CENTRALISED PROCESSING AND MARKETING OF SMALL HOLDER RUBBER - A CASE STUDY OF SMALL HOLDER DEVELOPMENT CENTRE UNDER CHANGANACHERRY CO-OPERATIVE RUBBER MARKETING SOCIETY, KOTTAYAM DISTRICT, KERALA STATE

by

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THESIS

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MY GRAND FATHER

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CERTIFICATE OF ORIGINAL WORK

This is to certify that Shri JACOB T. MANI of the University of Allahabad, planned his study, carried out the empirical work involved, analysed the data and prepared this thesis on "Centralised Processing and Marketing of Small Holder Rubber - A Case Study of Small Holder Development Centre under Changanacherry Cooperative Rubber Marketing Society, Kottayam district, Kerala State".

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The thesis attached hereto, entitled, "Centralised Processing and Marketing of Small Holder Rubber - A Case Study of Small Holder Development Centre Under Changanacherry Cooperative Rubber Marketing Society, Kottayam district, Kerala State", prepared and submitted by Shri Jacob T. Mani in partial fulfilment of the requirements for the degree of Master of Science in Agricultural Economics is hereby accepted.

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Date: 10.07.1986. JACOB T. MANI

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LIST OF ABBREVIATIONS

drc	-	Dry rubber content
E.B.C.	-	Estate brown crepes
e.g.	-	For example
etc.	-	Et cetera (and the rest)
Fig.	-	Figure(s)
hr.	-	Hour(s)
ha	-	Hectare (s)
i.e.	-	That is
Kg	-	Kilogram(s)
Km	-	Kilometre (s)
m	-	Metre(s)
Max.	-	Maximum
Min.	-	Minimum
mm	-	Millimeter(s)
mt	-	Metric tonne(s)
NR	-	Natural Rubber
PLC	-	Pale Latex Crepe
RRIC	-	Rubber Research Institute of Ceylon.
RRII	-	Rubber Research Institute of India.
RRIM	-	Rubber Research Institute of Malaysia.

RSS		Ribbed smoked sheet (s)
t	-	Tonne(s)
viz.	-	Namely
/	-	Per
%	-	Percent

CHAPTER I

INTRODUCTION

Rubber tree (Hevea brasiliensis Muell Arg) is an unique crop of exclusive strategic industrial application. Natural rubber has multifarious uses and there is hardly any segment of life which does not make use of rubber based materials. Though a new comer among plantation crop in the country rubber occupies a pride of place in the national economy. It plays a vital role in the economy of Kerala and has spread far and wide in the state obviously due to the lucrative and labour intensive nature of the crop, besides the agroclimatic suitability. Unlike the other rubber producing countries in the world who export most of their rubber produce to the largest single factor that has accelerated the promotion of this crop in India, is the emergence of a strong rubber goods manufacturing industry capable of absorbinb more than the entire domestic production, which can be seen from our imports which stood at 1,64,000 tonnes since 1978 (Ref. Rubber imports, Financial express).

In order to appreciate the importance of raw rubber marketing it is essential to analyse the structure of the rubber industry as a whole. The rubber industry in the country comprises of two sections, the producing sector consisting of petty small holdings to large estates and the consuming sector consisting of small manufacturing units to sophisticated modern plants to produce automobile tyres. While this is the picture of the producing sector the consuming sector presents a different set up. Rubber goods manufacturing units in the country which number slightly over 3000 are distributed in the various states

with comparatively better concentration in Maharashtra, West Bengal and Uttar Pradesh. It is interesting to note that these three states are non-rubber producing states located at far distant places, miles apart. This necessitates the need to have an effective marketing channel to link the producers and consumers who are at the two extreme ends.

Yet another feature which demands a well developed marketing network is the fastly changing structure of the plantation industry. To begin with rubber cultivation was confined only to large estates slowly small growers also entered the field attracted by the lucrative price of rubber. Due to the various socio-economic changes rubber is fastly becoming a small holders crop. In 1961-62 the small holdings accounted for only 60% of the total area under rubber which by now has increased to 72%. Similarly production from small holdings which formed only 21% in 1950-51 has increased to 71% by 1981-82 (Varghese, 1984). Majority of the small holdings are located in villages. In effect within a decade or so the lions share of the natural rubber produced in the country will come from numerous rubber growing villages. In brief the future prospects of NR industry in India is heavily dependent on the prosperity of small growers significantly those owing about a hectare of land.

Intensive research development and extension activities undertaken by rubber board, has enabled the industry to increase the productivity to a very great extent. However, the problems of processing and marketing of small growers

which are by and large the most complex of all their problems still remains to be solved.

Natural rubber is obtained by tapping, an action of making a regulated incision in the trunk of the tree. The milky liquid that flows into a cup is collected as latex a few hoars after tapping, whilst further late drippings are collected, after natural coagulation, as cuplump and tree lace just before the next tapping. The latter is referred to as 'Scrap' and is of lower grade because of extraneous materials gathered during exposure and handling. The relative yields of latex and scrap vary with a host of factors, but are generally in a 4:1 ratio. Both latex and scrap can readily be sold after collection from the trees without any further treatment. However most small-holders prefer to process their latex, using traditional methods, and sell it is the form of sheet. This type of rubber, as well as scrap, has to undergo further processing and treatment before it can be utilized by the manufactures of rubber goods.

This is an old conventional system which reduces the quality of the rubber and as such the same fetch only lower price in the market. This is precisely the reason for the general complaint of the consuming industry that there is shortage of top grade rubber in the market. This problem has been engaging the attention of all natural rubber producing countries and the concept of centralised processing and

marketing of small holders rubber emerged as the ideal solution (Somporon Krisanasap, 1982; Chalong Manneekul, 1985).

A necessary pre-requisite for the successful operation of this concept is a well organised collection machinery. A network of collection centres in predominant smallholders areas will be required for this purpose. These centres need not be a mere crop collection centre, but could be developed later on as development centres were small holder could get all their inputs as also technical advice over and above the disposal of their crop. The small growers crop is converted into premium grades, PLC in the factory which naturally fetches attractive premium in the market. A share of the profit accruing to the factory can be channeled back to the growers as purchase bonus. Thus the grower is benefitted by securing an attractive price for his crop and the country is benefitted by upgrading the quality of small holders rubber which otherwise would have been converted into low quality sheet rubber.

Coming to the agency to own the central processing factories there will not be two opinion about the suitability of small grower cooperatives. They are the ideal agency which can ensure the active participation and involvement of member growers in such developmental efforts. More of centralised factories to upgrade small holders production is required in the cooperative sector in a state like Kerala where the size of a holding is becoming lower and lower.

There is a marketing network for small holder's rubber involving a chain of agencies which has been evolved through the past many years. It consists of primary dealers, middle dealers and big dealers. Primary marketing cooperatives are also an integral part of this chain. However their share of the market is considerably low. Their system of operation is more orless like middle dealers. Primary dealers operate at the village level and serve as the first out let for small holders rubber into the market. Middle dealers operate in towns and buy rubber mostly from primary dealers and medium and big estates. From the middle dealers the rubber passes to the big dealers operating at important rubber markets in the country. At the level of the big dealers, proper grading and packing are done before the rubber is despatched to the ultimate consumer.

In India much thought was given for centralised processing and marketing of small holders produce. With this end in view rubber board has grown up a scheme to start small holders development centres, to modernise the small holding sector, an idea conceived based on the operation of milk cooperatives in Gujarat. The Department of rubber processing with the help and assistance of the Changanacherry Cooperative Rubber Marketing Society started 3 centres as pilot project in May 1979. The number of centres since then increased manifold.

The idea being knew to the rubber plantation industry, it became imperative to assess the receptiveness of small

growers to this idea. A case study of the said collection centres through interviews with farmers and the cooperative officials was carried out during 1985-86 with the following objectives.

OBJECTIVES

1. To study the working of small holders development centre under Changanacherry rubber marketing cooperative society.
2. To study the market structure and problems of processing and marketing.
3. To study the reactions of the small holder and the tapper towards this scheme to find reasons for its popularity.
4. To find out shortcomings of the scheme with special reference to drc estimation, pricing policy and systems of payment.
5. To study the correlation between production and rainfall and between supply and price.

HYPOTHESES

1. Formation of collection centres by the rubber marketing cooperative is a feasible and workable proposal.

2. Reasons for popularity of the scheme are convenience, economy and time saving.

3. Problems of the schemes are unsatisfactory drc estimation, transport facilities, price policy and payment system.

CHAPTER II

REVIEW OF LITERATURE

Relatively very few attempts have been made on Latex collection and preservation aspects. So a brief review of the available literature is cited below.

George,C.M.[1] (1982) in production and consumption of preserved latex and latex concentrates. About hold of the total preserved latex and latex contrates produced in the world was being used for foam production. A number of utility goods can be manufactured from latex and the catalogue of these products are increasing through the years shows that there are exciting prospects for the latex producing and consuming industry in a developing country like ours. The consumption of preserved latex and latex concentrates during the period 1970-71 to 1980-81 vis-a-vis the consumption of all varieties of NR are given below.

Table No. 2.1 : Consumption of Latex vis-a-vis Total Natural Rubber.

Year	Latex concentrates (drc) (tonnes)	% Increase	Total NR (tonnes)	% Increase
1970-71	6,206	-	67,237	-
1971-72	7,020	13.1	96,454	10.5
1972-73	6,829	(-) 2.7	104.028	7.8
1973-74	7,846	14.9	130,302	25.2
1974-75	7,453	(-)5.0	132,604	1.7
1975-76	6,332	(-)19.8	125,692	(-)5.2
1976-77	8,497	33.7	137,623	9.5
1977-78	9,033	6.3	144,967	5.3
1978-79	10,960	21.3	164,524	13.5
1979-80	11,690	6.6	165,245	0.4
1980-81	13,820	18.2	173,630	5.1
Average		9.2		7.4

From the table it can be seen that the average growth rate in consumption of latex during the one decade was around 9.2% as against 7.4% for the natural rubber industry as a whole. In this context, it may be noted that there has been a abnormal rise in consumption of latex during the period 1976-77 to 1980-81. The average growth rate during the period works out to 17.4%. The trend in production of latex vis-a-vis natural rubber as a whole during the last one decade was as shown below.

Table No. 2.2 : Trend in production of latex vis-a-vis NR during the last one decade

Year	Latex concentrate d.r.c. (tonnes)	Increase %	Total natural rubber (tonnes)	Increase %
1970-71	6,652	-	92,171	-
1971-72	6,626	9.5	101,210	9.8
1972-73	7,316	10.4	112,364	11.0
1973-74	8,585	17.3	125,153	11.4
1974-75	6,508	(-)24.2	130,143	4.0
1975-76	7,050	8.3	134,750	5.8
1976-77	8,475	20.2	149,632	8.6
1977-78	9,024	6.5	146,987	(-) 1.8
1978-79	10,948	21.3	135,297	8.0
1979-80	12,278	12.1	148,470	9.7
1980-81	13,139	7.0	153,100	3.1
Average		8.6		5.4

Varma,K.S. et al. (1979) discussed on the report on the working of latex collection centre operated by rubber marketing co-operatives. The study has observed the actual reception of latex is the depot practice existing in the depots and the records maintained and sample testing donate the depot and the factory. The operation at the collection centre for the three months, September, October and November 78 were taken for the study. The performance of the depot is shown in table.

Table No. 2.3 : Performance of the depot studied.

	Sept.	Oct.	Nov.	Average
No. of members giving latex.	48	44	47	46
Quantity of latex supplied (kg drc)	8247.8	9563.7	10013.3	9274.6
Average latex supplied per member(kg)	171.8	217.4	213.0	200.1
No. of days of latex supply	24	27	23	25
Average daily receipt (kg)	343.6	354.0	434.9	370.9

Personal interview with the growers he studied that co-operation and support of the small growers as the locality is an essential pre-requisite for the successful operation of crop collection schemes. The common practice seen in the locality is that of the distance to the centre is less than 1 km. and the total weight of latex to be carried is 30 kg, or less, the tappers do this work without any extra remuneration. However, in cases where the distance is more than 1 km. and additional payment ranging from Re. 1 to 1.50 depending on the quantity to be transported. The main problem raised by the small growers under this study, centres round the method of payment and the difficulties in transportation.

Mathew N.M.and U.C. Karna[3] preserved latex may be as the field latex or concentrated latex. Various chemicals are used as

preservatives among which amonia is of prime importance. Other chemicals used along with amonia are known as secondary preservatives. The primary requirement of any preservative is that it should preserve latex against spontaneous coagulation and patrefication. For the preparation of preserved field latex, latex from the field is sieved and bulked and ammonia bubbled through it so as to get a concentration of 0.7-1.0% on vol. of latex. After ammoniation, latex is left undisturbed for about 15-20 minutes to allow separation of sedimentable impurities and reaction product (magnesium ammonium phosphate. It is then transferred to drums sealed and marketed. The process of latex concentration involves the removal of a substantial quantity of serum from field latex, thus making latex richer in rubber content.

Creaming

Latex is collected and ammoniated to 1% and preferably kept for a few days for aging the creaming agent solution and 3% concentration is prepared by boiling the required quantity of the material with water. The preserved and de-sludged latex is taken in the creaming tank. Calculated quantity of the creaming agent solution, which has been seived to remove uncooked materials is then added. A 10% percent solution of soap is added so as to make its concentration 0.3% on latex. The latex is then thoroughly stirred for about 1 hr. The complete dissolution of creaming agent and the thorough mixing of the solution in latex are very important. After stirring

latex is allowed to remain undisturbed till the desired level of creaming is obtained. Minimum period of 48 hrs is usually required for satisfactory creaming.

Centrifuging

Now this is the most widely used method. For the concentration of latex over 90% of the concentrated latex is produced by centrifuging. In centrifuging, centrifugal force replaces gravitational force which brings about separation of rubber particles in creaming. Most widely used machine is the "de Laval" type. The rotating mass of latex is broken up into number of thin conical shells within the bowl which rotates as speeds around 6000 rpm. The degree of ammoniation of the latex prior to centrifuging depends upon the period which has elapsed since collection and ranges from 0.25%, centrifuging is immediate to 0.8%. After centrifuging the cream is separately collected in bulking tank, its ammonia constant estimated and made upto 0.7% on latex and packed in drums

Thomas E. et al.[4] (1980) in the collection and processing of the crop, presented that seventy to eighty five percent of the crop harvested from rubber plantations is in the form of latex. The remaining portion is collected in coagulated forms which are collectively known as field coagulum rubbers or scrap rubbers. Cocoment shell (lower half) is the most popular type of collection cup used in rubber plantation in India. In some Malayasian estates, collection

of latex from several tapperings is done in polythene bags fixed to the trees and containing shell amount of coagulant to start with the latex collected in suchbags mostly into solid block rubber. Bucket or other container made of galvanised iron is mostly used for collecting latex from the field. Flow of latex usually ceases 1.5 - 3.0 hrs after tapping. generally the tappers deliver the latex to the processing factory or the collection unit by carrying it in the buckets or other containers.

Pre-Processing Operation

Latex received in processing factory or collection unit is weighed and the quantity of crop brought by each tapper is separately recorded. The quantity of rubber present in latex is calculated from its drc. The drc of latex falls in the range of 30-40.

Baby Kuriakose[5] (1980) and Sunny Sebastian.

Raw rubber sheets are of various types like ribbed smoked sheets (RSS), air dried sheets (ADS) and sun dried sheets, depending on the method adopted. For drying. The operations involved in making RSS and ADS include sieving, bulking and standardisation of latex, addition of chemicals, coagulation, sheeting, dripping and drying.

