied by the polybagged plants except in the year 1985. The scarcity of budded stumps at the right time for the preparation of polybagged plants in the year 1984, would have caused a hike in the use of budded stumps in 1985. Of the 87 units surveyed 46 units were planted with polybagged plants. Further, 43 units were occupied with RRII 105 with an extent of 22.87 ha and 3 units with GT1 with an extent of 1.62 ha. Out of the 41 units planted with budded stumps, 35 were occupied with RRII 105 with an area of 16.67 ha and 6 units with GT1 covering an area of 1.92 ha (Table 3). Thus, RRII 105 is the popular clone in the surveyed area and more than 50 per cent of the total units were occupied with polybagged plants.

4.1.4 Manurial practices adopted

Manuring was a regular practice in all the holdings surveyed except one (Table 4). Different forms of manure were found applied. Complex fertilizers and cattle manure were found applied in different

Table 3. Planting material used in the surveyed units

Year of planting	RRII 105				GT_1			
	No. of units		Area in ha		No. of units		Area in ha	
	P.B.	B.S.	P.B.	B.S.	P.B.	B.S.	P.B.	B.S.
Bef. 1980	-	-	-	-	-	2	-	0.87
1980	3	8	2.34	4.09	-	1	-	0.45
1981	2	3	1.18	1.62	-	-	-	-
1982	7	2	3.48	1.60	-	-	-	-
1983	13	7	8.15	3.66	3	3	1.62	0.60
1984	14	9	5.77	4.29	-	-	-	-
1985	4	5	1.95	1.41	-	-	-	-
Total	43	35	22.87	16.67	3	6	1.62	1.92
Grand Total	78		39.54		9		3.54	

Table 4. Manurial practices adopted

Manure type	No. of units manured		Units not manured	Total	Percentage	
	Single dose	Double dose			Single dose	Double dose
a) Complex fertilizer as per Rubber Board Recommendations	7	22	-	29	8.0	25.3
b) Complex fertilizer and cattle manure	30	22	-	52	34.5	25.3
c) Cattle manure only	5	-	-	5	5.75	-
d) No manuring	-	-	1	1	-	-
Total	42	44	1	87	-	-

combinations. Split application of manures was recorded in 51 per cent of the holdings whereas it was applied as a single dose in other units. Cattle manure alone was found applied in 5 units in the surveyed area. Thus it was observed that though manuring was practised in 99 per cent of the holdings in the surveyed area no systematic approach was observed. Indiscriminate manuring according to the availability of manure were found practised in the surveyed area. One grower did not apply any type of manure since maturity; for which the farmer did not give any specific reason.

4.1.5 Disease incidence and its management

The mature rubber plants in the holdings surveyed were found infected with abnormal leaf fall, pink disease and powdery mildew. However, the intensity of infestation was low for all the three diseases. Percentage of intensity of infestation was classified as low, medium and high. Only 9 to 12 per cent of the holdings showed slightly high (medium) rate of infection (Table 5-1). Control measures have been adopted in all the cases. To control abnormal leaf fall, low volume and high volume sprayings have been done. Low volume spraying was found cent per cent effective whereas high volume spraying is only 73 per cent effective (Table 5-2). Control on pink disease and powdery mildew was cent per cent successful. The Board is supplying spraying materials through R.P.S.'s at concessional rates and this has helped the growers to control the diseases to a very great extent.

Table 5. Percentage of intensity of diseases observed shown as Low, Medium, High are with respect of total number of units surveyed (87)

1. Disease incidence

I. Diseases observed	Intensity (% of holdings)		
	Low	Medium	High
a) Abnormal leaf fall	27.6	8.0	1.15
b) Pink disease	25.3	12.6	2.30
c) Powdery mildew	26.4	10.3	-

2. Management practices

II. Control measures	No. of units infected	No. of units treated	Success	Percentage of success
a) Abnormal leaf fall				
i) Low vol. spraying	43	43	43	100
ii) High vol. spraying	15	15	11	73.3
b) Pink disease				
i) Bordeaux paste application	13	13	13	100
c) Powdery mildew				
i) Sulphur dusting	2	2	2	100

4.2 Tapping systems followed

4.2.1 Standard of tappability

The tapping panel was found opened at a height of 125 cm in all the holdings in the surveyed area. Though standard girth recommended to start tapping is 50 cm, trees having slightly varying girth were opened for tapping. Units were grouped as, those trees having girth below 50 cm, having 50 cm and having above 50 cm. Highest percentage (48%) observered was in 50 cm group in RRII 105. It was also observed that 40 to 44 per cent were having girth above 50 cm at the time of opening. Reason for adhering to the specification in opening the trees for tapping may be perhaps due to the strict restriction imposed by the Rubber Board for tapping before they attain specified girth of 50 cm.

4.2.2 Tapping System

Half Spiral cuts were opened by all the farmers in the surveyed area for both the clones, RRII 105 and GT_1 (Table 6). Alternate daily tapping was observed in 94 per cent holdings of RRII 105 and in all the 9 holdings of the clone GT_1. None of the holdings followed daily tapping whereas 6 per cent of the holdings under RRII 105 practiced tapping once in three days. The farmers were not found practising any of the special systems of tapping like microtapping, CUT or V cut. Intensive systems were also found not adopted in the surveyed area. None of the holdings were found using yield stimulants (Table 6).

