1987-88
1989-90

ANNUAL REPORT OF THE RUBBER BOARD FOR THE YEAR 1987-'88

THE RUBBER BOARD
[GOVT. OF INDIA, MINISTRY OF COMMERCE]
KOTTAYAM—686 001
KERALA STATE

THE RUBBER BOARD

Annual Report on the activities for the year 1987-88.

PART I - INTRODUCTION

PART II - CONSTITUTION AND FUNCTIONS.

PART III - RUBBER PRODUCTION

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PART IV - RUBBER RESEARCH

PART V - RUBBER PROCESSING.

PART VI - ADMINISTRATION

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ANNUAL REPORT ON THE WORKING OF THE RUBBER BOARD FOR 1987/88

PART I - INTRODUCTION

This is the Annual Report of the Rubber Board on its working for the year 1987/88 and contains a summary of the activities from 1st April 1987 to 31st March 1988.

As a strategic raw material with thousands of industrial uses rubber plays an important role in the industrial and economic development of the country.

The English introduced rubber cultivation in our country, in the 1st decade of this century. At first, the cultivation was confined to the organised sector. Indian owned plantations and small holdings made their appearance later. After independence the growth was fast. The Rubber Production Board was set up in 1947 and later on under the Rubber Act of 1947 the Rubber Board was created. In the meantime research in prominent rubber growing countries had progressed well, the Rubber Research Institute of Malaya, having been set up in 1938. The Rubber Research Institute of India was set up in 1955 under the Rubber Board. Breeding of high yielding clones and developing improved cultural practices and efficient crop exploitation and processing techniques followed. This paved the way for a quick changeover from traditional methods to modern cultural practices and technologies.

In selection of planting materials, soil conservation measures, plant protection techniques, tapping, crop harvesting etc. India had to evolve suitable package of practices. With sustained research and development activities coupled with extension and advisory back-up for transfer of technologies evolved in the laboratories to the planters' fields, India soon emerged as a force among the natural rubber producing countries. We are the fourth largest producer of NR in the world, after Malaysia, Indonesia and Thailand.

In breeding high yielding planting materials we are not behind any other country. The Indian clone RRII 105 with yield potential of about 2500 Kg. per hectare a year, can

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stand comparison to any clone in the world. Other rubber producing countries like Malaysia, Thailand and China have obtained nucleus material of this clone for observing its performance in their environment. More promising varieties in the RRII 200 and 300 series are in the pipeline, undergoing evaluation trials.

Growing the crop with leguminous ground cover, application of fertilisers after soil and leaf analysis, crop exploitation with yield stimulation, processing technically specified rubbers that offer process advantage and energy saving to the manufacturer, consumption research to improve the technological properties of rubber etc. are some of the major techniques we follow.

As the country accelerates its pace of industrial development, demand for rubber will go on increasing. India would require about 5 lakh tonnes of natural rubber by 2000 AD. We have a two-pronged strategy for this. Increasing the area in North East and other new regions and improving production in existing plantations. We have to step up the planting activity, so that by 1994, we have at least 100,000 ha. of rubber plantation in the North Eastern States. This will ensure that we get 100,000 MT from this area in 2000 AD. With the widespread adoption of productivity improving practices, it will be possible to get a production of 400,000 T from the existing plantation/areas./in the traditio
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1. Review of progress

Natural rubber industry performed well during 1987/88; production increasing to 235,197 tonnes from 219,520 tonnes during 1986/87, registering 7.1 % growth. The growth in consumption was more impressive - 287,480 tonnes as against 257,305 tonnes during the previous year, recording a growth of 11.7 %. In order to meet the gap between demand and supply, 53,685 tonnes of NR was imported, including 11,694 tonnes under the export incentive scheme.

The activities undertaken for development of the natural rubber industry consisted of implementation of schemes for -

(a) promotion of newplanting and replanting of rubber,
(b) production and distribution of high yielding planting materials,
(c) improving production and crop processing through extension services, training, demonstration, supply of inputs etc.

Promotion of newplanting and replanting was mainly carried out through implementing an integrated scheme called the Rubber

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Plantation Development Scheme. This scheme offers financial assistance and free technical assistance. Cash subsidy at Rs.5,000/- per hectare is granted for planting rubber by growers owning upto 5 hectares of rubber in traditional areas and by all categories of growers in the non-traditional areas. Input subsidy in the form of reimbursement of the cost of high yielding planting material of advanced growth at Rs.6 per plant and interest subsidy at 3% on loans taken for meeting planting expenses under the agricultural refinance scheme of NABARD are also granted to rubber growers.

In view of the limited scope for expansion of rubber cultivation in the traditional areas, development of rubber plantations in selected non-traditional tracts is undertaken in the north-east region; Orissa, Goa, Maharashtra, Andaman & Nicobar islands etc. To effectively propagate rubber in these new areas special awareness campaigns were conducted & nurseries for generating sufficient seedlings & planting materials were set up.

2. Rubber prices

The Government had fixed Rs.1700 as fair price within a price band of Rs.1650-1750 per quintal for RMA-4 grade rubber in May, 1987. This fair price was determined on the basis of the recommendations of the Cost Accounts Branch of the Ministry of Finance, who conducted a study of the cost of production of NR. However, the market remained more or less steady a little above this, as can be seen from the monthly averages given below.

Monthly average price of RMA-4 per quintal

		Rs.
1987	April	1816
	May	1847
	June	1821
	July	1860
	August	1816
	September	1750
	October	1753
	November	1746
	December	1743
1988	January	1788
	February	1778
	March	1768

3. Expenditure

The total expenditure during 1987/88 was Rs.2191.22 lakhs; Rs.1474.70 lakhs under Plan and Rs.716.52 lakhs under non-Plan. The Funds received from the Government amounted to Rs.2018.25 lakhs. An amount of Rs.1116.08 lakhs was collected towards excise duty on rubber and Rs.1094.05 lakhs was remitted to the

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Consolidated Fund of India. The physical and financial performance/ were impressive. At the end of the 3rd year of the Seventh Five Year Plan, 90% of physical goals for the entire 5 year period has been achieved; utilising about 80% of the 5 year outlay.

4. International Developments

The world production of natural rubber during 1987 went up to 4,680,000 tonnes, recording a growth rate of 5.5%. The consumption was 4,730,000 tonnes, which is more than the production by 50,000 tonnes. The estimated supply-demand balance during 1987 vis-a-vis 1986 was as follows, according to the International Rubber Study Group.

	1987	1986
	('000 tonnes)	
Production	4680	4435
Consumption	4730	4420
Difference	(-) 50	(+) 15

The international price of natural rubber recorded a steady increase during 1987/88. The average price for RSS-3 grade (equivalent to RMA-4) which was M$ 209 (Rs.1108) per quintal in Kuala Lumpur in April 1987 improved to M$ 280.6 (Rs.1487) in March, 1988. The heavy spurt in demand for examination and surgical gloves in the context of the escalating 'AIDS scare' has resulted in an abnormal increase in the demand and price of latex, which in turn pushed up the price of other grades also. The staggered wintering in South-east Asia, the trade boom in Japan and increased demand from countries like China, South Korea and Taiwan were reported to be the contributing factors.

/ under the seventh five year plan

PART II - CONSTITUTION AND FUNCTIONS

1. Introduction

The Indian Rubber Board was constituted under the Rubber (Promotion and Marketing) Act, 1947 which came into force on 19 April, 1947, " to promote by such measures as it thinks fit the development of the rubber industry in India. The Rubber Production and Marketing(Amendment) Act of 1954 made certain changes in the constitution of the Board and its name was changed as Rubber Board. This Act came into force on 1st August, 1955. The Rubber Act of 1947 was further amended by the Rubber (Amendment) Act, 1960 and by the Rubber (Amendment) Act 1982. This last amendment was made to enable the Central Government to appoint a part time/whole time Chairman for the Rubber Board and an Executive Director on whole time basis (if considered necessary by the Government).

2. Constitution

The Rubber Board is attached to the Ministry of Commerce of the Central Government. The Board has at present a full time Chairman as principal executive officer responsible for implementation of the decisions at the meetings of the Board and discharge of the duties under the Rubber Act. There are 25 other members consisting of -

i) two members to represent the State of Tamilnadu one of whom shall be a person representing rubber producing interests;

ii) eight members to represent the State of Kerala, six of whom shall be representing the rubber producing interests, three of such being persons representing the small growers;

iii) ten members to be nominated by the Central Government, of whom two shall represent the manufacturers and four labour;

iv) three members of Parliament of whom two shall be elected by the Lok Sabha and one by the Rajya Sabha;

v) the Executive Director (ex-officio); and

vi) the Rubber Production Commissioner (ex officio).

A list of the members as on 31-3-1988 is given at the end of this report.

One of the members is elected as Vice Chairman. Sub Committees are formed to examine in detail various proposals and affairs affecting the rubber industry and make recommendations to the Board. Seven such Committees, viz., Executive Committee, Research and Development Committee, Planting Committee,

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Statistics & Import/Export Committee, Market Development Committee, Labour Welfare Committee and Staff Affairs Committee were constituted. The Research and Development Committee was constituted under Notification (Rubber Control) OM No.13/1/85-Plant (B) dated 6-4-1987 of the Government of India in the Ministry of Commerce, with provision for inducting three scientists/technologists to represent the Council of Scientific and Industrial Research, the Indian Council of Agricultural Research and the rubber manufacturing industry. The Committee replaced the Research and Training Committee and the Development and Extension Committee of the previous Board.

Sri P.C. Cyriac, IAS continued to be the Chairman of the Board.

Sri M.K. Vidyadharan, member representing small rubber growers, was elected as Vice Chairman at the 109th meeting of the Board on 27 November 1987 for a period of one year.

3. Functions

The functions of the Board according to clause 8 of the Rubber Act are -

(1) To promote by such measures as it thinks fit the development of the rubber industry. The measures may provide for:

(a) undertaking, assisting or encouraging scientific, technological and economic research;

(b) training students in improved methods of planting, cultivation, manuring and spraying;

(c) supply of technical advice to rubber growers;

(d) improving the marketing of rubber;

(e) collection of statistics from owners of estates, dealers and manufacturers;

(f) securing better working conditions and the provisions and improvement of amenities and incentives for workers, and

(g) carrying out any other duties which may be vested in the Board.

(2) It shall also be the duty of the Board -

(a) to advise the Central Government on all matters relating to the development of the rubber industry, including the import and export of rubber;

(b) to advise the Central Government with regard to participation in any international conference or scheme relating to rubber;

(c) to submit to the Central Government and such other

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authorities as may be prescribed, half yearly reports on its activities and the working of this Act; and

(d) to prepare and furnish such other reports relating to the rubber industry as may be required by the Central Government from time to time.

4. Meetings of the Board and its Committees

The following meetings of the Board and the Committees were held during the year.

(a) Board meetings - on 3 occassions viz., on 19-10-1987, 27-11-1987 and 8-3-1988.

(b) Committee meetings -

(i) Executive Committee and the Statistics & Import/Export Committee met on 3 occassions each and the other Committees once.

Since the three-year term of the Rubber Board had expired on 25-4-1987 and the Board was reconstituted only by September/October 1987 no meeting could be held from May to September. However an Ad-hoc Committee was constituted and its meeting held in July to conduct the periodic review of the supply and demand situation of rubber.

5. Organisational set up

The activities of the Board are carried out by six Departments viz., Administration, Rubber Production, Rubber Research, Rubber Processing, Finance & Accounts and the Department of Training; headed respectively by the Secretary, the Rubber Production Commissioner, the Director of Research, the Project Officer, the Financial Adviser and the Joint Director. Three new Sub Offices were opened during the year; at Ahmedabad and Kanpur in May and at Bangalore in November 1987.

The head quarters of the Board, along with the Administration, Rubber Production and Finance and Accounts Departments are located at the Kottayam Public Library Building, Sastri Road, Kottayam-1. There are eight Sub/Liaison Offices under the Administration Department, functioning at important rubber consuming centres in the country. The Rubber Production Department has 26 Regional Offices, 125 Field Offices, 20 Regional Nurseries and 11 Tappers Training Schools located at different rubber growing regions. The Rubber Research cum Development Station in South Andamans. The Zonal offices at Bhubaneswar and Guwahati, and the Nucleus Rubber Estate cum Training Centre at Agartala also come under the Department of Rubber Production.

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The Research Department, the Department of Rubber Processing and the Department of Training function in the Board's own buildings at Kottayam-9. The Research Department runs two Regional Experiment Stations in Kerala, one each in Tripura, Maharashtra (Dapchari), Assam, Meghalaya, Mizoram and Orissa. The Pilot Crumb Rubber Factory located at Kottayam is run by the Department of Rubber Processing.

The Chairman exercises administrative control over all departments and offices. The total of officers and staff under the Board as on 31-3-1988 was 1643. Very cordial relations existed between the staff and the management. The good work turned out by them as a whole has resulted in the impressive record of achievement during the year.

The activities of the different departments are summarised in the following pages.

PART III - RUBBER PRODUCTION

Licensing and registration of rubber estates. Formulation and implementation of schemes for the modernisation and development of rubber plantations. planning and undertaking advisory and extension services (for all categories of rubber growers). Production and distribution of high yielding planting materials. Imparting training in tapping and production of raw rubber and Identification of suitable areas and production of rubber cultivation in non-traditional areas formed the major functions of the Rubber Production Department.

The Rubber Production Commissioner exercised overall control and supervision of the Department. He is assisted by four Jt. RPCs and eight Dy.RPCs and a complement of other officers and staff.

The field activities of the Department are managed through 27 regional offices, 26 of which are grouped under four zones, ie. South Zone, North Zone, East Zone and North-East Zone.

Control and supervision of activities at the Zonal level are exercised by Dy.RPCs excepting in the North-East Zone which is under a Jt.RPC. A NRETC each is functioning in Tripura and Andamans. The NRETC, Tripura is headed by a Project Director (Jt.RPC) and the NRETC in Andamans (earlier the RRDS) is manned by an Estate Manager (Dy.RPC) A Central Nursery is run in Kerala.

Under the Regional Offices there are 125 Field Offices, 20 Regional Nurseries and 11 Rubber Tappers' Training Schools.

2. LICENSING & REGISTRATION OF ESTATES

The Rubber Act stipulates that any replanting or newplanting of rubber in the country shall be undertaken only under and in accordance with licences issued by the Board. It is also laid down that all rubber estates in the country shall be registered with the Board. During the period under report 12, 384 newplanting licences were issued covering an area of 6,929 ha, and 4,601 replanting licences covering an area of 3,245ha were also issued. A total of 10,253 rubber plantation units were newly registered. The total rubber area newly brought under registration was 5,493ha and planted area removed by cancellation of registration was 1,284ha. The total registered area

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as on 31-3-1988 was 2,86,016ha and the total number of units was 224,758.

At its 110th meeting held on 8-3-1988 the Board decided that pending amendment of the Rubber Act and Rules, the system of licencing planting/replanting be dispensed with from 1-4-1988. This decision was taken in view of the finding that the system does not serve any useful purpose at present. Steps were under way to take up the matter with the cent-ral Government seeking appropriate amendments of the relevant clauses of the statute.

3. REPLANTING SUBSIDY SCHEME

The Replanting Subsidy Scheme aimed at rehabilitation of old and uneconomic rubber plantations with high yielding varieties in order to increase the supply of natural rubber was introduced in 1957. This was the first important development Scheme coined by the Board. It underwent many r.visions/modifications from time to time. The Scheme provided for replantation assistance to varying extents based on the size of the plantation.

Initially the replanting subsidy ranged from Rs.250/- to Rs.400/- per acre. The rate was revised to Rs.1,000/- per acre (Rs.2,471 per hectare) from 1960. Until 1972, subsidy was granted for replanting areas planted prior to 1955 and registered with the Board in April 1958 or earlier. The rule was later relaxed enabling replanting of all uneconomic areas planted upto 1952 and registered with the Board. From 1975 to 1979, subsidy was paid under 3 slabs of Rs.7,500/-, Rs.5,000/- and Rs.3,000/- per hectare for growers having upto 2 ha of rubber, those having rubber above 2 ha but not more than 20 ha and those having above 20 ha of rubber. The subsidy was payable in 7 annual instalments.

The instalments of subsidy due in 1975 and in subsequent years for replanting carried out from 1969 to 1974 were also paid at revised rates. With the introduction of the RPD Scheme in 1980-81 which aimed at promotion of replanting and newplanting in an integrated manner, the RP Subsidy Scheme ceased to operate except for effecting spill over payments.

As at the close of the period under report subsidy amounting to Rs.192,132,518/- was granted for replanting a total area of 53,605 ha under 34,822 permits. Out of the 53,605 ha replanted under the scheme, trees in a total area of

51,220 ha had been brought under tapping as at the close of the period under report.

Apart from payment of cash subsidy the scheme provided for additional assistance to small growers owning less than 6.07 ha of rubber for purchase of high yeilding planting materials and fertilisers and for soil conservation work. Since introduction of the Scheme, the following amounts had been disbursed as additional assistance:

1.	Half cost of fertiliser mixture supplied	Rs.21,097,575.00
2.	Reimbursement of cost of planting materials	Rs. 1,905,152.00
3.	Assistance for soil conservation work	Rs. 131,326.00

4. LOAN SCHEME

In addition to assistance for replanting loan schemes were operated for expansion of area under small holdings and for maintanance loan schemes. The newplanting Loan Scheme and upkeep Loan Scheme were first introduced in 1952 and 1953 respectively, providing loan assistance at the rate of Rs.750/- per acre for expansion of un-economic units to economic units of the size 5 to 15 acres by newplanting, and a maximum of Rs.475/- per acre to immature small plantings of 15 acres and below for doing maintenance operations until the bearing stage. Both the loans were interest free.

An amount of Rs.7,34,038.91 was disbursed to newplant 439.01 ha and Rs.7,92,986.27 was recovered under the Loan Scheme. The amount disbursed under the upkeep loan scheme was Rs.2,62,560.14 to maintain 304.73 ha and the money received back was Rs.2,67,659.37

In replacement of these two Loan Schemes a Revised Loan Scheme was introduced in 1966, which provided for higher rates of loan for expansion of holdings to 2.00 and 20.23 ha and for maintenance of immature area in small holdings. The rates were Rs.3,460/- per ha for newplanting and a maximum of Rs.2,200/- per ha for maintenance over 6 years. An interest of 5% per annum was charged under this scheme from the 10th year of planting.

The Loanees had to mortgage the rubber area to the Board as security. Payments were effected in yearly instalments, after completion of the respective items of work. Repayment became due from the 10th year of planting.

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The Revised Loan Scheme was discontinued after 1978 when the Rubber Newplanting Subsidy Scheme 1979 was put into operation. However pending instalments on the permits already granted continued. Repayment of instalments due were forthcoming. Steps for recovery of over-dues were also taken.

As on 31-3-88 an amount of Rs.74,71,082.14 was disbursed to benefit 849 parties with 3,113.38 ha. The amount returned with interest came to Rs.86,80,701.88.

Loan permit holders possessing not more than 6.00 ha. of rubber were eligible for additional assistance by way of reimbursement of cost of planting materials and half cost of fertiliser mixtures. Total amount reimbursed by way of cost of planting materials/cost of fertiliser mixtures was Rs.56,101.64 and Rs.508,935.60 respectively. No amount was disbursed under the head during the year.

During the reporting period an amount of Rs.1,791.35 was got repaid under Upkeep Loan Scheme and Rs.145,258.05 under Revised Loan Scheme. The accounts under 23 Revised Loan Scheme permits were closed. No. of files/permits now remaining under Revised Loan Scheme and Upkeep Loan Scheme are 88 and 3 respectively. Of the remaining files majority are under legal proceedings for recovery of the amount due. Normal repayments are taking place in a few cases.

5. Rubber Newplanting Subsidy Scheme, 1979

Rubber Newplanting Subsidy Scheme, 1979 was sanctioned by the Government in January, 1980. It is estimated that new plantation under the scheme has been carried out in about 6550 ha. thereby exceeding the target of 4000 ha. The following were the incentives offered under the scheme :

1. Capital subsidy at the rate of Rs.7,500/- per ha. for growers owning upto 2.00 ha. of rubber and Rs.5,000/- per ha. for growers owning above 2.00 ha. and upto 20.23 ha. The amount was paid in 7 annnual instalments after the completion of the items of works stipulated for each year.

2. Input subsidies were also given to growers whose total rubber area did not exceed 6.00 ha. These comprised of reimbursement of cost of approved planting materials, 50% cost of fertilisers and a subsidy for carrying out soil conservation work.

3. Interest subsidy at the rate of 3% for loans availed of from banks to supplement the subsidy.

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1. Advisory and extension services at all stages of planting, maintenance, tapping and processing of crop, free of cost.

Though 34,350 applications were received for subsidy, actual planting was done only in 17,131 cases. Field verification was completed in all these cases. Final position is detailed hereunder:

A total of 10,998 permits were issued covering an area of 6,548.53 ha. Subsidy amounting to Rs.449.50 lakhs had been sanctioned since inception of the scheme. The amount of subsidy sanctioned from 1-4-1987 to 31-3-1988 was Rs.13.90 lakhs.

According to information made available, banks have sanctioned loans to about 907 permit holders to the order of approximately Rs.96.28 lakhs.

6. Rubber Plantation Development Scheme - Phase-I

The RPD Scheme Phase I provided for the integrated promotion of newplanting and replanting of rubber on an accelerated scale. The main objective of the scheme was to successively make India self reliant in production of NR and to reduce dependence on imported rubber. This scheme replaced all the earlier subsidy Schemes. The target set out was 12,000 ha. per year for 5 years 1980-81 through 1984-85.

The following incentives were offered under the scheme for planting rubber.

1. Capital subsidy @ Rs.5000 per ha. to growers owning upto 20 ha. of rubber plantation including any area proposed for newplanting and Rs.3000 per ha. to growers owning more than 20 ha.

2. Input subsidies to the weaker sections of growers i.e. those having not more than 6 ha. of rubber. These included reimbursement of cost of approved planting materials and approved fertilisers during immaturity period, and a subsidy of Rs.150/- per ha. for undertaking soil conservation work.

3. The beneficiaries could avail of long term credit from banks under long term agriculture credit scheme of NABARD to supplement the assistance granted by the Board. The maximum extent of credit per ha. was limited to Rs.15,020,Rs17,000, and Rs.18,700 respectively for growers owning upto 6 ha. of rubber, above 6 ha. and upto 20 ha. of rubber and above 20 ha. of rubber, according to the rates revised by the NABARD. The loan, advanced by the banks in 7 annual instalments was repayable in 5 instalments from the 10th to the 14th year of planting. The interest

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accrued upto the 7th year of planting is payable during the 8th and 9th years. During repayment of the loan, only current interest becomes payable.

4. The normal rate of interst for long term credit from banks is at present 12½ %. The Board subsidises 3 % interest to all categories of growers subject to limitations laid down on the quantum and mode of availing such loans.

5. Free advisory and extension support at all stages of planting and maintenance.

The progress of implementation of the scheme as on 31-3-88 is summarised below.

	Years to which application relate					
	1980	1981	1982	1983	1984	Total
No. of subsidy permits issued	17,482	18,987	18,960	20,621	23,507	99,287
Area covered by permits	12,088	13,474	13,742	15,195	16,707	71,206
No. of cases rejected	9,202	8,967	8,995	9,202	10,114	46,480
No. of cases pending final disposal	9	39	117	580	939	1,684

During the period under report, an amount of Rs.405.53 lakhs was disbursed as subsidy. The total disbursement of subsidies since the inception of the scheme comes to Rs.3268.33 lakhs as on 31-3-1988.

The RPD Scheme is a credit linked subsidy scheme. NABARD has made financing arrangements for grant of bank loans through 18 selected commercial and co-operative banks. According to information from banks, 14 banks have sanctioned loan to the order of Rs.439.59 lakhs. The instalments of loan already disbursed amounts to Rs.140.41 lakhs. The beneficiaries number around 3,160 with an area coverage of approximately 4,480 ha.

7. Rubber Plantation Development Scheme - Phase II

The RPD Scheme Phase II is being implemented from 1985 onwards. As against the target of 60,000 ha. set out for newplanting and replanting under Phase I Scheme, the target envisaged under Phase II Scheme is only 40,000 ha. in view of resource constraints.

The assistance offered under Phase II Scheme are the following.

1. Capital subsidy at the rate of Rs.5,000 per ha. for growers

owning upto 5 ha. of rubber in traditional areas and for all categories of growers in the non-traditional areas.

2. Input subsidy for use of high yielding planting materials [illegible] budded stump/budded grown polybagged plants) at the rate of Rs.6 per [illegible] subject to a maximum of 450 plants per hectare. Growers [illegible] traditional region having more than 5 ha. of rubber and [illegible] planting under the Scheme are also eligible to re- [illegible] assistance.

3. [illegible] beneficiaries under the Scheme could avail of bank [illegible] under the agricultural refinance scheme of NABARD. The loans will be advanced by banks in 7 annual instalments. It is repayable in 5 annual instalments from the 10th year of planting onwards. There will be a moratorium on the payment of interest till the 7th year of planting. The interest accrued upto the close of 7th year will be payable during the 8th and 9th year. During the repayment of loan, only the current interest becomes payable.

4. The normal rate of interest for the loan is 12½% per annum. The Board would subsidise 3% of the interest from the first to the 9th year to those who are eligible for the capital subsidy.

5. Free advisory and extension support at all stages of planting, maintenance, tapping and processing of crop.

The following is a summary statement of the progress of implementation of the Scheme:

	Year to which the applications related			
	1985	1986	1987	Total
Total no. of applications received	29,553	25,464	23,790	78,807
No.of cases in which planting has materialised	29,279	25,185	23,569	78,033
No.inspected in the field	28,414	24,125	19,976	72,516
Balance pending for inspection	865	1,060	3,593	5,517
Permits issued	19,426	15,539	10,018	44,983
No. rejected/withdrawn	6,601	4,555	2,155	13,211
Area covered by permits(ha.)	13,357	11,307	8,934	33,598
Applications pending disposal	3,251	5,095	11,398	19,744

According to the informations obtained from banks, an amount of Rs.50.50 lakhs has been sanctioned as loan for the period upto 31-3-88 of which Rs.11.71 lakhs is already disbursed to 225 beneficiaries involving an area of 166.13 ha.

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8. Advisory and Extension Services

Free advisory and extension support made available to growers who undertake scientific cultivation, production and processing, have contributed significantly to the modernisation and expansion of rubber plantation industry.

During the year rendered advice to growers through 70 letters, 14 radio talks and 1011 seminars/study classes/group discussions. A total of 170,132 visits were made to planters' premises, of which 3,383 were exclusively for advisory and extension work.

9. Demonstration and Training in Tapping and related activities

These services went on gaining momentum as areas planted under the aid schemes came into tapping extensively. The Rubber Tapping Demonstrators gave demonstrations to groups of small holders and tappers on all aspects of tapping, collection of latex, processing into sheets and control of tapping panel diseases. They visited 8432 small holdings for the purpose. They also conducted 232 demonstrations to groups comprised of 2,251 growers/tappers.

Regular training of growers/tappers in tapping and related activities was undertaken through Tappers' Training Schools at different locations. Each training centre is run for a period of 8 weeks and takes on upto trainees. The classes are essentially practice oriented but are extensively backed up by lectures on the theoretical aspects. Each school conducts 5 courses on an average per year. The trainees are provided residential accommodation and a stipend at Rs.5/- per working day.

As at the close of the period, there was 11 regular schools. Apart from these two schools were run by voluntary agencies at Kuravilangad(Palai region) and Payyavoor (Taliparamba region). and Trainers course materials were provided to these free of charges.

In all, 625 persons were trained in 39 batches in all these schools during the year. Efforts for increasing the number of schools were continued.

In Tripura, the services of a Rubber Tapping Demonstrator were continued to be made available to the public sector Tripura Forest Development and Plantation Corporation Ltd. for training their tappers.

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10. Production and distribution of High Yielding planting materials

During the year the Board had a Central Nursery and 23 regional nurseries for production and distribution of high yielding planting materials. Of these nine were in the traditional region and 15 in the non-traditional rubber growing region. Two were managed by the two NEETCs in Tripura and Andamans and one by the Research Department in Mizoram.

A total of 2,59,439 green budded stumps, 8,33,430 brown budded stumps, 31,731 metres of budwood raised by the Board at its Central/Regional nurseries in traditional areas were distributed to large/small growers. Besides growers in the non-traditional areas and northern districts of Kerala were given authorisation to procure 33,3000 polyclonal seeds from approved seed gardens. While issuing the authorisations the applicants were informed that polyclonal seeds are not high yielders as modern clones, that they are prone to higher incidents of brown bast and that the trees should be tapped once in 3 days.

There was great demand for assorted seeds. The Board procured 100.42 lakhs of seeds from estates and local parties in Kanyakumari District, out of which 27.68 lakhs were utilised in own nurseries in traditional areas and the remaining 72.74 lakhs in nurseries in non-traditional region including the nurseries maintained by four public sector corporations.

The nursery at Khandagiri in Orissa was wound up as the lease of land was only for one year. It was decided that the nursery at Neriyamangalam should also be discontinued in view of the pressing demand of the Government of Kerala for termination of the lease and reallotment of the land to a Navodaya Vidyalaya.

Under the programme for accelerated development of rubber plantations in non-traditional areas and assisting growers/entrepreneurs belonging to SC/ST, budded stumps as shown below were procured from Kerala and transportation to selected destinations for raising polybag plants for 1988 planting. The required polybags were procured locally and supplied.

North Eastern Region	:	12,90,875
Orissa	:	47,460
Total		13,38,335

Efforts were continued for establishing more nurseries in

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non-traditional region to make it self sufficient in local production of planting materials. As a part of this, the State Farms Corporation of India was assisted in establishing a large rubber nursery at their Kokilabari Farm in Assam and three Public sector Corporation of Orissa in their respective operational areas.

11. Procurement and distribution of cover crop seeds

In order to popularise use of Pueraria as a leguminous ground cover in small holdings of rubber, 4.8 MT cover crop seeds were procured and distributed among the small growers through regional offices at 25% subsidised prices.

12. Scheme for popularisation of use of power operated low volume sprayers/dusters

This is a continuing scheme aimed at better control of Abnormal leaf fall and Powdery mildew leaf diseases. As the machines are costly(about Rs.12,000/- per sprayer and about Rs.14,000/- per sprayer cum duster), small growers can hardly purchase them individually. The scheme provides for subsidising the price by 50 % in the case of co-operatives and registered associations of rubber growers and by 25 % in the case of individual small growers. During the year purchase of 34 machines was assisted spending Rs.1,57,031/-.

13. Scheme for assisting small growers for purchase of rubber sheeting rollers

One of the major constraints in the production of quality sheets is the financial strain of small growers in procuring good quality had operated sheeting rollers. Many growers depend on other growers for converting their coagulated latex into sheet form. This proves to be not only unsatisfactory but also expensive. The small growers are ultimately compelled to market their produce as 'lot' or ungraded sheets which fetch relatively low price. To remedy the situation a scheme was introduced in May, 1987 to assist smallgrowers to purchase sheeting rollers of standard quality offering subsidy in price. The actual price of a roller set varies from Rs.5,000/- to Rs.7,000/- depending upon size and quality. The subsidy was as follows:

i)	610 mm X 127/125 mm cast iron rollers	Rs.3,500
ii)	610 mm x 122/120 mm mild steel rollers	Rs.3,000
iii)	610 mm x 114/110 mm cast iron or mild steel rollers	Rs.2,500

The scheme drew enthusiastic response and the applications

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received were far more than that could be accommodated under the [illegible] Rs.10 lakhs outlay. The number of roller sets subsidised [illegible] and the subsidy paid Rs.999,526/-.

14. Scheme for extending assistance to small growers for construction of own smoke houses

[illegible] is also a scheme aimed at upgrading the quality of small [illegible] rubber. [illegible] sheets require to be cured in a combination [illegible] and wood smoke in order to make grade sheets. The [illegible] is to be done in special smoke houses, each of which [illegible] have a furnace connected to a smoke chamber fitted with wooden racks for supporting the sheets during the process of curing. A small smoke house capable of an intake of 17 to 18Kg sheet rubber per day would cost about Rs.10,000/- in construction. Unable to raise resources of this order, a vast majority of small growers content themselves with mere sun drying of their sheets. Some of them also expose the dried sheets to smoke above their kitchen hearths although this makes the kitchen premises unhygenic. The resultant sheets are either unsmoked and sticky on the surface or insufficiently cured. Further, in the process of exposure to sun by spraading the sheets on ground, roof tops of houses etc. they gather all forms of dirt and go down badly in quality.

To encourage small growers to take to smoke house curing of their sheets, a scheme was introduced in October 1987 for assisting them in construction of smoke houses. The assistance offered was both technical and financial. Technical aspects covered supply of drawings and specifications, estimates of standard costs, literature on proper use and maintenance and on the spot advisory service. The financial assistance was to an extent of Rs.5,000/- per unit, paid after construction and successful commissioning of the smoke house.

The scheme proved popular, and 373 small growers sought the assistance of whom 199 were given it in full measure. Against the outlay of Rs.10 lakhs, an amount of Rs.9.95 lakhs was utilised.