The bulked latex is to be diluted to a standard drc of 12.5% before it is coagulated. Coagulation consists of transferring the standardised latex into coagulation pans or tanks and adding suitable coagulating agent. Coagulation

is the process of destabilisation of latex by some means with a view to recovering rubber from it. Coagulation of latex by the addition of acid is due to neutrisation of charge on the protective layer of proteins surrounding the rubber particles. After this for sheeting the sheeting rollers consist of a pair plain rollers and another set of grooved ones, are at length 60 cm and diameter 15 cm. The design obtained by passing through the grooved rollers helps faster drying of the sheets due to increased surface area. It also helps in separating the dried sheets after they are packed in bundles. The wet sheets are allowed to drip in shade for 1-2 hrs before they are transferred to smoke houses for producing RSS or to hot chambers for making air dried sheets. At present there are five grades of sheet rubbers and they are designated as RSS-1, RSS-2, RSS-3, RSS-4 and RSS-5 in India, these grades are even now designated as RMA sheets.

K. Kochappan Nair[6] (1980) and Baby Kuriakose

When coagulum from latex or any form of field coagulum or RSS cuttings after necessary preliminary treatments is passed through a set of creping machines, crinkly, lace-like rubber is obtained. This when dried, is called crepe rubber. Pale latex crepe (PLC) and sole crepe are processed from field latex. PLC are mainly used for the production of surgical and pharmaceutical articles, light coloured and transparant goods, adhesive and tapes, derivatives like chlorinated rubber, cyclised rubber etc. The other forms of crepe are used for the manufacture of tyres, foot-wears, retreating materials etc. Prodasses

involved in the production of latex crepes include sieving, bulking, and standardisation of latex, addition of chemicals, coangulation, creping of coagulatum and drying.

PLC and sole crepe are produced from field latex under strictly controlled conditions. Grading of PLC is done as per the standards of quality and packing of natural rubber grades, presented in the "Green book". The crepes prepared from field coagulum materials fall into five types. These are Estate brown crepe (EBC), remilled crepes , thick blanket crepes, flat bark crepes and smoked blandet crepes.

V.K. Bhaskaran Nair[7] (1984)

Rubber crop is covered by an area of 3,00,000 hectares small holders sector which are counts for 75% of the area under the crop and makes the major contribution to the total production of natural rubber in the country. The agerage productivity in the small holders sector is only around 770 kgs/ha/year, while that of estate sector is over 1046 kgs. Rubber Board has implemented a number of schemes in the past to increase the productivity and improve the economic viability of the small holders which are through co-operatives and through private sectors also e.g. Modi Rubber Limited has launched a rubber development project for the development of this weak sector.

LIM SOW CHING[8] (1985)

The world produced just over 4 million tonnes of

this crop in 1983. Some 94% of which came from the Asian countries. About 84% of this rubber is exported. Malaysia accounting for 39.2% of the world's output and 45.7% of the world's net export in 1983. The rubber industry is divided into two parts, estates largely controlled by limited companies with sophisticated management and small holdings mostly below 4 ha a piece. Malaysia produced about 1.525 million tonnes of rubber in 1983 of which some 63% came from small holdings. Around two-thirds of small holder's latex is processed by them into unsmoked sheet (USS) which is sold to first level village dealers. This rubber is then cleaned and smoked, either at this level or at for being passed to the middle dealers, before clipped, graded and boiled by the packers For export largely as ribbed smoked sheet (RSS), the bulk is finally graded as RSS-3 and RSS-4.

P.N. Krishnan Kutty[9] (1985)

The growth of rubber market in India is closely associated with the development of rubber plantation industry as well as rubber goods manufacturing industry. The rubber plantation industry started on a commercial scale in 1900's grew rapidly in terms of area production, and productivity over the years. The area and production of rubber which were around 30 thousand hectares and 6.5 thousand tonnes respectively. in 1930 have increased manifold. At present the area under rubber is around 291 thousand hectares and the production has attained the level of 166 thousand tonnes.

He made an attempt to examine the following aspects of rubber markets in the country . (1) Structural set-up of the markets, (2) Relevance of grading and standardisation in the present marketing system, (3) Fluctuations in prices - (a) Variations in monthly prices , (b) Trends in long-term prices.

W. Wickermaasingha

Studies conducted and the use of natural rubber lates in leather finishing. There are several new processes that are used in other countries for finishing of leather were undertaken on the feasibility of using natural rubber latex in leather finishing. Polymery in latex form are being used as binders and thermoplastic resin binders. The resin latices used in leather are almost exclusively of the synthetic types obtained by copolymerization . In Cylon the common type of high polymer that can be obtained in latex form is natural rubber latex which is a linear, homopolymer of cis-1-4 isoprene. The property of rubfastness of leather which had been finished using only natural rubber latex is very poor and the rubbery coat peels indicating poor adherance to the leather surface. These investigations revealed that the growth of co-polymerized natural rubber latex could be used as a substitute for imported synthetic binders and this connection a patend had been field relating to this use of modified rubber latex leather finishes.

W.G. Weerartine[11] et al.(1972) in their article 'The use of natural rubber latex-resin blends as an adhessive for plywood'. Approximately 1,300 tons of urea formaldehyde (UF) and 100 tonnes of phenol formaldehyde (PF) resins involving a foreign exchange expenditure of 2½ million rupees are expected to imported annually into Srilanka for bonding plywood. The basis of this work is the use of natural rubber latex UP resin blends or of natural rubber PF resin blendes as the adhesive for plywood. Formal dehyde is used as the stablized for NR latex as its use enables the blending of UF resin with NR latex without any coagulation of latex and gives an accedic pH which is necessary to cause polymerization of UF resin. Using NR latex PF resin blends it should be possible to substitute satisfactorily 2/3rd of the imported UF resin by NR. It also finds new use of NR in Srilanka. The total annual consumption of formaldehydes resin in Srilanka plywood manufacture is approximately 1,400 tons. If 65% of this is to be substituted by NR 910 tonnes of NR is needed.

M. Nadarajh et al.(1970)

Studies conducted in use of natural rubber latex in paints in Ceylon, polymers in latex form have recently been introduced in water, thinned paints as filim binders. The latices used in emulsion paints have been exclusively of the synthetic types. Initial experiments using natural rubber latex in such paints showed its serious disadvantages in hardness, stability, and pigment binding capacity. The properties

were improved by grading natural latex with a monover such as styrene or methylthacrylate. Emulsion paints made from stablized field latex can be manufactured easily by these methods in NR producing countries to displace distemper paints. Use of latex water paints and distempers is beset with difficulties the major one being the clogging of bristles during the application of distempers containing , latex. The rubber latex is coagulated by the friction of the hair tips on the waalk surface. Hardening in the case of emulsion paints appear.

Fernado M.J.[13] (1970).

Use of natural rubber latex in road construction latex is the most effective form of natural rubber for road construction. Both centrifuged latex and reverfex being used. The authors found creamed skim latex most effective for road making. The dispersion of rubber particles , temperature dependent and rheological properties. Latices used were -

(1) Low Ammonia field latex (treated with 0.35% ammonia).
(2) Revertex
(3) Centrifuged latex
(4) Creamed skim latex.

The observations made by the author on the experimental roads laid recently confirm the view that the temperature dependant properties, elastic properties, and stripping action due to monsoon rains and traffic are improved considerably.

M. Nadarajah, P.A.[14] (1971) published in the article proposals to improve the increase quality production of pale cr-epe (PLC) in Ceylon. The present annual production of natural rubber in Ceylon is 5,000 tons, Ceylon being the worlds leading producer of pale crepe producing 40,000 tonnes. In 1969 and 41,730 pale crepe due to its white colour and high degree of cleanliness is generally used where light colour and cleanliness are important e.g.- in the manufacture of surgical goods, thread rubber, adhesive tape, pastel-coloured articles, such as childrens toys, domestic and decorative articles, chemical derivatives of NR such as cyclised rubber and chlorinated rubber. The worlds demand for this type of high quality rubber is teadily increasing. The latex of cloue pB 86 is ideal for pale crepe manufacture and since this alone is widely planted in Ceylon, the proposal increased pale crepe production has a greater chance of success.

G.Scott et al[15] (1971) reported that Ceylon's latex crepe is the highest quality rubber produced anywhere in the world. It is used in the manufacture of medical goods where colour and general cleanliness are of paramount importance and it has found an important outlet in the manufacture of pastel coloured articles, Such as childrens toys, domestic and decorative articles. At present the market price of pale crepe in London is about 50% greater than first quality smoked sheet (RSS1).

Fernado, W.S.E.[16] (1973) studied that a variety of rubber goods for a wide range of end uses can be made using concentrated latex as the basic raw material. The most popular method of making it is by centrifuging. Since heavy machinery is not required, a low capital out lay is possible in the direct manufacture of articles from centrifuged latex. The most important equipments needed are a Ball mill, an oven to obtain five dispersion and also drying and vulcanisation, when preserved latex is spun at a very high speed (6000 RPM) most of the water along with a small quantity of other substances are removed as the skim; the latex become concentrated. This process can give latices containing up to 55-63% of dry rubber. This type of preserved centrifuged latex is commercially available. The only public sector organisation involved in the production of this commodity, the Ceylon, Cooperative Industrial Union "Ceyesta".

Tillekeratna, L.M.K.[17] et al (1983) studied that the studies on improvement of quality of small holder rubber is SriLanka, Rubber obtained from holdings under 20 ha in Srilanka accounts for more than 50% of the countries production. At present about 20% of this rubber is sold as latex. For processing into block rubbers latex crepe (PLC) and centrifuged latex. The balance of 80% is processed as sheet rubber of which the major portion is sold as good grades. Natural rubber is the second largest plantation crop of SriLanka and the extent land under rubber cultivation is Island is 208678 ha.

P.Mukundan Menon[18] (1983) reported that natural rubber has bounced through extreme viscissitates during its history of nearly five centuries. Christopher colombs who from the modern world first discovered rubber in the world tropical forests of Amazon valley towards the close of 15 century. The petroleum crisis which started manifesting itself from 1973 is again bringing about a change in fortunes. Synthetic rubber which mainly depends on petrochemical feed stocks is finding it hard to hold its grips owing to enormous escalations in costs.

The area under rubber in India in 1950-51 was 69,000 ha. This has grown over four fold to 290,000 hectares in 1982-83.

Table No.2.4 : Statewise distribution of Area in 1982-83.

S.No.	States/Union Territories	Area(hect.)
1.	Kerala	255,000
2.	Tamil Nadu	16,000
3.	Karnataka	9,500
4.	Tripura	4,800
5.	Assam	1,100
6.	Meghalaya	1,100
7.	Antaman; Nicobar Island	900
8.	Goa	700
9.	Manipur	400
10.	Mizoram	400
11.	Others (Maharashtra, Arunachal, Nagaland, Andhra, West Bengal , Orissa)	100
	Total	290,000

Average yield per hectare per year is the indicator of the growth of internal efficiency of the industry. 280 kg in 1950-51 average yield per year per hectare and in 1982-83 it is around 830 kgs.

Wan Abdul Rahman[19] (1985) reported that Breeding and selection have increased the potential annual yield of the rubber tree, from the 200 to 300 kg/ha of the original seedling to over 2000 kg/ha by the mid-1960s and to over 3000 kg/ha by the early 1980.

The average yield for both the small holder and plantation sector has increased by about 80% during the 20 yrs. The improvement in the estate sector (532 kg/ha) being more than that in the small holder sector (384 kg/ha). The best average yield obtained in the individual small holder sector is now 1103 kg/ha and in the estate sector is 1900 kg/ha.

B.C.Sekher[20] written in his article about the 25th assembly of the international rubber study group held in Washington. Natural rubber and its future outlook have been subjected to economic, socio-economic and techno-economic scrutiny in numerable agencies, individual and organization. The general acceptance world demand for customers will continue to increase substantially with indications of requirements exceeding 19 million tonnes in 1985 and 24 million tonnes 1990. The NR industry is a user of non-cost energy input from other sources starts with planting and their involves fertilizing, transportation and processing.

Industry Guide[21] (1985) Project Report for the manufacture of Latex thread. Latex thread is a unique product having varied uses. The principal consumption of thread is in garment making. It also goes into industrial and mechanical goods. It is manufactured from natural rubber latex by the process of extrusion. For extrusion, nozzles of accurately dimensioned borosilicate glass or stainless steel capillaries are used. The latex is suitably compounded and is extruded through the nozzles into coagulation bath which sets the latex into long thread. The thread is then carried over a roller, which rotates at slightly higher speed than the former to facilitate a little stretching into a hot air chamber to remove excess water. The thread is then vulcanised in hot air or hot water at a temperature of 100^{o}C. Its worked out that it need a capital of 1,40,000 rupees and working capital Rs. 59,000.

CHAPTER III

MATERIALS AND METHODS

This study pertains to centralised processing and marketing of small holder's rubber. This study was carried out in small holder development centre under changanacherry cooperative rubber marketing society, District Kottayam, Kerala state. This study was undertaken to know the response of the different size group of rubber growers towards this marketing strategy.

Selection of the State

Contribution of the Kerala state in the natural rubber production of the country is about 99% on area basis and 91% on production basis (Varghese E.T., 1984). Another reason for selection of the Kerala state that the structure of industry is changing were the small holder share in the total production has gone upto 73%. Since this is of direct consequence to the profit of the Farming community of the state (especially for the small holders) and to the economy of the state, the study is of great importance for the state.

Selection of the district

Kottayam is the most important rubber growing district in Kerala state and the country (Fig. No. 3.1). Moreover Rubber Research Institute (RRII) is also located in Kottayam district, and the study was carried out under RRII Kottayam. The subject of the study, centralised processing and marketing through the scheme of small holder development centre was first started in Kottayam district, an as such farmers of

this area has greater experience with this scheme.

Selection of the Society

Changanacherry Cooperative Rubber Marketing Society was specially selected for the case study because the new scheme was implemented by the Rubber Board through this particular society as a pilot project.

Description of the Society

The society was registered on 22.12.1971 and started working on 24.12.1971. The area of operation of the society extends to the whole of Changanacherry Taluk. Societies office and godown is near Karakachal Junction. Society has got one PLC Factory in Nethalloor. Under this society there are 14 collection units for Latex collection.

Selection of the Latex Collection Centres

Out of 14 latex collection units 4 were purposely selected and studied which are Meenadom, Kangzha, Vazhoor, and Kuttickal.

Selection of the Rubber Growers

Rubber growers who supplies the entire latex to the collection centres were selected from each unit, 50 farmers were selected and interviewed from 4 collection centres. Number of rubber growers selected from each collection centre were given in Table No. 3.1.

Table No. 3.1. Number of Rubber growers selected from each latex collection centres.

Sl. No.	Name of the Collection Centre	No.of farmers selected
1.	Meenadom	10
2.	Kangazha	15
3.	Kuttickal	10
4.	Vazhoor	15
	Total	50

The following table shows the distribution of rubber growers according to the size group.

Table No. 3.2. Distribution of Rubber growers according to the size group.

Sl. No.	Group Size	Area (Ha.)	Total No.of growers	Total Area(Ha)
1.	Small	0 to 1.99	20	21.05 (13.8)
2.	Medium	2 to 3.99	15	54.2 (33.63)
3.	Large	4 and above	15	84.5 (52.54)
	Total		50	159.75 (100.00)

(Figures in the Parenthesis showing percentage)

Methods of Enquiry

Survey method was used for the collection of data from the sample farmers.

Schedule

The schedule were prepared and pre-tested and necessary changes were made in the light of pretesting. A copy of the Final Schedule is attached in Appendix I.

In addition to the scheduled study data were collected by informal talks with the rubber growers, tappers and the society officials. Data were collected from the Rubber Marketing Cooperative Society office record also.

Period of Enquiry

The data related to the agricultural year 1984-85.

Method of Analysis

The tabular method of analysis were used for the analysis and interpretation of the results. The data were analysed statistically.