Table 6. Standard of tappability and tapping system followed

Standard of tappability	No. of holdings			Percentage	
	RRII 105	GT_1	Total	RRII 105	GT_1
1. Height at opening as 125 cm	78	9	87	89.65	10.34
2. Girth at 125 cm					
a) Premature tapping girth < 50 cm	9	2	11	11.54	22.30
b) Girth having 50 cm	38	3	41	48.72	33.40
c) Girth having > 50 cm	31	4	35	39.75	44.40
3. Tapping systems					
a) Regular systems					
S/2 d/1	Nil	Nil	Nil		
S/2 d/2	73	9	82	93.6	100.00
S/2 d/3	5	Nil	5	6.4	-
6. Special tapping					
Micro tapping	Nil	Nil	Nil		
CUT	Nil	Nil	Nil		
V cut	Nil	Nil	Nil		
Intensive tapping	Nil	Nil	Nil		
4. Yield stimulants applied	Nil	Nil	Nil		

It was observed that the farmers were adopting alternate daily tapping mainly because of their financial constraints and lack of co-operation from the tappers. Though the Rubber Board is at present recommending once in three days tapping. Generally the farmers at Taliparamba taluk were found reluctant to adopt the same. Since the base panel of the plants in the surveyed area is not yet completely exploited the farmers have not yet thought of adopting special systems like CUT and V cut or exploitation using yield stimulants.

4.2.3 Slope of the cut and depth of tapping

The angle of tapping cut prescribed for budded plants is 30°. All the units in the surveyed area had strictly followed this specification initially ie., at the time of opening the tapping cut (Table 7). At the same time it was surprising to note that only 39 per cent of the holdings could maintain the specified limit one year after opening the tapping cut. The angle of cut exceeded 35° in 56 per cent of the holdings and it was less than 30° in 5 per cent of the holdings occupied with the clone RRII 105. The deviation from the specified angle of cut indicates the supervisory lapse on the part of the grower as well as the inefficiency of the tapper.

4.2.4 Depth of tapping cut

Depth of tapping cut should be the optimum for the best exploitation system in rubber. In the present study, tapping cuts

Table 7. Slope of the cut and depth of tapping

Particulars	No. of units		Total	Percentage	
	RRII 105	GT_1		RRII 105	GT_1
1. Angle of tapping cut					
a) Initial 30°	78	9	87	100	100
b) After one year					
< 30°	4	Nil	4	5.1	-
30° to 35°	30	1	31	38.5	11.1
> 35°	44	8	52	56.4	88.9
2. Depth of tapping cut					
a) Shallow tapping	27	3	30	34.61	33.3
b) Normal tapping	28	Nil	28	35.90	-
c) Deep tapping	23	6	29	29.49	66.7

with optimum depth (1 mm near to the cambium) were observed only in 36 per cent of the holdings (Table 7). In clone GT_1 3 units were doing shallow tapping and 6 units were adopting deep tapping. None of the units adopted tapping at normal depth. So in this clone 33 per cent of the units were tapping shallow whereas 67 per cent units were tapped deep. High percentage of deep tapping in GT_1 may be in order to extract more latex from the tree since the yield obtained from that clone is low compared to that of RRII 105.

4.2.5 Tapping tools used

To start tapping in a young rubber area plants are to be marked rather precisely with tools and implements designed for the purpose, so that all the trees in the unit are tapped maintaining a uniform slope, bark consumption etc. For fixing the angle of cut, template has to be used while marking the tree. Here in the survey all the 87 units used template while marking knife was found used only in 57 units (65%). Rest of the units ie., 30 (35%) used tapping knife for marking (Table 8). It is noted that all the 87 growers do not possess template or marking knife. In many cases, the trees were marked by the tapping demonstrator from the Rubber Board at the request of the planter and in some cases the planter did it with the help of his tapper using own or borrowed tools. Tappers in all the 87 units were found to use and rather prefer to use Michie Golledge knife for tapping and G.I. buckets to collect the latex. It was also observed that 79 per cent used plastic cups for latex collection,

Table 8. Tapping tools

Particulars	No. of units	Percentage
1. Tools for marking		
a) Template	87	100
b) Marking knife	57	65.5
c) Tapping knife	30	34.5
2. Knife used for tapping		
a) Michie golledge	87	100
b) Jebong	-	-
c) Gouge	-	-
d) Modified gouge	-	-
3. Collection cup		
a) Coconut shell	18	20.69
b) Plastic cup	69	79.31
4. Vessels for transporting latex		
a) G.I. bucket	87	100
b) Other vessels	-	-

Table 9. Time of tapping and latex collection

Particulars	Units	Percentage
a) Starting time of tapping		
4.30 a.m	7	8.05
5.00 a.m	18	20.70
5.30 a.m	29	33.30
6.00 a.m	30	34.50
6.30 a.m	3	3.45
Total	87	100.00
b) Time of collection		
1.30 hrs after	72	87.75
2.00 hrs after	15	17.24
2.30 hrs after	Nil	Nil

while 21 per cent were found using coconut shells (Table 8). It has to be noted that considerable improvement can be seen in marking rubber trees and the use of plastic cups for the collection of latex. But regarding the use of tapping knife, the tappers here prefer Michie golledge knife to other types which possess higher turn over potential. To popularise the use of knife like Jebong, the Rubber Board may have to launch an intensive training programme and supply good quality knives at concessional rates.