15. Scheme for promotion of irrigation in rubber plantation

Occurance of repeated droughts all over the country in recent years had resulted in heavy casualities in rubber plantations. The losses were in the shape of extensive mortalities of young plants in the field, full or partial drying up of mature trees grown in shallow soil or in the vicinity of rocky outcrops, and seasonal drop in yield. The Board had considered that

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irrigation, whereever feasible, would to a long way in mitigating the ill effects of drought. A scheme was introduced in February 1988 for promoting irrigation in all categories of rubber plantations on a trial basis. It provided for capital grant at the rate of Rs.3500 per ha. to small growers and Rs.1500 per ha. to large growers for developing irrigation infrastructure. The financial outlay was limited to Rs.10 lakhs for 1987-88. Though initially it appeared we may not be able to spend this sum in full, very soon a large number of application came and the earmarked funds could meet only a fraction of the demand. A total of over 2,000 applications were received for the assistance. The assistance could be granted only on completion of work and certification. Out of 1,400 cases inspected in the field, 729 were found qualified to receive the assistance. However, payments could be effected in favour of only 170 of them as by then the entire amount of Rs.10 lakhs had been exhausted.

16. Scheme for boundary protection of small holdings in North Eastern Region

One of the major impediments faced in the expansion of rubber cultivation in North Eastern States is the extensive loss of young rubber plants and cover crops in the field in the face of uncontrolled menace of cattle and other tresspassers. Once damaged during the young age, rubber plants and cover crops fail to regain original shape and vigour. Repeated damages result in total annihilation of the plants. In traditional rubber growing areas, growers are fully aware of this situation and take care to protect the boundaries of their holdings with proper fencing, hedging or erection of walls. The practice is not widely prevalent in the North Eastern States. In many places rules or local customs permit anyone to let loose cattle and other grazing animals on anyone else's property which remains open during the period from November to April. This is resulting in widespread failures of new rubber plantings, including those financed under Board's Rubber Plantation Development Scheme.

During the year introduced two schemes for promoting boundary protection of small and marginal rubber holdings in North Eastern India - one for members of SC/ST and the other for growers belonging to general communities. The assistance offered was the amount equivalent to the estimated cost of barbed wire and U-nails for fencing by the case of SC/ST growers and about 60% of this for others. The growers were expected to procure

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large pests and to contribute labour. The financial assistance was laid down as follows:

Sl. No.	Size of plantation	Assistance under SC/ST scheme (Rs./ha.)	Assistance under general Scheme (Rs./ha.)
1.	Upto 1 ha.	3,500	2,000
2.	Above 1 ha. and upto 2 ha.	2,500	1,500
3.	Above 2 ha. and upto 5 ha.	1,800	1,000

The scheme for SC/ST growers provided for free supply of barbed wire and U-nails as soon as other arrangements were found made in the field by the growers. In the case of general category growers, the assistance was payable only after completion of work and certification.

The scheme generated widespread acceptance from both the target groups. In the case of SC/ST farmers, 488 beneficiaries were given assistance worth Rs.9.75 lakhs against the targeted Rs.10 lakhs. However, in the case of others under similar target, the achievement was only to the extent of 12 beneficiaries receiving an amount of Rs.31,310. It is expected that continued promotion from early 1988-89 would bring forth the desired results in their case too.

17. Scheme for popularising bee-keeping in small and marginal holdings

The Board had implemented a scheme on a limited scale for popularising bee-keeping among small and marginal rubber growers during 1986-87 on an experimental basis in Kanjirappally Taluk of Kerala through a local voluntary agency. This had yielded encouraging results, 13 growers having availed of financial assistance amounting to Rs.13,650 for setting up of 52 bee hives. During the year the experiment was continued through the same agency. The assistance offered was 75 % of four bee hives, accessories and bee colonies per growers of general category and 90% of the cost in the case of SC/ST growers. The assistance was given only after the entire work was undertaken and certified satisfactory. One SC grower and 83general category growers participated in the scheme and availed of assistance amounting to Rs.1.05 lakhs for 336 bee hives successfully set up.

The success achieved points to the potential for large scale promotion of apiculture as a source of subsidiary income to

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small and marginal rubber growers. It may be noted that rubber trees have been found to be a rich source of nectar for bees. The bees collect the nectar from extra-floral nectaries borne at the junction of leaf petioles and leaflets of tender leaves put out by rubber trees during January-March, that is at the time of refoliation after wintering. During other seasons of the year, the bees draw nectar from other sources in the locality. A number of voluntary agencies are willing to render comprehensive technical services to growers in honey collection and marketing.

18. Development of rubber plantation in non-traditional areas

In view of the limitation of land along the South West coast where rubber has been traditionally grown in India, the Rubber Board has been progressively identifying suitable non-traditional areas and promoting development of rubber plantations there. Such non-traditional areas where rubber cultivation has already established well or which are in the process of making significant progress are the following:

1. Coastal districts of Karnataka
2. Goa
3. Konkan Region of Maharashtra
4. East Godavari and Visakhapatnam Districts of Andhra Pradesh
5. Coastal and adjoining districts of Orissa
6. Bastar District of Madhya Pradesh
7. North Eastern parts of West Bengal
8. North Eastern States
9. Andaman & Nicobar Islands.

The Board has been maintaining its development establishments in all these regions excepting, Maharashtra, Madhya Pradesh, West Bengal, Manipur, Mizoram, Nagaland and Arunachal Pradesh, which were also being covered from the nearby existing development centres.

i) North Eastern Rubber Development Project

The North Eastern Rubber Development Project(NERDS) for accelerated development of rubber plantations in the North Eastern Region has been under implementation from 1984-85. The project period is six years, during which 24,000 hectares would be newly brought under rubber in two phases, at the rate of 3,000 ha. during the first three years and at 5,000 ha. during the next three years. However, as the project was cleared late in 1984-85 and as the region posed many unforeseen problems such as

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poor infrastructural facilities, socio-political upheavals and insufficient supply of planting materials expected from State Government owned nurseries, the progress during the first three years was not to the level expected. Our set up in the North East could be strengthened only during 1985/86with the establishment of a Zonal Office in Guwahati employing skeleton staff. Additional staff posting was also delayed as fresh recruitment after obtaining sanction and other processes had taken its own time. The actual planting in 84-85 was only 1150 ha. and in 85-86, 1800 ha. Therefore the progress was critically reviewed and the targets were revised, taking into account the realities, but with a view to achieve the original goal of 24000 ha. by 1989. During 86-87 the area planted was 3000 ha. and during 87-88 the achievement was 4540 ha. Thus, so far 10,500 ha. have been planted. The goal during 88-89 is 6000 ha and that during 1989-90 is 8000 ha. To achieve this new nurseries have been set up in the NE and the extension network has been strengthened.

The project had envisaged establishment of a 1,000 ha. Nucleus Rubber Estate and Training Centre(NRETC) in Tripura to cater to the demonstration and training needs of the entire NE Region. However, the Tripura Government could not manage to hand over to the Board the requisite land in time and consequently the implementation of this component got delayed. During 1987-88, the State Government finally alloted 400 ha. of land at Surendranagar in Tripura West District. By the time the Board could undertake planting in 30 ha., local tribal people started disrupting the work in agitation against the State Government. After protracted negotiations prospects for continuance of the work emerged. It would however appear that the Board would have to surrender 50 to 100 ha. of the allotted land back to the State Government for rehabilitating the agitating tribal families. Arrangements were made for planting upto 70 ha. during 1988-89. Civil constructions required for the NRETC were being progressively entrusted with National Building Construction Corporation(NBCC).

In the meantime, the Board established a few small demonstration plots in Tripura during the last three years. These were maintained properly. Training of farmers selected from all over the region was undertaken in batches availing local limited facilities and by taking them to traditional rubber growing areas on sponsored training trips.

ii) NRETC in A & N Islands

The Government of India has approved a scheme for converting

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the Rubber Research cum Development Station (RRDS) established in 202.55 ha. from 1964-65 into a Nucleus Rubber Estate and Training Centre (NRETC) for the whole of Andaman and Nicobar Islands. The approval was granted in 1984-85. However, owing to persistent industrial disputes raised by workers, the work of NRETC had not marked real progress.

The industrial dispute remained in appeal with the High Court of Calcutta during the period under review. However, civil works required for the NRETC were entrusted with the National Building Construction Corporation. Their work was started during the review period. Other normal activities at the centre were also continued, though badly affected by the strained industrial relations.

During the year, the centre produced the following quantities of rubber:

Sheet rubber	60258 Kg.
Field coagulums	6470
Foam sheets	504
Total	67,232

iii) Eastern India Rubber Development Project

During 1987-88, the Board had submitted a project for development of rubber plantations in Eastern India comprising of areas suitable for rubber cultivation in Andhra Pradesh, Orissa, Madhya Pradesh and West Bengal. The staff component of the project was studied by the Internal Work Study Unit of the Commerce Ministry during the review period. Sanction for implementation of the project was expected early in 1988-89.

Pending clearance of the Project, the Board has started advance action in the zone even from 1986-87. A skeletal Zonal Office at Bhubaneswar with three field offices at Dhenkanal and Berhampur(Orissa) and Indukuripetta (Andhra Pradesh) were started for this purpose. As a result of the activities the Orissa State had adopted a Policy Resolution in February, 1987 to encourage rubber plantations in suitable areas and to undertake large scale planting in the public sector through three Government owned corporations. One of the Corporations has already planted rubber in 63.84 hectares. Small holdings established number 20 covering an aggregate area of 21.46 ha. All the three corporations and a number of individual entrepreneurs were assisted to set up nurseries of polybagged plants for undertaking field planting in 1988-89.

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19. Special Component Plan and Tribal Sub Plan

Under SCP and TSP, the Board assisted members of scheduled castes and scheduled tribes all over India to undertake rubber planting. The special incentives provided in this regard included free supply of planting materials, supply of fertilisers at half cost/reimbursement of half cost incurred for fertiliser application for immature areas and grant of financial assistance for various other schemes at rates higher than those applicable for other growers. Special emphasis was given for organised group planting by members of SC/ST sponsored by concerned State Governments.

The amount spent during the year under these Schemes is as under

	S.C.P	T.S.P	Total
	Rs. lakhs	Rs. lakhs	Rs. lakhs
Planting material	12.16	32.91	45.07
Maintenance grant	2.95	5.51	8.46
Boundary protection	6.92	2.83	9.75
RPD Scheme	7.02	16.40	23.42
Total	29.05	57.65	86.70

PART IV - RUBBER RESEARCH

The Rubber Board is undertaking assisting and encouraging scientific, technological and economic research in pursuance of Clause (8) of the Rubber Act, through the Rubber Research Institute of India. The Institute continued to concentrate on various field trials and experiments on rubber cultivation, crop processing and product development.

During the period under report, the post of Joint Director attached to the Research Department had been shifted to the newly formed Department of Training. The Scientists of the Research Department actively co-operated with the various training courses conducted by this Department.

AGRONOMY/SOIL DIVISION

Field trials for assessing the nutritional requirements of rubber at different stages of growth, weedicides, irrigation and soil moisture, intercropping, etc. were continued by the Agronomy/Soils Division. The pre and post monsoon fertiliser applications and annual girth recording were undertaken in the trials for immature rubber. Sites were selected to lay out new experiments. At the mature phase trials, imposition of the fertiliser treatments and collection of data on yield and girth were done. A site was selected to start a new trial on mature rubber in the northern region of Kerala. Fertiliser applications and annual girth recording were undertaken in trial on the effect of density of planting on girth and yield. In the studies on irrigation and soil moisture, irrigation treatments were imposed during summer. However, due to summer rains the period of imposition of the treatments was short.

The trials on weed management were in progress and the data are under statistical analysis. A site was selected for a new trial on commercial evaluation of herbicides. In the studies on intercropping, planting of rubber and intercrops (coffee, cocoa and pepper) was undertaken. For laying out a trial on intercropping at high elevation conditions, planting materials (rubber, cardamom, coffee and pepper) were raised in nursery. In another area two varieties of coffee were planted at two spacings.

Resource information system for rubber through remote sensing was in progress in two estates and periodical ground truth data were collected. Action was taken to expand the studies.

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Three experiments were started at Regional Research Station, Orissa, on wind belt system, testing of clones and nutritional requirements. Budded stumps were planted, but heavy casualties were noticed in the field due to adverse climatic conditions in the region. Seedlings of wind belt trees were planted. Irrigation was given during summer.

Height and diameter of plants were recorded and soil samples analysed for total and available sulphur in the studies on comparison of the effect of Ammonium sulphate and Urea on rubber seedlings. Planting, treatment of imposition, etc. were also done for 1988 season and growth measurements were recorded.

Studies indicated that bowldsledge is as good as Superphosphate for rubber and associated cover crops. An incubation study using Superphosphate, Mussorie Rock Phosphate and Bowldsledge was taken up to study the phosphorous release characteristics of these materials. It was found that coating of Urea with neam cake and tar decreased volatilization loss of nitrogen in the form of ammonia. Manganese status of rubber growing soil was under study and 21 samples collected from different agroclimatic regions were analysed. Post recommendation evaluation of fertiliser application was in progress and adoption of discriminatory fertiliser application was found economical.

Advisory work was continued. Soil analyses as well as tissue analyses were undertaken at the RRII laboratory, the regional laboratories and the mobile units. During the year 8,646 analyses of soil and 787 analyses of leaf/tissues were undertaken and discriminatory fertiliser recommendations were offered. Four fertiliser samples received from estates were also analysed.

BOTANY DIVISION

The Botany Division concentrated on breeding, ortet selection, propagation techniques, anatomical studies and cytogenetical investigation. The Division also attended to germplasm introduction and conservation. In the 1988 hybridisation programme, 9,835 hand pollinations belonging to 34 cross combinations were done. A total number of 786 seedlings, resultant of 1987 hybridisation, belonging to 40 families were planted in the nursery. However, damage was severe inspite of continuous efforts to control them. The juvenile yield and growth characters of 1986 H.P. seedlings were recorded. The 1983 H.P. seedlings were multiplied and raised in polybags. All the trials of H.P. progenies were maintained and observations were continued. Seven selections from 1971 hand pollination

programme and their parents were multiplied. The small scale trial of 1958 H.P. was wound up.

Forty nine ortet clones were vegetatively multiplied and planted in polybags at HBSS, Nettana for taking up small scale trial. Screening of nearly 151 ha. under GG 1 and GG 6 trees in an estate resulted in the identification of 199 potential mother trees. From another estate out of 211 mother trees observed 64 were finally multiplied and established in polybags for raising source bush nursery. These clones were further multiplied for taking up a small scale field trial. From the third estate, out of 55 mother trees selected, 46 were multiplied for cloning.

Juvenile growth characters of the ten open pollinated families maintained in the nursery were recorded to study genetic parameters. Open pollinated progenies of 14 clones were raised in the nursery. Work on inbreeding in Hevea was initiated. Causes of low fruit set in Hevea was under study.

Monthly yield recording was carried out in the different trials. Among the seven clones planted in 1979 clone trial, RRII 105 recorded the highest yield during the first year of tapping while RRII 118, RRII 203, RRII 300 and RRII 308 recorded higher yield than GT 1. Among the 12 clones planted in Manikal Estate, RRII 208, RRII 105 and RRII 203 yielded 41.02, 38.88 and 38.02 g/t/t respectively during 1987 in comparison to GT 1 (25.71 g/t/t) and RRIM 600 (21.81 g/t/t). Nucleus materials of selected clones were supplied to five estates for multiplication and taking up block trials. Green budsticks of eight selected clones were also supplied to one of the estates to meet their requirements for field planting during 1988. Budded stumps of six selected clones were supplied and planted in polybags at UPASI, Coonoor, for an observational trial. Nucleus materials were supplied to Hevea Breeding Substations at Nettana, Paraliar, NERC, Guwahati, and Regional Research Station, Orissa for establishment of budwood nurseries. Breeding gardens are being established at HBSS, Paraliar. Selected materials were established in the budwood nursery at RRII.

The budding trial initiated at Tripura was continued. Studies on benchgrafting was repeated and the benchgrafted plants and controls were planted in polybags. Growth characters of the first set of plants raised in polybags were recorded. A field trial was laid out for evaluating their cooperative performance. Plants raised in polybags for crown budding were maintained properly and crown budding was initiated. In the

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deep planting trial paint marking, numbering and recording of girth were done and casualties were supplied. The trial on genetic basis of stock-scion relationship was continued and characters observed.

Monthly yield recordings and annual girth measurements were continued in the trials on irradiated and polyploid materials. The colchicine treated shoots of RRIC clones continued to show morphological variations in the VM 5 generation. The growth measurements indicate that the intermediate progenies of the dwarf are more vigorous in terms of height and girth. Hand pollinations were carried out using the natural mutant as male parent. For further genetic studies 350 progenies from the natural mutant were raised in the nursery. Palynological studies indicated clonal variation in pollen morphology and germinability. In vivo studies on pollen tube growth have shown that there is no barrier for pollen germination and tube growth. Fruit set was obtained when pollen grains stored for six days were incorporated in hand pollination. A male sterile clone was identified from the irradiated population. Hand pollinations carried out during the last three years in RRII 15 and RRII 33 have shown that there was no fruit set in RRII 15 and that RRII 33 is a shy seeder.

Quantitative studies on the intraxylary phloem groups, primary xylem groups and the patiolar and laminal stomata of ten clones were in progress. For studies on early evaluation, leaf and twig samples were collected and recording of density and size of stomata of six clones have been completed. Bark anatomical triats were recorded from eight clones for studies on the comparative anatomy of virgin and renewed bark and the seasonal variations of bark anatomical characters. Data on virgin and renewed bark showed significant differences with respect to the seven quantitative triats studied. Recording of yield, yield factors and secondary characters of ten clones have been completed. Bark anatomical characters of the 1985 collection were recorded. Study to assess the variations of bark anatomical characteristics with age was continued. Bark anatomical studies of seven clones and 196 genotypes (seedlings) resultant of 1983 hand pollinations were done. Bark study on 100 genotypes of the Brazilian germplasm was initiated. A study on bark renewal was commenced. Wood anatomical studies on PB 86 were continued.

Out of nearly 5,000 genotypes of Brazilian collection to be imported to Kottayam, a total of 997 clones received during May-June 1987 were multiplied and the resultant plants (7,198)

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established in a polybag nursery. From the next set, budded stumps (5,027 numbers) of 846 clones were planted in polybags. Juvenile yield and girth of 100 genotype in the budwood nursery were recorded. The RRII clone museum and germplasm nurseries and gardens at C.E.S. were properly maintained. The germplasm garden II was opened for tapping. Yield recording and other observations were done in the first and second gardens.

Two rounds of test tapping representing two different seasons were carried out in the trials on early evaluation for yield and that for drought for recording of juvenile yield and collection of latex samples for biochemical studies. Plants were selected and labelled for physiological, anatomical and biochemical studies. Plant girth and percentage leaf retention during drought season were recorded. Green budsticks of ten selected clones were prepared and supplied to an estate, for taking up nutritional studies on emerging RRII clones during the immature phase.

MYCOLOGY/PLANT PATHOLOGY DIVISION

Research work on disease affecting rubber and their control, microbiological problems, pests, apiculture, etc. were conducted by the Mycology/Plant Pathology Division. Phytophthora diseases and SALB were not observed in the north eastern rubber areas. Even though partial artificial defoliation could be achieved with 0.25% Ethephon, refoliation started after three weeks. Extensive die back of twigs also was noticed. Experiments on high volume control of leaf fall and shoot rot diseases did not give any tangible result, as the disease incidence was very poor. A new crown budding experiment was started in an estate on clone PB 311, the crown clones being RRII 33 and PX 516. The budding success achieved was 76 and 82% respectively with the two crown clones. For studies on pink disease and its control, a new experiment to compare the efficacy of two carrier formulations, using thiride 0.75% and Calixin 0.1%, was started.

Investigation on Powdery mildew disease was continued. In the dusting experiments in mature trees, Calixin 1.5% dust at the rate of 10 kg per ha. proved to be superior to Sulphur dusting in three locations. A new experiment with three different combinations of alternate rounds of Calixin 1.5% dust and Sulphus dust is being conducted. In immature plants experiment is in progress using ten popular systemic and nonsystemic mildewcides.

Out of the six fungicides tested in laboratory against leaf spot disease pathogen, at 50 ppm level Topsin was

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fungitoxic and Thiride fungistatic. A new experiment is in progress for the control of this disease in nursery. For dry rot disease control petroleum compound was found to be an effective carrier of fungicides. Dithane M 45, Emisan, Tilt and Calixin proved to be equally effective. A new field trial was started on the control of root diseases by surface application of three systemic fungicides. In laboratory bioassay Thiride totally inhibited the growth of root disease pathogen at 50 ppm.

Wood preservation by pressure injecting chemicals before felling is being experimented. Pressure injection experiments for disease control are in progress. Statistical analysis of the data of pressure injection experiment with systemic fungicides and antibiotics for the year 1985 and 86 indicated that none of the treatment is effective.

In sprayed areas, copper residue was seen to be steadily increasing in soil but not in the latex. Pollution due to fungicides, pesticides and rubber factory effluents was under investigation. In the performance analysis of effluent treatment systems, the Oxidation Ditch system of crumb rubber processing factory was satisfactory. A new project on problems and prospects of waste generated from rubber factory effluent was started. Rubber sheet serum with 4% sucrose was found to encourage growth of yeast.

The yield loss study on powdery mildew disease is being continued in an estate. The study on abnormal leaf fall disease is conducted in RRIM 600, RRII 105, GT 1 and RRII 118 at C.E.S.

The physiological susceptibility of isolates of Phytophthora is being evaluated. Large number of oospores was seen embeded in organic matter particles of soil, upto a depth of 20 cm. Phytophthora spores were trapped in greater number from slides kept at 15 cm and 30 cm height from soil in June and July. Wetness of leaf was found to be an essential requirement for the epidemics of powdery mildew disease.

Thirteen leguminous plants including pulses and fodder crops were tested as cover crops of rubber. Mochai and Dolichos sp showed faster growth. Rubber plants growing with Mucuna and Pueraria as cover crops showed comparable growth. The biomass in Mucuna grown area was three times that of Pueraria area. An experiment was started to find out the effect of slashing of Mucuna during summer and also the dual effect of Rhizobium and Beijerinckia on nodulations of Pueraria. The optimum pH for nitrogen fixing by Beijerinckia was found to be 5.5

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Rhizosphere studies and isolation and testing of antagonistic micro organisms against plant pathogens of rubber were continued. The microrhizal root infection percentage was more in GT 1 compared to CG 1 and PB 5/51. The RRII isolate on micorhiza increased the weight of shoot and root of Pueraria in five months. But rubber seedlings did not show any difference. The antagonistic actinomycetes isolated against pink disease pathogen proved to be as effective in the field as that of Bordeaux paste. Out of the nine other antibiotics tested against this disease only Auriofungin showed fungistatic effect in the field.

The attack of Holotrichia serrata was noticed in the regional nursery at Manjeri. In other regional nurseries Anomala spp., occurred in small numbers. Phorate 10 G and Carbofuran 3G gave significant control of root grubs. Biological control with entomogenous fungi Beauveria spp. gave upto 95% control in the experiment in progress. Isofenphos 5G gave 90.5% control. For the control of bark feeding caterpillar a new synthetic pyrethroid, Fenvel 0.4% D, was found to be most effective.

Application of Aldicarb at 0.1% as slurry in Maida along with Dithane M 45 at 0.2% gave effective control of slugs and snails. The same preparation was effective against rabbits and hares attacking young seedlings. The population of plant parasitic nematodes revealed no correlation with the organic content in the soil of different rubber nurseries.

Off seasonal bud flora are being planted and maintained at the Central Experiment Station.

The contribution of North East Monsoon rains during October-November was more at Chethackal than at Kottayam. At Dapchari nine months' drought period with a water deficit of 1074 mm was recorded. The macro climatic conditions of Orissa state was studied and the constraints and potential for rubber cultivation evaluated. At RRII two months' lag period was noticed for the influence of rainfall on yield. The moisture depletion pattern in rubber plantations is being studied.

PLANT PHYSIOLOGY/EXPLOITATION DIVISION

The Plant Physiology/Exploitation Division continued investigations on yield constraints, soil moisture stress, and rubber biosynthesis, exploitation, use of ayurvedic preparation, yield stimulation, brown bast, intercropping of medicinal plants and related aspects. Growth, yield and yield components were recorded in clone GT 1 planted in the same year (1977) at five locations. Yield continued to remain lower at Kinalur

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when compared to that of New Ambadi estate. Analysis of latex samples for nutrients and soil moisture determinations were included as new parameters. Soil and leaf samples were also tested during this year. The soil moisture levels at 0-90 cm depths were consistently higher at New Ambadi estate when compared to Kinalur estate. Analysis of 20 years' rainfall data indicated that Kanyakumari district receives 50% more rainfall during summer months than Calicut.

Components of soil-plant-atmosphere system as well as that of yield were monitored on monthly basis in four clones. Compared to wet season the 1986-87 summer drop in yield was 67%. The values were 61% for RRII 105, 63% for RRII 118, 63% for Gl 1 and 82% for Tjir 1. There was nearly 80% inhibition in daily transpiration. The crop coefficient worked out in terms of transpiration was 1.06 in wet season and 0.18 in dry season. Clone RRII 105 maintained lower transpiration both in wet and dry seasons. The higher yields in RRII 105 is associated with better moisture status in the plant caused by lower transpiration and higher root density. In a drought survey conducted at four locations covering seven clones, during the unusual drought of 1986-87, it was found that in all of the locations the soil moisture status was below wilting point in the feeder root zone (0-30 cm). Even at 60-90 cm depth the available soil moisture was very low. No live feeder roots were seen in the active root zone. Clonal variation were noticed in the plant moisture status.

Monitoring of growth and physiological parameters were continued. At RRS, Dapchari, clones RRIM 600, PR 107 and RRII 300 showed better growth. At Mudigere (983 M able MSL) clones RRIM 703, RRIM 600, GT 1, RRII 300 and RRII 118 were found to be comparatively better. At Wynad (900 M above MSL) clones RRIM 600, RRII 203, RRIM 612 and RRII 118 showed better growth.

A total of 66 plants were sampled for early evaluation studies. Preliminary data indicated that leaf lipid composition was related to yield. Thermostability of leaf membranes was found to be significantly different. Visual scoring of precoagulation was found to give good correlation with yield. Drought resistant clones had higher waxes with higher reflectance. There was also clonal variation in leaf rubber content.

Study on physiological biochemical sub components of major yield components was started in the germplasm garden at CES. Contrary to the dry season observations made during 1986-87, in the wet season no clear cut diurnal variation was found in bark HMG-CoA reductase activities. Further, preliminary studies have

shown no difference in the enzyme activities in the barks of low and high yielding clones. Experiments were carried out to determine the Peroxidase activity in leaf extracts. Polyacrylamide gel electrophoresis (PAGE) was standardised for isozyme analysis. In order to find out the significance of stored carbohydrates in crop production, a study was undertaken to monitor periodic changes in stem and leaf samples. Starch was found to accumulate in bark and wood at the time of wintering and there was drastic decline during refoliation.

The study on the effect of different exploitation systems on 'k' and 'c' factors was continued in clone RRII 118 with six tapping intensities. Additional planting was done, with clone RRII 105, for conducting similar study in future. Effects of different exploitation systems on the yields of modern clones was in progress with three tapping systems. Yield under d/3 system was found to be 18% lower compared to d/2 control. The one fourth double cut system tapped daily (2 x ¼ S↑↓ d/2 6d/7(tt) yielded much less. The loss of latex through spillage was observed in the case of upward cuts. To evolve suitable tapping system and to study yield components, an experiment was laid out at Hevea Breeding Substation (Karnataka).

The trial laid out at Pullengode estate with six double cut treatments on Tjir 1 seedling trees was continued. The double cut exploitation system, 2 x ½ S↑↓d/1 (tt) gave yield of around 2000 kg/block/year, compared to the average yield of 1000 kg with normal system of tapping. The system, 2 x ½ S↑↓d/2 also has recorded an yield of 1600 kg. The treatments were later limited to the two promising ones.

The studies on the effects of stimulation during pretapping phase in two clones was continued. In contrast to the earlier claims, there was no significant girth increase by pre-tapping stimulation or by puncture tapping. The trees are now under normal tapping and yield recordings are being done. Effects of different rest periods on the yield performances and girth increment during BO 1 and BO 2 stages were under observation.

The study on the effect of an ayurvedic oil on brownbast was started in two estates. A new experiment was started to evaluate Calcium carbide stimulation and the treated trees showed 50% higher yield compared to ethephon stimulation by bark application under normal tapping. In puncture tapped trees stimulation with ethephon showed inhibition of yield while Calcium carbide had 30% higher yield than control. A new tapping experiment was started with six tapping systems for evaluation of tapping systems for small growers.

Survey of brown bast incidence in commercial clones on an individual tree basis was done in ten blocks in three estates. The incidence varied from 9.5% to 51.8%. A total of 120 each of soil, leaf and latex samples were collected for chemical analysis which is in progress. Work has also been initiated for differential treatments to reduce brown bast incidence.

Quantification of light availability during immature phase (1-4 years) was started. Contact shading for substitution of conventional shading was in progress at RRS, Dapchari. The results so far are very encouraging.

Field evaluations of Brobastrem, Rubberstem and Ethephon were done. It was seen that Ethephon was better than the other two. Cracking of bark and bark dryness were noticed with Brobastrem and Rubberstem. Tapping knives supplied by a manufacturer were also tested. One sample of rainguard adhesive was field tested.

Onfarm trial, using an ayurvedic oil formulation for treating brown bast is in progress. Nineteen units covering an area of 87.17 ha. were selected, and 192 litres of oil was supplied. Ten litres of oil was supplied for studies on ayurvedic oil on pink disease control. Twelve small holdings, covering an area of 26 ha, were selected for onfarm trial and 35 litres of oil was supplied.

A nursery of promising medicinal plants suitable for intercropping in rubber plantations was established. However, this was severely damaged by the unusual drought of 1986-87. Planting patterns have been worked out for "adalodakam" and "Karimkurunji". Seeds of "amukiram" and "Serpagandhi" were collected for this year's planting. More species such as, "Kattu ayar", "Kattu Uzhunnu", "Thrippali" and "Thazhuthama" were also selected for further studies.

BIOTECHNOLOGY DIVISION

Work on tissue culture techniques were continued by the Biotechnology Division. Refinements of the media were attempted. Generation of tissue culture derived plants was continued. Efforts are under way to plant an area with the plants derived through tissue culture at the RRII premises during this season. Refinement of the tissue culture propagation system to develop it into a commercial system for mass scale propagation is being done.

Anther culture, being an important direction in Biotechnology, is actively pursued. Several plants were generated through anther culture. China is the only country now who claims having anther culture derived plants of rubber.

Somatic embryogenesis (production of embryos from vegetative tissue) is another direction being pursued to develop new tissue culture propagation methods other than the shoot tip meristem culture technique already developed. Currently this effort is limited to a smaller scale due to space/facility limitations. Lot of efforts were made in designing the new Biotechnology building and procuring new instrumentation systems.

RUBBER CHEMISTRY, PHYSICS AND TECHNOLOGY DIVISION

The Rubber Chemistry, Physics and Technology Division undertook studies on graft polymerisation on NR, utilisation of waste materials from manufacturing industry, development of chemical and heat resistant NR components, depolymerised NR, development of solar drying system for sheet rubber etc. Graft copolymerisation of vinyl monomers on to NR was under study and the results are being published. The properties of reclaimed latex waste were evaluated in comparison with whole tyre reclaim and the former was found better. It was also observed that talc is more effective than clay in reducing tackiness of the reclaimed latex waste. Trials conducted so far on blooming indicated that 5 phr CI resin prevents blooming to a certain extent and the residual acidity of clay does not contribute to blooming of rubber products.

Development of chemical and heat resistant natural rubber compound was under progress. Studies on the effect of ageing clay-filled NR vulcanizates in sulphuric acid showed that as the concentration of acid increases the effect on ageing is less pronounced. Samples aged in distilled water showed a higher volume swell and larger changes in physical properties. Ageing of different filled vulcanisates, prepared with and without antioxidants, in phosporic acid (40%) at 70°C for 24 and 48 hrs showed that there is no appreciable change in properties under the test conditions.

Depolymerised natural rubber was evaluated as a plasticiser in nitrile rubber compounds. Results are encouraging. Since it was difficult to control the temperature of the reaction for preparing DPR, with the existing set up, another heating system is being tried.

Studies on the ozone resistance of blends containing different proportions of NR and 1,2 polybutadiene showed that critical stress values correlated with ozone resistance of blends as observed by the visual comparison method whereas critical elastic stored energy density did not show any such correlation. It was also observed that the technological properties of the blends could be improved by adding Ultrasil VN_3 and that

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small quantities of 1,2 polybutadiene decreased the ozone resistance of NR but with higher proportions there is definite improvement in ozone resistance of NR.

Using the preserved field latex sent by us, blends of NR and SBR were prepared at the latex stage by M/s. Synthetics & Chemicals Ltd. and the properties of the blends were analysed by RRII. Results showed that the blends were having low Po and PRI and that the distribution of the component polymers was not uniform.