Correlation Coefficient

The relationship between production and rainfall were studied by measuring "Karl Pearson's" method of Correlation Coefficient. Formula used is

$$r = \frac{U_1 V_1 - n\bar{U}\,\bar{V}}{\sqrt{U_1^2 - n\bar{U}^2}\ \sqrt{V_1^2 - n\bar{V}^2}}$$

The significance of correlation coefficient is tested by using 't' test.

$$t = \frac{r\sqrt{n-1}}{\sqrt{1-r^2}}$$

Calculated value of 't' was compared with the table value 't' at 5% level of significance and n-2 degrees of freedom.

X^2-Test

The X^2 test was used to test the goodness of fit of the null hypothesis Ho : There is no difference between the different tapping system.

$$X^2 = \frac{(O - E)^2}{E}$$

where,

O = Observed value

E = Expected value

Producer's share in Consumer's Rupee

Producer's share in consumer's rupee were calculated in both the methods, viz. selling as Latex and selling as Ribbed Smoked Rubber Sheets.

$$Ps = \frac{C - M}{C} \times 100$$

where,

Ps = Producer's share in consumer's rupee.

C = Consumer's price

M = Middle men's margin.

CHAPTER IV

RESULTS AND DISCUSSION

Background :

The crop from rubber plantations consists of rubber latex which contains about 30 to 35% of dry rubber and field coagulum (Scrap rubber). The ratio of latex rubber to scrap rubber in a typical plantation is normally 4:1 based on dry rubber content. The latex and scrap collected from the plantations have to be processed into various marketable forms for effective and efficient use in the manufacture of different rubber products. For the manufacture of latex rubber products the crop collected as liquid latex have to be processed into preserved latex and/or latex concentrates. To manufacture dry rubber products on the other hand, the latex is to be processed either into visually graded dry ribbed sheets and crepes or into technically specified block rubber. The scrap rubber can also be processed into visually graded crepes and/or technically specified block rubber.

Nearly 10% of the world supply of N.R. is used in the form of Preserved Latex and Latex, concentrates. About half of the preserved latex concentrates are used to make latex form using various processes to beat air into the latex which is then gelled and vulcanized. Other important outlets are dipped goods and a variety of adhesive application. Being in liquid form it is suitable for introducing rubberinese into other materials by simple and mixture.

Marketable Forms of Latices :

The various grades and qualities of latices are preserved normal latex upto 35% drc, preserved latex concentrates of 36-50% drc and preserved latex concentrates of 51% -60% drc and above. Among these, preserved normal latex is processed from field latex by adding preservatives usually ammonia. With the introduction of preserved latex concentrates into the market there is not much scope, in the production of preserved normal latex on a commercial basis. Unless there is a local demand because the cost of packing and transportation will be very high per unit quantity of dry rubber when compared to latex concentrates.

Two majormethods namely creaming and centrifuging are practised at present for the production of preserved latex concentrates. Creaming method though is a simple process at has been superceded by the centrifugal concentrate method. A study contacted by George C.M. et al showed that at present centrifuged factories are producing almost all the preserved latex and latex concentrates and marketing the same. However, it was found that majority of the small latex prod. manufacturing units in Kerala and Tamil Nadu buy field latex and process the same into preserved latex concentrates by creaming.

Sources of Raw Materials :

A study by George C.M. et al showed that large number of units are owned by large plantations and the raw materials

used come exclusively, from the latex obtained from the plantation. The field latex is collected by using Ammonia as a preservative/anti-coagulant and transported to the factory on timely basis.

The raw material sources for commercial units are mostly from estates and large holdings. The payment of field latex is made based on dry rubber content. Some units make payments on basis of weekly average lot sheet prices while others on monthly average prices. The rates given depend mostly on quantity of latex supplied and distance of the plantation from processing factories. The rates paid varies from lot sheet price to over one rupee premium per kg Drc. In some cases where it is collected as preserved latex a premium upto Rs. 1.35 per kg drc over the lot sheet price is being given. Some of the units also collect field latex from small holders employing collection agents. But the prices paid to the growers are lower when compared to prices afford to estates.

Co-operative Units :

Main raw material sources for the co-operative units were found to be small grower member of the society. The society collect the latex produced by their member by a network of collection centers, which are operated by agents working on commission basis. The Society provides weighing scales, barrels, ammonia cylinder and facilities for determination of drc to the collection agent. Payments are made to the members by

the society based on kg drc supplied by each member on weekly basis. The rate paid depends on the weekly average lot sheet price at Kottayam plus 25 Ps premium. 1980-81 onwards Society started paying price differential also to the members based on total quality of latex supplied to the society annually. The rate being paid by the society for preserved latex is Rs.1.20/kg drc over the weekly average lot sheet price, if the preservation is done by the supplier (George, C.M. et al, 1982).

Marketing :

Since India was importing preserved latex before 1934, there was no problem of marketing of product initially. From 1943 onwards the price of preserved latex and latex conc. were controlled by government with a view to ensuring renumerative prices for the products and the production increases considerably. But in 1947, for brief period price control was lifted and marketing and utilization showed a declining trend which was arrested in course of time after the fixation of a tractive premium prices to the latex. The controlled premiums were Rs. 17.5 and 45 respectively, 45% and 50% to 55% latex per 100 drc over RMI-I price. This being much higher than the cost of production, its served as a incentive for increased production. In this connection, it is important to mention that the Tariff Commission which made enquiries on cost of production as observed that premiums referred are much higher than the actual extra cost involved for the processing, also it is relevant in this content to point out that the price of concentrated latex

is Malaysia is only comparable that of RSS-I grade rubber.

Small Holder Development Centres :

Considering the growth pattern of the industry, it becomes obvious that the share of small holding to the total area under rubber and their production continues to increase at a rapid rate so it becomes absolutely essential to modernise the small holding. With this in view rubber board has drawn up a scheme to start small holder development centre, an idea conceived based on the famous"ANAND PATTERN" cooperatives.Under this scheme small holder development were set up indense rubber growing ares to serve as nucleus of all activities. Such as distribution of required inputs, desemination of knowledge on scientific and modern system and exploitation and procurement of their entire crop, which otherwise would have gone in for production of low quality crepe and sheet, for the prod. of super marketable forms of technically specified rubber and other products which can fetch a better price through bulk collection and transportation and centralised processing and marketing. The first pilot project was started at Chemcherry rubber marketing society, 1979.

Changanacherry Rubber Marketing Society :

The Changanacherry Cooperative Rubber Marketing Society was registered on 20.12.1971 and started working on 24.12.1971. The area of operation of the society extends to the whole of Changanacherry Taluk . The main objects of the

Society are :-

1. To arrange for the sale of rubber and other agricultural products.
2. Distribution of rubber planting materials, fertilizers, insecticides etc.; and
3. Collection of Latex through collection centres and process it.

In 1973-74 Society has build one PLC (Pailed Latex Compound) Factory also. The Society office is near Karukachal Junction. Table No. 4.1 showing details regarding the present position of membership and share capital of the Changanacherry Rubber Marketing Society.

Table No. 4.1. Details regarding the present position of membership and share capital of the Society in 30.6.1985.

	Members	No. of Members	Share Capital Rs. Ps.
1.	Growers	1684	1,04,475.00
2.	Societies	22	58,700.00
3.	Government of Kerala	1	3,40,000.00
4.	Rubber Board	1	80,000.00
	Total	1708	5,83,175.00

During the critical period, the Society was engaged in out-right purchase of rubber sheet and scrap, as this was found to be inadequate for the benefit of the members, the Society started collection of latex through 14 latex collection depots, on the "AMUL PATTERN" under the auspices of the Rubber Board.

Working of Latex Collection Centre operated by Changanacherry Rubber Marketing Cooperative Society :

The present study being mainly directed towards marketing of rubber of small holders, the rubber boards pilot project on small holders development centres working under Changanacherry Rubber Marketing Cooperative Society was studied, 4 collection centres were choosen, out of the total 14 centres, selected farmers were interviewed for collection of relevant data to study the working of latex collection centre. Data were also collected, from the collection centres and from the main cooperative society also.

Table No. 4.2 showing the quantity of rubber handled during the last four years and their values by rubber marketing society.

Table No. 4.2. Quantity and value of different Rubber Latex(kg drc) sheet and scrap handled dur ing the last four years by the Society.

S. N.	Particulars	1981-82		1982-83		1983-84		1984-85	
		Qua- lity	Amount	Qual- ity	Amount	Qua- lity	Amount	Qua- lity	Amount
1.	Rubber Latex	250.00	40.85	216.46	29.08	142.42	23.92	172.32	26.37
2.	Scrap	25.00	2.25	9.84	0.87	16.40	2.09	12.99	1.33
3.	Sheet and Scrap	-	-	-	-	-	-	31.84	4.74
	Total	275.00	43.10	226.30	29.95	158.82	26.01	217.15	32.44

Quantity in MT drc
Value in Lakhs.

Below table shows the one year total Latex (drc) and scrap collected through the 14 Latex Collection Centres working under Changanacherry rubber marketing society.

Table No. 4.3. Total Latex (drc) and scrap collected through Latex Collection depots in 1984-85.

S. No.	Name of the Collection centres	Latex (drc)	Scrap (drc)
1.	Nedukunnam	5597.90	601.25
2.	Nedumannya	20490.41	418.80
3.	Vellavoor	20632.00	2037.45
4.	Kodungoor	13413.97	993.25
5.	Vazhoor	15219.79	863.30
6.	Kannam	7581.52	744.40
7.	Kangzha	21836.36	2174.90
8.	Kuttickal	32100.49	3153.80
9.	Neenadom	13234.20	438.75
10.	Santhiepuram	5553.57	39.25
11.	Koothrapallie	2047.10	72.55
12.	12th Mile	1269.69	63.00
13.	Koomackal	717.65	21.40
14.	Neduganddapally	1028.76	21.95
	Total	160723.65	11644.05

Processing and Marketing :

The latex collected through the latex collection depots is partly coagulated and processed as crepe in the plc factory

of the Society and the balance ammoniated and sold as preserved field latex.

Table No. 4.4 shows the quantity of amonified latex is sold by Society.

Table No. 4.4. Total Quantity of Ammonified Latex (kg drc) sold by the Society in 1984-85.

Month	Wet weight (kgs)	DRC (kgs)	Amount in Rs.
July	5959.00	1823.31	34121.21
August	5489.10	1763.39	33046.88
September	22169.70	7138.71	138037.74
October	45644.30	13877.94	270492.02
November	31121.00	9876.87	186499.10
December	52348.70	16039.68	303719.88
January	38235.50	11608.07	205041.20
February	37790.50	11507.67	189711.10
March	11996.00	3977.60	68645.00
April	18310.80	5980.56	104473.30
May	17597.35	5472.26	102434.35
Total	37694.15	89116.06	2556220.73

Table No. 4.5 shows the total quantity of PLC and EBC sold by Society in monthwise.

Table No. 4.5. Total quantity of PLC and EBC Sold by Society in 1984-85.

Month	PLC DRC	Amount in Rs.	EBC	Amount in Rs.
July	18850	365475.00	3075	46893.75
August	1350	24650.00	-	-
September	1550	26300.00	-	-
October	4500	87875.00	-	-
November	11004	199626.00	3000	41100.00
December	3000	56437.50	-	-
January	8000	153200.00	-	-
February	9450	164035.00	2000	26550.00
March	7000	130750.00	1205	15527.50
April	10800	185287.50	-	-
June	7000	137980.00	6462	8227.52
Total	82504	1531616.00	15742	138298.77

Ttotal drc sold from these processed latex and scrap and their income received by the society is given in below table.

Table No.4.6. Total drc sold and their income received by the Society in 1984-85.

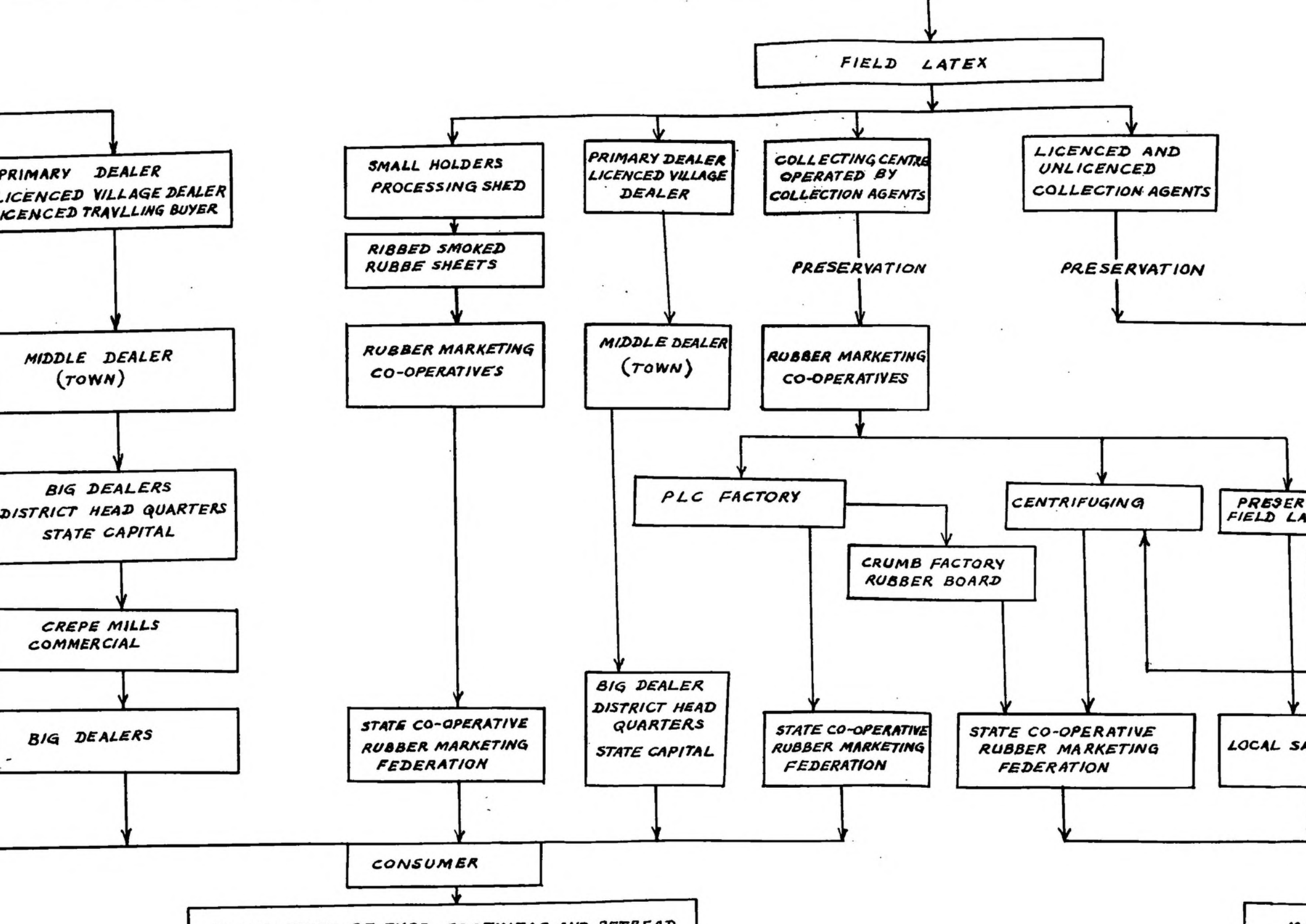
Sl.No.	Particulars	Drc	Amount (Rs.)
1.	PLC	82504.00	1531616.00
2.	Amonified latex	89116.06	2556220.73
3.	E.B.C.	15742.00	138298.77
4.	Others	5338.00	35729.92
	Total	192700.06	4261865.43

Small Holders Rubber Disposal Channels :

Through Fig. No. 4.1 an attempt has been made excostively to chart down the channel through which the rubber produced by the small holders reaches the consumer, is this taken as the rubber goods manufacturing units as the consumer.