4.2.6 Time of tapping and latex collection

The data collected for understanding the time of tapping and latex collection are presented in Table 9. In more than 85 per cent of the holdings, tapping started in the early morning hours ie., between 5 am and 6 am. Tapping was started still earlier ie., by 4.30 am in 8 per cent of the holdings. Tappers in those holdings were provided with headlamps. Delayed tapping was observed only in 3 per cent of the holdings in the surveyed area. It was also observed that the tappers in 88 per cent of the holdings started collecting the latex one and a half hours after tapping (Table 9).

4.2.7 Tapping rest provided

Among the rubber growers there is a practice of giving rest to rubber trees during winter which is also known as summer rest. Rest given to the trees during summer as well as during rainy season in the surveryed units is presented in Table 10. In the case of clone

Table 10. Tapping rest provided during different season

Type of rest	No. of units		Percentage	
	RRII 105	GT_1	RRII 105	GT_1
Rest during				
1) Summer season	29	6	37.18	66.70
2) Rainy season	22	-	28.20	-
3) Units given no rest	27	3	34.62	33.30
Total	78	9	100.00	100.00

RRII 105, 37 per cent units were found to give rest during summer whereas in GT_1 it was 67 per cent. The high percentage in GT_1 may be due to the low yield from that clone. During the rainy season tapping rest was given in 28 per cent of the holdings which was mainly because of the less popularity given for rain guarding during the period. Units with continous tapping schedule, without rest period were also obsered during the survey. This accounted 35 per cent (27 Nos) in RRII 105 and 33 per cent (3 Nos) in GT_1. Though Rubber Board is not insisting to give rest during summer months, few growers are still giving rest to their trees, with an intention to tell upon the longivity of the trees.

4.2.8 Yield of rubber

Table 11 reveals the average yield per hectare obtained for two clones under alternate daily and once in three days systems of tapping. GT 1 was found to be tapped at d/2 frequency alone. In this system of tapping yield obtained for RRII 105 is far higher than that of GT 1. Only 6 per cent units of RRII 105 are tapped once in three days. Yield per hectare in these units are slightly lower as compared with those under d/2 tapping frequency. However, the intensity of TPD in these units i.e., units tapped once in three days were relatively low (2.30%) compared with the units of same clone tapped alternate daily (Table 16). These farmers were aware of the incidence of tapping panel dryness and hence were adhering to d/3 tapping though there exist slight reduction in yield in this system.

Table 11. Yield particulars for the clones RRII 105 and GT_1 under different systems of tapping

Particulars	Age of plants	Yield per hectare (kg)	
		RRII 105	GT_1
System of tapping			
a) S/2 d/2	15	-	1690
	14	2318	1685
	13	2371	-
	12	2316	-
	11	2266	1345
	10	2115	-
	9	1935	-
b) S/2 d/3	15	-	-
	14	-	-
	13	-	-
	12	-	-
	11	2160	-
	10	2042	-
	9	-	-

4.2.9 Methods of processing

Processing methods adopted by the growers in the surveyed area is presented in the Table 12. In the units surveyed only two types of processing were observed - ribbed smoked sheets and supply of field latex. Processing of latex into smoked sheets comes to 92 per cent in the case of RRII 105 and 100 per cent in the case of GT1. Only 8 per cent units (RRII 105) disposed their produce as field latex. It is understood that many growers are willing to give field latex as it greatly reduces labour and other production costs. But lack of ready market, accessibility and transportation problems in the locality compelled them to make ribbed smoked sheets. In 93 per cent of the units (72 + 9 = 81 units) disposal of sheets was observed as ungraded. Though the Rubber Board had launched campaigns in order to improve quality of sheets, the growers have not fully accepted the same as a policy since demand for high grade sheets is not adequate and the premium not consistant. They were found not paid upon the quality of sheets that they produce.

4.3 Details of rain guarding

The rain guarding system practiced in the surveyed holdings is presented in Table 13. The farmers were found to use only one type of rain guard, i.e., the polythene skirt type. It is also observed that rain guarding was practised only in 24 per cent of the holdings comprising 33 per cent of the area.