Compression set determinations of gum and filled samples prepared using different cure systems showed that at 30 to 50°C the compression set values increased in the order conventional system < EV system < peroxide system. But from 20°C downwards, the trend was reversed. The results of the study on polybag collection of latex were published. The data obtained in the study on NR/EPDM blends were compiled and presented at the IRMRA conference, Bangalore. Studies on the effect of acrylonitrile graft NR as a compatibiliser in NR/NBR blends showed that the graft rubber did not improve the properties to any significant extent.

A solar drier for drying sheet rubber was established. Small scale trials using 30-40 sheets per day indicated that drying could be completed in four days with firewood backing and with solar energy alone the sheets took 7-11 days. Large scale trials using 125 to 150 sheets per day with firewood backing indicated that sheets could be dried in five days. The firewood consumption was less than 24 kg indicating a saving of approximately 70%.

Laboratory scale epoxidation by performic acid formed in situ was found to provide a clean reaction below room temperature. The products were characterised by IR and high resolution NMR spectroscopy. Attempts are being made to fix suitable recipe which would give a clean product at room temperature.

A cushion gum compound for precured tread was developed and the technology was transferred to M/s. Midas Precured Tread (P) Ltd., Ettumanoor. The data obtained in the study on the effect of plasticisers on engineering properties of rubber were compiled for publication.

The neoprene compound developed by us for low frequency transducer cover has passed the laboratory trials conducted by NPOL, Cochin and this is being tried now in transducers used in submarines. The Oring compound developed by us for NPOL, Cochin has passed both laboratory trials and actual performance trial. NR compounds for rubber bungs used in electrolytic

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AGRICULTURAL ECONOMICS DIVISION

The Agricultural Economics Division continued studies on economical evaluation, rubber wood, farm gate price, economics of intercropping, rubber seed oil, rubber honey etc. Evaluation of planting materials under commercial planting was in progress and the third report is under preparation. Study on rubber wood was continued and all the important centres of rubber wood consumption in Madras were visited. The estimated consumption of rubber wood in Madras is placed at 3.1 million cft. The rubber wood consumption in the plywood, veneers and splinters sector was 3 million cft. The estimated consumption in Bombay and Bangalore are placed at 4 million and 2.65 million cft respectively.

A survey covering 100 units was undertaken to study the technical facilities available in rubber wood consuming units. The results were presented at the Planters' Conference held in August 1987, which revealed that only 16 per cent of the units subjected the final products to some form of treatment. Only 2 per cent of the units stack the logs in the North South direction as an elementary measure to prevent cracking and end splitting.

The study on farm gate price was completed. This showed that the growers realised 88 per cent of the terminal price. A study of the extent of area planted with RRII 105 has been completed, involving 20,000 units planted in 1984. Around 90 per cent of the area of these 20,000 units has been planted with RRII 105. The study on intercrops revealed that Nendran banana was the most desirable intercrop from the point of view of stability of net income to the rubber growers.

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A study to collect data on the extent of involvement of co-operative societies in the dissemination of scientific information was initiated. Framework for a study on econometric analysis of the productivity of natural rubber was finalised. Data on yield rates and other relevant variables pertaining to around 50 estates are being processed.

A study on management of rubber small holdings at different levels of input has been initiated involving 300 small holdings in the Palai region. Hundred sample units each have been selected at Palai, Changanacherry and Kanjirappally for a study on brownbast of which 23 have been visited for collection of data.

Data collected from rubber seed oil producing units at Madurai and Virudhunagar backed up by supplimentary data on the production of rubber seeds indicated that about 6000 tonnes of rubber seed oil has been produced during 1987/88.

A study of the potential of rubber honey was made with data collected from 42 co-operative societies and 13 purchasing centres engaged in honey production and marketing in Kerala and Kanyakumari district. Contacts were also made with Sarvodaya sanghams, Khadi & Village Industries Commission and the Central Khadi Bee Research Institute. It was revealed that around 40 per cent Board of the honey produced in India originated from rubber plantations. On an average, 10 kgs of honey can be produced from one hive and 15 hives can be placed in a hectare of rubber plantation. Thirty hives can be managed by one bee-keeper. The study noted that 3 lakh hectares of mature rubber plantation in India can produce about 45000 tonnes of honey in a normal year. This can give part-time employment to 1,50,000 bee-keepers.

RESEARCH COMPLEX (NE REGION)

The Research Complex of the RRII for the North Eastern Region has its headquarters in Guwahati and five Regional Stations, one each in Tripura, Assam, Mizoram and two in Meghalaya. All the long term research investigations were continued in the different regional stations. The growth of the plants in general was satisfactory except in the farm located at Darachickgre, at an altitude of 1100 m MSL. At Ganolgre (Tura) farm situated at 600 m MSL, the constraints due to high altitude situations were not evident. The observations thus indicated that the cut off point in respect of suitability for rubber cultivation is in between these two elevations.

New experiments initiated in the different regional stations were modified taking into account priority in need

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based research for the region. At the Regional Research Station in Taranagar (Tripura) studies on soil-moisture interaction in young rubber, evaluation of clones for stress tolerance and screening of potential intercrops were started. At the Regional Research Station in Sorutari (Assam) a new experiment on the interaction of potassium with magnesium was initiated. At the Regional Research Station in Tura (Meghalaya) studies on the nitrogen requirement of rubber under different ground covers, rubber based cropping systems with perennial crops and screening of potential intercrops were started. In the Station at Darachickgre (Meghalaya) new experiments on evaluation of clones for stress tolerance, intercropping of perennial crops like coffee, tea and orange in rubber plantation and selection of genotypes from polyclonal seedlings were taken up. At the Regional Research Station in Kolasib (Mizoram) experiments on the effect of physiographic features on growth and yield, rubber based cropping systems with perennial crops and assessment of potential intercrops were started. In addition, the experiments taken up earlier were continued.

Mother tree selection programme at Wagessi, Umling and Bankumari was continued. Multidisciplinary evaluation of clones at various stations revealed appreciable difference in growth at different locations. Physiological and meteorological parameters were recorded from all the trials to identify the effect of stress conditions on the performance of clones. It was revealed that incidence of Oidium is regular in all the years affecting mostly seedlings and young plants. Mild infections of Drechstera and Alternaria were also noted in seedlings and budwood plants. Outbreak of leaf eating beetles was noted on young plants and budwood nursery plants during February/March. The population could be kept under control by spraying Malathion.

At the Regional Research Station in Tripura 230 genotypes from the germplasm material imported from Malaysia were planted in a budwood nursery and 280 genotypes were grown in polybags at the Assam Station. Budwood nursery at the Assam Station was expanded. The Biotechnology laboratory was equipped with minimum facilities for tissue culture work. To start with two projects on tissue culture, one on standardisation of micropropagation of elite materials and the other on embryogenesis/organogenesis, were initiated.

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REGIONAL RESEARCH STATION, DAPCHARI

The experiments laid out for physiological evaluation of clones, drip irrigation, evaluation of clones, etc. were continued. Cultural operations were carried out in time. An experiment on dry farming techniques and another on irrigation to compare different systems, were initiated. Action was taken to raise 15,000 budded stumps in polybags for distribution to growers and for taking up further planting in the Station.

REGIONAL RESEARCH STATION, ORISSA

An area of 8 ha was brought under experimental planting, but about 60% of the plants were destroyed by miscreants of the local village. The remaining plants are coming up well. About 15,000 assorted seedlings and 5,000 polyclonal seedlings are being maintained in the nursery. A budwood nursery is also under establishment. Fencing the area was not done as land lease agreement has not yet been executed. Two ponds were already opened and action has been initiated for opening a tube well.

RRII EXPERIMENT STATION

The Experiment Station of the RRII at its HQ has 15.33 ha under mature rubber, 5.39 ha under immature rubber and 2.23 ha under nurseries. The Station has been employing 37 permanent and 38 casual workers. Total labour employment during the year was 12,781.5 mandays. During the year, the crop produced was 19.383 tonnes of rubber. The total rainfall received was 2926 mm, spread over 141 rainy days. Cultural operations were carried out on time in the fields and nurseries as per schedule. Maintenance of the garden and the premises of office/residential buildings was also promptly attended to.

CENTRAL EXPERIMENT STATION, CHETHACKAL

The Central Experiment Station of the RRII at Chethackal has a total area of 254.86 ha of which the area under rubber is approximately 192 ha. The Station employs 206 permanent and 258 casual labourers. The crop production during the year was 267.014 tonnes of rubber. The total rainfall recorded in the Station was 3551.2 mm. The field trials conducted by the different research divisions were properly maintained and cultural operations were carried out in time.

Several batches of officers/participants of the training programmes visited the Station. Groups of rubber growers from the North Eastern Region and two teams of Senior Agricultural Officers of the Kerala Govt. and a team of Officers of the

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Rubber Control Board of Sri Lanka also visited the Station.

The Medical Unit was attached to the Central Experiment Station, Chethackal and the Medical Officer and Nurse attended to patients at the RRII Dispensary once every week. At the CES 12979 cases and at the RRII 6667 cases were treated during the year.

HEVEA BREEDING STATION

Activities of the two Hevea Breeding Substations were continued. In the Karnataka Substation, cultural operations were carried out in the field and in the nursery in time. Preliminary works were taken up for setting up an agromet observatory. In the Kanyakumari Substation, cultural operations could not be carried out due to reasons beyond control.

INSTRUMENTATION SECTION

The Section attended to the repairs and maintenance of all the instruments in the different laboratories of the RRII. Forty nine new equipments were installed and calibrated in the research divisions. Seven instruments were installed and calibrated for the Central Testing Laboratory of the Department of Rubber Processing. Preliminary work was started to power-fence some of the research farms and also for installing an EPABX system at the RRII. A collaborative project, on DRC measurement using microwaves, with the Cochin University of Science and Technology was initiated.

STATISTICS SECTION

The Section attended to the compilation, analysis and interpretation of data relating to experiments as well as preparation of layouts. During the year, data relating to 14 studies were analysed and layouts were prepared for seven experiments.

LIBRARY AND DOCUMENTATION CENTRE

The Centre has a good collection of rubber and related documents. This collection was totally reorganised with a view to computerising the catalogue. The library subscribed more than 400 titles of periodicals relevant to rubber plantation and processing.

As part of the documentation and information services the library brought out weekly compilations of price of natural

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rubber at the international markets. The library also started bringing out rubber alerts as a continuation of the documentation list published previously, select bibliographies of different subjects, recent additions, news clipping etc. This year, 300 new books were added to the collection. The indexing and documentation of periodical articles has been a continuous activity. Constant monitoring of the literature published on rubber was also done to strengthen the resources available. The facilities and services of the centre were extended to planters, manufacturers and others connected with the industry and to students, research workers, etc. from outside.

PUBLICATIONS

During the period under review twenty papers were published/ presented in conferences by the Scientists of the Research Department.

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PART - V RUBBER PROCESSING

The main object of the machinery to promote rubber processing is to make contributions to the improvement in processing and marketing of the Natural Rubber produced in the country. This object is fulfilled through the following functions:

(1) Provide Engineering Services to the processors and/or Rubber Goods manufacturers for establishment and/or maintenance of processing/manufacturing facilities.

(2) Provide analytical services to Rubber Processors, Rubber Growers and Rubber Goods Manufacturers in connection with crop processing, standardisation and quality control of Rubber and Rubber products.

(3) Provide technical assistance and consultancy services for establishment and or operation of rubber processing and rubber products manufacturing units.

(4) Promote quality of NR, adopting the standards fixed by Bureau of Indian Standards (BIS)

(5) Running of the Pilot Crumb Rubber Factory and production and market promotion of Technically Specified Rubber and Speciality rubbers.

(6) Modernisation of small holdings through the establishment of Rubber Producers' Societies and implementation of various schemes through them for the benefit of the small holders.

(7) Conduct market research, market studies and price collection and monitoring of price movements of various forms of rubber.

Besides these Engineering Services were provided for civil construction and maintenance work and for the maintenance and upkeep of the vehicles and electrical installations of the Board.

Major items of work undertaken

The details of the work done during the year ending 31st March 1988 are given below: (indicating the achievements

1. Provision of Engineering Services

The engineering services required for the operation of six crumb rubber factories established under the KADP and for the Pilot Crumb Rubber Factory (PCRF) were rendered. Procurement, installation and commisssioning of Diesel Generators of Meenachil Muvattupuaha, Palai, Thodupuzha and the Pilot Crumb Rubber factory to tide over the power shortage problems caused by the power cut were organised and monitored. The Mannarghat factory and Kanjirappally factory were assisted in selection of generators and in their installations by preparation of designs and specifications for civil and electrical works. In addition the following works were done during the year.

(a) Arranged for the procurement, installation and commissioning of two generators, one for the Bio-Technology Lab and one for the Rubber Research Institute building.

(b) Arranged for the procurement of heater boxes, drier shell, trucks, ducts, thermostats, temperature indicators, etc for erection of the new drier for the PCRF.

(c) Followed up with FEDO on the LT to HT conversion of RRII, and as a result tender evaluation report for the connected civil work was obtained.

(d) Prepared the designs, specifications and estimates for the centrifuged factory establishment at the Central Experiment Station and tenders were floated for civil works. The tenders received for the factory building, deammoniation shed, shed for acid storage and road work were evaluated and work awarded. Day to day supervision of the work and periodic inspection of work were done. Also issued tenders for effluent treatment plant, generator room, water supply and other miscellaneous items of civil work connected with the establishment of the CES factory.

(e) Provided engineering consultancy services to Tripura Forest Development and Plantation Corporation for establishing a latex centrifuging factory.

(f) Provided the engineering services for the civil construction work being done by National Building Construction Corporation (NBCC) at Nucleus Rubber Estate and Training Centres at Andamans and Tripura.

(g) Followed up with CPWD the Silver Jubilee Memorial Building construction and as a result tenders were invited by CPWD and awarded work for civil and electrical work.

(h) Assisted in the selection of suppliers for Rubber Rollers, sieves and Platform balance for implementation of the quality improvement scheme for raw rubber.

(i) Provided technical assistance to Kaduthuruthy Society, Changanacherry Society, Palai Society and the Rorest Development and Plantation Corporation of Andamans for improving their processing facilities.

(j) Initiated action in the establishment of a diesel filling station at RRII campus.

(k) Helped six Rubber Producers' Societies to select sites for the construction of smoke house and gave them technical assistance.

2) Quality Control and Analytical Services

The Central Laboratory Continued to provide analytical services in connection with standardisation and quality control of raw rubber and rubber products and for treatment and disposal of factory effluents. A total of 14,607 analytical determinations on latex, rubber and effluent samples were made as against 9717 determination during 1986-87. A tptal of Rs. 2.00 lakhs were levied as testing fees. Besides, the laboratory personnel provided assistance for the quality control and I.D.I certification of the block rubber produced in the factory. For promoting the concept of quality improvement and maintenance, conducted two sets of round robin test on dry rubber among the various Rubber Quality Control laboratories in the country and provided training to six chemistry post-graduates for a period of six months in analysis of latex, rubber and effluent samples. Initiated 3 research projects namely (1) studies on standardisation of block rubber (2) studies on chemical treatment to improve PO and PRI of block rubber and (3) studies on Rubber effluents to develop suitable treatment methods. These were in progress. From the preliminary results, the following indications are obtained.

(1) Due to variations in the soaking time and number of passes given on Macerators for dry as well as wet scrap there is no appreciable difference in PO and PRI. On the other hand, by increasing the number of passes the dirt levels in the block rubber can be reduced appreiably.

(2) Treatment of wet crumbs with 0.5% Thio Urea resulted in reasonable improvement of both PO and PRI of the block rubber.

(3) The oxidation ditch system of effluent treatment was found to be effective in bringing down the Biological Oxygen Demand of crumb rubber factory effluents below 50 ppm, the limit fixed by the Pollution Control Board, for disposal of the effluents to waterways.

3) Technical Assistance and Consultancy Services

During the period, a variety of consultancy services were provided to rubber growers, rubber processors and rubber goods manufacturers and a total of Rs.3.88 lakhs was levied as fees. The important achievements are the following:

(1) Developed 18 project reports, 10 for establishment of Rubber Processing units and 8 for rubber products manufacturing units.

(2) Prepared a modernisation report for improving the working of tread rubber factories in India.

(3) Samples of rubber products and chemicals received from 180 parties were tested for various parameters and provided advisory assistance based on the test results for quality improvement and for solving technical problems.

(4) Organised and conducted training programmes in latex goods manufacture, grading of sheet rubber, latex foam testing, testing of rubber and rubber products and testing of reclaimed rubber.

Besides collaborated with the Department of Training in conducting training programmes in dry rubber goods manufacture, latex goods manufacture, visual grading of sheet rubber and programmes for the Development and Extension Officers, Estate Supervisory personnel, trainees from the North-eastern region, for small growers in Malayalam and training in analytical chemistry.

(5) Standardised processes for production of the following speciality rubbers.

(a) Viscosity stabilised latex grade rubber meeting the standards specified for ISNR-3CV by BIS.

(b) General purpose rubbers required for volume consumption.

(c) Pre-vulcanised latex.

(d) Methyl Methacrylate grafted rubber

(e) Cyclised Rubber

Samples of such rubbers were given to selected consumers for evaluation.

(6) Continued efforts for the developement of rubber products for new application and or for import substitution which lead to the following achievements.

(a) The Natural Rubber Chord was developed for Naval Physical Oceanographic Laboratory as an import substitution work was popularise among other major consumers.

(b) Developed a synthetic rubber based adhesive for M/s.St. Joseph's Chemical Industries, Tricur and M/s.Kelachandra Rubber Industries, Chingavanam. It is proposed to transfer the knowhow to the parties on a consultancy basis.

(c) A rubberised bitumen compound for electrical application was developed as per the request from M/s.Asphaltics, Bhubaneswar and transferred the technical knowhow to them on a consultancy basis.

(d) Developed sponge rubber pads for M/s.Bharat Electronics Ltd., Bangalore and M/s.Bangalore Tools Works Ltd for use as Rubber lids. It is proposed to transfer the technical know-how on a consultancy basis.

(7) The following development works were initiated during the year and the works are now in progress.

(i) Development of heat resistant elastic thread

(ii) NR/PVC blends

(iii) Latex stage compound

(iv) Reclaim rubber from waste of latex products manufacturing units.

4) Standardisation and Quality Control

continued implementing the I.S.I. Certification scheme for raw Natural Rubber and Latex Concentrates in collaboration with BIS. A total of 216 inspections of processing units were done, samples were collected and tested for the various parameters specified by BIS as per the stipulation in the scheme of

Inspection and Testing. A total of 6273 parameters related to block rubber and 3413 parameters related to latex were tested and the results were communicated to BIS and other concerned organisations. In addition samples of rubber products and or chemicals received were tested for quality control purposes on a charged basis. A total of 791 parameters relating to rubber products and 141 parameters relating to rubber chemicals were tested in this connection and results were communicated to the concerned organisations. Continued participating in the international Round Robin Cross Check scheme and in the committees set up for standardisation by BIS. For the former, 100 parameters were tested on the rubber samples received and for the latter, the draft Indian Standards formulated were examined and appropriate comments were communicated to BIS. Also offered comments on one draft ISO standard for determination of styrene content in styrene containing polymers.

5) Production and Market promotion

The operation of the pilot Crumb Rubber Factory was continued and a total quantity of 275.72 M.Tonnes of block rubber was produced as against the target of 400M.Tonnes. The target was not achieved because of the power cut imposed by the Kerala Government and the additional work in taking up development of Speciality Rubbers. To counter the power cut problem, a 237.5 KVA Diesel Generator was procured and installed during the year. As a result of the developmental works, 13.9 M.Tonnes of CV rubber, 417 Kgs of G.P.Rubber, 21 kgs of PA 80 and 93 Kg of M.G 30 rubber, were produced and distributed among selected consumers for commercial evaluation. Also a quantity of 34.25 M.Tonnes of dry rubber content equivalent of preserved field latex was processed. A total of 361.61 M.Tonnes of rubber costing Rs. Rs.68.8 lakh which included technically specified block rubbers, speciality rubbers and preserved field latex were marketed and the average sales realisation was Rs.20.39 and Rs.17.45 respectively per kg for the latex and scrap grades of rubber.

Works connected with the erection of a new electric drier and the setting up of a latex concentrate factory at the Central Experiment Station, Chethackal were in progress.

6) Modernisation of small holdings

With a view to modernise small holdings, continued efforts for establishment of Rubber Producers Societies. A total of 325 Rubber Producers Societies were registered and out of which 170 societies were given approval. Also implemented the following schemes.

(i) Scheme for equipping the latex collection centres

The following equipments were distributed to the Rubber producers' Societies for establishment of latex collection centres.

(1)	Platform balance	- 19 Nos.
(2)	Chemical balance	- 25 ,,
(3)	Air Oven	- 15 ,,
(4)	Bulking tank	- 25 ,,

(ii) Scheme for equipping sheet rubber and scrap rubber collection centres at village level

A total of 102 platform balances were procured and issued to the Rubber Producers' Societies.

Among the 102 RPSs who were given platform balances, 37 societies were linked to an organised sheet and scrap procurement programme with the help of one of the largest rubber consumers. The scheme was to ensure the quality of sheet rubber produced by small growers. A total of 375 M.Tonnes of sheet rubber produced by the members of the RPSs, was sold as graded rubber.

(iii) Scheme for setting up of smoke houses

Applications received from six Rubber Producers' Societies were processed and the sites selected approved. An amount of Rs. 1.74 lakh has been disbursed as subsidy for the purpose. Among them, two RPSs, namely Kadayanicadu and Elamkulam have almost completed their smoke houses.

(iv) Scheme for the supply of inputs at subsidised rates

A total of 2,279 M.Tonnes of Fertilizers, 84 M.Tonnes of Copper sulphate, 49.3 M.Tonnes of copper oxych-loride, 49800 liters of spray oil, 3.4 M.Tonnes of sopkot, 120.5 kg of Emissan

135 kg paranitrophenol and 2069 nos. of sieves were distributed to eligible small holders through the Rubber Producers' Societies at subsidised rates.

7) Market Research, studies and connected activities.

(i) Rubber price stabilization

During the period only the spill over work connected with the rubber price stabilization scheme was needed. The pending claims from the Kerala State Warehousing Corporation for incidental expenses were processed and settled. Also a detailed sc scheme for price stabilization for the year 1987-88 was prepared and made all necessary arrangements for STC procurement at short notice. Since the price continued to rule within the price band during the entire period no activity was warranted.

(ii) Study on Block Rubber Industry

A study on block rubber processing industry was conducted and the report was published in a booklet form entitled "Changing Dimensions of Block Rubber Processing Industry in India."

(iii) Directory of Rubber Goods Manufaturers in India

A directory of rubber goods manufacturers showing their State-wise and product-wise classification was brought out and got released by the Hon.State Minister for Parliamentary Affairs Shri.M.M.Jacob, in a function organised at New Delhi. As entire copies of the first edition were sold off, work relating to the revised edition was started.

(iv) Study on Latex Concentrate producing industry.

A study on production and consumption of preserved latex and latex concentrates has been completed and preparation of the report is in progress.

(v) Survey on Carbon Black Masterbatches.

A market survey on Carbon Black Masterbatches was initiated to assess the demand prospects of carbon black masterbatches. The data collection is in progress.

(vi) Price Collection

Continued the work relating to collection, compilation, monitoring and reporting of prices of various grades of rubber

at Cochin and Kottayam markets. In addition, the collection, compilation and reporting of scrap rubber prices were started. Compilation of weekly average price of centrifuged latex was continued.

(vii) Market Promotional activities

Continued close monitoring of the marketing of crumb rubber produced by factories established under the KADP and analysed the marketing problems and suggested remedial action. In the case of speciality rubbers detailed circular letters highlighting the advantages of GP rubber and CV rubber were sent to major consumers which helped development of demand for them. Data on export of rubber products were collected and made available to prospective exporters. Also provided marketing assistance to rubber products manufacturing units in the small scale and co-operative sector.

(viii) Natural Rubber Subsidy

Calculation and dissemination of NR subsidy payable to exporters of rubber goods in order to compensate them for higher indigenous price of raw rubber, was continued .

(ix) Market studies

Studies on regulated markets and marketing of thread rubber were conducted and the report was submitted.

(x) Work connected with co-operative movement.

Continued collecting progress reports from Co-operative societies financed by the Rubber Board and payments due to the Board are refund of the various types of loans granted to them and dividend due to the Board. A total of R.11,14,040.76 was recovered from the societies. Also the followingschemes were implemented through co-operative Societies during the year.

subsidising

(1) Scheme for the installation of diesel generators by co-operative processing factories

The Moovattupuzha and Thodupuzha Societies were granted a total of Rs.650,000/- for installation of diesel generators after their successfulcommissioning.

(2) Scheme for distribution of rainguarding materials at subsidised rates.

Implemented the scheme for distribution of rainguarding materials to small rubber growers through Co-operative societies and or Rubber Producers' Societies. A total quantity of 28.855 M.Tonnes of polythene sheets and 122.14 M.Tonnes of Adhesives were distributed during the year.

(3) Scheme for distribution of plastic cups at subsidised rates.

Implemented a scheme for distribution of plastic collection cups at subsidised rates through co-operative societies and or Rubber Producers' Societies. A total of 8.61 lakhs collection cups were distributed during the year.

8) Other Matters

(1) Organised three and participated in 9 conferences/seminars on technically specified rubbers and allied themes in which papers were presented in different aspects such as NR processing and energy saving, role of NR in products manufacture, quality control in tyre retreading and treatment of processing factory effluents.

(2) Examined the project reports of 17 applicants for the Processor's Licence and conducted site inspections and suitability for issue of licences.

(3) Guided 3 M.Sc. Polymer Chemistry students of Mahatma Gandhi University, Kottayam for a period of 3 months in their dissertation work on the following projects:

(i) Studies on production of surgical gloves

(ii) Studies on production of elastic thread

(iii) Studies on creaming of natural rubber latex

(4) Radiation pre-vulcanised latex received from Jakarta was used for producing products like gloves and elastic thread and their properties were evaluated. The ageing properties were found to be inferior. Dr. K.Makuruchi, expert from International Atomic Energy Agency, who visited the Rubber Board, gave suggestions for improving the properties.

(5) Provided technical assistance to the Andaman and Nicobar Forest Plantation Development Corporation Ltd. for improving quality of sheet rubber and to Rubber Products Manufacturers so solve their technical problems.

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(6) Developed project profiles for the manufacture of 12 rubber products earmarked for the small scale sector by the Government of India.

(7) Reports were prepared for reviving 5 sick industrial units. Among them, revival operations are progressing in a chappal factory owned by the Kanjirappally Co-operative Rubber Marketing Society and another chappal factory owned by the Punchavayal Industrial Co-operative Society. They are provided all technical assistance including services of an Assistant Factory Manager on deputation terms for the former, and the services of a Rubber Technologist was given for a period of 3 months, as Administrator for the latter.

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PART VI - ADMINISTRATION

The major functions of the Department of Administration consist of constitution/reconstitution of the Board its Committees, i.e. the bodies that give policy directions to the various activities to achieve the objectives envisaged in the Rubber Act, maintenance of Board's establishment, collection of cess, licensing and market intelligence activities, collection of statistics, publicise Board's schemes and activities, carry out labour welfare measures, attend to vigilance and legal functions, training of employees. etc.

These functions were carried out through the following sections/divisions/offices.

1. Establishment(General Administration, Personnel administration and Entitlements)
2. Boards Secretariat
3. Excise Duty
4. Market Intelligence
5. Licensing
6. Statistics & Planning
7. Publicity & Public Relations
8. Labour Welfare
9. Internal Audit
10. Legal
11. Vigilance
12. Hindi
13. O & M
14. Sub/Liaison Offices.

All the sections except Statistics & Planning and Vigilance functioned under the Secretary. These two sections are functioning directly under the Chairman. The Liaison officers in charge of Sub Offices in Madras, Bombay, Calcutta, Delhi, Jullundur, Ahemadabad and Kanpur continued to function under the Secretary in the Administration Department.

1.1 General Administration/Labour Welfare/Staff Welfare

The activities of the Board were documented through half yearly & annual reports and presented to the Government after the approval of the Board at its meeting held on 19-10-1987. Educational Stipend amounting to Rs.14,46,444 was granted to the children of rubber plantation workers during the year as a labour welfare measure.

Eligible employees were granted Children's Educational Allowance/reimbursement of Tuition fees etc. as staff welfare measure. During the period 86 employees were given financial

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assistance for construction of houses by advancing Rs.25,65,975/- as per the approved scheme of Government. Vehicle advance of Rs.3,77,900/- was paid to 35 employees for purchase of motor cars/ scooters/bicycles. Maintenance work of office building, staff quarters etc. were done as necessary and uninterrupted water supply/electrical facilities were ensured to all Head Quarters offices/staff quarters. To make the concerned officers and staff mobile in their bid to serve the producers and consumers of rubber, the Board owned 66 vehicles which were maintained in good condition.

1.2 Personnel Administration & Entitlement

Selection of suitable personnel essential for the smooth functioning of the Board, was ensured during the period by following recognised recruitment procedures and statutory provisions relating to reservation of posts for candidates from SC/ST category. There were properly constituted selection committees/ DPCs for selection of personnel by evaluating the merits/skills and other credentials of the candidates while vacancies in the Board's establishment were filled up.

Periodical returns on the personnel recruited were sent to the Government and the Employment Exchange. Service Books, leave accounts and Personal files of employees in the Administration Department were maintained. Retirement benefits were given to all the employees who superannuated during 1987-88 in time. The total number of officers and staff under the Board as on 31-3-88 was 1643.

2. Excise duty (cess) on rubber

Under Section 12(1) of the Rubber Act 1947, a duty of excise not exceeding 50 paise per Kg. is to be levied on all rubber produced in India. The Rubber Board has been charged with the responsibility of collecting the cess under Section 12(2) of the Act. The cess is collected on the quantity of rubber acquired by the manufacturers who use it except in the case of Sole Crepe rubber which is collected from the producers. Every manufacturer has to obtain a licence from the Board to acquire natural rubber. Every manufacturer is bound to give monthly and half yearly returns showing the quantity of rubber acquired and consumed. It is on the basis of the purchases reported in the half yearly returns that the assessment of cess is made.

A. Issue of Licence

The function of issue of licences includes the work of

issue of licences to prospective manufacturing units and renewal of such licences in the subsequent years. Some manufacturers after exhausting the licensed quantity for which original application was furnished, apply for licence for acquiring additional quantity of rubber and in such case, supplementary licences are issued after obtaining form 'D' application for the required quantity and the licence fee. Some manufacturers holding the special licences issued under Rule 40 require licence in an emergency to sell rubber acquired by them under that licence to another manufacturer who is also holding a valid licence issued under the said rule. In such cases, emergency licences are to be issued under Rule 40A.

The details of licences issued during the year 1987-88 are given below:

	1987-88	1988-89
a) Fresh licences	610	46
b) Renewal licences	739	2954
c) Supplementary licences	28	-
d) Emergency licences	12	-
Total	1389	3000

The total number of licences issued for the year 87-88 was 4393. The state-wise distribution of the licensed manufacturer is furnished hereunder.

Sl.No.	Name of State	No. of units
1	Kerala	711
2	Maharashtra	524
3	West Bengal	460
4	Punjab	452
5	Uttar Pradesh	419
6	Tamil Nadu	395
7	Delhi	373
8	Gujarat	285
9	Haryana	222
10	Karnataka	199
11	Andhra Pradesh	132
12	Madhya Pradesh	59
13	Rajasthan	57
14	Bihar	37
15	Orissa	16
16	Goa	13
17	Himachal Pradesh	16
18	Pondicherry	11
19	Tripura	3
20	Assam	3
21	Mizoram	1
22	Daman	4
23	Manipur	1
	Total	4393

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The list of licensed manufacturers was prepared and supplied to the rubber dealer and other public.

2. Registration of letter of authorisation to purchase rubber by dealers on behalf of manufacturers

Registered 1101 letters of authorisation issued by various manufacturers, in favour of dealers to purchase and despatch rubber on their behalf.

3. Registration of Branch/Purchase Depot

On the basis of the applications received from the manufacturers, 11 branches/purchase depots were registered.

4. Letter of authorisation to purchase rubber to units situated in Jammu & Kashmir

Letters of authorisation to 6 manufacturers in Jammu and Kashmir, were issued to enable them to purchase natural rubber from the licensed rubber dealers/processors.

B. Assessment of Excise Duty on rubber

During the financial year 8,646 half yearly returns were obtained from the various rubber goods manufacturers and Sole Crepe Producers. The total amount of cess assessed during the period was ₹s.10,91,00,094.00. On the basis of the discrepencies detected in the books of accounts of manufacturers and cross checking of their monthly returns with their half yearly returns and the monthly returns of dealers etc. additional assessments were made in 141 cases on a quantity of 8,23,527 Kgs. of rubber involving a cess amount of ₹s.4,06,349.00.

C. Collection of Excise Duty on rubber

The amount of cess collected during the period far exceeded the target fixed. As against the target of ₹s.10.75 crores, the actual collection came to ₹s.11.16 crores. This included the recovery of ₹s.25 lakhs out of old arrears. The amount was remitted to the Bank for credit to the Consolidated Fund of India.

D. Amendment in Procedure

An important amendment brought about in the Licensing procedure was that immediately on presentation of application, licence fee etc. a licence valid for six months is issued without insisting on advance collection of rubber cess and site inspection. Another change was that inspection by Board's officials of the units whose annual consumption of natural rubber is less than 10 tonnes was stopped except against specific and reliable information of malpractices.