Collection procedure :

Latex is brought by the growers to the collection centres in Carbuogs and Aluminium Vessels. Vessels of copper alloys of copper are also used in some cases. Latex is then strained through a 40-mesh stainless steel screen and bulked in a buket of the collection centre. A sample of approximately 30 grms. of Latex is taken and kept in a membered porcelain cup,


FIELD LATEX
PRIMARY DEALER
LICENCED VILLAGE DEALER
ICENCED TRAVLLING BUYER
SMALL HOLDERS
PROCESSING SHED
PRIMARY DEALER
LICENCED VILLAGE
DEALER
COLLECTING CENTRE
OPERATED BY
COLLECTION AGENTS
LICENCED AND
UNLICENCED
COLLECTION AGENTS
RIBBED SMOKED
RUBBE SHEETS
PRESERVATION
PRESERVATION
MIDDLE DEALER
(TOWN)
RUBBER MARKETING
CO-OPERATIVES
MIDDLE DEALER
(TOWN)
RUBBER MARKETING
CO-OPERATIVES
PLC FACTORY
CENTRIFUGING
CRUMB FACTORY
RUBBER BOARD
BIG DEALERS
DISTRICT HEAD QUARTERS
STATE CAPITAL
CREPE MILLS
COMMERCIAL
BIG DEALERS
STATE CO-OPERATIVE
RUBBER MARKETING
FEDERATION
BIG DEALER
DISTRICT HEAD
QUARTERS
STATE CAPITAL
STATE CO-OPERATIVE
RUBBER MARKETING
FEDERATION
STATE CO-OPERATIVE
RUBBER MARKETING
FEDERATION
CONSUMER

the number corresponding to that given to each grower who supplied latex to the centre. 20 gms. of latex are weighed into another porcelain cup, membered and coagulated with 1% formic acid after dilution of the latex with an equal volume of water the coagulam after 4 to 5 hours is rolled into a thin sheet of round shape, the number corresponding to the grower marked and kept for drying in the air. The sheets after drying (normal drying time is 4 to 5 days) is weighed to an accuracy of 1 mg. and drc of latex is calculated. Latex in the bucket is weighed in a platform balance in the presence of the agent of the grower (Usually Tapper) and a temporary receipt is given indicating the total weight. By the end of the week, the Depot agent will send the correct weekly drc weight of the growers record to the Society office. The growers will be paid from the Society office weekly. Growers are getting 25 Ps. less than the weekly average lot price of rubber sheet.

The latex is then bulked in the ammoniation tank which is cleaned throughly first with fresh water and then with ammonia water. The first consignment of latex is ammoniated and poured into the tank. Subsequent consignments are poured into the tank and ammonia from a weighed ammonia cylinder is passed into the latex. Dosage of ammoniation is adjusted to 1% on latex.

Latex is stirred manually using puddles and filled in clean drums by gravity flow. Transportation is made when a truck load is ready.

When the consignment from the depot is received in the factory, it is weighed bulked, a sample taken and drc determined. The details are sent to be the depot information. At the end o-f each year a statement will be prepared and if any shortage is found in the quantity of latex received at the factory, the depot manager will be asked to remit an amount corresponding the difference between the drc values reported by the depot manager and that by the factory.

Personal Interview with Farmers :

The present study was mainly directed towards marketing of rubber of small holders. The study was mainly carried out on farmers who dispose of their entire rubber as latex to the rubber marketing society.

1. Socio-Economic Status :

(a) Family status :

The structure of the Farm Family has an important role in the farm economy. As the income earning capacity is based on its family structure. Table No.4.7 shows the family status of the studied farmers.

Table No. 4.7. Family Status.

S. N.	Size Group	Male	Female	Children Below 15 years			Total
				Male	Female	Total	
1.	Small	34 (33)	31 (30)	20	18	38 (37)	103 (100)
2.	Medium	24 (30.4)	24 (29.11)	14	18	32 (40.5)	79 (100)
3.	Large	22 (35)	24 (38)	10	7	17 (27)	63 (100)

Figures in parenthesis indicating percentage.

Study of the above table shows that the number of male and female members of the families do not show much variation. But the number of children among large farmers seems to be lower and its highest among medium holders. Family status of the sample farmers is shown in Fig. No. 4.2.

(b) Educational Background :

Table No. 4.8 gives the educational background of the selected farmers. Literacy generally reflects upon the adoption of improved practices of cultivation by educated farmers as indicated by several studies.

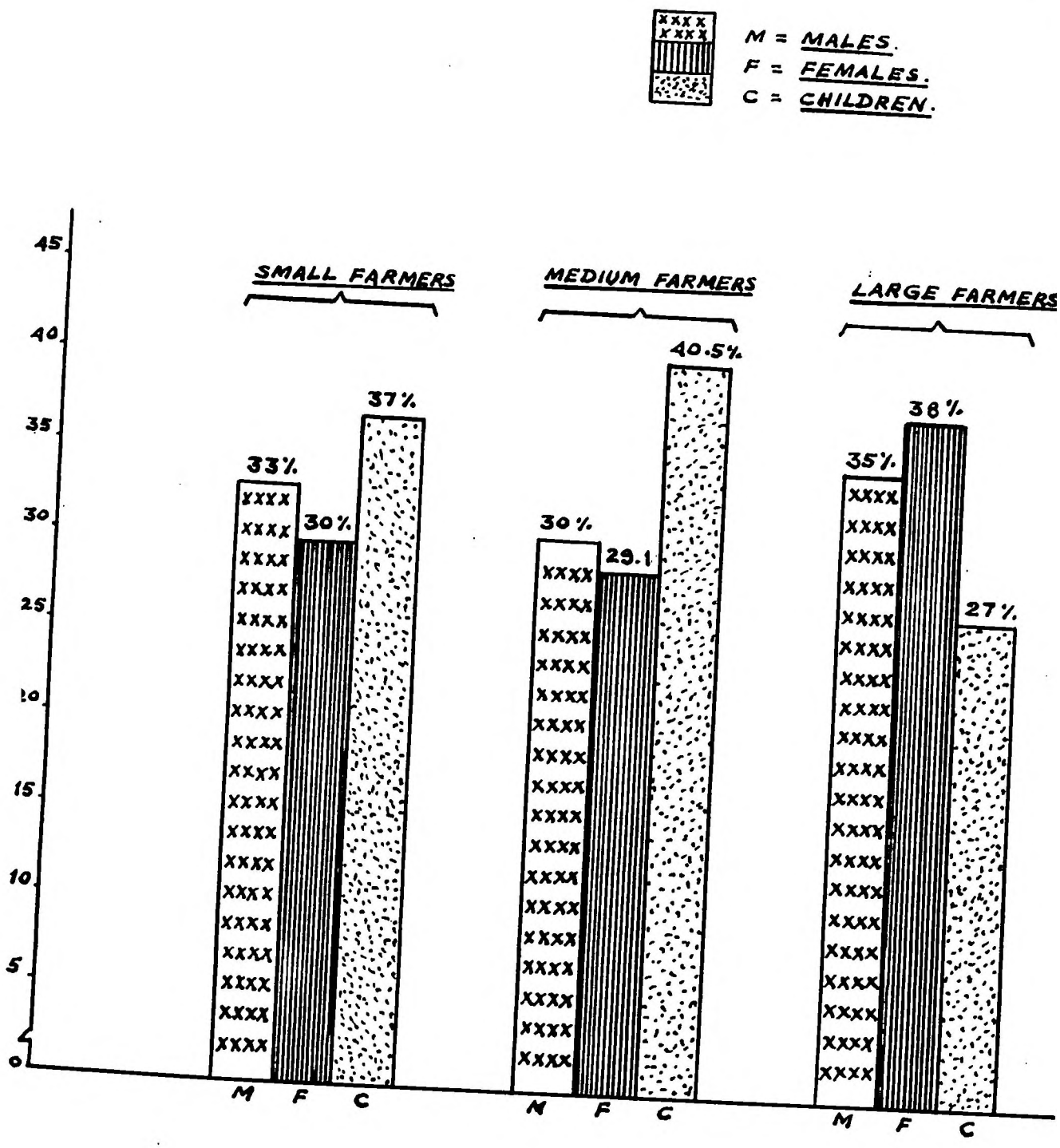


FIG. NO.4.2. FAIMLY STATUS OF DIFFERENT SIZE GROUP OF FARM

Table No. 4.8. Educational background of the selected farmers.

Sl. No.	Group Size	Upto Primary	Upto High School	Upto Graduation	Above Graduation	Total
1.	Small	-	7	12	1	20
2.	Medium	-	4	10	1	15
3.	Large	-	1	14	0	15
	Total	0	12	36	2	50

Educational background reflects the farmers ability to understand problem and adoption of new technologies and marketing strategies. Among the large farmers out of 15 farmers 14 of them are found to be graduates. Even among small and medium farmers majority of them were found to be graduates and one each from both the categories were found to be post-graduates. So this shows they have enough educational background to understand problems and react to the new technology and marketing strategy.

(c) Occupation :

Table No. 4.9 shows the occupation of different size group of farmers.

Table No.4.9. Occupation of different size group of farmers.

Group Size	Farming	Farming & Business	Farming & Govt.Employment	Total
Small	5	5	10	20
Medium	4	3	8	15
Large	10	2	3	15
Total	19	10	21	50

It is a paradox that though the large farmers are better educated, majority of them are solely occupied in farming, where as small and medium farmers depends on business and government employment along with farming. It might be because larger farmer finds it possible to make a livelihood solely from rubber cultivation. Whereas small and medium farmers, their land may,do not be good enough to support his family and hence he is involved business or government employment along with farming.

(d) Family Labour :

Table No. 4.10 gives availability of labour force from sample farmers under different size group.

Table No. 4.10. Labour availability from the sample farmers.

Sl.No.	Group size	Family labour	Hired labour	Total
1.	Small	2	18	20
2.	Medium	-	15	15
3.	Large	-	15	15
	Total	2	48	50

Above table shows except 2 small farmers, all the farmers studied were hiring labour and no family labour is being utilized these again reflects his economic status to the higher.

(e) Size of Holding :

Table No. 4.11 giving the details about the size of holding of the sample farmers. Fig. No. 4.3 is shown the distribution of area according to the group size.

Table No. 4.11. Size of Holding of the sample farmers.

S. No.	Group	Size Group	Area (Ha)	Total No. of farmers	Average Holding
1.	Small	Below 2 Ha	21.05 (13.18)	20	1.05
2.	Medium	2-below 4 Ha	54.2 (33.93)	15	3.61
3.	Large	4 and above	84.5 (52.89)	15	5.63
	Total		159.75	50	10.29

(Figures in parenthesis denote percentage)

Of the sample farmers studied there were 20 small farmers with the holding of less than 2 hectares. There are 15 medium farmers with the holding 2 hectares to below 4 ha and 15 farmers of large size group with the area of 4 ha and above. This reflects the economic status of the farmers.

Field Latex Production Pattern :

Since all the farmers studied supplied their entire field latex production to the collection centre, the production and supply are same here.

The production/supply pattern for the whole year on a weekly basis is given in Table No. 4.12 and Fig. No4.4.

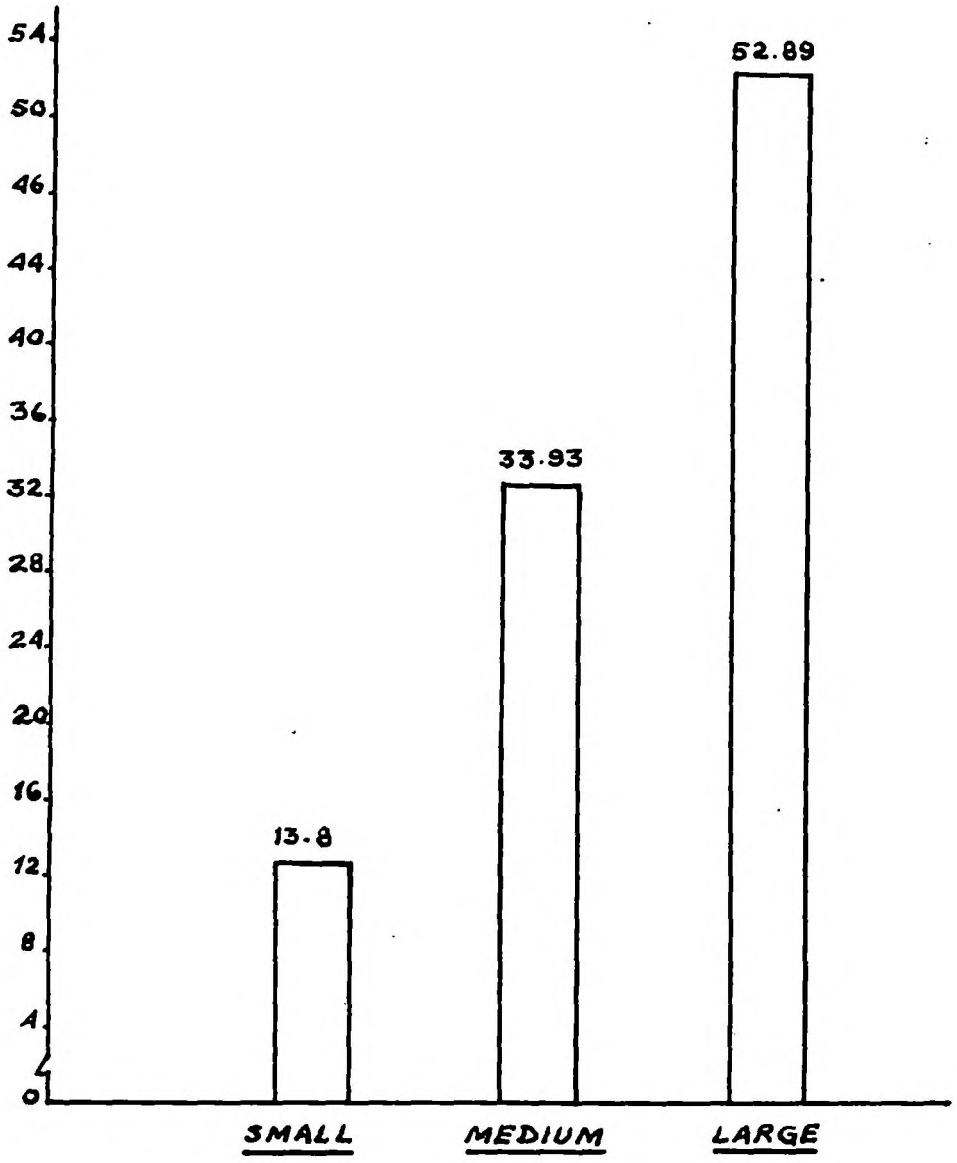


FIG.NO.4.3. AREA DISTRIBUTED.

A study of Fig. No. 4.4 shows that the trend in production i.e. peak and lean periods of production is similar in all three size groups. There are four distinct production peaks and lean periods. Peak periods of productions are end of April to May and August to middle of September, Middle of October and Middle of November, December. The corresponding periods, lean periods are end of September to October, end of June to beginning of March, June and July.

The peaks and leans are not produced in case of small holders, and the production do not touch very high level. This may be because they tend to do daily tapping ($S_{1\ 1}$ system) which has a tendency to give a lower yield without much of a fluctuations.

Table No. 4.12. Weekly latex production of different size of farms in 1984-85.