Table 12. Methods of processing

Method	No. of units		Percentage	
	RII 105	GT_1	RRII 105	GT_2
1. Sheet rubber				
a) Graded	-	-	-	-
b) Ungraded	72	9	92.30	100.00
2. Field latex	6	-	7.70	-
3. Preserved latex	-	-	-	-
4. Other forms	-	-	-	-
5. Disposal of cuplumps/tree lace				
a) Sold as raw	78	9	100.00	100.00
b) Other methods	-	-	-	-

The rain guarded units could obtain 25 to 50 additional tapping days. About 48 per cent of the rain guarded units were found to get 41 to 45 additional tapping days due to rain guarding (Table 13). Maximum number of growers (47%) benefited by rain guarding belong to this group. Though the quantum of rain obtained in each area may vary, early rain guarding enables the grower to avail maximum number of additional tapping days. Lesser percentage of growers who adopted rain guarding may be due to the opinion among the growers that in rain guarded units there is a drop in yield after rainy season nullifying the enhanced yield obtained by rain guarding. However, from the rain fall data (Table 14) collected for the area it could be observed that there exists possibility for the loss of large number of tappable days during the months of June, July and August (Table 14). Hence there is an urgent need to popularise rain guarding in Taliparamba Taluk and the farmers are to be made well aware of the costs and benefits of rain guarding.

4.4 Panel protection

The different panel protection methods adopted by the growers were observed and presented in Table 15. Application of wound dressing compound, white washing the tapping panel and panel treatment with fungicide were the common panel protection measures adopted. The extent of panel protection in the surveyed area was relatively low. Wound dressing compounds were found applied on the tapping panel only in 45 per cent of the units survyed.

Table 13. Details of rain guarding practiced in the surveyed area

Particulars	Units		Area	
	No.	Percentage	No.	Percentage
1. Type of rain guard				
a) Polythene sheet skirt	21	24.14	14.06	33.43
b) Guardian	-	-	-	-
c) Shade	-	-	-	-
d) Other type	-	-	-	-
2. No. of additional tapping days obtained				
a) 25 to 30 days	1	4.76	0.43	3.06
b) 31 to 35 days	2	9.52	1.07	7.61
c) 36 to 40 days	5	23.81	3.25	23.11
d) 41 to 45 days	10	47.62	6.59	46.87
e) 46 to 50 days	3	14.29	2.72	19.35
Total	21	100.00	14.06	100.00

Table 14. Rainfall data for Taliparamba taluk for 1993-94

Month	Rainy days	Total rainfall in mm
May 1993	10	109.2
June 1993	23	754.6
July 1993	29	1260.2
August 1993	26	555.8
September 1993	12	64.6
October 1993	19	255.8
November 1993	10	204.8
December 1993	4	62.4
January 1994	1	3.0
February 1994	Nil	Nil
March 1994	2	10.6
April 1994	9	131.0
Total	145	3412.0

Table 15. Details of panel protection

Mode of protection	Units	Percentage	
1. Application of wound dressing compounds	39	44.83	
2. White washing of tapping panel	7	8.05	
3. Application of fungicides on rain guarded panels			
a) Once in 7 days	20	22.99	100% of rain guarded units
b) Once in 14 days	1	1.15	
4. Units without treatment	20	22.99	

It was quiet encouraging to note that all the rain guarded units had resorted to panel protection in the way of applying fungicides in the tapping panel. The practice of white washing the tapping panel during summer months was not popular in the surveyed area. Only 8 per cent of the holdings adopted this practice. None of the panel protection measures were found adopted in 23 per cent of the units in surveyed area.

4.5 Incidence of tapping panel dryness (TPD)

The observations recorded for tapping panel dryness (TPD) is presented in Table 16. The TPD was found directly related to tapping intensity and the panel under tapping. The incidence was rather nil at 'C' panel even when it was tapped at high intensity. The incidence was more in the first panel and showed an increasing trend with increase in tapping intensity. The incidence of TPD was observed in 66 per cent (57 units) of the units in the BO 1 panel having a relative intensity of 100 per cent whereas it was only 6 per cent for the same panel with a tapping intensity of 67 per cent. The incidence was also relatively more at higher intensity of tapping. The clone GT1 was found less infected by TPD. However, TPD incidence was relatively low at Taliparamba taluk compared to many other rubber growing tracts.

Table 16. Incidence of tapping panel dryness and the intensity observed

Panel	Intensity of tapping in percentage	No. of units		Control measures No. of units				Percentate of Intensity of TPD	
		RRII 105	GT_1	Tapping rest		Alternate panel		RRII 105	GT_1
				RRII 105	GT_1	RRII 105	GT_1		
A	67	5	0	3	0	2	0	2.30	-
A	100	57	6	33	6	24	0	5.00	0.5
B	100	16	2	5	2	11	0	4.50	1.0
C	100	0	1	0	1	0	0	-	-

Intensity of TPD. No. of plants infected - expressed in %

4.6 Limitations in adopting scientific methods

After analysing the present system of tapping, an attempt was also made to unravel the limitations/constraints on the part of rubber growers in the surveyed area. The data collected are tabulated in Table 17. The main limiation observed was the lack of awareness of scientific tapping methods. This indicates the need for strengthening the extension work so as to effectively transfer the scientific technologies to the farmer. The lack of awareness was mainly on certain aspects like rain guarding, depth of tapping and slope of tapping cut. Economic constraints in respect of reduction in yield corresponding to the change in system of tapping was identified as the second limiting factor. The extent of other limitations identified were quiet negligible.