E. Opening up of new offices

With a view to maintain liaison with the rubber industries and other government offices and ensuring the effective monitoring of the rubber transactions, 3 Sub Offices were opened one each in Kanpur, Ahemedabad and Bangalore.

F. Court cases

During the year, an Auto Tyre unit had filed a petition in the District Court, Kottayam challenging the order of assessment of excise duty. Detailed parawise comments were prepared and forwarded to the Board's Counsel at Calcutta for filing the counter affidavit in a writ petition filed by a manufacturer in the High Court of Calcutta against the revenue recovery proceedings initiated by the Board. In another case detailed parawise comments were prepared and forwarded to the Board's Counsel at Kanpur for preparing objections against the petitions filed by a manufacturer in the District Court, Kanpur challenging the assessment order of the Board.

3. Licensing of rubber dealers

According to Section 14 of the Rubber Act no person shall sell or otherwise dispose of and no person shall buy or otherwise acquire rubber, except under and in accordance with the terms of a general or special licence issued by the Board.

The Rubber dealer's licences and Rubber processor's licences are two special licences, issued for transactions in natural rubber.

I. Issue of Dealer's licence

Issued 1420 licences for the period 1987-88 of which 1096 were new licences and 324 were renewal of licences. The total number of licences issued as on 31-3-1988 including those issued prior to 1-4-1987 was 5946. The licences were issued for various periods which are as shown below:

Year/Period	No. of licences
1987-88	1404
1987-89	26
1987-90	1830
1986-89	2676
1986-88	10
Total	5946

Out of the 5,946 licences issued 70 licences were suspended, 11 licences were revoked on account of serious irregularities in

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their rubber business and 62 licences were cancelled due to the death of licencees, request of the licencees and 4 were short period licences.

The break up of suspension, revocation, cancellation and short period licences is as shown below:

Sl.No.	Category	1986-89	1987-88	1987-90	Total
1	Suspension	37	18	15	70
2	Cancellation	45	8	9	62
3	Revocation	7	3	1	11
4	Short period licence issued	-	4	-	4
	Total	89	33	25	147

It may be noted that out of 70 licences suspended, the order of suspension of the 9 cases were later revoked on receipt of satisfactory explanation, documentary evidences, cess etc.

There were thus 5808 licensed rubber dealers all over in India as on 31-3-1988. The statewise/district wise distribution of dealers as on 31-3-1988 is shown in the following table.

KERALA			OUTSIDE OF KERALA		
Sl. No.	Name of District	No. of Dealers	Sl. No.	Name of State/ Union Territories	No.of Dealers
1	Alleppey	24	1	Assam	1
2	Cannanore	213	2	Andhra	1
3	Ernakulam	775	3	Andamans	6
4	Idukki	295	4	Bihar	2
5	Kasaragod	22	5	Chandigarh	2
6	Kozhikode	140	6	Gujarat	15
7	Kottayam	1849	7	Haryana	23
8	Malappuram	153	8	Karnataka	45
9	Palghat	73	9	Maharashtra	73
10	Pathanamthitta	540	10	Madhya Pradesh	5
11	Quilon	579	11	Meghalaya	3
12	Trichur	55	12	Mizoram	1
13	Trivandrum	326	13	New Delhi	135
14	Wynad	36	14	Orissa	1
			15	Punjab	96
	Total	5080	16	Rajasthan	1
			17	Tamil Nadu	173
			18	Tripura	8
			19	Uttar Pradesh	52
			20	West Bengal	85
				Total	728
	Grand Total	5080 + 728 = 5808			

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In addition, 1006 licences were issued with validity from 1-4-1988 onwards of which 267 licences were for a period of one year i.e. for the period 1988-89, 20 licence were for a period of 2 years i.e. 1988-90 and 719 licences were for a period of 3 years i.e. 1988-91. Of the 1006 dealer's licences 2 cases were new licences and 1004 licences were renewal cases. So also the change in the constitution of 47 firms were approved.

II. Issue of Processor's licence

During the period 17 processor's licences were issued for the year 1987-88 of which 11 were new licences and 6 were renewal cases. Taking into account the licences issued during the previous half year i.e. 1-10-1986 to 31-3-1987 84 processors licences were issued for the period 1987-88. The District/State wise distribution of licensed rubber processors in all over India as on 31-3-1988 is shown in the following table.

KERALA			OUT SIDE OF KERALA		
Sl. No.	Name of District	No. of units	Sl. No.	Name of State	No. of units
1	Cannanore	1	1	Karnataka	4
2	Ernakulam	9	2	Tamil Nadu	6
3	Idukki	2	3	Tripura	1
4	Kottayam	38		Total	11
5	Kozhikode	2			
6	Kasaragod	2			
7	Malappuram	8			
8	Palghat	5			
9	Trichur	5			
10	Trivandrum	1			
	Total	73	Grand Total: 73 + 11 = 84		

Apart from the above 70 processor's licence were issued for the year 1988-89 with validity from 1-4-1988 onwards.

Registration of Branches

Registered 1202 branches of dealers for the year 1987-88. Taking into account the branches registered prior to 1-4-87 for the year 1987-88, the total number of branches registered for the year was 1256. Besides 218 branches of dealers were registered for the year 1988-89 valid from 1-4-1988 onwards.

Registration of agency

On the basis of authorisation letters received from the dealers authorising certain other dealers to function as their agents on commission basis, 375 agencies were registered for the year 1987-88. Taking into account the agencies registered prior

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to 1-4-1987 the total number of agencies registered for the year 1987-88 was 402. Besides 101 agencies were also registered for the year 1988-89 valid from 1-4-1988 onwards.

Approval for shifting of business premises

On the basis of application received the change in the place of business of 283 dealers were approved during the period.

Amendment in procedure

Conduct of site inspection before issue of dealers licence has been discontinued. Accordingly, licences are issued straight away on receipt of application and other documents. The routine inspection will be completed during the course of next six months. Similarly if documentary proof i support of the right of possession of the premises are available, the branch will be registered. If the branch proposed is situated outside the state the same will be registered only if the dealer has a turnover of Rs.10 lakh per quarter or if he furnishes a bank guarantee for Rs.5000/-

Supply and distribution of declaration forms regarding inter state transport of rubber

The declaration forms regarding interstate transport of rubber i.e. N1, N2, N3 & N4 were supplied to various estates, dealers, processors and manufacturers situated within the jurisdiction of the Cochin office, as requested for by them. The details of forms supplied during the period are given below:

Sl. No.	Type of declaration forms	No. of units/parties to whom supplied	Number of Books
1	N1	165	554
2	N2	970	1169
3	N3	5	6
4	N4	1378	2176
	Total	2518	3905

Duplicate copies of Form N Declarations and unused books of declaration forms in certain cases received at this office were forwarded to the Market Intelligence Section for scrutiny and compilation.

Receipt of money

During the period an amount of Rs.6,94,859 was received under various items. The itemwise receipts are given below:

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Sl. No.	Items	Amount received Rs.
1	Dealer's licence fee	6,30,800.00
2	Value of Form N supplied	17,533.90
3	Cost of Dealer's and Manufacturers lists	5,273.00
4	Cess collected from Dealers	26,570.00
5	Miscellaneous	14,682.10 *
		Rs. 6,94,859.00

* includes Rs.10,000 towards forfeiture of bank guarantee in the case of a delinquent dealer.

4. Market Intelligence

The important functions in Market Intelligence are to detect bogus/unlicensed dealings in rubber, arrange surprise inspection of the business premises of the dealers for verifying their books of accounts and correctness of physical stock and cross verify the correctness of statutory returns filed by the dealers/manufacturers/processors/estates, to improve collection of cess and prevent evasion of cess. Ascertain suitability for issue of fresh dealers licences, branch registration, inspection of manufacturing units to expedite payment of Excise Duty arrears etc. formed allied functions.

Inspection and Verification

During the year, 1678 inspections were conducted as depicted below:

i)	No. of inspections for issue of new licence	: 634
ii)	No. of surprise inspections at the premises of licenced rubber dealers	: 368
iii)	No. of inspection for registration of branch/approval of godown etc.	: 203
iv)	No. of manufacturing units visited to expedite payment of cess/verify records/ ascertain suitability for holding fresh licence	: 335
v)	Confidential enquiry regarding issue of licence and other irregularities	: 63
vi)	No. of cases in which unlicenced dealing in rubber detected	: 58
vii)	No. of visits to Rubber Producer's Society in connection with procurement of rubber	: 17
	Total	1678

In addition the records of 14 dealers were verified at the office. These inspections helped to collect an amount of Rs.9,53,764.20 towards cess on rubber.

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Detection of bogus transaction

To curtail bogus transactions and detect bogus dealers, timely watching and scrutiny of Form N declarations and connected returns were undertaken. As a result, suspicious transaction of certain dealers came to light. It was noticed that there was a tendency on the part of Delhi based dealers to purchase bulk quantity of rubber from big estates or from certain dealers on agency basis and abscond from the market after inflicting heavy cess loss to Rubber Board. The estates were contacted and arrangements were made by which further sale of latex to the bogus dealers was stalled. All these helped in detection of serious irregularities in the business activities of certain dealers which include fictitious sale/unaccounted purchase to the extent of 7068 metric tonnes which ultimately lead to suspension of 32 licences.

Detection of unlicenced dealing

Due to surprise inspection detected unlicenced dealing in 58 cases. Since the quantities involved were small no prosecution steps were initiated against them. However, they all stopped such unlicenced dealings forthwith. Some of them later applied for licence and were granted the requisite licence.

Cross checking of returns/Form N declarations

Cross checking of monthly returns of dealers/manufacturers with those of their suppliers was carried out. As a result, unaccounted purchase to the tune of 2,062 metric tonnes of rubber made by two manufacturers was detected and action was initiated to realise the cess on the quantity involved. On cross checking of returns and subsequent spot inspection, the licence of a manufacturer in Rajasthan was suspended. A sum of Rs.2,24,189 was realised from the estates/dealers on account of their sale of rubber to bogus dealers/manufacturers.

Prosecution under the Act

Consent for prosecuting two persons for unlawful possession of rubber in violation of Section 16(1) of the Rubber Act was given to the Sub Inspector of Police, Sullia, Puthur.

Interstate transport of rubber

To facilitate transport of rubber across state boundaries 1894 numbers of Form N books were supplied to various estates/processors/dealers/manufacturers and to the Board's various offices. Form N declaration in 38799 cases were received.

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These were scrutinised and wherever discrepencies were noticed, explarations/clarifications were called for from the concerned parties. As per daily statement received from Walayar Sales Tax Check Post 18,533 consignments of rubber were passed through the check post which were cross verified with the returns of the concerned parties.

5. STATISTICS & PLANNING DIVISION

1. General Statistics:

The statutory monthly returns collected from rubber growers, dealers, processors and manufacturers were compiled and analysed every month. The sample studies in the small holding sector by field visits were continued with the help of the field staff in order to ascertain the monthly variation in production, stock etc. pertaining to small growers. The data collected from various sources were computed and production, consumption, import and stock of rubber were worked out on a monthly basis. These details are presented in tables attached as part VIII of the report.

The Division monitered supply, demand and price of rubber periodically and appropriate recommendations were submitted. During the year the Board had met thrice and its Statistics and Import/Export Committee also thrice. Necessary statistical data for these meetings were prepared and supplied. The statistical information required for publishing the "Rubber Statistical News" (monthly) was prepared. This publication covers among other things details of production, consumption, import and stock position of natural, synthetic and reclaimed rubber and price of natural rubber. Indian Rubber Statistics Vol.18 was published during the year. Statistics relating to area under rubber, production, import, consumption, price, manufacturers and dealers of rubber, rubber products and various other topics besides world rubber position are furnished in this publication.

A census of rubber goods manufacturers in Kerala was conducted during the year for which 714 factories were visited. During the census work 56 unlicensed factories were detected. Also visited 186 rubber growing units and 88 crepe mills to ascertain trend in production, cross checking returns/reports etc.

Preliminary steps were initiated to conduct a census of rubber area, for which relevant details were collected from taluk headquarters in Kerala and Kanyakumari district of Tamilnadu. Questionnaire for collecting data was developed.

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2. Planning

'Monthly reports' pertaining to the rubber plantation industry were prepared and forwarded to the Govt. of India. These reports interalia include trend in production, consumption, import, stock and price of rubber, progress of assessment and collection of excise duty and progress of important plan schemes. Materials were prepared and furnished for answering 33 Parliament Questions pertaining to various aspects of the rubber industry. A 'Commodity Note' covering developments of the rubber industry and progress of various schemes implemented by the Board was made up-to-date for forwarding to Government.

The Annual Plan for 1988-89 was prepared and presented.

3. Supply of information to world organisations

Continued to supply information to world organisations like the International Rubber Study Group(IRSG), London and the Association of Natural Rubber Producing Countries (ANRPC), Kuala Lumpur.

The 9th meeting of the ANRPC Statisticians was held in Hat Yai, Thailand from 5th to 7th August, 1987. Six member countries namely, India, Indonesia, Malaysia, Singapore, Sri Lanka and Thailand attended the meeting. The meeting of the Statisticians was preceeded by the 3rd meeting of the Working Group on improvement of Natural Rubber Statistics which was convened on 3rd and 4th August, 1987. Shri R.G.Unny, Deputy Director, Rubber Board represented Indian at the meetings. He presented a paper on 'Progress and development on the improvement of Natural Rubber Statistics in India'. The meeting reviewed progress and development on NR Statistics in member countries. Problems encountered by member countries in the collection, compilation and publication of NR statistics were discussed and recommendations to overcome the problems were made. The Working Group on improvement of NR statistics considered in depth the recommendations of the four studies under the project on 'Improvement of NR statistics'. The successful implementation of the recommendations of the four studies would facilitate uniformity and standardisation of statistical concepts and definitions in member countries.

6. PUBLICITY

Journals and Books

Rubber Magazine continued to enjoy popularity with an average circulation of 11000 copies. The scheme of enrolling perpetual subscribers received positive response and a total number of

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2908 perpetual subscribers enrolled during the period. A total of 1,26,500 copies of the Magazine were got printed and distributed during the year. Four issues of the Rubber Board Bulletin (English Quarterly) were brought out. Twelve issues of the Rubber Statistical News compiled by the Statistics Division were brought out by and distributed. The Indian Rubber Statistics (Volume 18) incorporating all the latest figures on production, consumption, area under rubber etc. was published. The revised edition of the Malayalam Book 'Vithumuthal Vipanivare' was brought out. The Rubber Grower's Companion 1988 brought out during the first week of January 1988 consisted of 344 pages including 144 pages for reference on various aspects.

Exhibition, Seminars and Conferences

Participated in 3 exhibitions at Coonoor, Agartala and Delhi. The Board had put up the theme Pavilion on Rubber at the India International Trade Fair at Pragati Maidan from 14-11-1987 to 28-11-1987. The Prime Minister also visited the Pavilion. A one day Rubber Planters' Conference was organised on 22nd August 1987 at Kottayam. Thirty seminars were organised in different rubber growing areas.

Press releases and advertisements

Press releases numbering 138 and 100 advertisements were issued. The press releases fetched wide coverage in local and national newspapers. Farm Features were also released for 'Karshikarangam' pages of the newspapers.

Rubber Replanting Campaign

A rubber replanting campaign was organised from 27th April to 15th May 1987. A total of 303 group meetings were held under the various Regional Offices of the Board. About 12,900 rubber growers participated in the meetings.

Rubber Producers Societies and Nurseries

A total of 325 Rubber Producers Societies and 57 Rubber nurseries were organised. Over 3 lakhs polythene bags and budded stumps were supplied to them. The nurseries have helped a lot in popularising correct nursery techniques in making available high yielding planting materials raised in polybags.

Other activities

Arranged study tours for three batches of rubber growers consisting of 51 members from non-traditional areas in North Eastern Region visited various holdings, estates etc. in Kerala to familiarise with the scientific aspects of rubber cultivation.

Contd ... 68/-

All channels of the media were used to project the activities of the Rubber Board. Talks on various topics were also put up on the AIR by the personnel in the section.

7. LABOUR WELFARE

Under Section 8(2)(f) of the Rubber Act, 1947 one of the main duties of the Board is to promote measures for securing better working condition and the provision and improvement of amenities and incentives to rubber plantation workers. To realise this objective, the Board has implemented the following three schemes during the period under report.

a) Educational Stipend Scheme
b) Pilot Scheme for Group Insurance cum Deposit for the Rubber Plantation workers in the unorganised sector.
c) Distress and prolonged illness relief scheme.

a) Educational Stipend Scheme

Educational Stipend Scheme is implemented to provide financial assistance to the children closely related to rubber plantation workers for prosecuting studies in recognised courses. The children and wholly dependent close relatives of workers and staff employed in registered rubber estates drawing wages not exceeding Rs.1600 PM are eligible for stipend.

The stipend will cover expenses towards tuition fee, hostel/boarding fee, and purchase of books/instruments. Students undergoing courses in Arts, Science, Commerce, Engineering, Agriculture, and medicine are eligible for stipend. Lumpsum grant and tuition fee will be granted to students attending higher secondary schools.

A sum of Rs.14,46,444 was paid towards educational stipend during the year as per details furnished below:

Number of applications pending as on 1-4-87	:	2484
No. of applications received during this year	:	8295
Total		10779
No. of applications disposed		7575
No. of applications rejected due to non compliance of formalities	:	324
Total		7899

Applications pending as on 1-4-88 due to non receipt of relevant vouchers/bills/documents : 2880

Contd ...69/-

b) Pilot Scheme for Group Insurance cum Deposit for the Rubber Plantation workers in the unorganised sector

The objective of the scheme is to encourage workers in the rubber estates in the unorganised sector to develop the habit of saving on a long term basis and to cover the risk against accidents. The scheme enables them to work with a better sense of security as it provides insurance coverage in a variety of circumstances. As on 31st March 87, the number of workers enrolled under the scheme was 173. During 1987-88, 547 No. of workers were enrolled under this scheme making the total to 720. Five workers have not renewed their enrolment during this period. A total sum of Rs.928 was disbursed to two claimants by the Insurance Company under risk coverage of the scheme.

c) Distress and Prolonged illness relief scheme

This scheme came into operation with effect from 1-4-87. It provides reimbursement of expenses incurred by a plantation worker in connection with medical treatment. Plantation workers who are not governed by the provisions of Plantation Labour Act and whose wages do not exceed Rs.1600 PM are eligible for the benefit under the scheme. Out of the 23 applications received during the year, a sum of Rs.4334 was disbursed to 7 workers. Three applications were rejected. Remaining 13 were pending for want of stamped receipts/supporting documents.

Against the budget sanction of Rs.15 lakhs under the head 'Labour Welfare' an amount of Rs.15,22,278/- was disbursed as per details furnished below:

Educational stipend	: Rs.	14,46,444.00
Distress and prolonged illness relief scheme	: Rs.	4,334.00
Group Insurance	: Rs.	71,500.00
Total		15,22,278.00

Housingsubsidy scheme for rubber plantation workers

The Board at its meeting held on 8-3-88 has approved the above scheme to be implemented during the year 1988-89. The scheme is intended to promote house construction by plantation workers by granting subsidy of Rs.5,000 per worker when the construction reaches roof level.

8. VIGILANCE

Anti corruption work, handling of disciplinary cases etc. in the course of enforcing CCA Rules and Conduct Rules form the major function of this wing in addition to the work of preventive vigilance.

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1. Complaints

During the year under report took up for enquiry/verification 26 complaints, containing allegations against 23 officials of Group I & II status and 13 employees of Group III and IV status. The allegations contained in these complaints pertained to undue delay in dealing with subsidy files causing hardship to growers, recommendation of subsidy/financial assistance to ineligible growers, failure to maintain absolute integrity/devotion to duty, office discipline/decorum, in subordination etc. Enquiries were made into the complaints and action was taken against corrupt/erring officials.

2. Cases

Major penalty proceedings against 13 officials and minor penalty action against 10 officials were taken. Administrative action against 9 officials were also taken.

3. Property statements and acquisition/disposal of immovable/movable property

Annual statements of immovable property as on 31-12-87, were called for from all officers of Class I and II status. Ninety one applications of the staff pertaining to sanction for acquisition/disposal of immovable property and 126 application/intimations concerning transaction in movable property such as two wheelers, Television, refrigerators etc. were processed/dealt with during the year.

9. Legal matters

The Rubber Act, 1947 is the fundamental statute governing the functions of the Rubber Board. Interpretation of the Rubber Act and Rubber Rules, 1955 forms major work of the Legal Section; in addition to rendering legal advise to different departments in the discharge of their functions, especially with regard to agreements, labour dispute, prosecutions for contravention of the provisions of the Rubber Act and Rules. The section took necessary steps to safeguard the interest of the Board in fifty cases pending before various courts/tribunal for or against the Board. During the year under report eight new writ petitions were initiated out of which six were service matters of the employees of the Board, one was preferred by the employees of the Rubber Board Labourer's Co-operative Society, Chethackal and one by a Marketing Co-operative Society challenging the Kerala Co-operative Societies (Amendment)Act, 1987. Besides these, two miscellaneous cases were filed by an assessee before the District Court, Kanpur

Contd ... 71/-

challenging the excise duty assessment and a claim petition filed by the workmen of C.E.S.Chethackal before the Labour Court, Quilon claiming bonus at the rate of 14.5% during the year 1981, are also pending. The section has initiated steps to carry out the Rubber (Amendment) Rules, 1987.

10. INTERNAL AUDIT

During the period under report internal audit was conducted in the following Regional Offices and attached nurseries and also in two major Departments viz., RP Department and the Department of Rubber Processing.

1. Regional Office, Palghat and Regional nursery Kanhikulam
2. Regional Office, Trichur
3. Regional Office, Kottayam
4. Regional Office, Calicut and Regional nursery peruvannamoozhy
5. Regional Office, Nilambur and Regional nursery Manjeri
6. Regional Office, Tellicherry and Regional nursery Ulickal
7. Regional Office, Kanhangad
8. Department of Rubber Processing
9. Rubber Production Department.

A total number of 13 units were so covered during the period, besides other functions which are given below:

i) The cases/files numbering 179 on Pension/DCRG, Pay fixation, leave encashment, service verification etc. were examined with reference to rules and regulations and endorsements issued.

ii) Quarterly consolidated review reports were prepared on the basis of monthly returns of vehicles/fuel consumption and strict economy was enforced in the maintenance/repairs of vehicles.

iii) The advance outstanding for settlement were analysed and delay for settlement of advances has been brought down.

iv) The outstanding paras in the AG's Inspection Report for the past years and had been vigorously pursued and a total number of 120 paras were got cleared. The pendency has come down to 254, out of which 36 paras are pending for want of comments from the Ministry of Commerce for long. The audit of AG was conducted during the year and nearly 200 enquiries received were replied.

v) Standing instructions on the Annual Stock Verification, disposal of unserviceable obsolete or surplus articles/stores, TA claims etc. were got issued for implementation by controlling officers.

Contd ... 72

11. Hindi work

A meeting of the Official Language Implementation Committee was held in July, 1987. It was decided to take action for implementation of the various provisions of the Official Language Act and Rules. Quarterly Progress Reports from the various offices showing the progress regarding use of Hindi were collected, tabulated and furnished to the Ministry.

Hindi classes were conducted in which 36 employees attended the Prabodh, Praveen and Pragya courses. Training in Hindi typewriting was given to six stenographers. Two Hindi Workshops were conducted, during may 1987 and January 1988. Hindi version of the book on "Rubber and its cultivation" is under print. The materials for publication of Quarterly Bulletin (Rubber Samachar) were collected and translated into Hindi. The Bulletin is under print.

Hindi week was celebrated in the Head Quarters and Regional Offices at Palai, Ernakulam and Trivandrum from 10th October to 20th October, 1987. Competition in Essay, Elocution, Translation, Noting and Drafting, Hindi Typewriting, Quiz etc. were conducted for the employees and their children in all the centres. Prizes were awarded to the winners. A total number of 164 employees and 36 children participated. A Raj Bhasha Seminar was conducted at SEERI HALL, Kottayam. Dr. Jose Austin (Official Language Department, New Delhi) presented a paper on "Hindi as Official Language".

Annual Report and Audit and Accounts of the Board for the year 1986-87 was translated into Hindi. Letters, sales deeds and other documents in Hindi were translated into English. Action for implementing Section 3(3) of the O.L.Act was taken.

11. Organisation Development Programme

Human resource development through training of inservice personnel has been adopted by the Board to improve the skills of the employees. As part of the programme the following training programmes were taken up during 1987-88.

1. Training programme for the employees of the Board at different levels - General programme

In order to improve efficiency of inservice personnel a three-tier Management Development Training Programme was organised through the Management Consultants M/s Sulaiman and Associates, Cochin. First senior staff in the grade of Rs.1400-2300 and Rs.1400-2600 were given training for 3 days from 20th

Contd ... 73

July to 22nd July 1987, in which 35 persons participated.

Training programme of 4 days' duration on supervisory development was conducted in 2 batches for supervisory staff in the scales of Rs.1640-2900 and Rs.2000-3200 and Junior Field Officers from 10-8-87 to 13-8-87 and 17-8-87 to 20-8-87. Total participants came to 35.

Next training programme on Executive Development was conducted in 3 batches for senior personnel in the scales of Rs.2000-3500 to Rs.3000-4500 from 7-9-87 to 12-9-87, 14-9-87 to 19-9-87 and 21-9-87 to 26-9-87. Here also there were 35 participants.

The faculty for the training included management experts and subject experts in different departments of the Board.

2. O & M Training

A departmental training course for Assistant Superintendents, Assistants and Stenographers Gr.I was conducted in which classes on various subjects for improving efficiency in service matters and accounting procedure were given. The duration of training was 28 days. There were 61 participants.

3. Refresher Course

A refresher training course was conducted for 8 Assistants for a period of six days.

A 3 days' training programme was also conducted through the Kerala State Productivity Council, Kalamasserry to improve clerical efficiency, in which 61 persons participated in 2 batches.

13. Sub/Liaison Offices

There are eight Sub Offices in the major rubber consuming centres outside Kerala, at Ahemadabad, Bangalore, Bombay, Calcutta, Jalandhar, Kanpur, Madras and New Delhi. The Sub Office at Bangalore was opened in November, 1987. These are manned by Excise Duty Officers/Asst. Excise Duty Officers. These Officers also function as Liaison Officers of the respective region, as a nexus between the Board and the local Government offices and institutions.

The officials assessed suitability of rubber dealers and rubber goods manufacturers to possess licences to purchase/deal in rubber and cross-checked many of the statutory returns with books of accounts and records to ensure that all rubber purchases have been included in the returns. Surprise/squad inspections were arranged at premises of certain dealers/manufacturers in order to detect unlicensed dealing in rubber in a contravention of the Rubber Act and the Rules. Arrears of cess reported for revenue

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recovery were pursued for early collection. The activities of these offices had a great bearing on the collection of Rs. 11.16 crores as excise duty during the year, surpassing the target of Rs. 10.75 crores and the collection of Rs. 9.42 crores during 1986-1987.

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PART VII - FINANCE AND ACCOUNTS

Finance and Accounts Department of the Board is a service Department entrusted with the following functions.

i/ Budgeting and budgetary control of the receipts and expenditure,

ii/ Demand, collection and distribution of the funds consisting of release from Government and resources generated internally,

iii/ Advising on the financial propriety and regularity of the transactions,

iv/ Consolidation of accounts, getting the same audited and presenting the annual accounts to the Government,

v/ Costing, financial evaluation of projects and taxation matters, and

vi/ Introducing progressive computerisation in different areas of the Board.

1. ORGANISATION STRUCTURE

In order to handle the functions the Department has Accounts Divisions in all the Departments viz. Administration, Rubber Production, Research and Rubber Processing. In addition, there is a Cost Accounts Division and an Electronic Data Processing Division functioning under the Department. There are also accounts units and cells in other Divisions and offices where Finance and Accounts functions have been decentralised. The Financial Adviser as the head of the Department co-ordinates and controls the activities of the various units.

2. IMPORTANT ACTIVITIES DURING THE YEAR

A. Budget

The revised estimates for 87-88 and the Budget Estimates for 88-89 were got approved and submitted to the Ministry. The Ministry sanctioned release of funds to the tune of Rs.2018.25 lakhs enabling expenditure to the tune of Rs.686.44 lakhs under Non-Plan and Rs.1400 lakhs under Plan with the addition of internal resources. In addition, an amount of Rs.28.25 lakhs was received under Non-Plan and Rs.43 lakhs under Plan during March 1988. The total releases during the year were Rs.592.25 lakhs under Non-Plan and Rs.1426 lakhs under Plan. These funds have been fully utilised for the purposes for which they have been granted. The performance of the Board during 1987-88 against the budgetary sanctions were analysed. Wherever there were variations in actual expenditure against budgets the

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reasons were explained and sanction of the Ministry was sought to regularise such variations.

B. Funds

The Board maintains two funds namely General Fund and Pool Fund. All amounts received from the Central Government under Sub Section 7 of Section 12 of the Rubber Act against the budgets indicated in previous para is credited to the General Fund. The General Fund is also credited with miscellaneous receipts and cost of collection of cess on rubber. From this Fund transfers are made to Pool Fund for meeting the expenditure budgeted under that fund for rehabilitation of small growers.

In addition, the Department deals with other funds such as Rubber Board General Provident Fund, Rubber Board Provident Fund (Contributory), Rubber Board Employees Pension Fund etc. under Rules framed in this regard. All claims of employees for payment out of these funds were processed in time and terminal balances under these funds due to the retiring employees/ officers, were released on the date of retirement itself. Group Insurance Scheme for the employees continued to be operated through LIC of India and the claims were settled promptly. A proposal for payment of pension through the authorised branches of State Bank of Travancore on the lines of the Central Government Pension payment pattern was chalked out.

C. Cess Collection

Under Section 12(i) and (ii), the Board collects and remits to the Consolidated Fund of India an excise duty collected as cess on indegenous production of natural rubber. This is collected at present at the rate of Rs.500 per metric tonne. The remittance is made to the Government after deducting the cost of collection from the total realisation. As against the budgeted figure of Rs.10.75 crores of cess collection during the year the actual collection was Rs.11.16 crores. The balance under cess fund with Government at the end of the reporting period was as follows:

	Rs/lakhs
Opening Balance as on 1.4.1987	468.64
Add Remittance to Consolidated Fund of India during the period	1094.05
Total	1562.69

Against this the amount released as grant by the Govt. during the year is Rs.2018.25 lakhs which includes a sum of Rs.455.56 lakhs from other sources than the cess fund.

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D. Progress of Expenditure

The expenditure for the period from 1.4.1987 to 31.3.1988 is as follows. These figures are subject to audit by the A.G.

NON-PLAN	Rs/lakhs
Administration	118.28
Research	178.01
Development	276.69
Works	30.26
Labour Welfare	15.06
Official Language	0.35
Advance to employees	24.70
Contribution to Pension Fund	53.24
Buffer Stock Scheme	3.69
Department of Training	3.98
PCRF Excess of expenditure of receipt	12.26
Total Non-plan	716.52
PLAN	
Research Schemes	25.69
RPD Scheme including Spill-over scheme	1111.75
Spl.Component Plan & Tribal Sub Plan	86.69
R.R.D.S.	17.12
Regional Nurseries	13.41
N.E.R.D.S.	82.85
Rubber Development in Eastern India	6.76
Boundary protection in NE Region	0.32
D.R.P. Scheme	29.05
Promotion of irrigation	10.00
Pool Fund Schemes	91.06
Total Plan	1474.70
Total Plan and Non-Plan	2191.22

E. Accounts and Audit

The annual accounts for the year 1986-87 were submitted to audit within the scheduled time limit of 30/6/1987. In addition to the Receipt and Payment Accounts for the General Fund, Pool Fund, Excise Duty Account, General Provident Fund, Provident Fund (Contributory) and Pension Fund, proforma Profit and Loss Account and Balance Sheet for the P.C.R.F. and Proforma Income and Expenditure Account and Statement of Assets and Liabilities for the D.R.P. were prepared and submitted. After getting the audit completed by the A.G. of Kerala, English and Hindi version of the audit report and the audited accounts

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were presented to the Ministry. Justifications for variations from the budgets were also highlighted.

F. Cost Accounts

The following activities were continued by the Cost Accounts Unit during the year.

a/ Cost Study, Collection of inputs and estimation of cost of collection and development.

b/ The functions of collection and updating input cost and cost of production/development and estimates and reports of Natural Rubber.

c/ Updated cost data was forwarded to the Commerce Ministry for revising the price ranges for operating buffer stock scheme from time to time.

d/ The development cost for different regions like traditional area, western region of Orissa, Karnataka and Maharashtra, Eastern Region represented by Orissa and NE Region were prepared separately for different planting practices (Conventional and Poly bag plants). An Estimated model for one Ha. nursery was prepared.

e/ Costing of operations of the P.C.R.F. was also done. Attended to the nursery costing for 1988 season with collection of actual data for 1987 season and projected figures for the coming season. This data were presented to the RP Department for making recommendations regarding prices of planting materials for the next season.

Tax Matters

Regular filing of monthly returns for Sales Tax of the Board and the annual returns for a Sales Tax and Agricultural Income Tax were submitted to the concerned tax authorities. Where necessary appearances were made before the tax authorities for presentation of books and explaining the correctness of the returns. Objections for the pre-assessment notices were filed and explanations given wherever necessary in consultation with the Lawyers.