Months	Week	Small	Medium	Large
July,1984	1	4.14	5.54	23.23
	2	13.02	23.58	73.62
	3	13.94	30.64	80.71
August	4	13.14	32.76	86.95
	5	17.52	61.05	136.56
	6	31.05	93.33	194.76
	7	32.16	109.25	215.76
September	8	30.57	108.50	197.70
	9	41.21	136.87	255.34
	10	38.33	125.87	227.06
	11	16.36	35.22	77.92

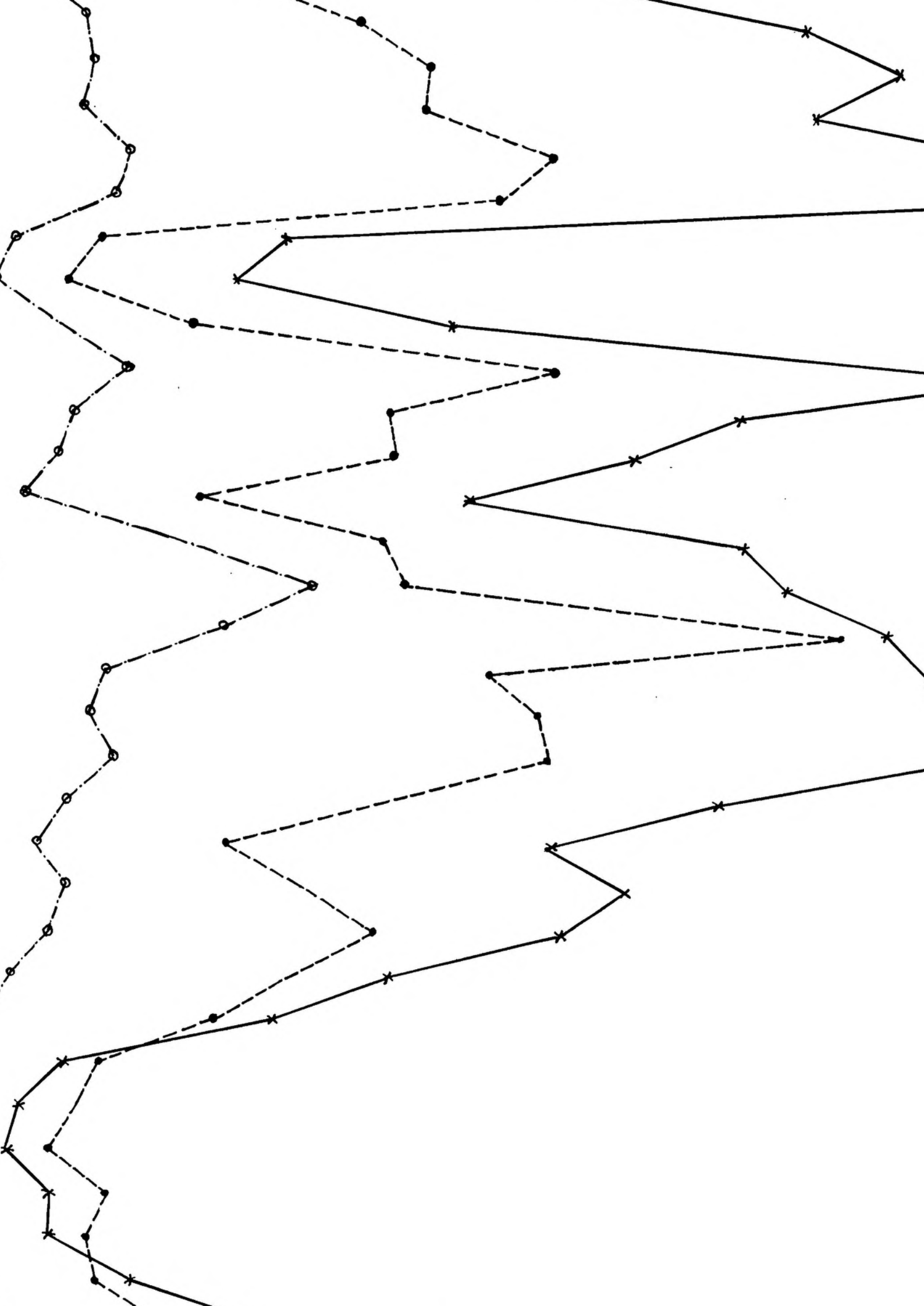
(Contd. Table No. 4.12)

Months	Week	Small	Medium	Large
October	12	11.22	27.07	65.46
	13	25.69	55.67	116.00
	14	41.00	138.84	245.69
	15	29.80	100.18	180.50
November	16	25.28	101.53	157.51
	17	17.57	56.94	118.12
	18	51.76	100.28	182.75
	19	84.48	105.35	190.95
December	20	63.65	235.54	214.82
	21	36.67	124.45	224.73
	22	32.98	136.90	231.07
	23	39.45	138.25	229.77
	24	28.02	100.00	177.26
January,1985	25	21.95	63.93	137.68
	26	28.78	83.40	154.70
	27	24.99	98.95	140.33
	28	16.12	78.55	101.50
February	29	11.17	62.37	75.21
	30	5.56	37.45	28.82
	31	6.29	31.02	18.90
	32	3.84	24.95	14.95
March	33	5.76	39.00	24.89
	34	7.61	34.20	24.67
	35	9.38	36.24	44.33
	36	15.22	52.72	76.37

(contdTable No. 4.12)

Months	Week	Small	Medium	Large
April	37	13.98	43.09	64.85
	38	13.31	44.98	73.34
	39	17.03	54.50	106.95
	40	20.06	63.35	128.56
May	41	22.21	63.38	134.74
	42	24.48	78.77	161.17
	43	25.34	84.85	157.22
	44	23.72	80.86	157.08
	45	12.61	37.52	91.40
June	46	1.95	12.06	22.02
	47	2.35	18.95	29.08
	48	8.11	38.86	60.24
	49	3.29	2.73	14.97
Total		1084.12	3450.39	5898.33

production of medium holders and large holders shows a similar trend in leans and peaks, but large holders get a sustained peak production during the peak period. This again may be attributed better condition of the trees, because of the alternate tapping, where the tree does not get badly drained because of daily tapping.



Production and Rainfall :

Monthly rainfall pattern and the production trend for the years 1984-85 is shown in Table No. 4.13 and Fig. No. 4.5.

Table No.4.13. Relationship of monthly production and rainfall in the year 1984-85.

Sl. No.	Month	Production kg drc	Rainfall in mm
1.	July	316.42	215.40
2.	August	1024.29	164.00
3.	September	1291.15	122.90
4.	October	1037.12	271.20
5.	November	1192.52	206.90
6.	December	1610.84	73.10
7.	January	949.90	20.10
8.	February	320.53	20.30
9.	March	370.39	43.50
10.	April	644.00	122.10
11.	May	924.28	248.60
12.	June	214.61	331.20
	Total	9896.05	1839.30

Above table has shown the rainfall pattern for the year 1984-85. The average production for the corresponding months are superimposed on the figure no. 4.5 to show the relationship between production and rainfall.

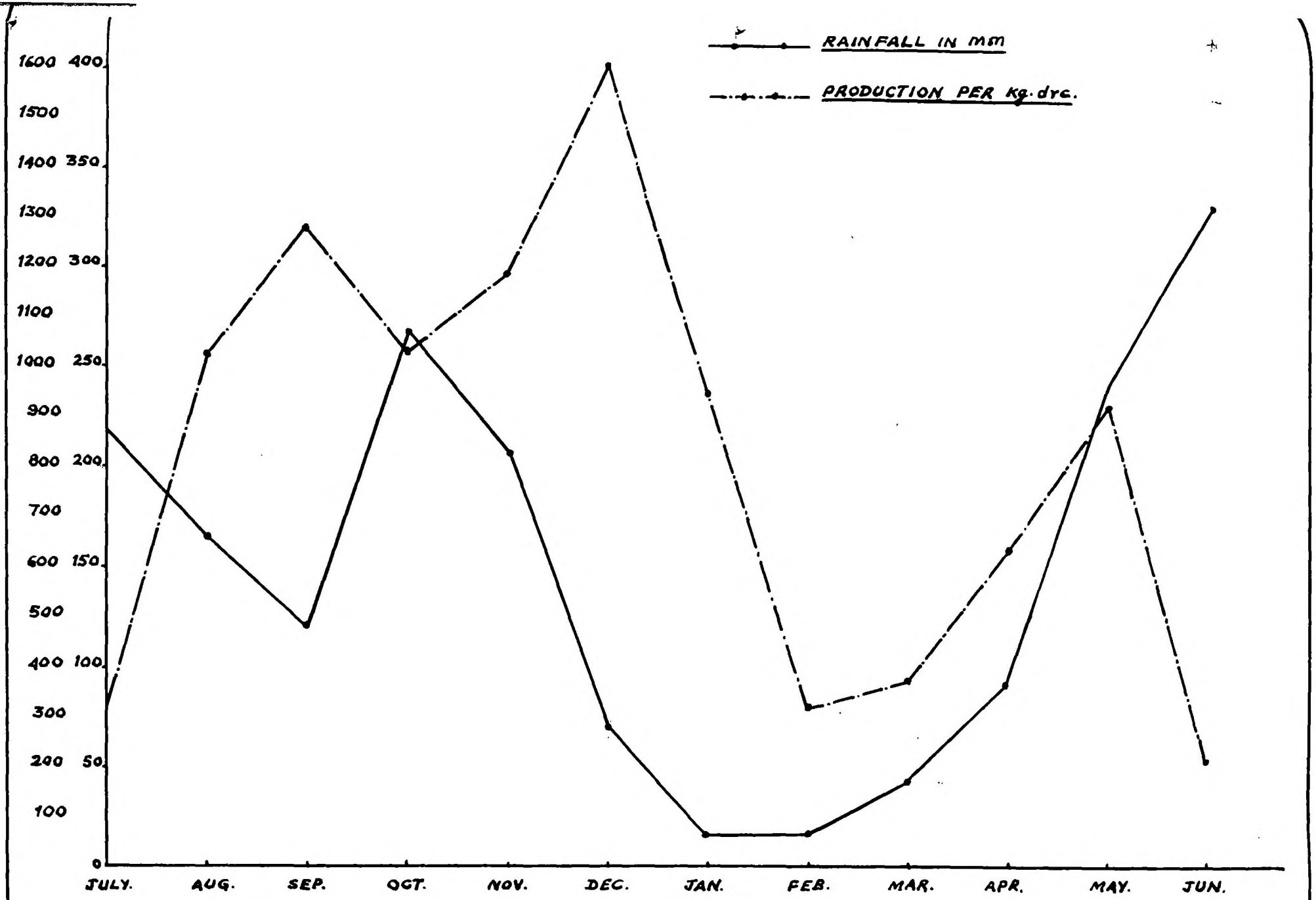


FIG.NO.4.5 LATEX PRODUCTION AND RAIN FALL RELATION SHIP IN 1984-85. (MONTHLY)

In July when the rainfall is fairly high production is quiet low. August and September the rainfall comes down in consequently the production goes up. In October again the rainfall goes up and consequently production comes down. The November to December the rainfall comes down the production goes up again and touches the peak in December. January and February which are the dry months rainfall is low and the production is also low. March, April and May when the rainfall is better production is also picks up. Again is June when the rainfall is very high the production goes very low.

The production is very strongly linked to the climate of the area rather than an effect of rainfall alone. Production is very closely dependent on the North-west and South-East monsoon and on the dry period, beginning from December to March.

Rain starts as pre-monsoon showers by the end of April, which merge into the south-west monsoon from the middle of June to middle of August. North-East monsoon is received from early October to middle of November. December to April is the dry period during which time rainfall is very scanty. The pattern of distribution of rainfall is reflected the average yield of rubber.

From the figure it can be very clearly seen that as the pre-monsoon showers starts after a prolong dry period. The crop production goes up, then in June when the monsoon is very active, the crop harvested is low, because number of days

tapping can be done is low due to the heavy rainfall. Then in August and September south-west monsoon which is faiding away allows more number of tapping days and the production goes higher. october as the north-east monsoon is very active again causes loss of tapping days and consequently reduce the yield. November to December the north-east monsoon faides away again allowing full tapping to get the peak production in December. December onwards the dry months starts and plant goes into wintering phase. Since during wintering phase as the leaves are falling and new leaves are forming the tree cannot be subjected to serve tapping and there is a loss of tapping days which cumilatively affect the production. Again in March, April when next monsoon starts this cycle again goes on.

Correlation between Production and Rainfall :

Correlation analysis were carried out the relationship between rainfall and production. Correlation coefficient is r = -0.6085218 was obtained showing that production as function of rainfall was found to be negatively correlated. However, further 't' test shows that it was non-significant.

Production, Processing Problems :

Since cultivation of rubber is beyond the scope of this study, discussion is related to problems regarding tapping of field latex, its collection and subsequent processing into preserved latex and latex concentrates, or into dry rubber

generally processed as ribbed smoked sheets, crepes and block rubber. Since the primary aim of processing is to get the maximum return from the product, the type of processing selected must be helpful to provide an assured return to the producer throughout the year. The factors to be considered are present and potential demand and price for various marketable forms and their relative cost of production, size of plantation and their production type of planting material and machinery utilities and know-how.

The traditional and most common method of processing is conversion into smoked ribbed rubber sheets. Farmers other than large estate owners opted for this processing mainly because of its relative easiness and much of technical know-how is not involved. Storage is also easier with this method. production into technically specified block rubber involves, heavy machineries. Preserved latex on the other hand poses problems of storage, processing know-how and marketing problems. Therefore, small farmers normally prefer to the traditional processing of ribbed smoked rubber sheets, though the return from the product is better from marketing it as preserved latex. The present study is mainly directed towards the problems regarding the marketing of preserved latex.

(a) Tapping System :

Table No. 4.14 gives tapping system followed by different group size of farmers.

Table No. 4.14. Tapping system.

Group size	Daily	Alternate Daily	Once in Three days	Total
Small	14	6	Nil	20
Medium	5	10	Nil	15
Large	-	15	Nil	15
Total	19	31	-	50

Among the different tapping systems followed the farmers studied were following S/2 d/2 (half circumference, alternate daily system) and S/1, d/1 (Half circumference daily system). Among the different groups studied most of the small farmers are found to prefer daily tapping system whereas most of medium and all the large farmers were adopting an alternate daily system. The difference in adoption of different tapping system by different size group farmers was found to be statistically highly significant (X^2 value = 14.4878(table value) at 1% level of significance is 6.635). Informal talks with the farmers suggest this is mainly because, the large farmer can keep one tapper and harvest half the plantation one day, on other plantation on another day. Whereas small farmers to relate to daily tapping to keep his taper employed throughout. Daily return might be another reason for the small farmers to adopt this sytem though, this will be injurious to the crop as such.

(b) Tapping Wages :

Table No. 4.15 shows the mode of payment to the tappers of the sample farmers under different size group.

Table No.4.15. Mode of payment to the tappers.

Size group	Per tree	Per block	Per day	Total
Small	16	-	4	20
Medium	5	9	1	15
Large	1	12	2	15
Total	22	21	7	50

Study into the mode of payment of wages to the tappers showed small farmers prefer to pay per tree whereas large and medium growers mostly pay for block.*

Latex Collection :

Seventy to eighty-five percent of the crop harvested from rubber plantations is in the form of latex. The remaining portion is collected in coagulated forms which are collectively known as field coagulum rubbers or scrap rubbers.

*A Block is a peace of land with 300-350 plants, depending upon the topography and planting material used.

Table No. 4.16. Whether the sample farmers are selling entire scrap rubber to the collection centre or not.