Table 17. Limitations in adopting scientific methods

Constraints	Units	Percentage
a) Lack of awareness of grower in tapping	49	56.30
b) Availability of tapper	2	2.30
c) Improper supervision	5	5.75
d) Non co-operation by the worker	6	6.90
e) Economic constraints	24	27.59
f) Absence of owner	1	1.15

SUMMARY AND CONCLUSION

A detailed study was conducted among the small growers of Alakode and Payyavoor villages of Thaliparamba taluk in order to ascertain the extent of adoption of scientific tapping and processing methods. Eighty seven holdings representing the highly concentrated rubber growing areas of the taluk under different size groups were selected for the investigations and the growers interviewed with a pre-tested questionnaire.

Size of the holdings varied from 0.20 to 1.60 ha and the units have been sorted out into 4 groups. Average size of the holdings was 0.51 ha in respect of RRII 105 and 0.39 ha in respect of GT1. Since the Rubber Board officials used to visit the holdings during immaturity period to assess the eligibility for the disbursement of subsidy, maintenance of all young rubber areas were satisfactory. But once the plants attain maturity, maintenance, tapping, processing etc. are done according to the knowledge, ideas and convenience of the growers and workers.

Standard of tappability, height of opening, slope of tapping cut and time of tapping were found followed as per the recommendations. Alternate daily i.e., ½S d/2 system of tapping was more prevelent. While 94 per cent followed ½S d/2 system 6 per cent adopted ½S d/3 system of tapping. Of the two clones RRII 105 and GT1 tapping panel dryness (TPD) was observed in RRII 105 @ 5 per cent

where tapping is done at an intensity of ½S d/2 i.e., 100 per cent on BO 1 panel. In the same clone units tapped at a frequency of 67 per cent, on BO 1 panel, i.e., ½S d/3 intensity of tapping, panel dryness is slightly low i.e., 2.5 per cent. In GT1, TPD is dismally low - 1 per cent even at 100 per cent intensity. However, the GT_1 plants in the surveyed area were older and tapping was in progress in BO 2 panel, compared with the RRII 105 trees.

Rain guarding is done by only 24 per cent growers. Drop in yield after rainy season is reported by many experienced growers and this makes many growers hesitant to rain guard their trees. Panel protection with fungicides in rain guarded trees is a must and it has to be done periodically. In rain guarded trees the panel protection with fungicide once in a week was observed in 99 per cent holdings whereas 1 per cent did it once in 14 days. In the units which were not rain guarded 45 per cent treated the panel with wound dressing compounds and 8 per cent only white washed the panel. Units which did not give any panel treatment accounted to 23 per cent.

Number of additional tapping days obtained by rain guarding varied from 25 to 50 days. This was depending upon the time of rain guarding and quantum of rain obtained in the respective localities. A good number of units obtained 41 to 45 additional tapping days which accounted 48 per cent of the total number units rain guarded.

It was also found that, alternate daily tapping is more prevelant among the growers. Though RRII 105 is recommended for once

in three days tapping, 94 per cent holdings adopted alternate daily tapping for the clone RRII 105, while 6 per cent followed once in three days tapping. From the study it is concluded that TPD is more in RRII 105 units tapped alternate daily i.e., ½S d/2 compared to the units of the same clone tapped once in three days i.e., ½S d/3. Small growers are much hesitant to adopt once in three days tapping because of constraints like financial difficulties, that arised due to the drop in yield and income; co-operation from the workers etc.

Clone-wise average yield obtained per hectare has been worked out. RRII 105 was found definitely yielding better that GT1. Though the yield obtained under ½S d/3 system was lesser than that of ½S d/2 system there was no substantial difference which can be considered as an advantage, as percentage of infection of TPD in those units is very low.

It was noted that 92 per cent of RRII 105 and 100 per cent of GT1 units processed their rubber into ribbed smoked sheets and 8 per cent units of RRII 105 sold their latex as field latex. Cup lumps and tree lace from all the units were disposed as raw.

From the survey and the field experience obtained otherwise it is concluded that generally the growers are not giving much importance to scientific methods of cultural operations and exploitation. Majority of the growers being small growers who lack awareness and suffer from financial constraints want to extract the crop, process

it and sell in the market. At the same time, in the market also quality consciousness is not seen. In order to enlight the growers about the need for the adoption of scientific methods of exploitation system, proceessing methods and to improve the quality of sheet rubber it is essential to reorient and strengthen the extension work so as to effectively transfer the modern technologies to the progressive farmers.