Correspondence with the Government of India, State Government and other Agencies

Recommendations and opinions in the matters of interest of the rubber plantation industry were brought to the notice of the concerned authorities. This included rehabilitation allowances of rubber growers, capital gains tax on felled rubber trees and their sale, cost of cultivation, price of rubber, turnover tax etc.

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Consultancy, Advisory and related matters

The Project Report for rubber cultivation in Zimbabwe was prepared based on the feasibility study made by Sri MO Joseph, Jt.RPC. Project Reports were also prepared for planting rubber in 1000 ha. each by Orissa Forest Development Corporation, Orissa Plantation Development Corporation and Similipahar Forest Development Corporation. A detailed report was also prepared for Assam Plantation Crops Development Corporation during the period. Comments were also offerred to the Kerala State Co-operative Agricultural Development Bank Ltd. on various schemes for granting loans to rubber growers. Collection of data for a trend analysis of the performance of different rubber plantations from their Company accounts was in progress during the year.

Management Information System

Reports were submitted regularly on the operations/achievements of the Board's Estates at CES Chethackal, RRII and RRDS Andamans from their monthly Management Information System Reports. Corrective activities were also followed up with the concerned Unit.

G. Electronic Data Processing Division

This Division continue to process the Form IV reports of the subsidy payable to rubber growers under different development schemes. Over 46,500 reports were processed during the year involving a payment of over Rs.2.22 crores. In all cases cheques were printed out in the Computer. In addition, over 1,500 permits were printed in the Computer. The Pay Roll and connected schedules for the 5 departments were processed in the Computer. Financial Accounting (development of cash book, bank book, ledgers etc.) for the R.P. Department for 1987-88 were taken out on an experimental basis and satisfactory progress was achieved. Over 4,000 questionnaire reports developed in the Statistical Division were processed in the Computer Unit.

The following programmes were developed.

1/ Statistical package, in consultation with and under the guidance of the consultants M/s.P.T.C.S.

2/ System for Provident Fund Account.

3/ Conducting necessary modification in the financial accounting, pay roll and subsidy programmes developed earlier based on demands from the user departments.

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H. Other points of interest

The Department also coordinated/initiated the following study/activities during the year.

i/ Achieving further progress on the study of Integrated Performance and Improvement Programme initiated with the technical consultancy, guidance and advice of M/s. A.F. Ferguson & Co.

ii/ Collecting data and coordinating completion of a study on the effectiveness of subsidy in improving production and productivity of Natural Rubber, entrusted to Dr. ET Mathew, Professor and Head of the Department of Economics, University of Kerala.

iii/ Preparing a scheme for getting bank loan for the construction of headquarters building.

iv/ Extending decentralisation of financial and accounting functions of the remaining Regional Offices of the RP Department and certain other offices of the Research Department.

v/ Taking action for developing a scheme for decentralised payment of pension to the Board's pensioners through branches of State Bank of Travancore on the pattern of distribution of pension by Central Government offices through banks.

.....

vns/

PART VIII - TRAINING

A new Department called the Department of Training was organised in July 1987, with Joint Director (Training) as its head.

During the period under report the following training programmes were conducted.

(1) Refresher Training Programme for Deputy Development Officers/Assistant Development Officers for seven days

Six batches of the refresher training programme for Deputy Development Officers/Assistant Development Officers were conducted, and 76 officers were given training under this programme.

(2) Refresher Training for Field Officers/ Junior Field Officers

This course is of 13 days duration and 19 officers were trained under this programme.

For all these batches a general management training was arranged through the Kerala Productivity Council, Cochin on the subjects Principles and Functions of Management, Leadership and Motivation, Interpersonal Relationship and Team Building. After the two refresher courses an evaluation was carried out for each batch.

(3) Training Course in Manufacture of Rubber Goods from Latex

Two batches of this course were conducted for the benefits of entrepreneurs/industrialists, the first batch in October 1987 and the second in January 1988, in which 43 candidates attended. The duration of this course was ten days.

(4) Short-Term Training Course in Malayalam for Small-holders and estate supervisors

The course is of ten days duration and 65 persons were trained under this in four batches.

(5) Short-term Training Course in Rubber Culture and Estate Management

This training course was conducted for the benefit of Managers, Superintendents and Supervisors working in estates. This is a course for a duration of four weeks. A total of 121 persons had undergone training under this programme in three batches. The statewise participation is given below:-

Kerala	..	37
Tamil Nadu	..	26
Orissa	..	20
Meghalaya	..	11
Manipur	..	10
Assam	..	07
Mizoram	..	05
Tripura	..	03
Karnataka	..	01
Andaman & Nicobar	..	01
Total	..	121

(6) Training Course in Rubber Processing

This course was for a duration of ten days, and 21 persons were trained under this programme in December 1987.

(7) Training Course in Dry Rubber Goods Manufacture

This training course was of 10 days duration and one batch was trained during December 1987 in which 16 persons participated.

(8) Training Course in Rubber Sheet Grading

This training was for a duration of three days. A total of 93 persons were given training on different aspects of visual grading of sheet and crepe rubbers in four batches.

(9) Training Course in Rubber and Rubber Product Testing

The course was of one month duration. The participants were graduates or post-graduates in Chemistry or Polymer Chemistry. This was conducted from 1st to 30th March 1988. Eight persons were trained under this programme on different aspects of analysis and testing of rubber, rubber latex and rubber products.

(10) Training of Rubber Tapping Demonstrators/ Rubber Tapping Instructors

This course was of four days duration, in which 37 Rubber Tapping Demonstrators/Rubber Tapping Instructors were given training in two batches.

(11) Training on Latex Preservation and Testing

One Technical Assistant was trained under this programme for a period of two weeks as per request from the State Farms Corporation of India Ltd., Cannanore.

(12) A one day training programme on various aspects of natural rubber production was conducted at the Missionary Orientation Centre on 4th February 1988. About 100 sisters (nuns) from various parts of Kerala attended this programme.

The traing mannual in Malayalam on "Rubber Tapping, Panel Diseases and Crop Processing" is now being sold at subsidised rate to planters. About 4500 copies of the same were earmarked for sales at Rs.3/- per copy among rubber growers throughout Kerala.

All the courses except Sl.No.1, 2 and 10 were conducted after levying course fee from candidates. A total amount of Rs.1,34,475/- was collected towards fees. Certificates were issued to candidates on completion of the courses.

PART VII

STATISTICAL TABLES

TABLE 1

PRODUCTION, IMPORT & CONSUMPTION OF NATURAL RUBBER

(Tonnes)

Month		Production	Import	Consumption (Indigenous & Imported)
April	1987	11,020	6,091	21,920
May	"	21,450	8,340	22,475
June	"	12,660	6,921	22,360
July	"	14,585	9,738	23,935
August	"	15,190	9,553	22,880
September	"	24,480	263	21,965
October	"	27,535	456	21,735
November	"	27,387	2,378	25,870
December,	"	29,240	681	27,815
January	1988	26,120	2,220	25,885
February	"	12,050	3,285	25,190
March	"	13,480	3,759	25,450
	Total	235,197	53,685	287,480

TABLE - 2

STOCK OF NATURAL RUBBER AT THE END OF EACH MONTH

(Tonnes)

Month		Grower's & Dealers	Manufa-cturers	STC	Total (Rounded)
April	1987	31,005	19,810	7,140	57,950
May	"	38,015	22,670	4,450	65,135
June	"	33,130	22,920	6,272	62,320
July	"	33,285	23,565	5,600	62,450
August	"	32,170	26,905	4,407	63,480
September	"	36,950	24,700	4,607	66,260
October	"	50,660	17,890	3,840	72,390
November	"	50,430	20,865	3,840	75,135
December	"	52,015	23,740	3,840	77,595
January	1988	48,430	25,955	5,754	80,140
February	"	34,930	28,340	7,012	70,280
March	"	29,590	28,950	5,561	64,100

TABLE - 3

GRADEWISE STOCK OF NATURAL RUBBER AT THE END OF EACH MONTH

	April 1987	May 1987	June 1987	July 1987	Aug. 1987	Sept 1987	Oct. 1987	Nov. 1987	Dec. 1987	Jan. 1988	Feb. 1988	March 1988
RMA Grades	33,315	38,040	35,060	34,570	35,275	39,370	46,415	47,650	49,060	50,845	43,805	39,870
Estate Brown Crepes & Remilled Crepes	8,420	8,530	8,830	8,560	8,750	8,970	6,695	8,000	8,495	9,820	7,865	8,240
Latex Concentrates(drc)	4,470	4,270	5,085	4,375	4,265	4,040	4,010	4,385	5,025	5,650	5,560	4,395
Pale Latex Crepes	890	795	770	685	675	690	625	615	675	785	690	475
Block Rubbers	5,355	5,820	5,730	7,180	7,845	6,370	5,280	6,085	5,250	4,945	4,780	4,935
Scraps (drc)	5,160	7,485	6,675	6,870	6,525	6,520	9,050	8,225	8,935	7,950	7,455	6,060
Other Grades	340	195	170	210	145	300	315	175	155	145	125	125
Total (Rounded)	57,950	65,135	62,320	62,450	63,480	66,260	72,390	75,135	77,595	80,140	70,280	64,100

TABLE - 4

PRODUCTION, IMPORT, CONSUMPTION & STOCK OF SYNTHETIC RUBBER

(Tonnes)

		Production	Import*	Consumption	Stock at the end of the month
April	1987	3,003	1,906	6,250	14,340
May	"	2,952	1,824	5,880	14,815
June	"	2,756	2,422	5,935	14,120
July	"	3,662	1,645	6,400	13,500
August	"	4,530	2,933	6,130	14,540
September	"	4,144	2,702	6,050	15,125
October	"	3,029	2,055	6,025	14,135
November	"	4,270	2,173	6,820	13,020
December	"	4,201	2,990	6,855	13,340
January	1988	2,418	1,823	6,450	11,860
February	"	4,888	3,407	6,885	13,170
March	"	4,615	2,207	6,730	13,245
	Total	44,468	28,087	76,410	-

*Incomplete

TABLE - 5

PRODUCTION, CONSUMPTION & STOCK OF RECLAIMED RUBBER

(Tonnes)

		Production@	Consumption	Stock at the end of the month*
April	1987	3,080	3,210	3,520
May	"	3,060	3,145	3,435
June	"	3,075	3,165	3,345
July	"	3,250	3,510	3,085
August	"	3,350	3,390	3,045
September	"	3,410	3,275	3,180
October	"	3,385	3,335	3,230
November	"	3,475	3,615	3,090
December	"	3,880	3,830	3,140
January	1988	3,570	3,640	3,070
February	"	3,450	3,490	3,030
March	"	3,550	3,535	3,045
	Total	40,535	41,140	-

@Indigenous purchase by manufacturers

*Stock with manufacturers

ANNEXURE I

LIST OF MEMBERS OF THE RUBBER BOARD AS ON 31/03/1988

1	PC Cyriac, IAS	Chairman, Rubber Board
2	The Agricultural Production Commissioner, Kerala, Trivandrum	Nominated by the Government of Kerala to represent that State.
3	The Chairman, Plantation Corporation of Kerala Kottayam - 4.	
4	The Chief Conservator of Forests, Tamilnadu, Madras	Nominated by the Govt. of Tamilnadu to represent them.
5	George John, Thamarapally Rubber Company, Kottayam	Elected by the large growers in the State of Kerala
6	K Jacob Thomas, Managing Director, Vaniampara Rubber Company, Kottayam	
7	Michael A Kallivayalil Kuttikkanam PO, Peermede	
8	R Subramonian, Veerabhadra Gardens, Pattom, Trivandrum-4	Elected by large growers in the State of Tamilnadu.
9	K Joseph Monipally, General Secretary, Indian Rubber Growers Association, Ernakulam, Cochin - 16.	Nominated by the Central Government to represent small growers of Kerala.
10	MK Vidyadharan, Uttamam LIC Lane, Pattom Trivandrum - 4.	
11	M Assainarkutty, Malickantath Chapparappadavu, Via Taliparamba	
12	K Padmanabhan, President Kerala State Plantation Workers Federation, Trichur	Nominated by the Central Government to represent labour.
13	A Kunheeran, General Secretary, Kerala State Plantation Workers Federation, Kondotty PO	
14	N Narayana Pillai, General Secretary, Kumari Estate Workers Union, 22A/13 AP Road, Nagercoil.	
15	Sridam Sutradar, Secretary Tripura Rubber Shramik Union Thakur Chara, Via Jolaibari Tripura.	
16	George Joseph Mundakal MP 192 North Avenue, New Delhi	Elected by the Lok Sabha
17	Dilip Singh Bhuria MP 214 North Avenue New Delhi.	

18	K Vasudeva Panicker MP 11 Mathur Lane New Delhi	Elected by Rajya Sabha
19	President, All India Rubber Industries Association, Lamington Road Bombay - 400 008.	Nominated by the Central Government to represent rubber goods manufacturers
20	President, Automotive Tyre Manufacturers Association 9A Cannaught Place New Delhi.	
21	ET Varghese, President Rubber Dealers Association Kottayam	Nominated by the Central Government to represent 'other interests'
22	Managing Director Karnataka Forests Plantation Corporation, Bangalore - 560 001	
23	Sudhir Majumdar MLA Agartala Tripura	
24	RG Ketkar, Managing Director, Sudhagad Rubber Industries, PB No.8969 Bombay - 72.	
25	P Mukundan Menon Rubber Production Commissioner Rubber Board Kottayam - 1.	Ex - Officio

ANNUAL REPORT OF THE RUBBER BOARD FOR THE YEAR 1989-'90

THE RUBBER BOARD
(Govt. of India, Ministry of Commerce)

KOTTAYAM - 686 001
KERALA STATE

THE RUBBER BOARD

Annual Report on the activities for the year 1989-90

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ANNUAL REPORT OF THE WORKING OF THE RUBBER BOARD FOR 1989/90.

PART I - INTRODUCTION

This is the annual report of the Rubber Board on its working for the year 1989/90. This contains a summary of the activities from 1st April 1989 to 31st March 1990.

Rubber plays an important role in the industrial and economic development of the country. Cultivation of rubber was introduced to the country during the first decade of this century. Large planters were the pioneers in this field. Small holders made their appearance later. The Government of India constituted the Rubber Board as a body corporate to look after the rubber industry, under the Rubber Act, 1947. In order to undertake scientific, technological and economic research, the Board set up the Rubber Research Institute of India in 1955. Until then monitoring the production and distribution of rubber in the country formed the major activity of the Board.

India had to evolve suitable package of practices for development of the rubber plantations. With sustained research and development activities coupled with extension and advisory services for transfer of technologies to the planters' fields, the rubber producing sector had a quick changeover from the traditional methods to modern cultivation practices. India soon became the fourth largest natural rubber producer in the world, after Malaysia, Indonesia and Thailand.

The research efforts made significant contributions to the rubber plantation industry. India evolved the high yielding clone RRII-105 with yield potential of about 2500 kg per hectare. Switchover from planting seedlings to buddings, evolving suitable fertiliser schedules for mature and immature rubber, pest and disease management / improved crop exploitation techniques and improved crop processing had played a vital role in enhancing rubber production from a meagre 15,000 tonnes at the time of independence to nearly 297,000 tonnes by 1989/90. Productivity in terms of yield per hectare rose from about 300 kg to over 1000 kg during the same period. Growing the crop with legumi- nous ground cover, application of fertilisers after soil and leaf analysis, crop exploitation in association with yield stimulation, processing technically specified rubber and process aid rubbers, consumption research to improve the technological properties of rubber, tissue culture etc are some of the current thrust areas in research and development activities.

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Natural rubber industry performed well during 1989/90. The production increased from 259,172 tonnes in 1988/89 to 297,300 tonnes in 1989/90, registering nearly 14.7% growth. The growth in consumption was also impressive at 341,840 tonnes in 1989/90 compared to 313,830 tonnes in the previous year, recording 8.9 per cent increase. In order to meet the gap between demand and supply, 44,871 tonnes of NR was imported, of which 17,896 tonnes was under the export incentive scheme.

The activities undertaken for development of the natural rubber industry consisted of implementation of schemes for -

(a) promotion of newplanting and replanting of rubber,

(b) production and distribution of high yielding planting materials, and

(c) improving production and crop processing through extension services, training, demonstration, supply of inputs etc.

(.....2/-)

Promotion of newplanting and replanting was mainly carried out through implementing an integrated scheme called the Rubber Plantation Development Scheme, offering financial assistance and free technical advice. Cash subsidy of Rs.5,000 per hectare and interest subsidy at 3% on loans taken for planting expenses under the agricultural refinance scheme of NABARD were granted for newplanting/replanting of rubber by growers owning upto 5 hectares of rubber in traditional areas and by all categories of growers in the non-traditional areas. Input subsidy in the form of reimbursement of the cost of high yielding planting materials of advanced growth at Rs.6/- per plant was granted to all growers.

In view of the limited scope for expansion of rubber cultivation in traditional areas, development of rubber plantations in selected non-traditional tracts was undertaken in the North Eastern States, Orissa, Andhra Pradesh, Madhya Pradesh, Goa, Maharashtra, Andaman & Nicobar Islands etc. To effectively propagate rubber in these areas special awareness campaigns were conducted and nurseries for generating sufficient planting materials were set up. The extent planted in non-traditional areas during the year increased to 7,000 hectares as against 5,645 hectares in 1988/89.

2. Rubber prices

The rubber market was buoyant during 1989/90. The monthly average prices of RMA 4 grade rubber is given below.

Monthly average price of RMA 4 grade per quintal

		Rs. per quintal
1989	April	1858
	May	2020
	June	2284
	July	2538
	August	2509
	September	2047
	October	1902
	November	1933
	December	2007
1990	January	2163
	February	2135
	March	2175
	Average for 1989/90.	2131

3. Expenditure

The total expenditure during 1989/90 was Rs.2439.67 lakhs; Rs.1602.26 lakhs under Plan and Rs.837.41 lakhs under non-Plan. The funds received from the Government amounted to Rs.2209.30 lakhs. The entire amount allotted under the Plan schemes, including Rs.142.0 lakhs sanctioned in March 1990 was utilised. An amount of Rs.1416.0 lakhs was collected towards excise duty on rubber.

4. International Developments

World production of natural rubber during 1989 increased by 2.4% over 1988 to reach a record level of 5.16 million tonnes. However, there was a drop in production in the world's largest producer - Malaysia by 12.3% or 240,000 tonnes.

(.....3/-)

Bulk of the decline was counterbalanced by the rise in production in Thailand upto 22.4% or 220,000 tonnes. Production of Indonesia improved by 2%. World consumption of natural rubber during 1989 grew by 4.4% to 5.34 million tonnes.

International price of rubber showed a downward trend in 1989. In Kuala Lumpur Market the average price in January 1989 was 290.6 Ringgits which gradually decreased to 214.0 Ringgits in December 1989. The average price for the whole year 1989 was 247.7 Ringgits as against 301.2 in 1988.

The International Natural Rubber Agreement (INRA) 1987, which was negotiated under the aegis of UNCTAD came into force provisionally on 29th December 1988. The Agreement subsequently came into force definitevelyin April 1989 when the necessary requirements relating to the ratification were fulfilled. During the first session of the INRA in April, the reference price under the Buffer stocking scheme was revised upwards to 218.1 Malaysian/Singapore cents. As a result the 'May sell' and 'must sell' levels were increased to 251 and 262 cents, respectively, while the 'may buy' and 'must buy' levels were raised to 185 and 174 cents respectively. Although during the third quarter of 1989, the moving average of the Daily market Indicator price went below the 'May buy' level for a short period, there was no market intervention by the INRO. INRO entered in the market in February 1990 and during February and March 1990 it is reported to have purchased about 20,000 tonnes from the various markets.

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PART II

CONSTITUTION AND FUNCTIONS

1 Introduction

The Indian Rubber Board was constituted under the Rubber (Promotion and Marketing) Act, 1947 which came into force on 19th April 1947, 'to promote by such measures as it thinks fit' the development of the rubber industry in India. The Rubber Production and Marketing (Amendment) Act of 1954 made certain changes in the constitution of the Board and its name was changed as Rubber Board. This Act came into force on 1st August 1955. The Rubber Act was further amended by the Rubber (Amendment) Act, 1960 and by the Rubber (Amendment) Act, 1982. This last amendment was made by the Government to appoint a part time/whole time Chairman for the Board and an Executive Director on whole time basis (if considered necessary).

2 Constitution

The Rubber Board is attached to the Ministry of Commerce of the Government of India. The Board has at present a full time Chairman as principal executive officer responsible for implementation of the decisions at the meetings of the Board and discharge of the duties under the Rubber Act. There are 25 other members consisting of -

(a) Two members to represent the State of Tamilnadu, one of whom shall be a person representing rubber producing interests;

(b) Eight members to represent the State of Kerala, six of whom shall be representing the rubber producing interests, three of such being persons representing the small growers;

(c) Ten members to be nominated by the Central Government, of whom two shall represent the manufacturers and four labour;

(d) Three members of Parliament of whom two shall be elected by the Lok Sabha and one by the Rajya Sabha;

(e) The Executive Director (ex-officio); and

(f) The Rubber Production Commissioner (ex officio).

The position of the Executive Director has not been created so far.

List of members of the Board as on 31.3.1990 is given at the end of this report.

One of the members is elected as Vice Chairman. Committees are formed to examine various proposals and affairs affecting the rubber industry and make recommendations to the Board. Seven such Committees viz- Executive Committee, Research and Development Committee, Planting Committee, Statistics & Import/Export Committee, Market Development Committee, Labour Welfare Committee and Staff Affairs Committee were constituted.

Shri PC Cyriac, IAS continued to be the Chairman of the Board.

Shri R Subramonian, member representing the large growers in Tamilnadu State was the Vice Chairman.

(..... 5/-)

3 Functions

The functions of the Board according to clause 8 of the Rubber Act are -

1) Promote by such measures as it thinks fit the development of the rubber industry. The measures may provide for -

a) Undertaking, assisting or encouraging scientific, technological and economic research,

b) training students in improved methods of planting, cultivation, manuring and spraying;

c) supply of technical advice to rubber growers;

d) improving the marketing of rubber;

e) collection of statistics from owners of estates, dealers and manufacturers;

f) securing better working conditions and the provisions and improvement of amenities and incentives for workers, and

g) carrying out any other duties which may be vested in the Board.

2) It shall also be the duty of the Board -

(i) to advise the Central Government on all matters relating to the development of the rubber industry, including the import and export of rubber;

(ii) to advise the Central Government with regard to participation in any international conference or scheme relating to rubber;

(iii) to submit to the Central Government and such other authorities as may be prescribed, half yearly reports on its activities and the working of the Act; and

(iv) to prepare and furnish such other reports relating to the rubber industry as may be required by the Central Government from time to time.

4 Meetings of the Board and its Committees

The following meetings of the Board and of the Committees were held during the year.

(a) Board meetings - on 2 occasions; the 113th meeting on 29.9.1989 and the 114th meeting on 21.2.1990.

(b) Committee meetings.

The Executive Committee met five times, the Statistics & Import/Export Committee met 4 times, the Staff Affairs Committee met three times and the Labour Welfare Committee, Research and Development Committee, Planting Committee and the Market Development Committee met once during the year.

5 Organisational set up

The activities of the Rubber Board are carried out by six Departments viz; Administration, Rubber Production, Rubber Research, Rubber Processing, Finance & Accounts and the Department of training; headed respectively by the Secretary,

(.....6/-)

the Rubber Production Commissioner, the Director of Research, the Project Officer, the Financial Adviser and the Joint Director (Training).

The headquarters of the Board, along with the Administration, Rubber Production and Finance & Accounts Departments are located at the Kottayam Public Library Buildings, Sastri Road, Kottayam 1. There are eight Sub/Liaison Offices under the Administration Department. The Rubber Production Department has 26 Regional Offices, 125 field offices, 20 Regional Nurseries and 11 Tappers Training Schools located at different rubber growing regions. The Rubber Research cum Development Station in South Andamans, the Zonal Offices at Bhubaneswar and Guwahati and the Nucleus Rubber Estate cum Training Centre at Agartala also come under the Department of Rubber Production.

The Research Department, the Department of Rubber Processing and the Department of Training function in the Board's own buildings at Kottayam 9. The Research Department runs two Regional Research Stations in Kerala, one each in Tamilnadu, Karnataka, Maharashtra (Dapchari), Orissa, West Bengal, Assam, Mizoram, Meghalaya and Tripura. The Pilot Crumb Rubber Factory located at Chethackal are run by the Department of Rubber Processing. The Department of Training is currently establishing a pilot plant for Radiation Vulcanisation of Natural Rubber at Chethackal.

The Chairman exercises administrative control over all the departments and offices. The total officers and staff under the Board as on 31.3.1990 were 1870; 106 under Group 'A', 393 under Group 'B', 1176 under Group 'C', 143 under Group 'D' and 52 under consolidated pay. Very cordial relations existed between the staff and the executive personnel. The good work turned out by them as a whole has resulted in the impressive record of achievement during the year.

The activities of the different departments are summarised in the following pages.

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PART III

RUBBER PRODUCTION

Functions and Organisational set up

Registration of rubber estates, formulation and implementation of various long term and short term schemes for the development and modernisation of rubber Plantations, planning and undertaking advisory and extension services and supplies (for all categories of rubber growers), production, procurement and distribution of high yielding planting materials and other inputs, imparting training on tapping and production of raw rubber and identification of suitable areas for expansion and accelerated development of rubber cultivation in non-traditional areas formed the major functions of the Rubber Production Department.

The Rubber Production Commissioner exercised overall control and supervision of the department. He was assisted by three Jt.Rubber Production Commissioners and eight Dy.Rubber Production Commissioners and a complement of other officers and staff.

The field activities of the department are managed through 34 Regional Offices which are grouped under four zones, i.e. south zone and north zone in South West India, Eastern Zone and North-Eastern Zone. Under the Regional Offices, there are 150 Field Offices, 21 Regional Nurseries and 27 Rubber Tappers' Training Schools.

Control and supervision of activities at the Zonal level are exercised by Dy.Rubber Production Commissioners excepting in the North-East zone which is under a Jt.Rubber Production Commissioner. An NRETC each is functioning in Tripura and Andamans. The NRETC, Tripura is headed by a Project Director (Jt.Rubber Production Commissioner) and the NRETC in Andamans (earlier the RRDS) is manned by an Estate Manager (Dy.Rubber Production Commissioner). A Central Nursery was continued to be maintained in Kerala. The Rubber Production Department's activities were organised under 2 wings at the Central Office level, viz., Development and Extension, co-ordinated by a Jt.Rubber Production Commissioner.

Activities of the Development Wing

1 Registration of estates

It is laid down in the Rubber Act that all rubber estates in the country shall be registered with the Board.

A total of 8348 rubber plantation units were newly registered covering 4389.00 ha. Area removed from records by cancellation of registration was 1492.09 ha. The total area progressively registered as on 31.3.1990 was 302704 ha. covered under a total number of 242481 units.

2 Replanting subsidy scheme

The Replanting Subsidy Scheme aimed at rehabilitation of old and uneconomic rubber plantations with high yielding varieties in order to increase the supply of natural rubber in the country was introduced as early as 1957. This was the first important development scheme implemented. It underwent many modifications from time to time. The scheme provided assistance for replanting on a slab rate based on the size of the plantation.

Initially, the replanting subsidy ranged from Rs.250/- to Rs.400/- per acre. The rate was revised to Rs.1,000/- per acre (Rs.2,471/- per hectare) from 1960. Until 1972, subsidy was granted for replanting areas planted prior to 1956 and registered with the Board in April 1958 or earlier. The rule was later relaxed to bring under replanting all uneconomic areas planted upto 1962 and registered with the Board. From 1975 to 1979, subsidy was paid under 3 slabs Rs.7,500- per ha. for growers owning upto 2 ha. of rubber, Rs.5,000/- to those having rubber between 2 and 20 ha. and Rs.3,000/- to those having above 20 ha. of rubber. The subsidy was paid in 7 annual instalments.

The instalments of subsidy due in 1975 and in subsequent years for replanting carried out from 1969 to 1974 were also paid at the revised rates. With the introduction of the RPD Scheme in 1980-81 which aimed at promotion of replanting and newplanting in an integrated manner, the RP subsidy scheme ceased to operate except for effecting spill over payments. Replanting subsidy scheme operated upto 1979 has been closed by effecting final payments in eligible cases or by cancelling the remaining infructuous cases. The total number thus cleared comes to 552.

As at the close of March 1990 subsidy amounting to Rs.193,470,413/- was granted for replanting a total area of 53,605 ha. under 34,822 permits. During the year under report the spill over payment made for earlier instalments amounted to Rs.9,44,836/-.

Apart from payment of cash subsidy, the scheme provided for additional assistance to small growers owning less than 6.07 ha. of rubber to use high yielding planting materials and for fertilisers and soil conservation work. Since the inception of the scheme the following amounts had been disbursed as additional assistance till 31.3.1990.

1. Half cost of fertiliser mixture supplied	..	Rs.2,16,62,511.00
2. Reimbursement of cost of planting materials	..	Rs. 19,61,735.60
3. Assistance for soil conservation work	..	Rs. 1,31,437.00

3 Loan Scheme

In addition to assistance for replanting, loan schemes were operated in the small holding sector (1) for expansion of area and (2) for maintenance of immature plantations. The Newplanting Loan Scheme and Upkeep Loan Scheme were first introduced in 1962 and 1963 respectively, providing loan assistance at the rate of Rs.750/- per acre for expansion of small holdings to economic units of 5 to 15 acres (2 to 6 ha.) by newplanting, and a maximum of Rs.475/- per acre to immature small plantings of 15 acres (6 ha.) and below for maintenance operations until the bearing stage. Both the loans were interest free.

2. From the inception of the scheme a total amount of Rs.7,34,038.91 was disbursed to newplant 439.01 ha against which Rs.792,986.27 was received back on repayment of loan with interest. The amount disbursed under the Upkeep Loan Scheme was Rs.262,560.14 to maintain 304.73 ha. and the amount received back was Rs.267,982.67.

3. In replacement of these two Loan Schemes a Revised Loan Scheme was introduced in 1966, which provided for higher rates of loan for expansion of holdings to a minimum of 2.00 and a maximum of 20.23 ha. and for maintenance of immature area in small holdings. The scale of assistance was Rs.3,460/- per ha. for newplanting and at a maximum of Rs.2,200/- per ha. for maintenance over 6 years. An interest of 5% per annum was charged under this scheme from the 10th year of planting.

4. The loanees had to mortgage the rubber areas to the Board as security. Payments were effected in yearly instalments, after completion of the respective items of work. Repayment became due from the 10th year of planting.

5. The Revised Loan Scheme was discontinued after 1978 when the Rubber Newplanting Subsidy Scheme, 1979, was put into operation. A cumulative amount of Rs.74,71,082.14 was disbursed as loan to benefit 849 small growers to cover 3,113.38 ha. The amount refunded by loanees with interest amounted to Rs.89,01,534.04.

6. Loan permit holders possessing not more than 6.00 ha of rubber were also eligible for additional assistance on reimbursement of cost of planting materials and half cost of fertiliser mixtures. Total amount thus disbursed was Rs.56,101.64 and Rs.508,935.60 respectively.

7. During the period an amount of Rs.98,820.60 was received back under the Revised Loan Scheme. The loan accounts under 16 Revised Loan scheme permits were closed. Now there are 56 cases under Revised Loan Scheme and 2 cases under Upkeep Loan Scheme wherein repayments are not complete. Majority of the cases are under legal proceedings.

4. Rubber Newplanting Subsidy Scheme, 1979

Rubber Newplanting Subsidy Scheme, 1979 was sanctioned by the Government in January, 1980 as a new measure to encourage newplanting on par with replanting. This was a credit linked scheme. Under the scheme/was taken up in 6,550 ha excelling the target of 4,000 ha. The following were the incentives offered under the scheme.

/re-plant-ing

(1) Capital subsidy at Rs.7500/- per ha for growers owning upto 2.00 ha of rubber and Rs.5,000/- per ha for growers owning above 2-00 ha and upto 20.23 ha of rubber. The amount was paid in 7 annual instalments after completion of the items of works stipulated for each year.

(2) Input subsidies were also given to growers whose total rubber area did not exceed 6.00 ha. These comprised of reimbursement of cost of approved planting materials, 50% cost of fertilisers and a subsidy for carrying out soil conservation work.

(3) Interest subsidy at the rate of 3% for long term loans availed of from banks to supplement the subsidy.

(4) Advisory and extension support at all stages of planting, maintenance, tapping and processing of crop, free of cost.

Though 34,350 applications were received for subsidy actual planting was done only in 17,131 cases. Subsidy amounting to Rs.462.30 lakhs had been sanctioned under the scheme. The amount of spill over instalments of subsidy sanctioned on pending cases from 1.4.89 to 31.3.1990 was Rs.7.25 lakhs.

The banks have sanctioned loans in favour of 907 permit holders for an amount of about Rs.96.28 lakhs.

Special efforts were made to finalise all spill over cases. Accordingly pending instalments and tapping certificates had been granted in all eligible cases. The remaining cases, where further developments and improvements were not possible, were closed.