Group Size	Yes	%	No	%
Small	16	80.00	4	20.00
Medium	13	86.66	2	13.34
Large	15	100.00	0	0
Total	34	88.00	6	12.00

Of the farmers studied large holders sell their entire crop of latex and scrap rubber to the collection centre. Whereas 20% of the small holders, 13.34% of the medium holders do not sell their scrap rubber to the collection centre, but sell their entire latex to the collection centre. In-formal talks with farmers reveal that they get better prices from outside agencies for scrap rubber. Large growers sell scrap to the collection centre since they do not want to bother about drying and disposal, and as the collection centre take it in the wet row form itself.

(c) processing :

The field latex collected from plantation other than which is grown on estate level are traditionally converted into sheet rubber. Where cooperative marketing society collect from small holders, they supply it as field latex to

the collection centre without any processing.

Ribbed Smoked Rubber Sheets :

Field latex collected by the tappers is brought to the smoke house where it is seived and bulked, the bulked latex is diluted to drc 12.5% before it is coagulated. Coagulation operation consist of transfering the standardized latex of coagulation pan or dishes and adding suitable coagulating agent usually acetic acid and formic acid. After the coagulation is complete, which usually takes about 4-5 Hrs the serum in the pan is drained out and the coagulam is washed with water before sheeting, the coagulam pass through plain and grooved rollers and the thickness is brought down to 2.5 to 3 mm. The lower thickness and the design obtained by passing through grooved rollers helps faster drying of the sheet due to increase surface area. Freshly machined and dripped sheet contain about 20% moisture for preparation of RSS. These sheets are dried in smoke houses which usually takes about 4 to 5 days.

Attempt to study average cost incurred in conversion of latex into sheet through the schedule (D_2) was not successful, because the farmers studied were all selling their entire crop as field latex to the collection centre. Attempt to study the same from farmers other than the sample farmers were also difficult. Since most of the farmers interviewed could not furnished the required data and the data supplied were also not reliable and lacked uniformity necessary for a comparison.

Therefore the estimation of the cost incurred in sheet making is given in Table No. 4.17.

Table No.4.17. Cost of Ribbed smoked Rubber sheet making (per kg drc).

Sl.No.	particulars	cost (in Rs)
1.	Establishment charges	0.20
2.	Smoking charge	0.75
3.	Sheeting charge	0.20
4.	Acid	0.35
5.	Labour charge	2.00
	Total	3.50

Sheet and Latex :

From the estimate of cost of processing into sheet is Rs.3.50 , it can be noticed that conversion of latex into sheet increase in additional expense of Rs. 1.50 over the cost of selling it as latex. Where the cost involved is only the labour charge (i.e. Rs. 2/kg drc).

The price difference between sheet and latex is 25 Ps/kg drc which is lower in latex. The total benefit therefore for selling as latex is Rs. 1.25/kg drc, coming as a saving from the processing cost.

Though there is so much of benefit, the choice of processing method for a farmer may be limited for want of marketing facilities, such as cooperatives or limited by long distance from collection centre.

Informal talks with the tappers all of them are preferred to selling it as latex. In sheet processing he spents 5-6 hrs extra without receiving any extra remuneration. When the latex is directly sold to the collection centre, tapper will free from his work. That way he is saving half a day and he is able to get extra Rs. 10/- as half day wage.

Producers share in consumers rupee :

Producers share in consumers rupee were found out by calculating the cost and margin occurred in different channels. In selling as Latex the producers share in consumers rupee worked out (P_S) 88.86% and in Ribbed Smoked Rubber Sheets its worked out (P_S) 84.09%.

Owners and Tappers Reaction towards selling crop as field Latex or selling as Latex and Sheet :

Table No. 4.18 shows the owners reaction towards selling crop as field latex or selling as Latex and Sheet.

Table No. 4.18. Owners reaction towards selling as Latex and Sheet.

Group Size	Selling as Latex	percen-tage	Selling as Latex & Sheet	percen-tage	Total
Small	20	100.00	-	-	20
Medium	11	73.33	4	26.67	15
Large	10	66.66	5	33.34	15
Total	41	82			50

Of the farmers interviewed all the small holders perfer to sell it as Field Latex. Whereas 73.33% of the medium holders and 66.66% of large holders prefer to sell it as latex, 26.67 of the medium holders and 33.34% of the large holders where interested in selling it as latex and sheet.

Informal talks with farmers as to why they want to sell it as sheet and latex though selling it as field latex fetches higher profit and also relatively easier. It was found that it is mainly to take advantage of the fluctuating price. It can be noticed that medium and large holders are the ones prefering this system of processing. This they do where storage facilities are available for them. When the prices are low part of the latex is converted into sheet and is stored, which is subsequently sold when the prices are

higher. Since the rubber price fluctuation are quite common to a high degree. This fetches the higher return.

Tappers Reaction :

Table No. 4.19 shows the tappers reaction towards crop selling as field latex or selling as latex and sheet.

Table 4.19. Tappers reaction towards selling as latex and sheet.

Group size	Selling as Latex	Selling as sheet
Small	20	-
Medium	15	-
Large	15	-
Total	50	Nil

All the tappers interviewed prefer selling it as field latex. The practice of the labour wage payment is such that the labour gets paid per tree or per block tapped (Table No. 4.15) irrespective of the processing followed in case of sheet processing the labour has to do extra labour has to do extra labour of sieving, bulking, dilution, keeping in coagulation pan, cleaning of utensils and premises and sheeting. So its quite natural he would prefer to sell it as latex.

Field Latex :

Where facilities such as latex collection centres exist small holders normally sell their crops, field latex to the collection centre belonging to the rubber marketing society who process it into high grade products to get a higher price.

Reasons for selling latex to the collection centre was critically studied and is presented in Table No. 4.20.

Table No. 4.20. Reasons for selling as latex to collection centre.

Size group	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8	R_9	R_{10}
Small	20	20	-	-	3	19	-	2	-	13
Medium	15	14	-	-	13	15	-	-	-	10
Large	15	-	3	-	15	15	-	-	-	-
Total	50	34	3	-	31	49	-	2	-	23

R_1 - Convenience

R_2 - Lack of transport

R_3 - Large number of Intermediaries

R_4 - Debt obligation

R_5 - More economical

R_6 - Time saving

R_7 - Lack of market information

R_8 - Highest price

R_9 - Malpractices in the market

R_{10} - Storage facility.

Of the 10 reasonsstudied farmers reacted only towards 5 of the reasons viz. convenience, lack of transport, more economical, time saving and lack of storage facilities.

Of all the 50 farmers studied agreed that selling it as field latex is more convenient. Lack of transport is a problem for small and medium growers,medium and large farmers fell that it more economical while small growers do not agree. All the farmers agree that it is time saving. Lack of storage facilities as one of the reason why small and medium farmers sell their crop to the collection centre. Whereas large farmers, storage facilities is not a problem. Therefore, we can very well say that reasons for selling latex to the collection centre is convenience, it is more economical, and time saving.

Problems in Supplying the Latex to the collection centre :

Table 4.21 and Figure No. 4.7 gives the problems faced by the growers in supplying to the collection centre.

Table No. 4.21. Problems in supplying Latex to collection centre (Growers).

Group size	P_1	P_2	P_3	P_4	P_5	P_6	Total
Small	-	2	-	2	-	8	12
Medium	-	1	-	3	-	5	9
Large	-	-	-	5	-	6	11
Total	-	3	-	10	-	19	32

P_1 - Collection agents behaviour and integrity not satisfactory.

P_2 - Payment system not satisfactory

P_3 - Pricing policy not satisfactory

P_4 - Long distance

P_5 - Tappers resistance

P_6 - Drc estimation not satisfactory.

Of the six reasons listed in schedule (C_{10}) only three reasons were relevant to the farmers viz., payment system, long distance and drc estimation not satisfactory. Among these only 3 farmers out of 50 showed dissatisfaction about the payment system. Ten farmers (2 small, 3 medium and 5 large) had problem of long distance. When the total weight of latex carried is about 30 kgs and the distance from the collection centre is one km., the tappers do this work with out any

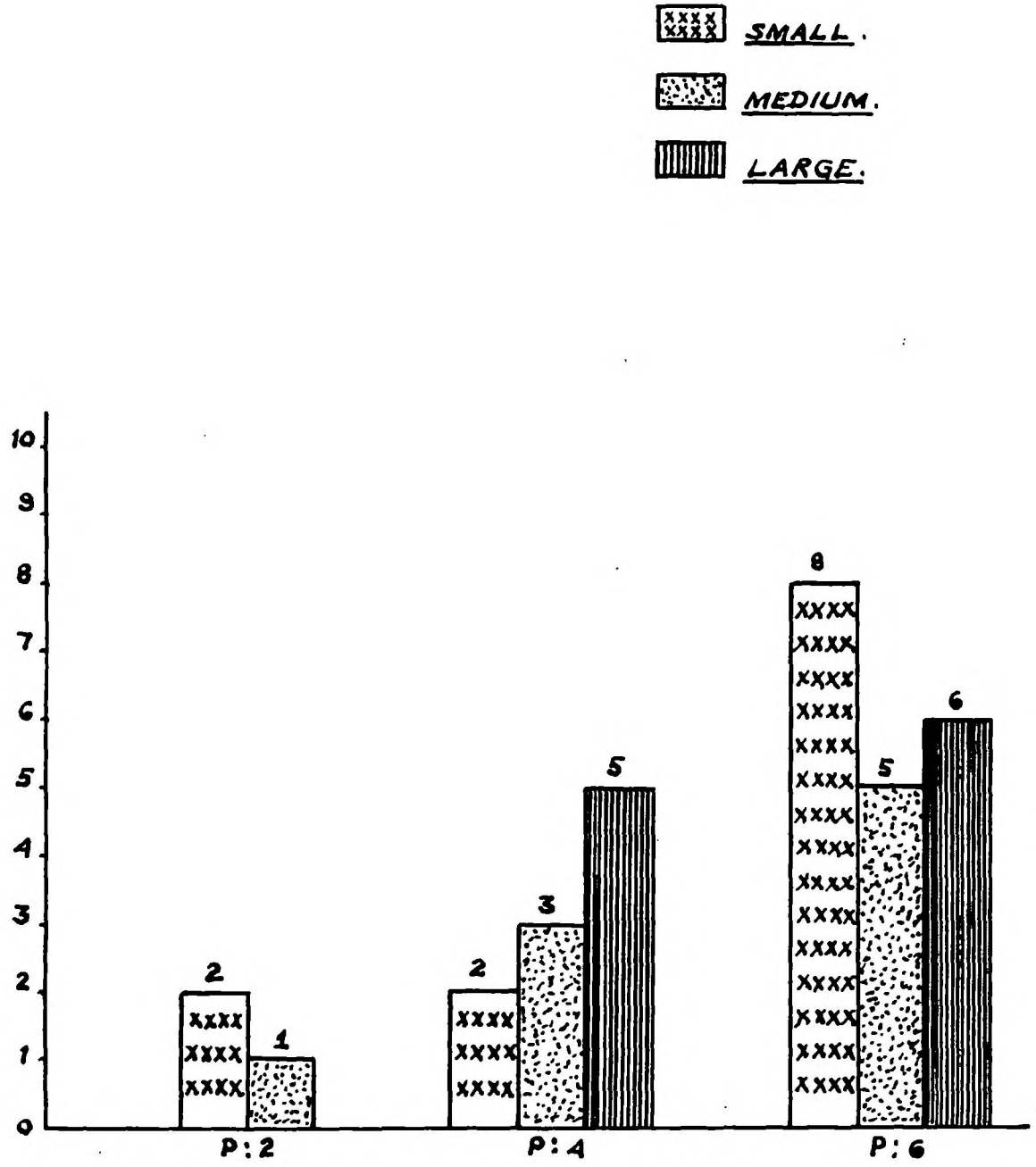


FIG. No 4.6. PROBLEMS IN SUPPLYING LATEX TO COLLECTION CENTRE (GROWERS)

remuneration. K. S. Varma et al (1980) however in cases where more than 1 km of distance on additional payment is paid Rs.1/- to Rs. 1.50 according to the latex carried though report on the working of latex collection centre operated by rubber marketing cooperative by K.S.Varma et al reports that regarding drc estate growers suppose to be generally satisfied because the growers have faith and confidence in the branch manager of the depots. The present study reveals that large number of growers are not satisfied with drc estimation.

Table No. 4.22 and Fig. No. 4.7 gives problems faced by the tappers carrying the latex to the collection centre.

Table No. 4.22. problems in carrying latex to the collection centre (Tappers).

Group Size	Yes	%	No	%	Long Distance	No Remuneration
Small	8	40.00	12	60.00	7	8
Medium	9	60.0	6	40.00	7	6
Large	11	73.33	4	26.66	9	11
Total	28		22	44.0	23	25

Mainly out of 50 tappers studied 28 were having problems and 22 does not having any problem in carrying the latex to the collection centre. Out of 28 tappers 23 having problem of long distance and 25 said they are not getting any extra remuneration for carrying the latex to the collection centre.

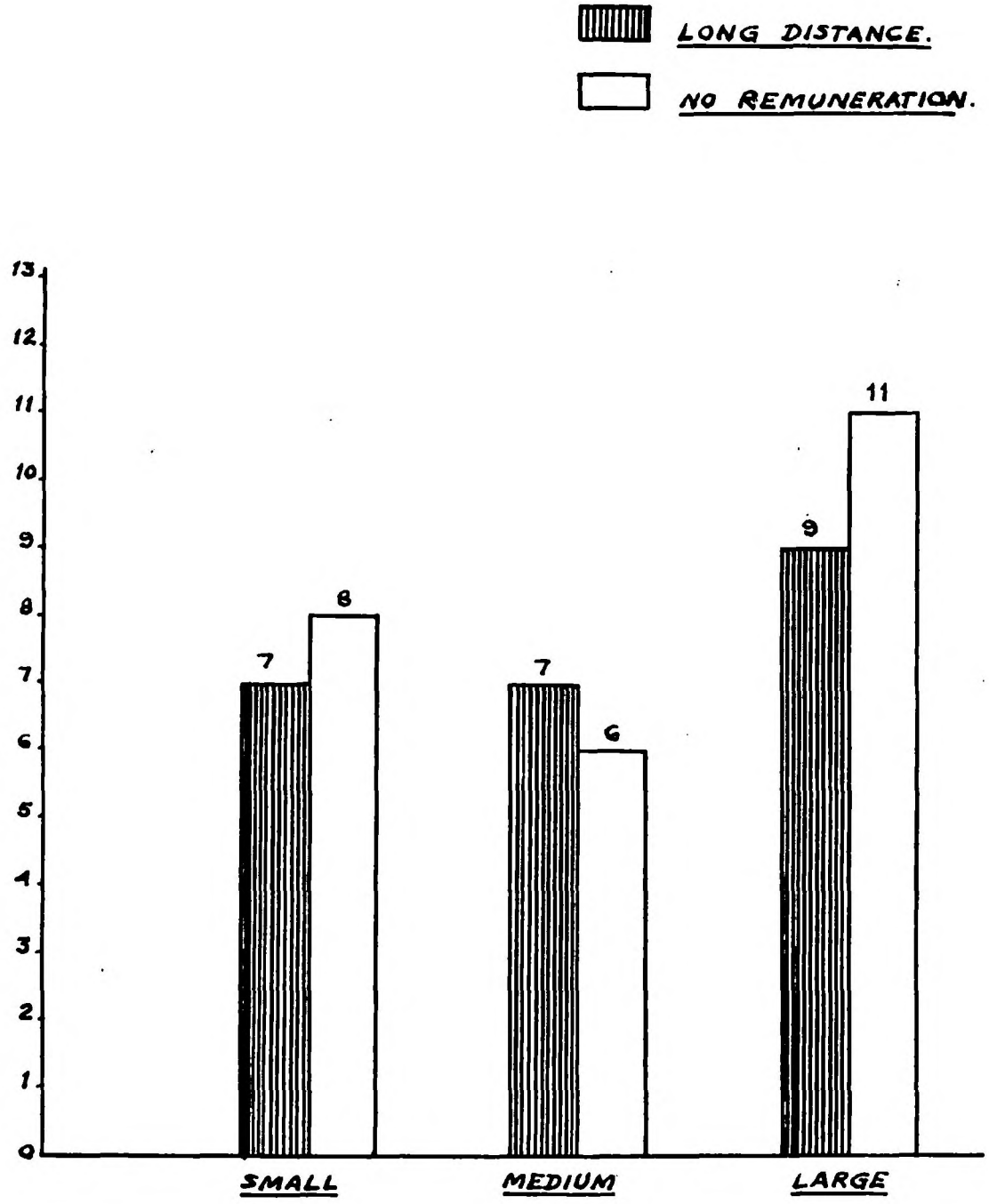


FIG. NO. 4.7. PROBLEMS IN LATEX CARRYING TO THE COLLECTION CENTRE. (TAPPER'S)

Latex delivery :

Table No. 4.23 shows the family labour on hired labour who carries the latex to the collection centre.