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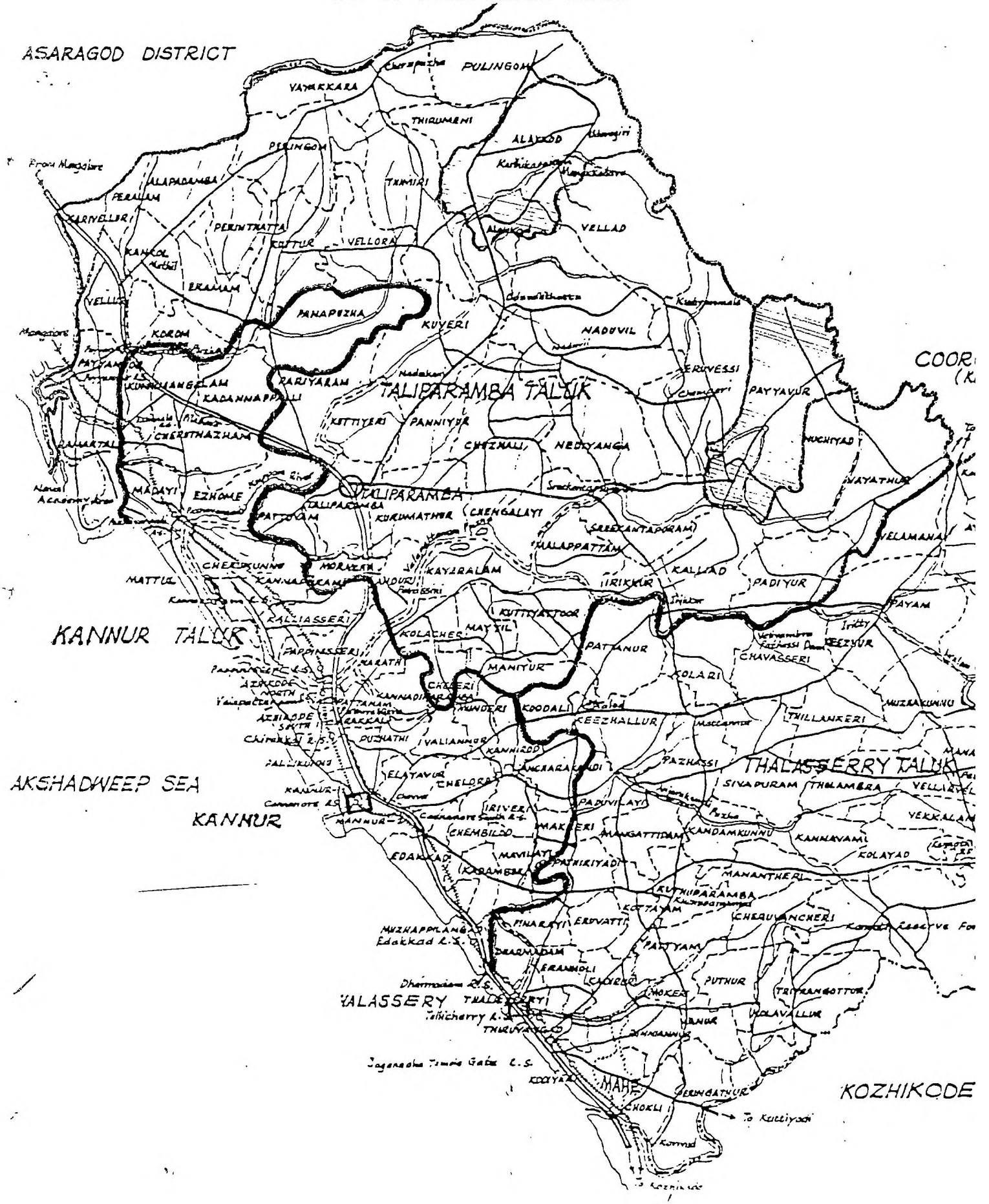
ANNEXURE-I

MAP OF TALIPARAMBA TALUK



ANNEXURE-II

Details of units selected

Sl. No.	Name and address of holder	Reg.No./PD No.	Extent (ha)
1	2	3	4
1	Varkey Padayattil, Nediyanga,P.O.	TPBA 4122	0.81
2	Mathew Thundathil, Nediyanga	PD/TP 235/79A	0.43
3	P.D.Mathew, Puliyanmackal, Vayattuparamba, P.O.	PD/TP 402/80A	1.10
4	Kuttiyamma, Kanattu Karuvanchal Alakode	PD/TP 1412/80A	0.86
5	Rosa, Paravanparambil, Vellad,P.O.	PD/TP 1079/80A	0.94
6	M.S.Varkey, Melukunnel, Vayattuparamba, P.O.	PD/TP 1275/80A	0.83
7	Issac Kuriakose, Pettayil, Nellippara, P.O.	PD/TP 1488/80A	0.65
8	Varkey Kelachamuriyil, Nellippara, P.O.	PD/TP 1445/80A	0.34
9	Scaria Kelachamuriyil, Manjakkad, Nellippara, P.O.	PD/TP 1299/80A	0.29
10	Ulahannan Puthenpurackal, Vellad, P.O.	PD/TP 976/80A	0.36
11	Gopinath Kunnath, Arangam, Alakode, P.O.	PD/TP 1485/80A	0.35
12	Mariyam Micheal, Chovelikudiyil, Alakode, P.O.	PD/TP 1114/80A	0.20
13	Scaria Michael, Chovelikudiyil, Alakode, P.O.	PD.TP 265/80A	0.51
14	Thomas Kuruvathazha, Payyavoor,P.O.	PD/TP 908/80A	0.45

Contd.