5 Rubber Plantation Development Scheme Phase I

This scheme aimed at integrated promotion of newplanting and replanting of rubber to successfully make India self-reliant in natural rubber. This replaced all the earlier planting subsidy schemes. The target set out was 12,000 ha per year for 5 years, 1980-81 to 1984-85.

The following incentives were offered for both replanting and newplanting of rubber.

(1) Capital subsidy @ Rs.5,000/- per ha to growers owning upto 20 ha including any area planted under the scheme and Rs.3,000/- per ha to growers owning more than 20 ha.

(2) Input subsidies to the weaker sections of growers possessing not more than 6 ha of rubber for using approved planting materials and approved fertilisers and a subsidy of Rs.150/- per ha for undertaking soil conservation work.

(3) The beneficiaries could avail of long term agriculture credit of NABARD to supplement the assistance. The maximum credit per ha was limited to Rs.15,020/-, Rs.17,000/- and Rs.18,700/- respectively for growers owning upto 6 ha of rubber, above 6 ha and upto 20 ha of rubber and above 20 ha of rubber. The loan advanced in 7 annual instalments is repayable in 5 instalments from the 10th to the 14th years of planting. The interest accrued upto the 7th year is payable during the 8th and 9th years. During repayment only current interest becomes payable.

(4) The rate of interest is 12½%. The Board subsidises 3% interest to all categories of growers subject to limitations on the quantum of loans.

(5) Free advisory and extension support at all stages of planting and maintenance.

The cumulative progress of the scheme as on 31.3.90 is summarised below:

	Years to which applications related					
	1980	1981	1982	1983	1984	Total
No.of subsidy permits issued	17541	19141	18894	21328	24939	101843
Area covered by permits in ha.	12098	13579	13838	15471	17316	72302
No.of cases rejected	9166	9481	9469	9403	10281	47800
No.of cases pending final action	1	6	35	149	584	775

During the year an amount of Rs.192.18 lakhs was disbursed as subsidy. The total disbursement of subsidies since the inception of the scheme came to Rs.3762.02 lakhs as on 31.3.1990.

6 Rubber Plantation Development Scheme Phase II

The RPD Scheme Phase II is being implemented from 1985 onwards. As against the target of 60,000 ha. set out for newplanting and replanting under Phase I scheme, the target under Phase II scheme was only 40,000 ha in view of resource constraints.

The assistance offered under Phase II scheme were the following:

(1) Capital subsidy at the rate of Rs.5,000/- per ha. for growers owning upto 5 ha. of rubber in traditional areas and for all categories in the non-traditional areas.

(2) Input subsidy for the use of high yielding Planting materials of advanced growth (poly-bagged plants) at the rate of Rs.6/- per plant subject to a maximum of 450 plants per hectare. Growers in the traditional region having more than 5 ha. of rubber and carrying out planting under the scheme are also eligible to receive this assistance.

(3) The beneficiaries could avail of bank loans under the agricultural refinance scheme of NABARD. The loans will be advanced in 7 annual instalments, repayable in 5 annual instalments from the 10th year of planting with a moratorium on payment of interest till the 7th year. The interest accrued upto the close of the 7th year is payable during the 8th and 9th year. During the repayment of loan, only the current interest becomes payable.

(4) The normal rate of interest for the loan is 12½% per annum. The Board subsidises 3% of the interest from the first to the 9th year to those eligible for the capital subsidy.

(5) Free advisory and extension support at all stages of planting, maintenance, tapping and processing of the crop.

The following is a summary of the progress of the scheme:

	Years to which the applications relate					
	1985	1986	1987	1988	1989	Total
Total no. of applications received	31807	28490	28149	28969	26165	143580
No.of cases in which planting has materialised	31786	28434	28149	28917	26165	143451
No.of cases inspected in the field	31364	27895	27236	27443	20046	133984
Balance pending for inspection	422	539	913	1474	6119	9467
Permits issued	22214	19685	19554	18896	11354	91703
No.rejected/withdrawn	8023	6344	5371	4147	1780	25665
Area covered by permits	14658	13529	13968	13643	8043	63841
Applications pending disposal	1549	2405	3224	5874	12839	25891

According to information obtained from banks, an amount of Rs.122.00 lakhs has been sanctioned as loan for the period upto 31.3.1990 of which Rs.39.58 lakhs has already been disbursed to 376 beneficiaries involving an area of 472.62 ha.

7. Insurance for rubber plantations

During December 1988, M/s.National Insurance Co Ltd implemented a crop insurance scheme for rubber through the Rubber Board. The perils covered are fire, fire resulting from explosion, lightning, bush-fire, forest fire, wind, storm, tempest, hurricame, flood, landslide, hailstorm, rockslide and subsidence. The Scheme had covered only rubber plantations raised during 1988 under Board's 'Rubber Plantation Development Scheme'. From June 1989 all immature plantations under RPD Scheme as well as all mature plantations upto 22 years of age have been brought under the coverage. The insurance certificates are issued through Rubber Board offices. The Board has taken Master Policies on behalf of rubber growers and issued individual certificates to participating growers. Claims for compensation were investigated by the Board's officers and eligible compensation was collected from the insurance company and passed on to the beneficiary growers.

Maximum liability of the insurer for plantations in the age group of 1 to 8 years would be Rs.45,000/- per hectare and for plantations of age group of 8 to 12 years, Rs.60,000/- per hectare.

The rates of premium and compensation payable for the various age groups are as follows.

Rates of Premium.	Compensation payable
Less than 1 yr.old plantations - Rs.500/- per ha. for 8 years.	
Between 1 to 2 years: Rs.440 per ha for remaining to attain 8 yrs.	Rs 41 per tree
" 2 to 3 yrs.: Rs 380 per ha -do-	Rs 74 -do-
" 3 to 4 yrs.: Rs 330 per ha -do-	Rs 100 -do-
" 4 to 5 yrs : Rs 270 per ha -do-	Rs 123 -do-
" 5 to 6 yrs : Rs 200 per ha -do-	Rs 132 -do-
" 6 to 7 yrs : Rs 150 per ha -do-	Rs 144 -do-
" 7 to 8 yrs : Rs 190 per ha -do-	Rs 166 -do-
For mature areas: Rs 473/- per ha for a period of 3 years.	Between 8 to 10 yrs Rs 200 -do-
	" 11 to 13 Rs.210 -do-
	" 14 to 16 Rs.225 -do-
	" 17 to 22 Rs.250 -do-

No salvage value of fallen trees would be deducted from the amount of compensation. For the newly planted rubber the insurance claim takes effect after a waiting-in period of one year and for other plantations this would be only 30 days. For the immature rubber, the insured grower has to bear 10% of the loss and in the case of mature rubber this is 10% or Rs.1,000/- whichever is higher.

Individual policies worth Rs.12,99,987.05 covering an immature area of 3126.23 ha were issued to 3,891 proposals for the period upto 31.3.1990. For mature area individual policies worth Rs.2,08,577.29 were issued to 465 proposals covering an area of 446.31 ha. An amount of Rs.27,082/- towards compensation had been paid to 13 policy holders, as on 31.3.1990.

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Activities of the Planting Materials Division

1. Maintained 8 rubber nurseries in Kerala with a total extent of 47,36 hectares and monitored functioning of 13 nurseries in Non-Traditional areas with a total extent of 64.79 hectares (in 1989).

Name of nurseries in Kerala	Total extent in ha.	Region
1. CN Karikkattoor	20.23	Kottayam Dist.
2. RN Kadackamon	4.04	Punalur
3. RN Perumpulickal	4.00	Pathanamthitta
4. RN Kanhikulam	4.88	Palghat
5. RN Ulickal	5.20	Tellicherry
6. RN Manjeri	2.00	Nilambur
7. RN Peruvannamoozhy	3.60	Kozhikode
8. RN Alakode	3.41	Taliparamba
TOTAL	47.36	

Nurseries in Non-Traditional Areas - 1989

1. RN RRDS (NRETC)	1.85	S.Andamans
2. RN Shoal Bay	2.00	S.Andamans
3. RN Devarappally	2.00	Andhra Pradesh
4. RN Ranibaro	8.00	Orissa
5. RN Derrangiri	5.30	Guwahati, Assam
6. RN Tesso Ajur	8.60	Diphu, Assam
7. RN Mijungdisha	4.00	Diphu, Assam
8. RN Balacherra	6.00	Silchar, Assam
9. RN Hilara	11.00	Silchar, Assam
10. RN Are-mile	5.00	Tura, Meghalaya
11. RN Jengithchakgiri	NIL	Tura, Meghalaya
12. RN Rangutia	7.54	Agartala, Tripura
13. RN Tulakona (NRETC)	3.50	Agartala, Tripura
TOTAL	64.79	

2 Production and Distribution of Planting Materials

Production and supplies from the 8 nurseries in Kerala in 1989 was 9,69,535 budded stumps (including 7500 green budded stumps), 10.394 metres of budwood and 3,490 polybagged plants.

The nurseries made a net profit of Rs.97,557/- in 1989 though these were continuously incurring losses during the previous years due to loss of seedlings consequent on adverse weather conditions, increase in wages and salaries and cost of materials, under-utilisation of area etc.

3. Procurement and Despatch of Budded Stumps to Non-Traditional Areas

The following numbers of brown budded stumps were procured and despatched to various regions.

A.	To Karnataka	..	40,000
B.	To Goa	..	1,17,600
C.	To Andhra	..	67,400
D.	To Orissa	..	57,600
E.	To Assam	..	4,86,400
			7,69,000

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			7,69,000

4. Procurement and supply of Rubber Seeds

In 1989, a total of 125.90 lakhs of assorted and 0.89 lakh of polyclonal rubber seeds were procured from Kanyakumari District of Tamilnadu and supplied to various places in India including Board's nurseries in addition to 51 lakhs of seeds procured from Tripura.

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ACTIVITIES OF THE EXTENSION WING

The undermentioned items of work were attended to during the period by the Extension Wing.

1. Rendering technical assistance and advice to rubber growers.

2. Participation in seminar and study classes and group discussions on rubber cultivation, production and methods of processing.

3. Demonstration of scientific methods of tapping in small holdings.

4. Imparting training to tappers through T.T.Schools and tappers training camps.

5. Extension activities for the development of rubber cultivation in non-traditional areas.

6. Procurement and distribution of Pueraria seeds for ground cover.

7. Implementation of the scheme for the supply of low volume power operated sprayers to Rubber Producers' Societies and individuals at subsidised rates.

8. Implementation of the scheme for grant of financial assistance to small rubber growers for purchase of hand operated sheeting rollers.

9. Assistance to small rubber growers for purchase of bee-hives.

10. Financial assistance to small rubber growers for construction of 55 kg. smoke house at subsidised rates.

11. Financial assistance for irrigation facilities in rubber plantations against drought.

12. Assistance for fencing in non-traditional areas.

13. Supply of estate requisites to small growers in non-traditional areas.

1. Technical Assistance and advice

During the period the various technical officers of the Boa Board visited rubber holdings for imparting technical advice to growers on scientific methods of rubber cultivation, production and processing.

2. Seminars, study classes and group discussions on rubber cultivation, production and processing

The details of visits conducted by the various officers of the Board stationed at Regional Offices and offices of the F.Os/J.FOs are furnished below.

Designation of officers	No.of units visited
J.F.Os	74,721
F.Os	86,102
A.D.Os	3,903
D.Os	1,127
	1,65,853

Out of the above 4041 visits were exclusively for advisory work. During the period under report 1156 seminars were conducted and 52392 growers actively participated. Further, 23 radio talks on various aspects of rubber cultivation were conducted by the officers of the Board.

Utilising the service of Mobile Soil & Tissue Testing Laboratories a total number of 5149 soil and 38 leaf samples had been analysed and recommendation given to growers for adopting discriminatory fertiliser applications in their holdings.

3. Demonstration of Scientific tapping in small holdings

This year also, the services of the Tapping Demonstrators were utilised for demonstration of scientific methods of tapping and processing. From the Regional Offices concerned 6,447 small holdings were visited by the Rubber Tapping Demonstrators for the purpose.

4. Imparting training to tappers through TT.Schools

Regular training of growers/tappers in tapping and related activities was undertaken through the T.T.School at different locations.

In all 25 regular T.T.Schools were functioning in the traditional area and 2 in non-traditional area. They are as follows:-

Name		Name of T.T.School
1. Nagercoil	:	Padappacha
2. Trivandrum	:	Karippur
3. Adoor	:	Kalanjoor
4. Punalur	:	Sadanandapuram
5. Pathanamthitta	:	Attachackal
6. Changanacherry	:	Palamattom
7. Kottayam	:	Madathiparambu
8. Kanjirappally	:	Karikkattoor
9. Palai	:	Pizhaku
10. Thodupuzha	:	Olamattom
11. Kothamangalam	:	Nedungapra
12. Kothamangalam	:	Panamkuzhy
13. Ernakulam	:	Veliyanad
14. Ernakulam	:	Vadavucode
15. Trichur	:	Puliyanam
16. Palghat	:	Velikkad
17. Kozhikode	:	Thiruvampady
18. Kozhikode	:	Koorachundu
19. Nilambur	:	Vadapuram
20. Tellicherry	:	Angadikkadavu
21. Taliparamba	:	Mangara
22. Taliparamba	:	Puravayal
23. Taliparamba	:	Pulingome
24. Kanhangad	:	Kalichanadukkam
25. Kanhangad	:	Chullikkara
26. Mangalore	:	Gandibagilu
27. Agartala	:	Tripura

A total of 2497 tappers were trained in 132 batches in these schools and an amount of Rs.7,18,980/- was spent for the purpose.

Apart from this 105 refresher training camps for tappers were conducted in batches of 20 to 25 in selected small holdings for a period of six days. A total of 2708 tappers were given training in these camps.

5. Extension activities for the development of rubber cultivation in non-traditional areas

The Board continued to promote development of rubber cultivation in non-traditional areas, where the agro-climatic conditions are suitable for rubber cultivation. Large number of farmers are taking up rubber plantation in the region. Apart from technical officers engaged in development and extension activities giving proper guidance on all aspects of rubber cultivation, the services of Rubber Tapping Demonstrators are utilised in the T.T.School, Tripura and the Regional Offices at Agartala and Guwahati for imparting practical training in scientific methods of crop exploitation and processing.

6. Procurement and distribution of seeds of Pueraria (leguminous ground cover)

In order to popularise the use of Pueraria as a leguminous ground cover in small holdings of rubber, the Board is operating a continuing scheme for bulk procurement of puraria seeds and distribution through Regional Offices at subsidised rates to small growers. During this year 24,752.350 kgs of cover crop seeds were procured for distribution to Regional Offices along with the previous stock of 284 kgs of seeds purchased earlier. Out of this, 6000 kg was sold to two Plantation Corporations in Tripura and 8,307.650 kgs was distributed to small growers.

Also procured 8.4 kgs of Mucuna seeds collected by Tripura Rehabilitation Plantation Corporation Ltd., Agartala and distributed to small growers through Rubber Producers' Societies in packets of 10 gms at a cost of Rs.0.25 per packet.

7. Scheme for supply of low volume power operated sprayers/dusters

The scheme aimed at popularising the use of low volume power operated sprayers/dusters among small growers for control of leaf diseases was continued. During the period purchase of 90 low volume sprayers/dusters was assisted and a sum of Rs.6,29,280/- was disbursed being subsidy.

8. Financial assistance to small growers for purchase of rubber sheeting rollers

With a view to improve the quality of sheet rubber of small holdings the Board implemented a scheme to extend financial assistance to small and marginal farmers, for purchase of rubber sheeting rollers of standard specification. A total amount of Rs.9,99,000/- was granted as subsidy for purchase of 667 rollers.

9. Financial assistance for bee-keeping

Rubber plantation being a good source of honey during the refoliation period, offers immense potential for beekeeping which generates additional income to small growers from the honey produced. This will be an added incentive to take up rubber plantation. In order to popularise this concept, Board has implemented a scheme for granting financial assistance in the form of subsidy fixed to the tune of 70% and 90% of the unit cost of Rs.1750/- per beehive and bee-colonies to general category and SC/ST category of growers respectively. During the period 865 growers have availed the benefit amounting to Rs.9,57,156.55.

10. Financial assistance for construction of small smoke houses

In order to persuade and help the small rubber growers to adopt better processing and curing technique, Board implemented a scheme by offering financial assistance in the form of 10% subsidy for construction of 85 kg capacity smoke houses. During the period small growers constructed 250 smoke houses with total subsidy of Rs.9,98,000/- from the Board.

11. Financial assistance in respect of irrigation in rubber plantation against drought

Irrigation has been found beneficial for establishment of young plants in the field, reduction of immaturity period, increase in yield and quick renewed growth of tapped bark. The infrastructure for irrigation is capital intensive. Hence in order to motivate and promote irrigation the Board implemented a scheme for giving financial assistance against capital investment incurred by rubber growers for establishing irrigation facilities.

The scheme evoked tremendous response and the entire applicants could not be serviced. A total subsidy of Rs.9,99,999.9 had been disbursed to 555 rubber growers in the traditional areas. In the non-traditional areas, a total subsidy of Rs.5.18 lakhs had been disbursed.

12. Assistance for fencing in non-traditional areas

One of the major constraints in the expansion of rubber cultivation in non-traditional areas is the difficulty in getting young rubber plants established in the field in the early years, due to the menace from cattle and trespassers. Hence in order to establish successful rubber plantation it has to be protected from stray cattle and trespassers by proper boundary protection. Due to the heavy expenditure involved, the small and marginal farmers are not able to make adequate investment on this. Therefore in order to motivate them the Board implemented two schemes for offering financial assistance at two different rates for SC/ST categories and general category growers for fencing rubber areas on standard pattern in non-traditional areas.

During the period, a total amount of Rs.6.54 lakhs was paid as subsidy for fencing in non-traditional areas.

13. Scheme for supply of estate requisites to small growers in non-traditional areas

Majority of the rubber growers in non-traditional areas are small and marginal growers who have taken up rubber planting with the aid/assisance from Rubber Board. A fairly good number of the plantations is reaching the yielding stage. Materials like tapping knives, latex collection cups, coagulating pans, rubber sheeting rollers and such other materials connected with crop exploitation and processing are not available in those areas. The Growers are experiencing great difficulties in getting them. In order to help small growers in non-traditional areas to acquire these materials the Board implemented a scheme to purchase the required item from available sources at cost price and transport them to non-traditional areas at own expenses for distribution to eligible growers allowing subsidy on the cost of materials as applicable in traditional areas. Under the scheme, the following quantum of materials were supplied to the various

offices of the Board in non-traditional areas for distribution to eligible growers during 1989-90.

	Item		No.
1.	Rubber sheeting rollers	..	37
2.	Tapping knives	..	120
3.	Plastic cups	..	50000
4.	Aluminium sieves	..	40
5.	Aluminium trays	..	2000
6.	Rubber coat	..	1000 kg
7.	Emisan	..	50 kg
8.	Cup hangers	..	50000
9.	Spouts	..	50000

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PART IV - RUBBER RESEARCH

The Rubber Research Institute of India, the Research Department of the Rubber Board, continued to concentrate on need based research on various aspects connected with productivity increase, agromanagement practices and post harvest technology. The research work of the different research disciplines as well as that of the regional stations progressed as scheduled during the year under review.

AGRONOMY/SOILS DIVISION

Investigations on the nutritional requirements of rubber during immature and mature phases were continued. The three NPK field experiments on immature rubber were in progress on clones RRII 105 and PB 235. A clone cum fertilizer trial on 10 emerging RRII clones was in progress. One multidisciplinary trial was also started at RRII with new emerging RRII clones. Five new NPK trials were started in five locations with selected treatments. With a view to studying the effect of different complex fertilizers available in the market, seven block trials were also initiated in different locations. Observations on growth of rubber were recorded and fertilizer treatments imposed in all the experiments.

Seven NPK field experiments were in progress on mature rubber. Imposition of fertilizer treatments and recording of yield and growth data and collection of soil and leaf samples were undertaken during the period in all the experiments.

In studies on irrigation and moisture management, one field experiment on mature rubber and two on immature rubber were in progress. One more observation trial was started during the period. Imposition of irrigation treatment during summer and recording of growth and yield were undertaken.

One field experiment on fertilizer cum density of planting is in progress. Imposition of fertilizer treatments and recording of observations on growth and light intensity were carried out. Increasing the density from 445 to 598 did not markedly affect the girth of the trees during the initial four years. Another experiment was started at Regional Research Station, Orissa.

Three experiments on intercropping, one on mature and two on immature rubber, were in progress. Cocoa was not suitable as intercrop under rainfed conditions. Field upkeep and maintenance of rubber and various intercrops were done.

Resource information system for rubber through remote sensing was in progress in two estates.

A field study to investigate the dissolution pattern of various indigenous phosphate rocks were initiated in the RRII farm. Growth of plants as well as the available phosphorus status are being monitored periodically.

Another field trial was initiated at Mundakayam to make a comparative evaluation of various nitrogenous fertilizers, including slow release fertilizers. A glass house study was also taken up simultaneously on this aspect.

Studies to investigate the long term effect of application of urea on sulphur status of rubber growing soils were continued.

Fololllow-up evaluation of the merits of discriminatory fertilizer usage was also continued. A total number of 17,225 soil, 2,520 leaf samples were analysed and discriminatory fertilizer recommendations were offered to estates and small holdings.

BOTANY DIVISION

Tree improvement through breeding and ortet selection continued to be a thrust area of the Botany Division. Investigations on propagation, anatomy and cytogenetics were also in progress. Activities connected with introduction, establishment and evaluation of germplasm being attended to by the Botany Division hitherto, are now being looked after by the Germplasm Division established during the year under report.

1. Breeding and selection

In the 1990 hybridization programme 11,163 distant hybridizations were attempted. The progenies of 1989 hybridization programme were established in a seedling nursery. Juvenile characters of the 1987 and 1988 HP progenies were recorded. The progenies resultant of the 1986 hybridization programme were laid out in small scale trials. The 1983 clones planted at KAU in 1988 were properly maintained. Clones resultant of 1982 HP planted during 1985 were opened for tapping during November 1989. Annual paint marking, numbering and recording of characters were carried out in the clone evaluation field trials. The different seedling nurseries and immature and mature small scale trials were properly maintained.

Ortet selection programme was continued and work was in progress in two large estates and a few small holdings. Fortythree ortet selections from another estate were planted at Mundakayam over an area of 3 ha.

Laid out three large scale trials with modern clones, two at CES, Chethackal over an area of about 14.8 ha. and one at HRSS, Karnataka over 3 ha. Laid out a new block trials with eight clones at Chittadi. Initiated a study on intraclonal variability and sixty trees each from monoclonal stands of four popular clones are under observation. Studies on genetic divergence, prepotency, estimation of genetic parameters etc. were continued. Polybag plants of 14 clones as well as their OP progenies were raised at HRSS, Nettana for field planting during 1990 season.

For investigations into the causes of low fruit set in Hevea, attempted hand pollinations employing four different treatments. Flowers pollinated employing selected treatments were collected and fixed during different intervals for fluorescent studies.

For laying out two multidisciplinary trials during June 1989 nine months old polybag plants of 25 selected clones were raised and made available. Recorded juvenile characters of clones planted in both trials at an age of five and eight months after field planting. Test tapping of the 13 clones in the trial on early evaluation was continued.

2. Propagation and Planting Methods

Budding trial at Tripura being conducted to find out the optimum season for budding as well as to assess the influence of climatic factors on bud-take was continued. Plants of the trial on depth of planting were maintained properly and their secondary characters recorded. Growth characters of the bench grafted plants raised in bags and field were recorded. Grown budded bag plants were transferred to the ground. A comparative study of polybags was laid out. Paint marking and numbering of the trees in all the field trials were undertaken. Diallelic budding was carried out using open pollinated monoclonal seeds and buds of three clones. The budded plants were planted in bags for field planting next year.

3. Anatomy

Studies on interclonal variability of bark anatomical characters and their relationship with yield and other secondary characters were continued. Bark samples collected at 11th year after planting from ten clones were under study. The samples sectioned in two planes were observed under the microscope and a set of characters were recorded. Virgin and renewed bark of the second selections from 1954 HP progenies were studied and the clones were characterised for the number of latex vessel rows and bark thickness. In connection with early evaluation studies, bark anatomy of six clones at the age of three years and eleven clones at the age of four years were studied. Fifteen clones in a trial at Dapchari were studied for anatomical characters. Studies on bark regeneration were continued. Paraffin blocks of the bark samples, collected for studying the process of bark renewal, were prepared. Periodic recordings of bark thickness were continued. The nature and extent of bark regeneration of the hailstorm affected trees at the RRS, Tripura were observed and samples collected for bark study.

Scanning electron microscopic studies revealed the wax pattern, its developmental stages and organographic differences. Utility of the wax pattern in disease management and the role of epidermal structure on organographic specificity to Phytophthora leaf fall disease in Hevea were continued on the basis of wax pattern. The data on stomatal characters of drought tolerant and susceptible clones at the juvenile stage indicated small stomatal aperture as a characteristic feature of drought tolerant clones. A set of characters were recorded with respect to 30 trees, out of the total number of 60 samples, to study inter clonal variability in leaf anatomy.

Wood anatomical investigations were continued. Data pertaining to comparative wood anatomy of seedlings and their respective buddings with respect to proportion of tension wood was summarised. Tension wood proportion in seedling trees was higher than that in the respective buddings in two cases whereas in the third case proportion of tension wood and normal wood was comparable. Proportion of tension wood increased as sampling height increased both in seedlings and in buddings. Studies on wood properties of stimulated trees were continued. Periodic application of stimulant was done as per the programme.

4. Cytogenetics .

Observations were continued in the trials on irradiated polyploids and progenies of natural variant. Daily yield recordings are being carried out in the 1982 polyploid trial. The triploid has not attained tappable girth. Selfing was attempted in the natural variant and the progenies of natural variant.

Meiotic studies on the male sterile clone isolated from the gamma ray induced VM_7 population had shown that there was a wide spectrum of cytokinetic aberrations. Studies on the seedlings progenies from three male sterile clones, namely GT 1, Ch 2 and RRII 35 along with a control MIL3/2 have shown that seeds from the male sterile clones showed early and more germination. The progenies of male sterile clones are more vigorous compared to the control. Test tapping yield also indicated the superiority of the progenies of male sterile clones. The male sterile clones recorded high heritability along with high genetic advance indicating additive gene action. The male sterile clones had good general combining ability. Among the male sterile clones GT 1 showed significant superiority over the other two clones. The selected forty seedling progenies from the male sterile clones were multiplied for further evaluation. Light and scanning electron microscopic studies on pollen morphology of three Hevea species namely H. brasiliensis, H. spruceana and H benthamiana have shown that pollen grains are 3-zonocolporate and there is significant differences among the species with regard to pollen size, exine thickness and ora-diameter. The SEM studies particularly have given a better insight into the fine structure of the exine ornamentation and this provides a new parameter for taxonomic differentiation of the species.

BIOTECHNOLOGY DIVISION

The major thrust area of this Division is the development of a successful mass-scale in vitro propagation system of commercial rubber clones. The experimental in vitro propagation system developed in this Division is being refined to be elevated to a mass-scale propagation system with commercial prospective. In view of this primary objective, multi-directional experiments are under way.

During the planting season of 1989 another batch of 90 tissue culture plants were planted in the field, which are growing well. Some of the anther culture/derived plants are of the actively ongoing programmes of the Division having significant progress. Two new directions of research initiated during this period are (i) Enzymological observations of tissue culture plants vs grafted plants, and (ii) Protoplast isolation and culture.

GERMPLASM DIVISION

The Germplasm Division started functioning since December 1989. Over 5,000 wild genotypes of Hevea brasiliensis introduced so far, have been multiplied and about 45,000 plants are being maintained in the base nurseries in traditional and non-traditional areas. Descriptors are being prepared for characterisation of the genotypes.

Post entry quaratine inspection was carried out by a team from the Plant Quarantine Department and they were satisfied with the precautions taken by us.

/plants were also planted out in the field. In vitro propagation by tissue culture and generation of anther culture

Studies on the floral biology of the 1986 introduction were initiated. Budding for gap supplying in the 1987 source bush conservation is being carried out. Yield data from three germplasm conservation gardens have been recorded regularly.

PLANT PHYSIOLOGY AND EXPLOITATION DIVISION

All the ongoing experiments in the field of exploitation progressed well. Half spiral alternate daily tapping system was found to be more remunerative than third daily tapping system though brown bast incidence was slightly higher in the former system. The results of the experiments on calcium carbide stimulation was continued and calcium carbide was found to show slightly better stimulatory effect than ethephon. Hence three on-farm trials on calcium carbide stimulation were taken during this period.

Studies on effects of different durations of rest period was extended to Karnataka region. The on-going experiment in the traditional region progressed well. The experiments on effect of tapping systems on KRC factor and the experiment on evolving a tapping system suitable for small holders were continued. A new large experiment on low-intensity tapping systems was started in one estate.

In the context of higher incidence of brown bast in high yielding clones efforts to tackle the problem was further intensified. No regional difference was found in the incidence of the syndrome. Analysis of soil in the immediate vicinities of affected trees did not show any significant variation in the levels of major nutrients. Tree-wise analysis of yield was also done to study the yield pattern of affected trees before the incidence of the syndrome. A fast method was successfully developed for quantifying clonal differences in susceptibility to brown bast syndrome. Though results of large scale experiment did not show any preventive effect by application of ayurvedic oil, the results of on-farm trials showed encouraging results. A new estate level experiment was started. In 1989 there was shortage of rainguard adhesive as the production is almost monopolised by one Company. Necessary guidance was given to M/s Indian Oil Corporation in successfully developing a formulation of rainguarding adhesive. The Corporation is expected to market it in the next season. Field testings were made for the suitability of a number of rainguarding materials and stimulants supplied by manufacturers.

Intercropping of medicinal plants.

The trials on introduction of commercially viable species of medicinal plants in mature stands of Hevea were continued. Strobulanthus haenianus produced nearly 5 tonnes/ha of useful dry matter in two years while production from Adathoda vasica was nearly 4 tonnes/ha. In case of Adathoda beddoimmie the production is one tonne/ha. after two years. The production potential of Plumbago rosea was found to be around 4 tonnes/ha. with that of Alpinia galangaas 2.2 tonnes/ha. after growth for one wet season. The various agromanagement and commercial aspects are being studied. The biological bund of Strobulanthus continued to perform well. The species was also found to be a good source of honey.

Biochemical studies

As part of efforts to identify more early prediction parameters, sugars, cyclitols, aminoacids, total acid phosphatase activity etc. were estimated in latex samples obtained by test tapping of high, medium and low yielding clones. It was found that the levels of reducing sugars, soluble amino acids, cyclitols and total phosphorus are low in low yielding clones. In the programme for identifying early prediction parameters by protein mapping/isozymes, electrophoresis was done in leaf samples of eleven clones. Isozymes of peroxidase, acid phosphatase and melate dehydrogenase were studied.

Monthly recording of major yield components in high and low yielding clones were continued. Monthly monitorings were done for the levels of sugars, inositols and for lipids in rubber and bottom fractions. HMG CoA reductase activity (the regulatory enzyme in rubber biosynthesis) was estimated in the bark samples obtained from low and high yielders.

Environmental physiology, photosynthesis and growth

Studies on physiological evaluation of clones in different agroclimates were continued. In the 1982 planted trial the general growth inhibition in North Konkan (RRS Dapchari) was about 5% when compared to the growth attained in traditional region. The comparable growth in Dapchari was partly due to irrigations given. In Dapchari clones, RRIM 600, RRIM 501 and RRIM 612 performed better. In the high elevation (Mudigere) the growth inhibition was around 30%. Comparatively, clones RRIM 703, RRIM 612, RRIM 600, RRII 300, PB 235 and GT 1 performed better. In Wynad (high elevation) there was severe growth inhibition. Here clones RRII 118, RRII 203, LCB 1320, RRIM 600 and PB 28/59 performed better.

In RRS, Dapchari during favourable season maximum photosynthetic rates were recorded in clones RRIM 600, RRIM 612 and RRII 105. During the dry season the rates were higher for clones RRIM 600, PR 107 and RRIM 612. However the inhibition in these clones were around 30-40%. In clones RRII 105, GT 1 and Ijir 1 the photosynthetic rate was negligible. Some of the clones showed repeated wintering. Clone RRIM 612, RRIM 600 and PR 107 showed higher transpirations and stomatal conductance during dry season. Leaf water potentials and latex vessel turgor were also studied.

In the 1987 planted RRII 105 irrigation was found to increase photosynthetic rate during dry seasons by 100 to 150% depending on the treatment.

In the traditional region in the 1988 and 1989 planted clone the overall inhibition in photosynthetic rate was around 50%. Seasonal variations were found in times of peak photosynthetic periods. During dry season RRII clones were found to close stomata earlier than PB clones.

The CO_2 compensation was found to be in the range of 65-70 ppm. Clonal variation was observed in this. The light saturation point was around 400 uE for polybag plants while in detached twigs of grown up plants (sun leaves) it was around 600 uE. Detaching was to inhibit photosynthesis without inhibiting stomatal opening when petiols were cut. But when twigs were cut, such inhibition was less.

Clonal variations were found in transmission of photosynthetically active radiation by closed canopy under field conditions. Studies on yield constraint analysis in the different agroclimatic regions of the traditional area were continued. Soil moisture stress was found to be the major yield constraint in the Malabar region. Two formulations of growth hormones were sprayed at monthly and bimonthly intervals for one year on immature plants of clone PB 217. No convincing growth improvement could be observed.