Table No. 4.23. Latex Delivery

Group size	Owner	Tapper	Total
Small	2	18	20
Medium	0	15	15
Large	0	15	15
Total	2	48	50

Table No. 4.23 shows that except for 2 small farmers where owner deliver latex himself, all the other farmers respective of smalll medium and large delivers that latex through the tappers.

Table No. 4.24 gives that if any extra remuneration paid to the tappers for transporting the latex to collection centre.

Table No. 4.24. Remuneration paid extra for selling Latex to Collection Centre.

Group Size	Yes	Perdentage	No	percentage	Total
Small	3	15	17	85	20
Medium	6	40	9	60	15
Large	8	53.33	7	46.6	15
Total	17	34	33	66	50

Above table shows that 34% of the growers pay extra remuneration for delivering the latex & 66% do not pay any extra remuneration for transporting the latex. This mentioned earlier is mainly depends distance from the collection centre.

Mode of Transport :

Table No. 4.25 and Fig.No. 4.8 shows how the tappers are transplanting the latex to the collection centre.

Table No.4.25. Mode of transport.

Group size	Head load	%	Cycle	%	Total
Small	16	80	4	20	20
Medium	10	66.6	5	33.34	15
Large	8	53.33	7	46.67	15
Total	34	68	16	32.00	50

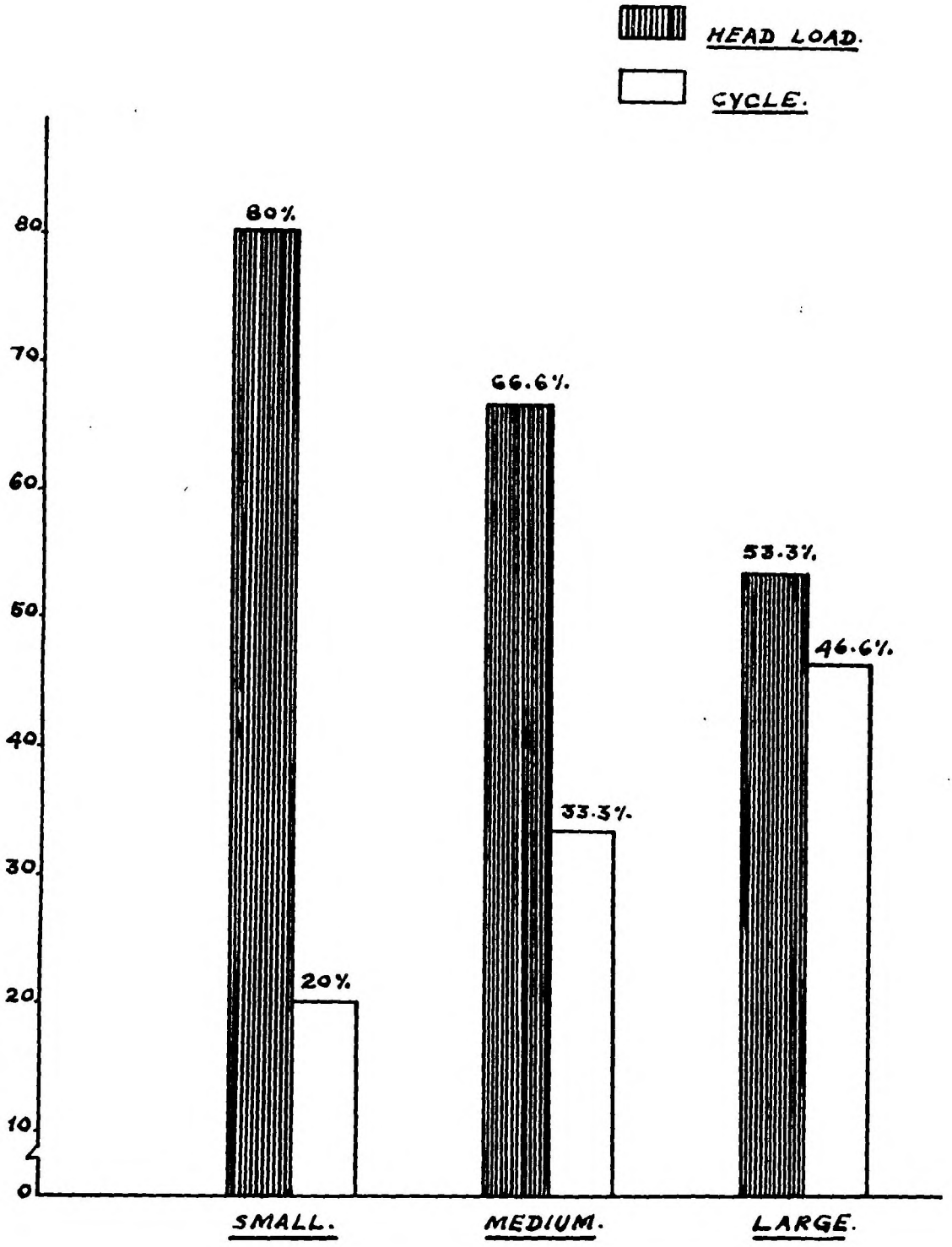


FIG. NO. 4.8. MODE OF TRANSPORT.

Generally latex is carried to the collection centre either as head load or on cycle, 80% of the small growers are take it as head load and 20% by cycle 66.6% of the medium growers by head load and 33.34% by cycle and 53.33% of large growers by head load and 46.67% by cycle. If the distance is more they will carry it in cycle. Normally the tappers hang two buckets at both the edge of the bamboostick, in that way they are balancing the weight on both side and they can carry maximum latex without much strain.

Supply and Price :

Price to a great extends depends upon the supply. Below table No. 4.26 shows the field latex supply and price month-wise in 1984-85 which is superimposed in Figure No.4.9.

Table No.4.26. Monthwise Field Latex Supply and Price of the year 1984-85.

Sl.No.	Month	Production kg drc	Price/kg drc
1.	July	316.42	16.98
2.	August	1024.29	16.56
3.	September	1291.15	15.63
4.	October	1037.12	15.27
5.	November	1192.52	14.68
6.	December	1610.84	14.77
7.	January	949.90	14.37
8.	February	320.53	14.37
9.	March	370.39	14.98
10.	April	644.00	15.53
11.	May	924.28	16.51
12.	June	214.61	16.42
	Total	9896.05	

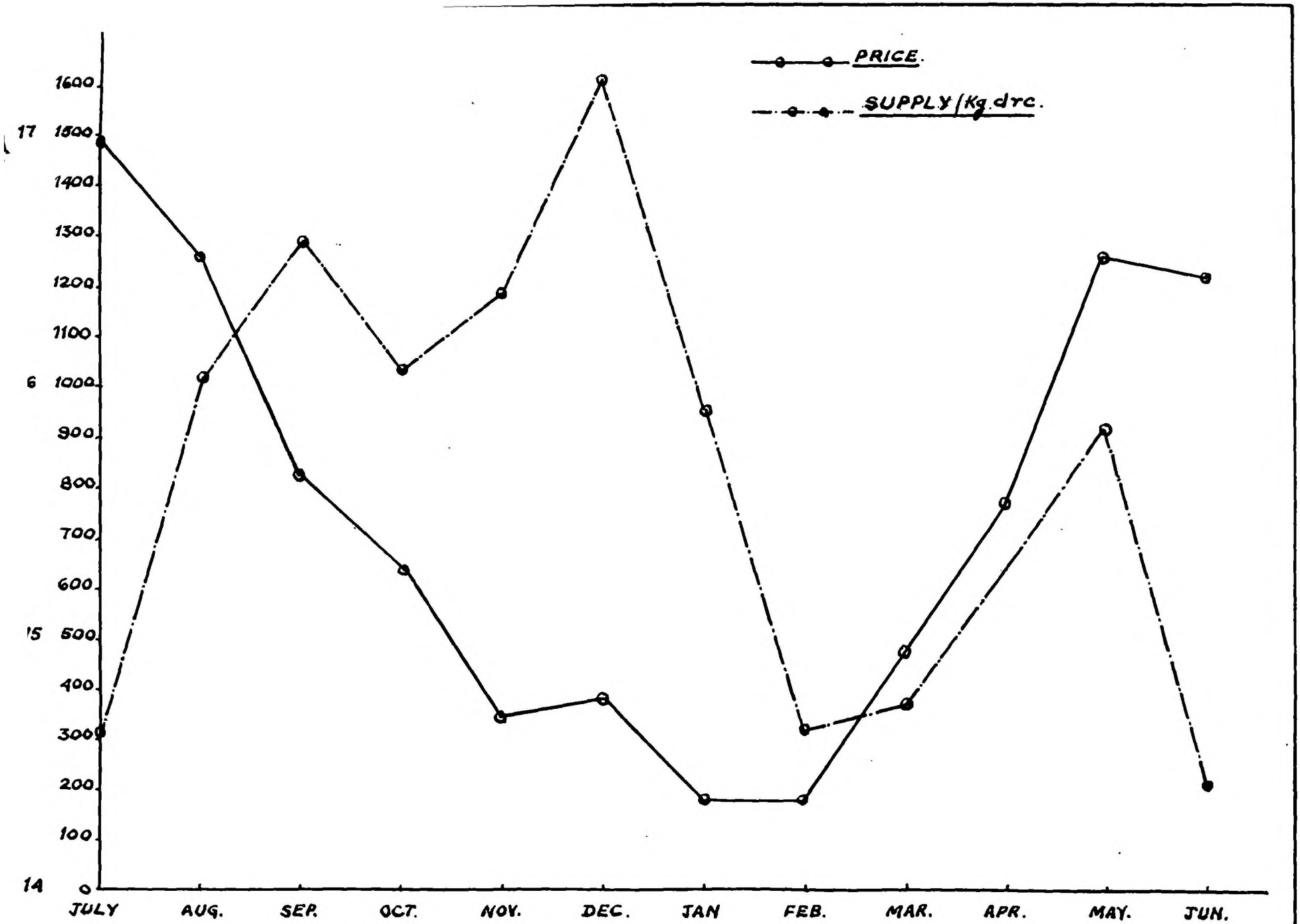


FIG. NO. 4.9. LATEX SUPPLY AND PRICE RELATIONSHIP IN 1984-85. (MONTHLY)

During the months of August, September, October, November, December, January, production is quite high from July the prices are highest the prices start falling touching the lowest in January, February. February onwards again the prices starts going up touching highest again at July during which period the production also slowly picks-up.

The price actually do not exactly confined to production trend as can be seen from the production and prices from January to May. In January and February though the production is going down the prices have not gone up; and again March onwards when the production is going up one can seen that the prices are also going up. This is mainly due to the supply pattern.

Prices are depends on supply of rubber to the market. Though supply in case of rubber depends upon production it does not follow the pattern of production. When the processed product comes into the market little delayed than its time of production. During June and July due to heavy rains production is low therefore prices are highest at that time. August to December as the production and supply goes up prices falls down. In January and February though the production is low, the processed products are still coming to the market keeping the supply and the prices low, from March onwards, though the production goes up the supply of market to meet the demand is not sufficient, the prices keeps upward trends, June, July are the month the production and supply are lowest prices are highest during this period.

Correlation between Supply and Price :

Correlation analysis were carried out the relationship between supply and price. Correlation coefficient is r_2 - 0.2665362 was obtained showing that price as a function of supply was found to be negatively correlated. However, further 't' test shows that it was non-significant.

Payment System :

Table No. 4.27 shows the payment system if the cooperative marketing society.

Table No. 4.27. Payment system.

Group size	Cash	%	Cheque	%	Weekly	Daily
Small	20	100	-	-	20	-
Medium	8	53.33	7	46.66	15	-
Large	3	20	12	80	15	-
Total	31	62	19	38	50	-

Above table shows that the prices paid by the society by weekly basis. All the small farmers are colledting the payment as cash 53.33% of the medium and 20% of the large farmers are also collecting it as cash. But 46.66% if the medium holders and 80% of the large holders are collecting their payment as cheques. This either the owner will come and collect it from

the society or the society will send it by post.

Effect of Price Policy :

This study is conducted to know whether any change in price policy will induce the members of the society or others to supply more latex to the collection centre. Result has given in Table No. 4.28.

Table 4.28. Effect of change in price policy.

Group size	Yes	No	Total
Small	11	9	20
Medium	5	10	15
Large	3	12	15
Total	19	31	50

Out of 50 farmers studied 11 of the small holders 5, of the medium holders, and only 3 of the large holders responded to change in price policy will effect the latex collection. Rest were not agreeing with this change will effect others to supply latex to collection centre.

Interview with the farmers showedthat the prices paid by the collection centre depend on the weekly average lot-sheet price minus 25 ps. per kg of drc. Though the report

of the study on production and consumption of preserved latex concentrates in India by C.M.George et al (1982) reported that the prices paid depend on weekly average lot sheet prices of Kottayam plus 25 Ps. per kg of drc. Our interview with the farmers that this is not the use case, and rates paid are average weekly lot sheet price at minus 25 Ps/kg drc which amounts to difference of 50 ps/kg drc than that is suggested in the report. Moreover, the report said that from 1980-81 onwards the Society started paying price differentials also to the members based on the total quantity of latex supplied to the society annually. Informal talk with farmers revealed that this payment is not done by the cooperatives but the farmers get the benefit of this price differential through their shares is the Cooperatives. Therefore the benefit is not based on the quantity of latex supplied but it based on the number of shares he holds in the cooperative society.

To compare the production per year and the benefit of differentials in the prices, number of shares held by different size group farmers and their total yearly production for the year 1984-85 is presented in Table No. 4.29. No. of shares held by the different size group of farmers were shown in Fig. No. 4.10.