1	2	3	4
15	Ouseph Varghese, Mukkattu, Ottathai, Alakode	PD/TP 323/81A	0.73
16	Abraham Alumpurath, Alakode,P.O.	PD/TP 1558/81A	0.71
17	Augusty Puliyarmattathil, Vannayi Kadavu, Payyavoor	PD/TP 1150/81A	0.24
18	E.M.Joseph, Elavumkunnel, Alakode, P.O.	PD/TP 22/81A	0.45
19	George Joseph, Panachapally, Payyavoor	TPBA 7549	0.67
20	C.P.Jose, Chennattu, Payyavoor	PD/TP 233/82A	0.99
21	Varkey Pullattu, Alakode	PD/TP 2166/82A	0.23
22	Thressiamma, Valukunnel, Ottathai, Alakode	PD/TP 117/82A	0.53
23	George Mannukandathil, Vannaikadavu, Payyavoor	PD/TP 903/82A	0.45
24	M.M.Joseph, Mecheril, Vembua, Payyavoor	PD/TP 320/82A	0.40
25	Vicar, Marsleeva Church, Vembua, Payyavoor	PDTP 230/82A	0.60
26	Mathew, Thachukunnel, Payyavoor	PD/TP 1157/82A	0.72
27	U.K.Thomas, Unnupalathinkal, Alakode	PD/TP 1212/82A	0.44
28	Thomas, Naduvakunnel, Nellippara	PD/TP 2353/82A	0.42
29	E.K.Madhavan, Elampurayidathil, Vellad, P.O.	PD/TP 2337/82A	0.28
30	Mathai, Kureekattil, Vembua,	TPBA 4561	0.35
31	K.O.Devasia, Kuttianimattathil, Alakode	PD/TP 868/83A	0.62

Contd.

1	2	3	4
32	T.Beena, Thollapurath, Chooliyad	PD/TP 2600/83A	0.20
33	K.P.Raman, Koyyott Puthiyapurayil, Chooliyad	PD/TP 2599/83A	0.20
34	Pushpaja, Thollapurath, Chooliyad	PD/TP 2598/83A	0.20
35	Joseph Kaniyankal, Manakkadavu, Alakode	PD/TP 686/83A	0.65
36	Thomas Kappukalayil, Payyavoor	PD/TP 29/83A	0.40
37	Baby Aanimoottil, Vathilmada Payyavoor, P.O.	PD/TP 272/83A	0.34
38	Annamma Thonnankuzhy, Pious Home, Payyavoor	PD/TP 108/83A	0.90
39	T.J.Antony, Tharamangalathu Alakode	PD/TP 2441/83A	0.26
40	Joseph poovanikunnel, Payyavoor	PD/TP 142/83A	0.27
41	Joseph Vandakunnel, Paisakary, P.O.	PD/TP 1542/83A	0.30
42	James Poovanikunnel, Payyavoor	PD/TP 914/83A	0.32
43	Thomas Kaichirayil, Neduvode, Kuttaparamba, Alakode	PD/TP 2709/83A	0.40
44	Scaria Varkey Idiyakunnel, Alakade	PD/TP 828/83A	0.34
45	M.C.Mathai, Moolekattu, Payyavoor	PD/TP 11/83A	1.28
46	Mother Superior, Sacred Heart Convent, Payyavoor	PD/TP 1291/83A	1.00
47	Kuriakose Pettayil, Nellippara	PD/TP 2460/83A	0.65
48	M.S.Thomas, Moozhiyil, Paisakari	PD/TP 2045/83A	1.60

Contd.

1	2	3	4
49	Narayanan Udayapara, Vathilmada Payyavoor	PD/TP 520/83A	0.38
50	A.J.Baby, Aanimoottil, Vathilmada, Payyavoor	PD/TP 272/83A	0.34
51	Mani Thomas, Kadankavil, Neduvode, Kuttaparamba, Alakode	PD/TP 1934/83A	1.22
52	Devasia Kureekattil, Vembua, Payyavoor	PD/TP 2495/83A	0.39
53	Sreedharan Kunnumpurath, Nellippara, Alakode	PD/TP 1678/83A	0.44
54	Mariam Mankanthanathu Chandanakampara, Payyavoor	PD/TP 214/83A	0.70
55	Devasia Valliamthadathil, Paisakari	PD/TP 656/83A	0.28
56	Ouseph Joseph, Thoompunkal Nellipara, Alakode	PD/TP 1455/84A	0.95
57	Ciciliamma, Kuttianimattathil, Vellad, P.O., Alakode	PD/TP 2039/84A	0.63
58	Varkey Thadathil, Paisakkari	PD/TD 869/84A	0.58
59	Chacko Arackaparambil, Payyavoor	PD/TP 684/84A	0.46
60	P.J.Jacob, Pulickathazhe, Udayagiri, Alakode	PD/TP 660/84A	0.58
61	V.D.Vijayakumari, Vadakkanatt, Arangam, Alakode	PD/TP 672/84A	0.79
62	Sunny Philip, Njarakolil, Payyavoor	PD/TP 1569/84A	0.20
63	Siby Philip Njarakolil, Payyavoor	PD/TP 1500/84A	0.22

Contd.