MYCOLOGY/PATHOLOGY DIVISION

1. Diseases caused by Phytophthora spp.

Aerial spraying experiments in 5 locations were started to compare dosage of coc and spray oil recommended by RRII with dosages used by certain large plantation companies. Three samples of improved spray oil supplied by M/s Indian Oil Corporation were subjected to preliminary testing and one among them was found to retain almost double the quantity of copper.

In the field experiment to determine the optimum volume of Bordeaux mixture, it was found that 4000 lit/ha. and 3000 lit/ha. gave adequate protection in RRIM 600 and GT 1, respectively. The adjacent micron sprayed area had 80% leaf retention, as against just above 75% for Bordeaux mixture.

Out of the 8 promising fungicides tried against shoot rot disease none was found to be superior to control, due to low incidence of the disease.

In the bark rot experiment which was repeated this year also, weekly application of 0.75% Dithane M.45 proved to be most effective.

2. Powdery Mildew Disease

Two rounds of application of 1.5% tridemorph at reduced dosage of 7 kg/ha. along with one round of sulphur dust at 12 kg/ha. in between was found to be better than 4 rounds of sulphur dusting. In young rubber areas 4 rounds of spray application of 0.025% carbendazim alternating with 0.1% sulphur gave equally effective but economical control compared to 4 rounds of 0.05 per cent carbendazim alone.

3. Pink disease

A species of Trichoderma was found to be strongly anatagonistic to pink disease pathogen. A copper containing fungicide Cobox L was found to be effective against this pathogen in laboratory assay. A survey of pink disease incidence at Kaliyar estate, Thodupuzha showed that the clone PB 217 is highly susceptible to this disease and 30-40 per cent disease incidence was noticed in 1-3 year plants. Development of equipments and methodology to give complete prophylactic protection to main stem and branches is in progress.

Preliminary results of the experiment on prophylactic bordeaux paste application at the forking region and at the top shoot indicate that if reduced the incidence of the disease, but its economics compared to curative method has to be worked out.

4. Minor leaf diseases

Dithane M-45 0.2%. Bavistin 0.05%, Delan 0.2% and Baycor 0.025% spray, were found to be significantly effective in controlling the disease.

5. Root disease

A new method of control by drenching the systemic fungicides without excavation of diseased roots is being tried and thiophanate methyl seems to be promising. In laboratory tests bayleton was fungicidal at 50 ppm.

6. Yield loss due to diseases

Yield loss of 9-16% was noticed in the unsprayed year. 15-18% was observed in the subsequent year with spraying. The disease was found to increase plugging index and reduce dry rubber content significantly. The yield loss experiment on four clones at Central Experiment Station, Chethackal is being continued.

7. Biological control of diseases

This is a newly initiated project. Rhizosphere microflora of rubber seedlings in nurseries was screened for fungi, bacteria and actinomycetes with antagonism to Phellinus noxius.

8. Unconventional methods of control of diseases

Prefelling pressure injection of copper sulphate for wood preservation seem to be promising. The lasting effect of the method has to be evaluated.

10. Mycological studies

Ten new isolates of Phytophthora were added including one from Tripura. Both sporangia and oospores of Phytophthora were collected in the spore traps kept over soil surface before the onset of disease on the trees. Repeated microtome studies indicated that the pink disease is in progress. The leaf bit method for evaluating clonal susceptibility to Powdery mildew disease seems to be dependable, on repeating the study.

10. Other studies

Two copper oxychloride formulations were subjected to preliminary tests. A wound dressing compound was tested and approved for use. A field study has been started to evaluate the effect of panel protectants on bark renewal and yield. Regular observations on diseases are being recorded in the multidisciplinary evaluation of newly developed clones. The germplasm collections and hand pollinated seedlings are being screened for Phytophthora resistance by artificial inoculation.

11. Cover crops and nitrogen fixation

Mucuna bracteata was found to be better in providing soil moisture and organic matter, compared to Pueraria phaseoloides, even in dry areas. Two strains of Rhizobium could produce better nodulation and biomass production on inoculation at three regions. A method for small scale production of these two strains has been developed. Under

pathogen enter through lenticells. Studies on the relation of sugars and phenols with abnormal leaf fall disease

shade conditions nitrogen fixation by cover crops is low. The inhibitory effect of seed coat of M.bracteata on rhizobium can be overcome by coating the seeds with calcium carbonate.

12. Rhizophere studies

The antagonistic actinomycete against pink disease pathogen was again field tested and found to be equally effective like Bordeaux paste. A fast growing phosphate solubilizing bacteria was isolated from soil.

13. Pollution due to fungicides and rubber factory effluents

Studies indicated that recycling of water from the PLC factory can be done once without any deterioration in rubber quality. A proprietary antiseptic product was found to be equally efficient as formalin, for cleaning storage containers and factory in centrifuging factory.

14. Insect pests of rubber

In repeated trials Beauvaria brogniatry and B. bessiana were found to give effective control of root grubs and comparable to effective pesticides of isophenphos 5G was and phorate 10G. Anomala spp recorded at rubber nurseries in Orissa. A field trial on control of termites is in progress in Orissa.

15. Non-insect and vertebrate pests

In trials repeated Aldicarb 0.04% and Bromodialone 0.005% baits against rats, Aldicarb 0.1% slurry against slugs and snails, and Fenvol 0.4% and Quinolphes 1.5% against bark feeding caterpillar, were effective.

16. Bee Keeping

Four species of off-seasonal bee forage plants are being established at Central Experiment Station, Chethackal. Out of these two species started flowering.

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Meteorology

The agroclimatic composition prevailing in the rubber growing areas and its impact on growth and production were studied. The microclimate induced by rubber plantation and the spectral distribution of solar radiation were monitored. Different ecoclimatic aspects of rubber were examined in comparison to forest plantations. Established two regional agrometeorological observatories in the traditional rubber growing regions of South India.

RUBBER CHEMISTRY, PHYSICS and TECHNOLOGY DIVISION

The Division continued its work on improvement of NR processing, chemical modification and technology.

1. Primary processing

Sulphuric acid has been tried as an alternative coagulant for latex for the production of sheet rubber. Preliminary studies indicated that sulphuric acid could be used for the purpose without any serious problem, if carefully handled. Cashew apple juice and cocoa serum also have been evaluated as coagulants. Although both

were effective as coagulants, the concentration of acid was found to vary depending upon the source and period of fermentation and hence a general recommendation regarding dosage is difficult. Efforts are being made to further increase the efficiency of the solar dryer for sheet rubber.

2. Chemical modification of NR

Reaction conditions for the preparation of epoxidised NR of 25 and 50 mole per cent epoxidation have been identified. Characterization of epoxidised NR has been carried out using NMR and IR techniques. Bench scale production was also carried out. Efforts are now aimed at developing a pilot plant for the production of ENR. Characterisation of liquid natural rubber (LNR) prepared by thermal depolymerisation has been carried out. Vulcanization of LNR was attempted, but the strength of the vulcanizates was very low. Use of LNR as a reactive plasticiser in nitrile rubber was studied and the results indicated that it is better than conventional plasticisers in resisting shrinkage occuring due to leaching.

3. Rubber Technology

Factors affecting transparency of latex vulcanization have been identified and formulations have been developed for the production of transparent rubber bands. The effect of compounding ingredients like carbon black, process oil and ack, orocess oil and antioxidant on the compression set of NR vulcanizates has been studied at different temperatures ranging from sub zero to 70°C, using three different vulcanizing systems. The effect of contact with solutions of sulphuric acid and sodium hydroxide of different concentrations on the strength properties of different NR vulcanizates has been studied. The effect of carbon black, precipitated calcium carbonate and precipitated silica on the degradation characteristics of NR vulcanizates has been studied. It was found that the rate of degradation of the filled vulcanizates was sharp during the initial periods of ageing, but slowed down on prolonged ageing. The effect of strain in rubber on its ageing behaviour has also been studied. It was found that ageing through main chain scission was faster in samples under strain. Blending of 1, 2 polybutadiene with NR was found to improve the ageing and ozone resistance of the latter. The effect of precipitated silica in these blends has also been studied.

4. UNIDO Project on precured tyre retreading

The evaluation of road performance of 10 radial retreaded tyres received from UK has been completed. The average distance covered by these tyres on Kerala roads was over 50,000 km. The second batch of 76 retreaded bias ply tyres have been received and arrangements for their evaluation are being made.

5. Development of rubber products

A method has been developed for the production of rubber band from lower grades of dry rubber including skim. Further evaluation of the process for commercial production is being made. Rubber pressure plate (a rubber-metal composite) for use in electronic weigh bridges has been developed. Carpet backing process for polypropylene based carpet has been developed.

AGRICULTURAL ECONOMICS DIVISION

Evaluation of planting materials under commercial planting was continued and the third report was completed. the first national seminar on rubber wood was organised on 12.12.1989. Thirty scientific papers were presented at the seminar, which are being published in the Rubber Board Bulletin. The production of rubber seed oil in India in 1988-89 was estimated at 4000 tonnes. It was found that around 40% of Indian honey originated from rubber plantations. A study on the conditions of workers engaged in processing and marketing of rubber has been completed. Survey on management of rubber small holdings at different levels of input is being continued. Visits were made to 108 small holdings and data collected. A census of unregistered small holdings in a ward in Pullyannoor village and a study of cover crops were completed. Study of brown bast incidence in small holdings planted with RRII 105 has been extended to Palghat, Trichur and Nilambur regions from where data were collected from 100 small growers. Study of pineapple intercropping in rubber small holdings has been completed. A case study of block rubber processing industry in India was done. An assessment of the missed linkages in rubber based industry in Kerala was attempted. Economics of two types of rainguards was investigated. Two studies, one on input subsidies and changes in cultural practices of small holdings and the other on adoption of improved methods of planting and processing, were initiated.

CENTRAL EXPERIMENT STATION

The Central Experiment Station at Chethackal, near Ranni, has an area of 254.8 ha. During the year (April 1989-March 1990) the total rainfall received at the station was 2953.4 mm. Crop production during the year was 209,114 kg.

Field experiments were laid out in 15 ha (replanting) during the year. A pilot latex processing centre was also established for producing centrifuged latex. The station has 197 permanent and 210 casual workers on the rolls.

The Research Complex for the North Eastern Region has its headquarters at Guwahati. The regional research stations of the complex concentrated on need based investiations relevant to the respective region. At RRS, Guwahati, evaluation of clones and investigations on nutritional requirements, performance of clones in planters' fields, survey of diseases and pests and creating genetic variability through anther culture were in progress. Agrometeorological studies were also initiated to ascertain the relationship between environmental factors and growth and yield. About 850 wild genotypes introduced from the Malaysian germplasm centre are being maintained in the station.

A Regional Experiment Station has been established at Nagrakata in Jalpaiguri District of West Bengal to ascertain nutritional requirements and study performance of clones.

All the research programmes at the Regional Research Station, Agartala, were continued. Study on yield components was initiated in 15 clones. The Station has been maintaining 353 Brazilian genotypes introduced from the Malaysian germplasm centre. The seedling and budwood nurseries were properly maintained. Tapping was commenced in the 1980 multinutritional trial. A total of 152 soil samples were analysed in the MST and 124 in the laboratory.

During the period under report a new fertilizer recommendation for NE region was published.

At the Regional Research Station Kolasib, a new trial on weedicides was initiated. Action for equipping the laboratory and on procurement of books and periodicals was also initiated.

At the Regional Research Station Tura, projects on botany, agronomy and physiology were continued at Gamolgre. Investigations on mushroom culture were also initiated. In the farm at Darachikagre clone trial, selection from polyclonal seedling genotypes, rubber based cropping system, etc. were in progress.

In the Hevea Breeding Substations at Karnataka and Tamil Nadu the field trials and nurseries were properly maintained and cultural operations were carried out regularly. In both the substations programmes for laying out field trials during 1990 were finalised and arrangements like preparation of planting materials for the experiments were in progress.

All the research projects in the Regional Research Station at Dapchari progressed satisfactorily. In the trial on dry farming techniques, though there was not much response in growth some of the treatments resulted in reduced leaf injuries. Experiment on contact shading was continued and contact resulted in positive growth performance. Even the 5% and 10% China clay sprayed plants have shown higher chlorophyll content and maintained better leaf water potentials over control plants. There was no difference in the incidence of casualties among basket shaded and unshaded plants. However, shading was found to increase growth considerably. Mulching trial was also continued. The results indicate that plant with irrigation both with and without mulch showed 30% growth. Irrigated plants with normal mulch showed good growth compared to other treatments. In basin/drip irrigation trial of 1987 plants, it was observed that plants with full potential of water requirement has attained good girth increments when compared to control. Drip irrigation with 75% potential has better performance compared to other drip treatments. Yield and yield components along with water relations were studied in Parali Estate in two clones (GT 1 and RRIM 600) which were opened for tapping in March 1989. Monthly observations were taken for different physiological parameters. It was observed that clonal differences were not significant, though monthly differences were significant. Rubber yields were better in mild stress periods. One year data showed that economic tapping is possible from July to February. First year yield was found to be around 500 kg/300 trees in clone RRIM 600 and around 450 kg/300 trees for GT 1.

PART V

RUBBER PROCESSING

The Department of Rubb er Processing, established in 1977, continued to function with six major Divisions namely Engineering, Quality Control, Technical Consultancy, Factory Management, Economics & Finance, and Marketing and Administration unit. The main functions assigned to the Department were the following:-

1. Provision of technical assistance for the Crumb Rubber factories established under the Kerala Agricultural Development Project.

2. Provision of engineering services for establishing modern processing factories, besides undertaking civil and electrical works for the various departments of the Board.

3. Running of the Central Testing Laboratory established under the Kerala Agricultural Development Project for providing analytical services and technical advice to rubber processors besides implementing the scheme for ISI marking of latex concentrates and dry rubber.

4. Running the Pilot Crumb Rubber Factory (PCRF) and Pilot Latex Processing Centre (PLPC) at Central Experiment Station at Chethackal for undertaking Research & Development activities connected with modern methods of processing.

5. Provision of technical assistance and consultancy services to rubber processing and rubber products manufacturing units.

6. Provision of assistance in training of entrepreneurs in the manufacture of latex and dry rubber goods and in the quality control of raw materials and finished products.

7. Conduct of market surveys and studies, and collection of data on price movements of various forms of rubber.

8. Provision of assistance to Co-operative Societies, Rubber Producers Societies and implementation of schemes for the benefit of small growers.

9. Implementation of projects for popularising the use of compounded rubber and speciality rubbers.

10. Arrange market promotion activities connected with selling of rubber as value added products.

11. Help re-vitalisation of rubber based sick units.

The details of the work done during the year ended 31st March 1990, in fulfilment of the functions and the major achievements are as follows:-

I. Technical Assistance to Crumb Rubber Factories under KADP.

The Department continued to provide engineering and technical assistance to the following 6 crumb rubber factories established under the Kerala Agricultural Development Project for improving production and marketing.

1) Indiar factory owned and operated by Palai Marketing Co-operative Society Ltd.

2) Kanjirapally factory owned and operated by the Kerala State Co-operative Rubber Marketing Federation Ltd.

3) Malabar factory owned and operated by the Kozhikode District Co-operative Rubber Marketing Society Ltd

4) Mannarghat factory owned and operated by the Palghat District Co-operative Rubber Marketing Society Ltd

5) Corubber factory owned and operated by the Thodupuzha Taluk Co-operative Rubber Marketing Society Ltd.

6) MRM factory owned and operated by the Muvattupuzha Co-operative Rubber Marketing Society Ltd.

During the year, these factories produced 9443.270 M. Tonnes of technically specified rubber as against 8885.495 M. Tonnes during the previous year. Four factories started production and marketing of General Purpose Natural Rubber, a speciality form of NR geared to meet the requirements of manufacturers of high grade steel belted conveyor beltings. Also, one of the factories - Indiar Crumb Rubber Factory - diversified their product mix to various latex grades of Indian Standard Natural Rubber including viscosity stabilized natural rubber.

II. Engineering Services

Provided engineering services in the setting up of new modern processing factories on a consultancy basis. The details are :-

1) Continued to provide technical assistance for the construction of the centrifuge factory of M/s.Tripura Forest Development and Plantation Corporation.

2) Provided technical assistance to M/s.Rehabilitation Plantations Ltd., for setting up their crumb rubber factory. Inspected the machineries, supervised their erection and electrification of the factory. The factory is almost ready for commissioning.

3) Provided technical assistance for electrification of the new chappal factory owned by the Kanjirapally Co-operative Rubber Marketing Society Ltd.

4) Assisted in the preparation of the plan and design of the workshed and office building for the Indiar Crumb Rubber Factory.

5) Prepared the general layout plan, estimates and tender documents for the civil works of the centrifuge factory at Vellavoor proposed to be established by the Changanacherry Co-operative Rubber Marketing Society.

6) Prepared estimate for effluent treatment plant for the centrifuging factory at Sullia belonging to the Karnataka Forest Development Corporation.

7) Inspected various sites proposed for establishment of processing factories by the following organisations and made recommendations on the suitability of the sites.

a) Kaduthuruthy Rubber Marketing Society for setting up a creaming factory.

b) Malankara Estate for setting up a centrifuge factory.

c) Kasaragod District Co-operative Rubber Marketing Society for setting up a latex centrifuge factory.

d) Kerala State Co-operative Rubber Marketing Federation for setting up an Intermix unit.

e) Thiruvalla Co-operative Rubber Marketing Society for setting up a latex centrifuge factory.

f) Gandhigram Agro-based Industrial Co-operative Society Ltd., for setting up a latex centrifuge factory.

g) Monippally Marketing Society for setting up a creaming unit.

h) Harijan Industrial Co-operative Society for establishing a centrifuging factory.

i) Periyar Latex (P) Ltd., for setting up a centrifuging factory.

8) Provided technical assistance to M/s.State Farming Corporation Ltd., for establishing a centrifuging factory. Designs were completed and tenders were floated.

9) The offers received by M/s.Indiar Crumb Rubber Factory for the fabrication of a Pre-breaker were evaluated and recommendations made.

10) Got developed a mechanised rubber roller for making sheets, conducted trial runs and recommended its use in Group Processing Centres.

11) Evaluated offers received for the procurement of pump sets for nurseries at Madhya Pradesh and Ulickal.

12) Provided technical assistance to the centrifuge factory of M/s.Meenachil Society for the electrification of their effluent treatment system.

13) Held discussions with the officials of ONGC regarding use of natural gas for processing rubber in Agarthala area.

14) Evaluated the indigenously developed centrifuging machine and recommendation made.

15) Helped the Malankara Rubber Factory in the maintenance of their drier and in the installation of a new belt conveyor.

Besides these, arrangements for the provision of consultancy services for setting up of modern processing factories by the following companies and/or co-operative societies were made.

1. Pazhassi Rubbers (P) Ltd
2. Pamba Rubbers (P) Ltd
3. Periyar Latex (P) Ltd
4. Sreekandapuram Latex (P) Ltd
5. Ponmudi Rubbers (P) Ltd
6. Gaico Ltd
7. Kasaragod Dist.Cooperative Rubber Marketing Society Ltd
8. Thiruvalla Co-operative Rubber Marketing Society Ltd.

The consultancy services included assistance for selection of sites, preparation of factory layout, project reports, estimates for civil works; specifications for plant and machinery and plant layout. Floated tenders for civil and electrical works for plant and machinery, evaluated the tenders, followed up with contractors and suppliers, supervised civil and electrical works, inspected plant & machinery, erection and commissioning of the factory. Assisted in recruitment and training of the key personnel.

Offers were obtained from consultants/architects to work as our consultants. Negotiations were conducted with selected parties and a list of consultants was drawn up. Agreements were then entered into with these consultants for making available consultancy services for civil works for the factories. The consultants selected and the job assigned are given below:

Name of consultants	Works awarded
(1) M/s.CR Narayana Rao Architects & Engineers Madras.	Part of the services for civil works for setting up the crumb rubber factory of Pazhassi Rubbers and the centrifuge factory of M/s.Gaico. Complete consultancy services for setting up of the crumb rubber factory belonging to M/s.Pamba Rubbers (P) Ltd.
(2) M/s.Santhosh & George Architects & Associates Cochin.	Consultancy services for the civil work in respect of the crumb rubber factory of M/s.Sreekandapuram Latex (P) Ltd and latex centrifuge factory of M/s.Kasaragod Co-operative Rubber Marketing Society.
(3) M/s.MM Philip & Co Kottayam.	Consultancy services for civil construction of the centrifuge factory of M/s.Periyar Latex (P) Ltd.
(4) M/s.Philip Mathew & Associates, Kottayam.	Consultancy services for civil construction of the centrifuge factory of M/s.Thiruvalla Society.

Engineering assistance/services in connection with the following items were also rendered during the year.

1) Civil construction and electrification of the PLPC at the Central Experiment Station Chethackal and commissioning the centrifuging machine at the centre.

2) Completed the HT conversion work at RRII and the sub station was charged.

3) Prepared the lay out for the creaming units of CES, Chethackal.

4) Selected and evaluated pump sets for Central Experiment Station.

Besides, executed directly civil works costing Rs.13.66 lakhs (excluding smoke houses) during the year. A list of various items of work completed during the year is given below.

Sl.No.	Name of the work	Cost of work done (Rs)
1	Centrifuging factory building at CES Chethackal.	7,02,698
2	Effluent ponds, septic tank water tank etc at CES, Chethackal.	3,00,000
3	Water supply facilities to Type II and III quarters at CES, Chethackal.	43,827
4	Office cum lab.building at CES,Chethackal.	98,140
5	Canteen building at CES, Chethackal.	1,84,160
6	Repair of fencing at RRII	20,386
7	Earth filling in rat-proof fencing at RRII	17,045
		13,66,256

The following items of civil works estimated to cost Rs.6.07 lakhs were also initiated during the year and all these are in progress.

Sl.No.	Name of work	Estimated cost of work(Rs)	Remarks
1	Water tank at Central Nursery, Karikattoor.	35,000	The contractor abandoned the work and hence arrangements were made to carry out the same departmentally.
2	Fencing around Tribal Rubber Plantation at Achencoil.	1,66,280	Nearing completion
3	Drain to approach road to Guest house at RRII.	28,500	Nearing completion
4	First floor over Central lab, RRII.	3,78,000	Nearing completion
		6,07,780	

In addition to the above works, supervised the construction of smoke houses for 25 Rubber Producers Societies (RPSs) under the Board's subsidy scheme. Out of the 25 smoke houses, wo work of 12 have been completed, 3 are nearing completion and 10 are in progress.

III. Running of the Central Lab.

(a) Analytical services rendered

The Central Lab continued to provide analytical services in connection with standardisation and quality control of raw rubber, latex and latex concentrates, and for treatment and disposal of factory effluents. A total number of 28,960 analytical determinations on latex, dry rubber and effluent samples were made during the year as against 17,942 determinations during 1988-89. An amount of Rs.3,06,700/- was collected as testing fees against Rs.1,59,048.50 during the previous year.

(b) Promotion of quality marketing of NR

Continued to implement the ISI marking scheme for Raw Natural Rubber and Latex Concentrates in collaboration with the Bureau of Indian Standards. During the year a total of 453 inspections of processing units were carried out, samples collected and tested for the various parameters specified by BIS as per the stipulation in the scheme of inspection and testing. A total of 11,119 analytical determinations were made in the lab and the results along with inspection reports were communicated to the BIS. Also the processing units were given proper advice on problems of quality control. An amount of Rs.2,14,243/- was received from the BIS towards the Board's share of ISI marking fee as against Rs.72,800/- during the previous year.

(c) Miscellaneous works

In addition the following works were carried out.

1) Recommended processor's licence for setting up 11 rubber processing factories, and for the suspension of 3 licences for violation of Section 48 of the Rubber Rules 1955 which specifies the quality of rubber to be maintained.

2) Participated in the 'International Round Robin Test' on dry rubber, carried out by the RRIM. The samples received in this connection were tested and the results were communicated.

3) Evaluated the sheet drier developed by M/s.Low Heat Driers, Kizhakkambalam. Based on the evaluation, two of the models viz.RRSD 160 and 240 were approved for procurement by small holders, under Board's scheme.

4) Rendered technical assistance to M/s.Rehabilitation Plantations Ltd for production of Cenex to meet the requirements of Hindustan Latex Ltd., Trivandrum.

5) Provided technical assistance for the development of effluent treatment plant to two centrifuge factories, 3 crumb rubber factories and 3 crepe mills. The problems of effluents generated in commercial crepe mills were studied and recommendations were forwarded to the Pollution Control Board.

IV. Running the PCRF at Kottayam and PLPC at CES

During 1989-90, made strong efforts to make optimum use of available facilities in the two factories for production as well as for undertaking R & D activities connected with modern methods of latex processing and the major achievements are given below.

(a) Pilot Crumb Rubber Factory

1) The Pilot Crumb Rubber Factory produced 406.6 M.Tonnes of technically specified block rubber against 315.5 M.Tonnes during the previous year. The sales turnover was Rs.98.85 lakhs as against Rs.60.35 lakhs for the previous year. The higher productivity was achieved by reducing the down time of machinery and labour absenteesm. There was an overall improvement in quality of the produce mainly owing to introduction of a pre-cleaning hammer mill.

2) The factory diversified its production activities by regular production of Constant Viscosity Rubber and General Purpose rubber, which were made available for evaluation by selected consumers.

3) Modified the effluent treatment system of the factory to make it more efficient and to reuse the treated effluent for production purposes.

4) Evaluated a proprietory coagulant marketed as latex acid and cocoa factory serum as latex coagulant. Cocoa factory serum was found useful for coagulation of latex for block rubber production. It is used in the factory on a regular basis for reducing the cost of production.

5) Initiated studies on the effect of storage of scrap rubber on initial plasticity and plasticity retention index of the processed rubber. Also initiated a study on dry rubber realisation of fresh scrap generated in estates.

(b) Pilot Latex Processing Centre

1) The processing centre produced 102.3 M.Tonnes of concentrated latex and 18.3 M.Tonnes of skim rubber. The sales turnover was Rs.18.9 lakhs.

2) Through the working of the factory in the initial 3 months, the problems connected with processing of small holders' latex into high ammonia latex concentrates were studied. The results clearly indicated that the major problem is the incidence of high volatile fatty acid content of the finished products. Various methods were tried and use of zinc oxide and TMTD along with Ammonia at low levels for the initial latex preservation was found to be the effective method to control high volatile fatty acid content in latex concentrates produced by small holders.

3) Standardised the procedure for production of high quality concentrated latex from field latex of small holders using the low ammonia zinc oxide TMTD system of preservation. The LA-TZ latex produced by the PLPC has proved to be quite acceptable to the latex consumers, as it is more economical and can reduce the incidence of atmospheric pollution.

4) Studies carried out in the PLPC have established that by double centrifuging, the VFA of latex collected from small holders can be made to conform to the standards fixed by the Bureau of Indian Standards.

5) Initiated studies on creaming of skim latex to increase the efficiency of rubber recovery from the skim faction.

V. Provision of technical assistance and consultancy service

A variety of technical assistances and consultancy services were provided to rubber growers, rubber processors and rubber goods manufacturers in the form of project reports, project profiles, technical bulletins and modernisation guides. A sum of Rs.4.53 lakhs was levied as fees against 4.02 lakhs during 1988-89. The important items of work done and/or achievements made in this respect are the following.

1) Developed 24 project reports relating to processing of NR into crumb rubber, concentrated latex and/or creamed latex. Five more are in the process of finalisation. Prepared 4 project reports on Rubber products manufacture.

2) Developed the following project reports also during the year.

a) Project report on Rubber Nursery for M/s.Field View Rubber Nursery at Puthuppally.

b) Project report on treatment and seasoning of rubber wood.

c) Project report on polythene sheets, bags and latex collection cups.

3) Prepared 4 project profiles relating to rubber products.

4) Completed development of 8 technical bulletins relating to rubber products.

5) Developed a modernisation guide on surgical gloves for the Small Industrial Service Institute, Trichur.

6) Samples received from 239 units were tested and offered advices based on the test results.

7) Samples of latex products like foam, gloves, rubberised coir, etc were tested and results were communicated in 187 cases.

8) Collected Radiation pre-vulcanised latex from Japan and Indonesia and studied its technological properties. Latex films were prepared from 12 samples of irradiated latex and its technological properties were determined.

9) Continued the efforts for the development of rubber products for new applications and/or for import substitution during the year and as a result, made the following achievements.

a) Developed knowhow for the manufacture of gaskets for M/s.Jindal Aluminium Ltd., Bangalore.

b) Developed Natural Rubber Sonobony chords for M/s.Tata Electronic Development Services,Bangalore.

c) Prepared a sample of latex adhesive for M/s.Kelachandra Polymer Ltd., Chingavanam.

d) Developed pharmaceutical closures based on NR and Butyl Rubber for Shri Prakash George Mathew, of Cochin.

e) Developed NR diaphram valves for M/s.Instrumentation Ltd., Palghat.

f) Developed low percentage flash crio crumbling for M/s.Indian Polymers, Hyderabad.

g) Developed a compound for producing printing kit for M/s.Johnson Plastimet, Trivandrum.

h) Prepared an NR based solution adhesive for M/s.Gokhru Chemicals, Bilwara for use in fixing Agmark labels.

i) Developed a Neoprene compound for the impeller of Caterpillar Auxiliary Engine for M/s.Fisheries Survey of India.

j) Standardised a Neoprene compound for M/s.Thungabhadra Steel Works, Karnataka and for production of sea water pump impeller to M/s.Philip Kochenayil, Kumarakom.

k) Developed and supplied rubber tubings to M/s.Triton Valves Ltd., Bangalore and rubber lids for BEL, Bangalore.

l) Developed a Neoprene based adhesive for M/s.Bilal and Co., Madras.

m) Developed seamless white rubber bands for M/s.Kanam Latex Industries.

n) Standardised Rubber Compounds for balloons and channels for M/s.Mobike Accessories (P) Ltd., Tamilnadu.

o) Developed a compound for lining for M/s.Navbharat Industrial Linings and Equipments Ltd., Hyderabad.

p) Developed rubber compound for polythene heat sealers for M/s.Sevana Electricals, Kizhakkambalam.

q) Formulated a sponge rubber compound for production of floor vipers by M/s.Manoj Steel Industries, Trivandrum.

r) Prepared a floor mat compound for M/s.Mobike Accessories.

s) Developed uridrain condomns to Shri V Rajan Paul, Edathala.

Apart from these, 3 M.Sc Polymer Chemistry students of Gandhiji University were given guidance in their dissertation work on the following projects.

1) Pre-vulcanised latex
2) Low Ammonia Latex
3) Degradation studies of latex vulcanisates.

VI. Market surveys and price movements

a) Study on Automobile Rubber Products

In order to ascertain the possibilities of establishing new automobile rubber components producing units in Kerala, a market survey on marketability of Automobile Rubber Products was conducted and a report was prepared.

b) Collection of Data on price movements

Continued collection of data on price movements. The prices of RMA-IV, V and Ungraded rubber were collected from selected dealers and manufacturers at Cochin and Kottayam and reports were sent to the Govt and to the press for publication.

VII. Provision of assistance to co-op.societies and RPSs and implementation of schemes for the benefit of small holders.

Efforts for the modernisation of small holdings through the establishment of village level Rubber Producers' Societies and implementation of various schemes through them were continued.

(1) Scheme for financial assistance to RPSs for setting up of Smoke House.

The scheme for financial assistance to RPSs for setting up Smoke House was continued during the reporting period. A total subsidy of Rs.7,19,744.50 was released to 21 RPSs for construction of smoke houses. The construction of 12 smoke houses was completed during the period and 9 were under different stages of construction.

(2) Scheme for financial assistance to RPSs for setting up of Group Processing Centre.

Under this scheme, a total amount of Rs.1,46,344.12 was paid to 8 RPSs to set up Group Processing Centres. The following equipments were also supplied to RPSs for equipping the Group Processing Centres.

Roller Set	-	2
Air Oven	-	3
Chemical Balance	-	4

(3) Scheme for financial assistance to RPSs for setting up of Latex Collection Centres.

The following equipments were supplied to RPSs for setting up of latex collection centres.

Platform Balance	-	42
Chemical Balance	-	33
Air Oven	-	34

(4) Scheme for equipping sheet and scrap rubber collection centre at the village level.

Under this scheme, 77 Platform balances were supplied to RPSs for equipping their sheet and scrap collection centres. The concerned RPSs were assisted in the procurement and marketing of the scrap and sheet rubber produced by their members. Concerted efforts were made to induce tyre companies to purchase rubber direct from RPSs. Major companies like M/s.Dunlop India, M/s.MRF, M/s.Vikrant Tyres and M/s.Modi Tyres and the Kerala State Cooperative Rubber Marketing Federation participated in the scheme of procurement. Rubber Producers Societies (119) procured 5,24,796.30 kg of different grades of sheet rubber and marketed against 2,098.60 kg during the previous year.

(5) Schemes for provision of assistance to Co-operative Societies

During the reporting period continued implementation of schemes for providing -

(a) Financial assistance to primary marketing cooperative Societies in non-traditional areas.

(b) Subsidy for installation of diesel generator by processing cooperatives.