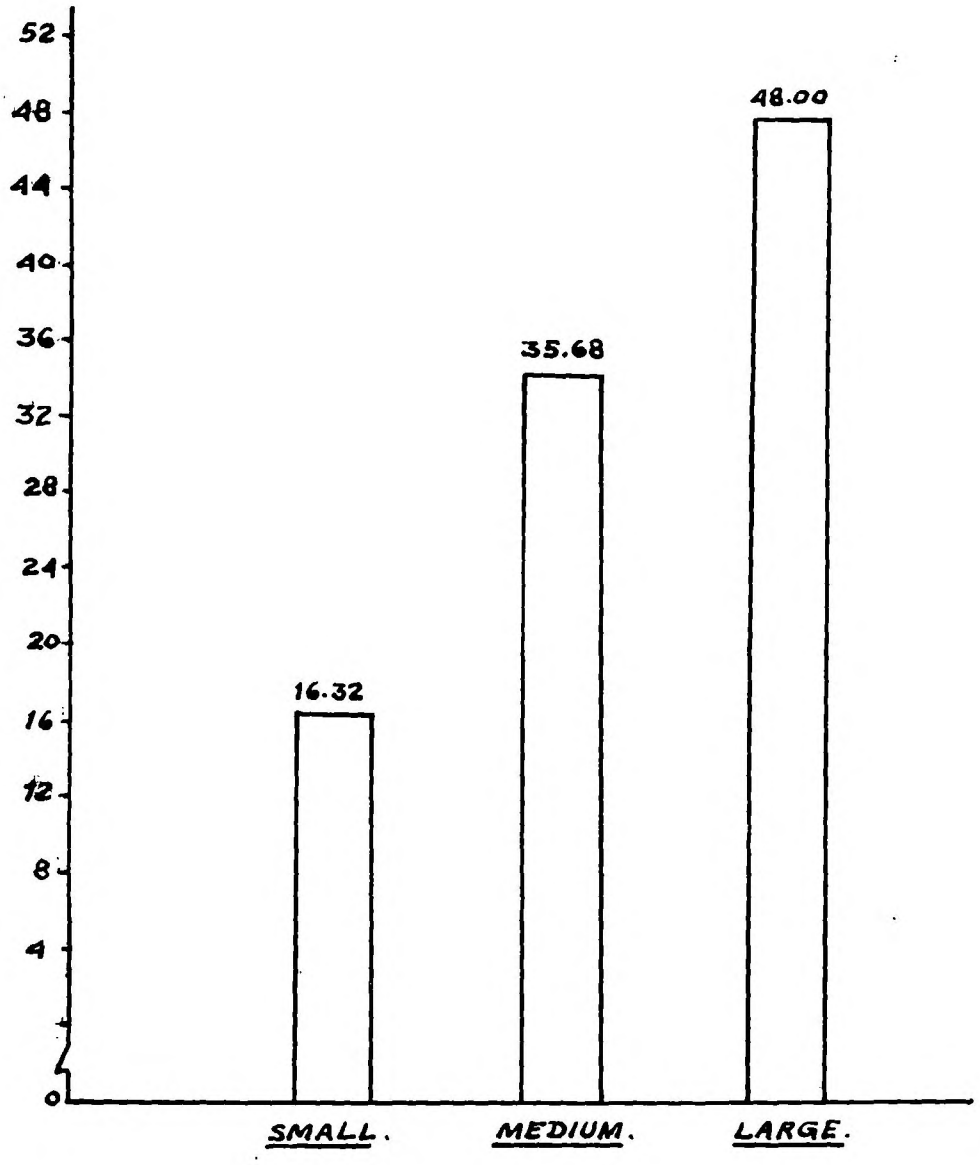


FIG. NO. 4.10. NUMBER OF SHARES DISTRIBUTED AMONG THE SAMPLE FARMERS.

Table No. 4.29. Yearly production and total shares in the society in 1984-85.

Size group	Total yearly production kg drc	%	Total shares %
Small	1094.13	11.06	16.32
Medium	3374.31	34.09	35.68
Large	5427.61	54.85	48.00
Total	9896.05	100.00	

It can be seen that small holders supply only 11.06% of the total production of all the groups they hold about 16.32% of the total shares held by all the group. Thus getting a higher benefit from the price differential whereas larger farmers, though they produce 54.85% of the total production. They hold only 48% of the share lossing the benefit of the price differential.

CHAPTER V

SUMMARY AND CONCLUSION

Rubber has become ubiquitous in our day to day life. Heavea brasilinesis Muell Arg a crop of exclusive industrial application occupies a pride of place in the national economy, and a strategic role in the economy of Kerala state in particular. India has a strong rubber goods manufacturing industry which absorbs this vital industrial raw material in excess of the entire domestic production, forcing the country to import rubber. A well developed marketing net work has become necessary in the fastly changing structure of the rubber plantation industry, which has seen a change of dominion from the hands of large estate owners to the small holder, who now account for 72% of the production. The future prospects of the industry is heavily dependent on the prosperity of small holders.

Though productivity has been improved to the great extent. The problems of processing and marketing of small holder rubber still remains to be solved. The traditional way of processing into sheet are of low quality and fetches low prices. The concept of centralised processing and marketing of small holder rubber has emerged as the ideal solution to upgrade the quality which otherwise would have been converted into low quality rubber. With this end in view rubber board with the assistance of Changanacherry Cooperative rubber marketing society started small holder development centres, and 'ANAND PATTERN' Cooperatives, for centralised processing and marketing of small holder rubber.

The idea being new, the reseptiveness of growers to the idea had to be assessed. A case study was carried out on the 4 collection centres of Changanacherry rubber marketing cooperative, 1984-85 with the objective of :-

1. To study the working of small holders development centre under Changanacherry Rubber Marketing Cooperative Society.
2. To study the market structure and problems of processing and marketing.
3. To study the reactions of the small holder and the tapper towards this scheme, to find reasons for its popularity.
4. To find out shortcomings of the scheme with special reference to drc estimation, pricing policy and systems of payment.
5. To study the correlation between production and rainfall and between supply and price.

Sample farmers were interviewed with pre-tested schedule in survey method for collection of data. Informal talks and data from cooperatives also formed part of the study.

Tabular method of analysis were carried out for the interpretation of data and were analysed statistically by X^2 test. Correlation studies were carried out on selected parameters.

The Changanacherry Cooperative Rubber Marketing Society was started in 1971 and has at present 1684 grower members. They have 14 latex collection centres, which collected in 1984-85 about 160.7 metric tonnes drc equallent latex and about 11.6 metric tonnes of scrap. This they convert into PLC and EBC which has sold through Kerala state cooperative rubber marketing federation. Some of it is sold to local dipped goods manufactures as amonified field latex.

Latex from the small holder and fresh scrap are collected by collection agents on behalf of the cooperative working on commission basis. Drc and the weight of the latex is recorded and the payment is made on weekly basis at the rate of 25 paise less than weekly average lot price of rubber sheet of Kottayam District.

Study on socio-economic status shows that family status may not be of much consequence in the industry since family labour is seldom used. Dedicationally the farmers were found to be very sound, most of them being graduates. Occupation seems to be influenced by the size group and educational background. An interesting fact revealed in the study is that the large farmers though more well educated are solely occupied in farming whereas small and medium farmers depends on business and government employment along with their farming.

A study of the production pattern shows that there are 4 distinct production peak in an agricultural year, which is

largely controlled by the monsoon pattern. Production was found to be negatively correlated with rainfall showing a correlation coefficient r = -0.6085218.

Studies on tapping system showed that while the small growers prefer daily tapping, larger holder group prefer alternate daily tapping. Tapping wages were found to be paid on per tree basis by small farmers and per block basis by large farmers.

Coming to the processing of small holder, sample farmers were supplying their field latex to the collection centre at the rate 25 paisa less than weekly average lot price of rubber sheets. Attempt to estimate the cost of sheeting showed that sheeting incurres an additional expense of Rs. 1.50 per kg of drc for processing, over the marketing system of disposing it as latex. The price difference being 25 paisa per kg drc the benefit of disposing it as latex is about 1.25 paise per kg drc; the producers share in consumer's rupee was found to be 88.86% and it worked out to be 84.09% in case of rubber sheets.

Studies indicate that where facilities are available small holders prefer to dispose it as field latex. But for a large number of farmers choice of the method of marketing is limited, for want of marketing facilities or by long distance from collection centre showing scope for further expansion of the centralised processing and marketing. 26% and 33% of medium and large holders respectively showed a desire to convert part

of their produce to sheet. Intention may be to take advantage of the fluctuating price. Since they have storage facility and economic stability. Tappers reaction was affirmative towards selling the produce as latex, since they are saved of the extra labour of processing without monetary loss.

Reason as to why the farmers prefer to sell their produce as latex were studied and the most frequent answered as it met with their convenience, thus economical and time saving.

Problems they pointed out where payment system and drc estimation is not satisfactory and long distance. Large number of them were dissatisfied with the drc estimation.

Latex is normally delivered to the centre by the tapper and 34% of them get extra remuneration for the effort. Mode of transport was found to be 68% of them by head load and 32% by cycle.

The price fluctuated between Rs. 14.37 per kg of drc in January-February to Rs. 16.98 per kg drc in July. Correlation studies on supply and price gave a correlation coefficient of r = -0.266536 which was found to be non-significant.

Though majority of the farmers feel that a change in price policy will induce the members of the society or the others to supply more latex to the society, 38% of them are interested in change in price policy. Informal talks reveal that there is scope for better price than the existing 25 paise lower than the weekly average lot sheet price.

Payment of price differential on annual basis is also not followed but the benefit is passed on by the cooperatives to the farmers through their share in the cooperative.

CONCLUSION AND SUGGESTIONS

From the findings of the study, the following are the conclusions arrived at and recommendations suggested.

1. Formation of collection centres by the rubber marketing cooperatives or the Keral State Cooperative Rubber Marketing Federation is a feasible and workable proposal.

2. Scope for further expansions and establishment of new centres exist. Collection centres to be successful should be established in concentrated pockets where 100 ha of small holding are available with in a radius of about 1.5 km.

3. Collection agents working on commission basis is found to work well in the collection centres studied. Utmost care is to be taken in selecting a good collection agent as his reliability, temperament, influence and popularity in the locality can decide the success of the centre.

4. Scheme is popular because of its convenience, its economical and time saving. Since majority of small holders own average tappable rubber area of 1 ha. or

less they prefer latex supply to collection centres. Only large and more affluent small growers with their own sheeting and smoking facility find self processing attractive, mainly to take advantage of the fluctuating price.

5. Tappers prefer this system since they get their afternoon free. Only when more than 30 kg are to be transported by head load or when the distance is more than 1.5 kms., they demand additional payment.

6. Drc estimation system was not satisfactory for the growers. Slight improvement is possible by providing the depot with ovens to reduce the drying time.

7. Farmers also showed dissatisfaction towards payment system. The current practice of paying 25 paise less than weekly average lot price of rubber sheet of Kottayam, gives a benefit of Rs. 1.25 when disposed as field latex over processing it into sheet. There is scope for better payment of price, if the latex supplied is converted into concentrated latex through centrifuging. Payment of price differential on annual basis need to be followed to pass on the benefit to the producer.

8. Prompt payment by the society has to be ensured. Facilities to give advances to growers in case of need on the basis of goods supplied by them even before the weekly payment due will be an added incentive.

9. Even in case of affluent growers, a facility to supply the latex and receive a provisional price at first and receive differential prices based on the prices prevailing at the data of sale of processed rubber may prove attractive. Provided the society has enough working capital, such an arrangement can work.

10. Where the distance is more, the owning or hiring a transport (like trailor with tanker) by the centre will ensure good response to the latex supply.

11. Production was found to be negatively correlated with rainfall ($r = -0.6085218$). Price as a function of supply though negative correlated was found to be non-significant ($r = -0.266536$). Rainguarding should be popularised among small holder to reduce fluctuation in production pattern. Stabilisation of the price fluctuation needs government attention to be effective and will lead to greater popularity to this scheme.

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APPENDIX

STUDY OF DISPOSAL OF RAW RUBBER LATEX TO COLLECTION CENTRES RUN BY CO-OPERATIVES

Proforma for collection of Details.

A. GENERAL INFORMATION

1. Name :
2. Sex :
3. Age :
4. Residential Address :
5. Occupation :
6. Family status :
   (a) Male :
   (b) Female :
   (c) Children (below 15 years) } M F
   Total
   Grand Total :
7. Who manages the estate :

Owner himself	Husband	Others (pl- Sp.)

8. Educational background :
   (a) Owner :
   (b) Person who manages the estate. :
9. No. of shares held in the society by self and other members of the family living together.

B. DETAILS OF THE HOLDING

1. Registration No. :
2. Total Area planted (Both Registered and unregistered) :

3. Detail of the planted Area:

IMMATURE			MATURE		
Year of planting	Planting material	Extent (Acre)	Year of planting	Planting material	Extent (Acre)

C. PRODUCTION

1. Who does the tapping ?

Family Labour	Hired Labour

2. Tapping System

Daily	Alternate daily	Once in three days

3. Total No. of tapping days ? (In a year)

Tapping wages (Pl. Specify)

Per tree	Per block	Per day

5. Yearly average production

I. Latex (DRC)

II. Scrap

6. Dail y average production

1. Latex :

2. Scrap :

(b) Mode of disposal of Latex

1. Do you sell the entire Latex to the collection centre.

YES	NO

2. If no, how is the remaining portion sold.

3. The reason for not supplying the entire crop to the collection centre.

(1) (4)

(2) (5)

(3) (6)

4. Total quantity supplied to collection centre and other sources for the last one month/year.

(a) Collection Centre.

1. Latex :

2. Scrap :

(b) Other Sources (1) Latex :

(2) Scrap :

5. Would you like to supply your entire scrap rubber to the collection centre.

YES
NO

6- If yes, what are the conditions?

7. Who delivers the latex at the collection centre.

OWNER
TAPPER
PAID LABOUR

8. Mode of transportation of the Latex.

HEAD LOAD
CYCLE
OWNERS
P. Specify

8. Any extra remuneration paid for carrying the latex to the centre.

YES
NO

(If yes, pl. quantify)

10. Problems in supplying the Latex to the Collection Centre (Reasons not specified below may also be mentioned).

Collection agents behaviour and integrity not satisfactory.
Payment system not satisfactory
Pricing policy not satisfactory
Indebtedness to private dealers
Long distance
Tappers resistance
DRC estimation not satisfactory

11. Advantages in selling the Crop to the collection centre :

(a) Less botheration :

(b) Time-sacing :

(c) More Revenue :

(d) Less Processing cost :

(e) Less labour charge :

(f) Cleanliness in house/ premises. :

(g) Others

D. COST AND PRICES (Per Kg. DRC)

1. Average cost incurred in carrying the latex to the collection centre.

2. Average cost incurred in conversion of latex into sheet.

(1) Coagulation charges

(a) Acid :

(b) Others :

(2) Sheeting

(a) Dish :

(b) Straineer :

(c) Other :

(3) Smoking :

(4) Labour wages :

(5) Transportation to dealers. :

(6) Other Expenses. :

TOTAL :

3. Price received :

(a) At Collection Centre

1. Latex (Per DRC) :

2. Scrap :

(b) Private dealers

1. Sheet (per kg.) :

2. Scrap :

4. Average yearly income selected estate. }

(a) Latex :

(b) Scrap :

5. Average daily income from the selected estate. :

(a) Latex :

(b) Scrap :

6. If you are selling as a sheet what will be the average daily income/ Average yearly income.

D. PAYMENTS

1. When do you receive payments for Latex supplied to collection centre. } Latex -
} Scrap -

2. Payments received by -

Cash
D.D.
Cheque
Others

3. Suggestions, if any, to improve the payments.

1. 3.

2. 4.

E. SOCIAL ASPECTS.

1. Owners Reaction.

(a) Which method will be more profitable for you.

SELLING AS LATEX
SELLING AS SHEET

2. Specify reason for selling the latex to the collection centre.

Convenience	Lack of market information
Lack of transport	Highest price
Large no. of inter-mediaries.	Malpractices in the market
Debt obligation	
More economical	Lack of storage facility
Time Saving	Others

3. In your opinion whether any change in pricing policy, will induce you/others to supply more Latex to the collection centre.

YES	NO

4. Suggestions for improving the systems.

1. DRC estimation :
2. Price formula :
3. Payments :
4. Others :

2. Tappers Reaction

(a) Which method will be more beneficial for you.

Selling as Latex	Conversion of Latex into sheet.

(b) Are you facing any problems in carrying the Latex to collection centre.

YES	NO

(If yes, specify)

(c) Will you be getting any extra remuneration for carrying the Latex to the collection centre.

YES	NO

(If yes, pl. quantify)

Date of visit to
the estate.

Signature.