1	2	3	4
64	Devasia Thekkel, Alakode	PD/TP 680/84A	0.20
65	Santy Philip, Njarakolil, Payyavoor	PD/TP 1257/84A	0.20
66	K.T.Thomas, Kaniyampadickal, Payyavoor	PD/TP 1347/84A	0.29
67	Ulahannan Valiyaveetil, Arangam, Alakode	PD/TP 873/84A	0.40
68	C.C.Kunjikkannan, Chemmencheri Payyavoor	PD/TP 957/84A	0.33
69	Mathew Arackaparambil, Payyavoor	PD/TP 67/84A	0.40
70	M.O.Joseph, Mampuzhackal, Payyavoor	PD/TP 204/84A	0.45
71	K.C.Thomas, Kulamkuthiyil Vayattuparamba, Alakode	PD/TP 679/84A	0.58
72	Thomas Mampuzhackal, Payyavoor	PD/TP 203/84A	0.42
73	Chacko and Mary Kattakkayathu, Arivilanjapoil, Alakode	PD/TP 664/84A	0.34
74	Joseph Koovakkal, Paisakkari, Payyavoor	PD/TP 991/84A	0.30
75	M.T.Michael, Madapallil Chandanakkampara, Payyavoor	PD/TP 737/84A	0.20
76	Thomas Kachira, Arivilanjapoil, Alakode	PD/TP 692/84A	0.80
77	Thressiamma Kallarackal, Chandanakkampara, Payyavoor	PD/TP 2027/84A	0.38
78	Scaria Kelachamuriyil, Nellippara	PD/TP 1437/84A	0.34

Contd.

1	2	3	2
79	T.M.Xavier, Thudiyamplackal Paisakkari	PD/TP 914/85A	0.57
80	Thomas Peroorthekkel, Nellippara	PD/TP 550/85A	0.91
81	Abraham Pulickathadathil Nellippara	PD/TP 1606/85A	0.38
82	O.C.Jose, Odiyathumkal, Paisakkari	PD/TP 1081/85A	0.24
83	Aleykutty, W/o. Devasia Kuttyveettil, Arivilanjapoil Alakode	PD/TP 1503/85A	0.30
84	Somashekharan Nair, Malayil Paisakkari	PD/TP 189/85A	0.24
85	K.J.Thomas, Edattu, Paisakkari	PD/TP 1512/85A	0.20
86	Devasia Ambattu Kuzhiyil Rayarome, Alakode	PD/TP 1538/85A	0.25
87	Philomina Vallatu, Chandanakkampara Alakode	PD/TP 29/85A	0.27

ANNEXURE-III

INTERVIEW SCHEDULE FOR THE SURVEY OF TAPPING SYSTEMS ADOPTED BY SMALL GROWERS OF TALIPARAMBU TALUK

1. Name and address of the grower :

   Reg.No./PD No

2. Location :

3. Date of inspection :

4. Area owned by the grower : Mature clone Immature clone

   ..... ha ..... ha

5. Area came under tapping : ..... yr ..... yr

   ..... ha ..... ha

6. Cultural practices adopted

   a) Manuring Type Dose Organic manure

      1.

      2.

   b) Spraying High Volume Low Volume

7. Diseases observed : Intensity L.M.H.* Remedy taken

   a) Abnormal leaf fall

   b) Pink disease

   c) Powdery mildew

   * Low, Medium, High

8. Tapping system : Opening girth ..... year ....

   Daily, Alternate daily, Once in 3 days

9. Who taps the trees : Owner, Relative, Paid tapper

10. Wether other systems followed : (Cut, Puncture tapping)

11. Wether any area is under slaughter tapping

    Furnish details

12. Wether rain guarding done Type No. of trees Yield obtained

    a) Yes/No ... .

    b) No. of days tapped with rain guarding

    c) Frequency of panel treatment

13. Wether stimulant is being used : Yes/No

    a) System of tapping at which stimulant is used

    b) Panel applied ..... (c) Period applied .....

    d) Frequency of application .....

14. Wether tapping panel dryness is noticed ..... No. of trees

    a) When it was noted ..... (b) Clone .....

    d) Panel (d) Wether alternate panel is opened

    e) Frequency (f) Control measures adopted

15. Defects of tapping noted if any

    a) Tapping wounds ..... Slope of tapping

    b) Shallow tapping ..... $< 30^{\circ}$ .....

    c) Others ..... $30\text{-}35^{\circ}$ .....

    $> 35^{\circ}$ .....

16. Type of processing done : Sheeting, Field latex, Ammon. latex

    a) From the blocks

    b) From slaughter tapping

17. Type of knife used : (1) M.G. (2) Jebong (3) Gouge

18. Thickness of renewed bark (1) Top bark
(2) Middle
(3) Lower

19. Duration of tapping rest given .....

20. Panel dressing compound applied period .....

21. Other informations if any

22. Limitations in adopting scientific systems

Testing of farmers awareness in tapping systems

a) Depth of tapping
b) Slope
c) Time of tapping
d) Intensity
(show present state followed by the farmer)

Other limitations

1) Economic constraints
2) Availability of tapper
3) Lack of awareness
4) Absence of the owner
5) Improper supervision
6) Non co-operation by the tapper