(c) Financial assistance to co-operative societies for setting up processing units.

An amount of Rs.13,79,732.91 as refund of the various assistances and/or dividend, were recovered, details of which are given below:-

Sl.No.	Items		Amount received(Rs)
1	Refund of share capital contribution given for marketing	:	6,76,800.00
2	Refund of working capital loan given for marketing	:	3,85,256.00
3	Refund of Lorry Loan	:	10,000.00
4	Refund of loan given for setting up Testing Lab.	:	55,000.00
5	Payment of interest including penal interest due	:	1,52,923.61
6	Refund of S.C.C. for improving processing	:	40,000.00
7	Dividend due to the Board	:	59,753.30
			13,79,732.91

VIII. Implementation of Projects for popularising the use of compounded rubber and speciality rubbers.

Efforts were made to popularise technically specified natural rubber highlighting the properties and advantages of latex grade crumb rubber and GP rubber. For popularising the use of speciality latex (LA-TZ latex), organised a workshop at Bangalore on Foam Rubber production where use of the speciality latex for foam rubber production with cost benefits was stressed. The following papers were presented in the workshop.

(1) Selection of raw materials for latex foam manufacture

(2) Compounding and processing methods for Foam manufacture

(3) Quality control of latex foam products.

IX. Market promotion activities connected with the selling of rubber as value added products

A second revised edition of the Directory of Rubber Goods Manufacturers in India has been brought out. This Directory gives state-wise and product wise classification of all rubber products manufactured in the country. A general write up on Rubber Industry in India, list of processors of rubber and latex etc are the special features of this Directory.

Another notable work is the assistance given to rubber goods manufacturers to come into contact with the potential buyers both from India and abroad. A number of foreign buyers of rubber goods have been identified and export promotional activities were undertaken. Indian manufacturers were made aware of the potential market abroad citing various export incentives available. Gloves and rain suit manufacturers have been informed about the export-opportunities.

There is a proposal from a Srilankan firm to set up a joint venture for producing cycle tyre. The matter has been brought to the notice of cycle tyre manufacturers.

Prepared lists of EBC and centrifuged latex processors and list of manufacturers of moulded and extruded goods, rubber tube, rubb erised coir mats, bicycle, auto tyres & tubes, crepe mills and rain coats, gloves etc. These were supplied on request to various parties in India and abroad. Also prepared a circular on the profitable use of PA-80 rubber for the manufacture of extruded and calendered rubber products and sent to manufacturers for promoting the use of PA-80.

An indepth study on the rubber based manufacturing industry in India was conducted by a team of 5 officers of the Board with the assistance of two consultants appointed by the Asian Development Bank in order to help them prepare a report on Development of Rubber based Manufacturing Industries in ANRPC member countries.

With a view to encouraging local rubber goods manufacturers to boost their exports, continued computation of the difference between the prices of NR in India and in the international market and working out the NR subsidy payable to the exporters of rubber goods.

X. Revitalisation of Rubber based sick units

Took measures for the revival of sick units by providing technical knowhow and guidance for the manufacture of diversified products and finding market for the same. Punchavayal Cooperative Society is one such sick unit. Under the revival scheme, this society was provided with technical knowhow and guidance for the manufacture of rubber lids and sponge sheet rubber.

A revival scheme for the Rubber Industrial Cooperative Society, Kottayam was also prepared.

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Part VI - Administration

The major functions of the Department of Administration consist of constitution/reconstitution of the Board and its committees, ie, the bodies that give frame policy directions to the various activities to achieve the objectives envisaged in the Rubber Act, maintenance of Board's establishment, collection of cess, licensing of rubber dealers and rubber goods manufacturers, market intelligence activities, collection of statistics, publicise Board's schemes and activities, execute labour welfare measures, attend to vigilance and legal functions and training of employees.

The functions are carried out through the following Sections/Divisions/Offices.

1. Establishment (General & Personnel Administration)
2. Board's Secretariat
3. Excise Duty
4. Market Intelligence
5. Licensing
6. Statistics & Planning
7. Publicity and Rubber Promotion
8. Labour Welfare
9. Internal Audit
10. Legal and Vigilance
11. Hindi
12. O & M
13. Sub/Liaison Offices.

The Statistics & Planning Division, Publicity and Rubber Promotion Division and the Vigilance Section are functioning directly under the Chairman. Other sections and the Sub/Liaison Offices in Madras, Bombay, Calcutta, New Delhi, Bangalore, Jullundur, Ahmedabad and Kanpur are controlled by the Secretary.

I. 1) General Administration/Staff Welfare/Labour Welfare

The activities of the Board for the year 1988-89 were documented through an Annual Report which was presented to the Govt. after approval of the Board at its 113th Meeting held on 29.9.1989. The children of rubber plantation workers were granted educational stipend amounting to Rs.12.50 lakhs as a labour welfare measure. Apart from this the Board disbursed Rs.10.65 lakhs towards Medical Attendance, Personal Accident cum deposit and Housing Subsidy Scheme as labour welfare measure.

Eligible employees were granted children's educational allowance/reimbursement of the tuition fee etc. During the period 50 employees were given advance of Rs.17,99,959/- for construction of own houses and Rs. 3,13,280/- was paid to 29 employees as vehicle advance. Maintenance works of the office buildings and the staff quarters were done as necessary and water supply/electricity facilities were ensured to all Head Quarters Offices/ Staff quarters. To make the concerned officers and staff mobile in their bid to serve the producers and consumers of rubber, the Board owned 73 vehicles which were maintained in good condition. The services of the post, telegraph, telephone and telex were harnessed to advantage in establishing a good communication link between the Board and its clientele.

..45

I. 2) Personnel Administration

Selection of suitable personnel essential for the smooth functioning of the Board was ensured during the period by following recognised recruitment procedures and statutory provisions relating to reservation of posts for candidates from the SC/ST category. There were properly constituted selection committee/DPCs for selection of personnel by evaluating merits and skills while vacancies on the Board's establishment were filled up. Periodical returns on the personnel recruited were sent to the Govt. and Employment Exchange. Service Book, Leave accounts and personal files of employees were properly maintained. Retirement benefits were given in time to all the employees who superannuated during 1989-90.

The total number of officers and staff under the Board as on 31.3.90 was 1870, a groupwise break-up of which is given below:

No. OF OFFICERS AND STAFF UNDER THE BOARD AS ON 31.3.1990

Name of Department	G R O U P				Consoli-dated pay	Total
	'A'	'B'	'C'	'D'		
Administration	25	57	180	20	-	282
Rubber Production	60	277	669	73	12	1091
Research	47	106	180	28	16	377
Rubber Processing	15	24	39	6	2	86
Finance & Accounts	3	4	20	1	-	28
Department of Training	1	2	3	-	-	6
GRAND TOTAL :	151	470	1091	128	30	1870

2. Excise Duty (Cess) on rubber

Under Section 12(1) of the Rubber Act 1947, a duty of excise, not exceeding 50 paise per kg. is to be levied on all rubber produced in India. The Rubber Board has been entrusted with the responsibility of collecting the cess under Section 12(2) of the Act. The cess is collected on the quantity of rubber acquired by the manufacturers except in the case of Sole Crepe rubber, which is collected from the producers. Every manufacturer has to obtain a licence from the Board to acquire natural rubber, and he is bound to give monthly and half yearly returns showing the quantity of rubber acquired and consumed. It is on the basis of the purchases reported in the returns that the assessment of cess is normally made.

2.1 Issue of Licence

Licences are issued to purchase raw rubber by prospective manufacturing units and these are renewed in subsequent years under Rule 40 of the Rubber Rules, 1955. Some manufacturers after exhausting the licensed quantity of rubber apply for licence to acquire additional quantity.

..46

Supplementary licences are issued to them. There are also cases where manufacturers holding the licences require permission, in an emergency, to sell rubber acquired to another manufacturer who is also holding a valid licence. In such cases, emergency licences are issued under Rule 40 A.

The details of licences issued during the year 1989-90 are given below:-

	1989-90	1990-91
a) Fresh licences	488	12
b) Renewal licences	889	3352
c) Supplementary licences	54	-
d) Emergency licences	6	-
Total	1437	3364

During January/March 1989 i.e. the last quarter of the financial year 1988-89, licence in respect of 3508 manufacturers were renewed for the year 1989-90. Thus, the total number of licences issued for the year 1989-90 was 4945.

During 1989-90 the licences in respect of 13 manufacturers were suspended on account of serious irregularities and mal-practices detected in their business. Besides, licences of 4 units were cancelled at their own request. Thus, barring the supplementary and emergency licences issued to 60 manufacturing units and the four units whose licences were cancelled, the total number of manufacturers as at the end of 31.3.1990 was 4881. Their statewise distribution is furnished hereunder:-

Sl. No.	Name of the State/ Union Territory	No. of Units
1.	Kerala	767
2.	Maharashtra	57[illegible]
3.	Punjab	529
4.	West Bengal	48[illegible]
5.	Uttar Pradesh	48[illegible]
6.	Tamil Nadu	47[illegible]
7.	Delhi	39[illegible]
8.	Gujarat	30[illegible]
9.	Haryana	23[illegible]
10.	Karnataka	21[illegible]
11.	Andhra Pradesh	14[illegible]
12.	Madhya Pradesh	8[illegible]
13.	Rajasthan	6[illegible]
14.	Bihar	4[illegible]
15.	Orissa	1[illegible]
16.	Pondicherry	1[illegible]
17.	Goa	1[illegible]
18.	Himachal Pradesh	1[illegible]
19.	Daman	[illegible]
20.	Assam	4
21.	Jammu & Kashmir	4
22.	Tripura	4
23.	Manipur	[illegible]
24.	Mizoram	[illegible]
25.	Sikkim	[illegible]
	Total	488[illegible]

The list of licensed rubber manufacturers was prepared, printed and supplied to the rubber dealers and the public for reference.

2.2 Registration of letter of authorisation to purchase rubber by dealers on behalf of manufacturers.

Apart from the issuance of licence to the manufacturers, registered 1177 letters of authorisations of the manufacturers in favour of dealers to purchase and despatch rubber on their behalf.

2.3 Registration of Branch/Purchase Depot.

On the basis of the application received from the manufacturers, 3 new branches/purchase depots were registered during the year.

2.4 Letter of authorisation to purchase rubber

Apart from the issue of regular licence, 5 (five) letters of special authorisation were issued to organisations/Institutions to acquire rubber for experimental purpose, after collecting the cess in advance.

2.5 Assessment of Excise Duty on rubber

During the financial year 1989-90, 9,482 half yearly returns were received from various rubber goods manufacturers and Sole Crepe Producers and 1,338 reports on inspection of the books of accounts of manufacturers from the various Liaison Officers and other inspecting officials. The inspection reports were cross checked with relevant half yearly returns of the manufacturers and the monthly returns of dealers who supplied rubber to them. There were short reporting of purchased quantity in 191 cases involving 743429 kg. of rubber. Additional assessment of cess for Rs.3,71,589/- was made. The total amount of cess assessed during the period was Rs.14.25 crores.

2.6 Collection of Excise Duty on rubber

The amount of cess collected during the period far exceeded the target fixed. As against the target of 13.75 crores, the actual collection rose to Rs.14.15 crores, which was remitted to the Bank for credit to the Consolidated Fund of India. The amount included Rs.48.89 lakhs being realisation of old arrears.

2.7 Court Cases

The order of the District Court staying the Board's assessment of cess on rubber from one manufacturer in Kanpur was vacated.

A claim petition was filed before the Certificate Officer, Alipore for recovering the outstanding arrears of cess dues from one manufacturer in Calcutta.

Service charge of Rs.75 per licence where annual rubber consumption does not exceed 4 tonnes and Rs.200 in thecase of other rubber manufacturers was introduced with effect from 1st November 1989 in connection with the issue of licences. As a result, an additional amount of Rs.7 lakhs could be moped up approximately.

..48

3. Licensing of rubber dealers

Licences are issued to rubber dealers and of processors under Section 14 of the Rubber Act and Rule 39A of the Rubber Rules 1955.

The strength of the rubber dealers was 6450 at the beginning of the year. This went upto 6886 at the close of 1989-90. Similarly the number of the licensed processors which was only 88 at the start of the year went upto 113 as the year came to an end.

3.1 Dealers Licence

During the year 1572 dealers licences were issued of which 965 were new licences. A total of 99 applications had to be rejected since the requirements with regard to issue of licence could not be satisfied by the applicants.

Of the above 1,572 licences,1225 were for one year with validity upto 1989-90 (957 fresh licences and 268 renewal cases), 11 were for a duration of two years with validity upto 1989-91 (3 fresh and 8 renewal licences) and 336 were for 3 years with validity upto 1989-92 (5 fresh & 331 renewal licences). There were five short period licences also under the fresh licences issued.

In addition, 2,280 licences were granted to take effect from 1.4.1990; 1025 for one year period of 1990-91; 128 for two year period 1990-92 and 1127 for three years, 1990-93.

3.2 Suspension/revocation of dealers licence.

During the period under report 28 licences were suspended on account of serious irregularities in rubber business and 8 licences were revoked on account of the violation of the provisions of the Rubber Act and the Rubber Rules 1955. The orders of suspension of 8 licences (2 relating to 1987-90, 3 relating to 1988-91 and 3 relating to 1989-92) were later rescinded on getting satisfactory explanation/documentary evidence from the dealers concerned.

Death of licencees resulted in cancellation of 78 licences.

There were 6,886 licensed rubber dealers all over India. Their State and District wise distribution as on 31.3.1990 is shown in the following table:-

STATEWISE/DISTRICTWISE DISTRIBUTION OF DEALERS

1. Kerala State

Sl. No.	Name of District	No. of dealers
1	2	3
1.	Kottayam	1994
2.	Ernakulam	947
3.	Pathanamthitta	746
4.	Quilon	722
5.	Trivandrum	416
6.	Idukki	328
7.	Cannanore	243

1	2	3
8.	Calicut	161
9.	Trichur	79
10.	Palghat	106
11.	Kasargode	43
12.	Malappuram	222
13.	Wynad	39
14.	Alleppey	31
	Total	6077

2. Outside Kerala

Sl.No.	Name of the State/Union Territory	No.of dealers
1	2	3
1.	Rajasthan	2
2.	Delhi	140
3.	Tamil Nadu	197
4.	Maharashtra	76
5.	Uttarpradesh	55
6.	Punjab	114
7.	Haryana	29
8.	Karnataka	54
9.	Madhya Pradesh	4
10.	Gujarat	19
11.	Chandigarh	5
12.	Misoram	1
13.	Bihar	2
14.	S.Andamans	6
15.	Tripura	8
16.	Orissa	1
17.	Assam	3
18.	West Bengal	90
19.	Meghalaya	2
20.	Jammu & Kashmir	1
	Total	809

Grand Total : 6077 + 809 = 6886

3.3. Processors Licence

We issued 39 processors licences during the period under report. Of these 32 were fresh and 7 were renewal cases. Besides, 90 licences were issued with validity effective from 1.4.90, of which 6 were for the year 1990-91, 35 for years 1990-93 and 49 for the years 1990-95.

As on 31.3.1990 there were 113 licenced processors all over the country. Their Statewise/Districtwise distribution as on 31.3.90 is given below:-

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Kerala State			Outside Kerala		
Sl.No.	District	No.of Units	Sl.No.	Name of State	No.of Units
1.	Cannanore	4	1.	Karnataka	7
2.	Ernakulam	9	2.	Tamil Nadu	11
3.	Idukki	2	3.	Tripura	1
4.	Kottayam	47			
5.	Calicut	4			
6.	Kasargode	3			
7.	Malappuram	9			
8.	Palghat	4			
9.	Trichur	6			
10.	Trivandrum	2			
11.	Pathanamthitta	2			
12.	Quilon	2			
		94			19

Total = 94+19 = 113

3.4 Registration of branches

During the period 567 branches of the dealers were registered. Two branch registrations were cancelled and 2 were suspended. The registration of one branch was reinstated when the licence of the dealer concerned was restored. Thus, as on 31.3.1990 there were 951 branches of the dealers registered with the Board.

3.5 Registration of agents

On the basis of the letters of authorisation received from dealers, 361 agencies were registered to purchase rubber on commission basis. As on 31.3.1990 we had 514 registered agents.

3.6 List of licensed rubber dealers

Three batches of the list of the licensed rubber dealers were prepared and printed in book form. Of the 400 books received, 95 of the first batch and 75 of the second and third batches were supplied.

As regards manufacturers list 43 books of first batch, 36 books of second batch and 23 books of the third batch were sold. An amount of Rs.3210/- was collected towards sale proceeds of the lists of rubber goods manufacturers and rubber dealers.

4. Market Intelligence

Detection of bogus/unlicensed dealings in rubber, arranging surprise inspections of the business premises of dealers for verification of their books of accounts and correctness of physical stock and cross verification of the correctness of statutory returns filed by dealers/manufacturers/processors with a view to eschew malpractices and prevent evasion of cess on rubber formed the major portion of market intelligence work. Inspections are also

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conducted for ascertaining the suitability of the applicants to hold licences to deal in rubber.

The quantum of activities in various fields is narrated below:

4.1 Inspection and verification

During the period, 1870 inspections of various nature as shown below were conducted.

a)	Number of inspections in connection with issuance of dealer' licence.	935
b)	Number of inspections in connection with shifting of business premises of dealers and registration of their branch/godown	272
c)	Number of surprise inspections of the licensed dealers/processors for verification of accounts and records	475
d)	Detailed verification of accounts and records of dealers and processors at the office.	141
e)	Detection of unlicensed dealing in rubber	47
f)	Confidential enquiry regarding issue of licence and agency registration	8
g)	Inspection for issue of authorisation to acquire latex and sale after ammoniation	2
		1880

4.2 Detection of irregular transactions

With a view to curtail bogus transactions in rubber and to detect bogus dealers, timely watching and scrutiny of Form N declarations and connected returns were undertaken. Cross checking of monthly returns of 65 dealers, 43 manufacturers, 6 processors and 26 estates with those of their suppliers/purchasers were carried out. As a result, suspicious transactions of certain dealers were detected and licence in respect of 28 dealers and 13 manufacturers were suspended. A sum of Rs.8 lakhs approximately could be realised towards cess on rubber involved in such irregular transactions, and an amount of Rs.60,000/- furnished towards Bank Guarantee was forfeited on account of serious malpractices detected in the rubber business of five dealers.

4.3 Detection of unlicensed dealing in rubber

As a result of the surprise inspections, 40 cases of unlicensed dealings and 7 cases of illicit transport of rubber were detected. But as the quantities involved in these cases were small, prosecution steps were not initiated. They were warned and apprised of the consequences of such unlicensed dealings. Consequently, they stopped such dealings and subsequently applied for licences which were granted.

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Kerala State			Outside Kerala		
Sl.No.	District	No.of Units	Sl.No.	Name of State	No.of Units
1.	Cannanore	4	1.	Karnataka	7
2.	Ernakulam	9	2.	Tamil Nadu	11
3.	Idukki	2	3.	Tripura	1
4.	Kottayam	47			
5.	Calicut	4			
6.	Kasargode	3			
7.	Malappuram	9			
8.	Palghat	4			
9.	Trichur	6			
10.	Trivandrum	2			
11.	Pathanamthitta	2			
12.	Quilon	2			
		94			19

Total = 94+19 = 113

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4.4. Illicit transport of rubber

The details of the 7 cases of illicit transport of rubber detected, are given below:

a) 7 tonnes of rubber meant for despatch through Railway without proper documents was seized with the help of police, at Ernakulam Town Police Station and subsequently the rubber was sold in auction as per the orders of the 1st Class Magistrate Court and the sale proceeds worth Rs.1.10 lakh was deposited in the Court.

b) A truck load of rubber weighing 9250 kgs. transported under suspicious circumstances was detained at Moolaikaraipatty in Tamilnadu. The lorry with the rubber was released on execution of a bond for Rs.2.5 lakhs as per the orders of the Court. The matter is under investigation by the police.

c) Another consignment weighing 10000 kgs. of rubber transported without the prescribed documents, was detained at Ovari in Tamilnadu. The consignment was released as per the orders of the Court. The matter is under investigation.

d) A consignment weighing 1500 kgs of rubber transported in a tempo van without the requisite documents, was seized at Vellarada. This was produced before the Court and the material was released on the claimant furnishing proper security. The complaint filed by the Board before the Court is under trial.

e) 600 kgs. of sheet rubber transported by a jeep through the Walayar Salestax Check Post in the absence of any documents, was seized and produced before the Court.

f) 10 barrels of creamed latex transported by a dealer under a different trade name 'Latex adhesive' was detained at Salestax checkpost at Muthanga. The same was subsequently sold under auction and the sale proceeds was deposited in the Court.

g) A consignment of 1000 kgs of rubber transported by a rubber dealer in Kulasekharam in favour of an unlicensed manufacturer was detained at the checkpost at Kavalkinar by the Board's staff and a sum of Rs.500/- towards cess on rubber was realised. realised.

Two lorry loads of rubber detained at Thamarassery last year were sold as per the directions of the Hon'ble High Court of Kerala which fetched about Rs.3 lakh approximately. The amount was deposited in the Court in a separate account. Similarly, two lorry loads of latex seized at Sultan Battery during the last reporting period was sold in auction as per the direction of the Hon'ble High Court and the sale proceeds amounting to about Rs.3.75 lakhs was deposited in a separate account.

4.5 Functioning of New Check Posts

To keep surveillance and monitor interstate movement of rubber two new check posts on two main routes, namely, one at Kavalkinar in Tirunelveli Dist. of Tamil Nadu and the other at Manjeswaram in Kasaragod Dist. of Kerala, were set up.

..53

4.6 Prosecution

Permission was given to the State Govt. authorities for prosecuting Nine (9) accused for contraventions of the provisions of the Rubber Act and Rubber Rules. Prosecution steps were initiated against a person who was found dealing in rubber without the requisite licence and keeping rubber illegally. The accused was convicted by the Court and he was sentensed to pay a fine of Rs.1000/-. The Court also ordered for the forfeiture of the value of the rubber illegally kept by him which amounted to Rs.1.10 lakh.

On detection of certain malpractices including use of forged bills, in the books of accounts of a processor, a complaint was lodged before the Inspector General of Police (Crimes) and the matter is under investigation.

4.7 Supply of declaration forms for interstate transport of rubber.

A total 11,312 'N' Form books were supplied to various estates/processors/dealers/manufacturers and to the Board's various offices. Scrutinised 50,310 copies of Form N declarations. Wherever discrepancies were noticed, explanations/clarifications were called for from the concerned parties.

As per the daily statement received from Walayar, Kavalkinar and Manjeswaram check posts, 27,305 consignments of rubber had passed through the check post. Doubtful cases were cross verified with the returns of the concerned parties.

5. Statistics and Planning

5.1 General Statistics

The statutory monthly returns collected from rubber growers, dealers, processors and manufacturers were compiled and analysed every month. The sample studies in small holding sector by field visits were continued in order to ascertain the monthly variation in production, stock etc. The data collected from various sources were computed and production, consumption, import and stock of rubber were worked out on monthly basis. These details are presented in tables attached as part IX of the report.

Supply, demand and price of rubber were periodically monitored and appropriate recommendations were presented to the Government. During the year under report the Statistics & Import/Export Committee met four times to review the demand and supply of rubber. Continued furnishing relevant information to the various organisations connected with the rubber industry. The monthly ''Rubber Statistical News'' was published regularly. This publication covers among other things details of production, consumption, import and stock position of natural, synthetic and reclaimed rubber and price of natural rubber.

Materials were furnished for answering Parliament Questions and Kerala Legislative Assembly questions pertaining to various aspects of the rubber industry. A comprehensive note on rubber was prepared.

..54

The census work of rubber area initiated in March 1988 was continued. Data pertaining to 91900 small holdings were collected during the year.

5.2 Planning

'Monthly reports' pertaining to the rubber plantation industry were prepared for forwarding to the Government of India. These reports interalia included trends in production, consumption, import, stock and price of rubber, progress of assessment and collection of excise duty and progress of important Plan Schemes. Prepared Annual Plan for Rubber for 1990-91.

5.3 Supply of information to world organisations

Continued to supply information to world organisations like the International Rubber Study Group (IRSG), London and the Association of Natural Rubber Producing Countries (ANRPC) Kuala Lumpur.

The 31st Assembly of the International Rubber Study Group (IRSG) was held in Bangkok from 10th to 15th July, 1989. The Assembly estimated world production and consumption of rubber and discussed R&D in the NR & SR fields and progress of implementation of International Natural Rubber Agreement. The International Rubber Forum held in conjunction with the Assembly discussed topics like advances in tyre technology, quality consistancy and processability of elastomers, developments in new generation synthetic polyisoprene and polybutadiene rubber, latex based industries and marketing of elastomers. Shri P.C.Cyriac, Chairman, Rubber Board who represented India, chaired one of the sessions in the Forum.

The Fourteenth Assembly of the ANRPC and the Twelfth Meeting of Committee of Experts were held in Colombo, Sri-Lanka on 6th & 7th October and 2nd and 3rd October 1989 respectively. The meetings decided to organise a workshop on cost of production of rubber and to conduct a course on NR statistics for the benefit of statisticians of member countries. After some preliminary discussions, the report on 'Development of Rubber Based Manufacturing Industry in ANRPC member country' was deferred for an indepth study. The Assembly also accepted the audited Statement of Accounts for the year 1988 and approved the provisional budget for the year 1990 amounting to M$ 616,945.13.

6. Publicity and Rubber Promotion

6.1 Journals and publications

The Malayalam monthly 'Rubber' continued to be popular among the growers with average circulation of 11,330 copies a month. A total of 434 perpetual subscribers were enrolled during 1989-90 and the cumulative total under perpetual subscription comes to 3899. Four issues of the 'Rubber Board Bulletin' were brought out. Compiling and editing of the revised fourth edition of the malayalam book entitled 'Vithumuthal Vipani vare' were completed and arrangements were made for printing 5000 copies. The

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'Rubber Growers Companion 1990' a combined handbook cum diary was published in December 1989. A manual on 'Rubber Tapping' was brought out with 10,000 copies. Arrangements were made to print additional one lakh copies of 'Rubber Tapping' to coincide with the tapping campaign launched for training one lakh rubber tappers. One lakh inland letters containing an appeal of the Chairman, Rubber Board were also despatched in connection with the tapping campaign. Five thousand copies of the leaflet on 'Prospects of rubber cultivation in Goa & Maharashtra' and 2000 copies on the booklet 'Prospects of Rubber cultivation in West Bengal' were printed.

6.2 Press Releases, Advertisements & Farm Features

Press communiques on various topics were released to the national dailies which secured wide coverage. A total of 42 press releases and 95 advertisements were issued. Farm features were prepared and released to 'Karshika Rangam' page of the Malayalam dailies.

6.3 Exhibitions & Seminars

In the traditional areas 53 one day seminars and 102 half-day seminars were organised. In addition, group meetings were conducted in 450 centres to popularise rainguarding techniques. All these seminars were made possible with the active participation and involvement of the Rubber Producers Societies and fertiliser firms like F.A.C.T, P.P.C.L., Indian Potash etc.

Participated in the exhibition at Kottayam organised in connection with the Silver Jubilee Celebration of the Baselius College, Kottayam.

6.4 'Rubber Enna Kalpadhenu' - Rubber School on AIR

Made elaborate arrangements with the co-operation of AIR for a 50 week educational broadcast series entitled "Rubber Enna Kalpadhenu" on the scientific aspects of rubber cultivation, production, marketing and other related topics. The talks which commenced on 21.7.89 were regularly broadcast from AIR, Trivandrum.

6.5 Rubber Promotion

Organisation and establishment of Rubber Producer's Societies has been found as an effective tool for the modernisation and rehabilitation of a large number of small holdings. Their formation at the village level facilitated "group approach" among rural small holdings for dissemination of information on modern scientific cultivation of rubber and supply of inputs at reasonable price. With this objective, efforts to organise the Rubber Producers' Societies and to streamline their functioning were continued during the year. As a result, their number increased from 535 to 969 by the end of the year with an average membership of 100 growers per society. The break-up is given below:

..56

Region	No. of RPS	Region	No. of RPS
Nagercoil	6	Kothamangalam	37
Trivandrum	36	Ernakulam	58
Punalur	34	Trichur	41
Pathanamthitta	58	Palghat	49
Adoor	29	Nilambur	36
Changanacherry	38	Calicut	34
Kanjirappally	68	Tellicherry	29
Kottayam	51	Taliparamba	90
Palai	93	Kanhangad	48
Erattupetta	32	Mangalore	7
Thodupuzha	45	Goa	1
Moovattupuzha	48	Port Blair	1

Supply of the inputs at reasonable price at the door-steps of small holdings has been found as an important stimulant for increasing production in the short run. The Board devised schemes to supply all important items of inputs like fertilizer, fungicides, panel protection materials, plastic cups, rainguarding materials, sprayers, cuphangers, tapping lights etc. The impact of their implementation has reflected in the increased production of natural rubber during the past two years. During 1988-89, these inputs were issued from 5 centres. For making available these inputs to the small growers from closer points the number of distribution centres was increased to 17 during 1989-90.

Details of inputs issued under the scheme and the subsidy element in price during 1989-90 are furnished hereunder:

	Quantity	Amount of net expenditure
1. Fertiliser		
Urea	1278 MT	Rs. 6,96,000/-
Muriate of Potash	999 MT	
Mussorie Rock Phosphate	2977 MT	
2. Spray Materials		
Copper Sulphate	176 MT	Rs. 6,61,000/-
Copper-Oxy-Chloride	26 MT	
Spray Oil	126 KL	
3. Rainguarding Materials		
Polythene sheet	101 MT	Rs. 9,82,700/-
Adhesive	313 MT	
4. Panel Protection Materials		
Rubberkote	9 MT	Rs. 26,000/-
Emissan	.5 MT	
5. Sieves	4198 Nos.	Rs. 86,556/-
6. Para Nitro Phynol	440 Kg.	
7. Jebong knives	3428 Nos.	Rs. 27,424/-
8. P.Girdle	47330 Nos.	Rs. 21,300/-
9. Water Injector	59 Nos.	Rs. 12,626/-
10. Head Light	2232 Nos.	Rs. 3,46,000/-
11. Plastic Cup		
White	3.82 lakh	Rs. 4,59,000/-
Black	8.33 lakh	

...57

7. Labour Welfare

In order to promote measures for securing better working conditions and the provisions, and improvement of amenities and incentives to rubber plantation workers as per Section 8(2) of Rubber Act, 1947, the Board continued to implement the Educational Stipend Scheme, Medical Attendance Scheme and Group Insurance Cum Deposit Scheme. A Housing Subsidy Scheme was introduced on an experimental basis during the year.

7.1 Educational Stipend Scheme

The scheme provides educational assistance to children closely related to rubber plantation workers for undertaking recognised courses in Arts, Science, Commerce, Engineering, Agriculture and Medicine. The educational stipend covers reimbursement of tuition fee, hostel/boarding fee and grant for purchase of books, instruments, etc. An amount of Rs. 12,50,696.20 was paid to 6,527 workers towards educational stipend.

7.2 Group Insurance-cum-Deposit Scheme

The Scheme provides insurance coverage to rubber plantation workers in a variety of circumstances. It is applicable to workers of holdings not covered by the Plantation Labout Act, 1951, and assures compensation against death/injury by accident. It also promotes the habit of saving among them on a long term basis. So far 999 workers were enrolled under the scheme including 88 admitted during the year. The insurance premium is met by the Rubber Board and the enlisted worker in 2:1 ratio. An amount of Rs.91,500/- was remitted towards Board's share in the names of the insured during the financial year. The Insurance Company paid an amount of Rs.4,014/- to 6 workers as accident compensation.

7.3 Medical Attendance Scheme

This Scheme provides for grant of financial aid for treatment of prolonged illness exceeding two weeks to workers employed in rubber plantation not governed by the provisions of the Plantation Labour Act. An amount of Rs.52,665/- was disbursed to 88 workers during the period.

7.4 Housing Subsidy Scheme

The Housing Subsidy Scheme introduced during 1988-89 was continued during 1989-90. This scheme assists workers of rubber estates with a minimum of 5 years service in construction of their own houses. A worker constructing a house in own land with plinth area between 20 and 70 sq. mts. at a cost not exceeding Rs.70,000/- will be eligible for subsidy of Rs.5,000/- when the construction covers the roofing stage. The subsidy is meant for the finishing works like plumbing, electrification, plastering etc. An amount of Rs.9,20,275/- was paid to 200 plantation workers during the period under review.

A total amount of Rs.23.15 lakhs was disbursed under the Labour Welfare Schemes as per the following break-up:

1. Educational Stipend	Rs.12,50,696.20
2. Group Insurance cum deposit	Rs. 91,500.00
3. Medical Attendance	Rs. 52,665.00
4. Housing Subsidy	Rs. 9,20,275.00
Total	Rs.23,15,136.20

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8. Vigilance

Anti corruption work, handling of disciplinary cases etc. in the course of enforcing CCA Rules and conduct Rules form the major vigilance function.

During the period under report 19 complaints containing allegations against 7 officers of Group A & B status and 12 employees of Group C & D status were taken up for enquiry/verification. The allegations mainly related to recommendation of subsidy/financial assistance to ineligible growers, delay in dealing with subsidy files in eligible cases, causing hardship to growers, demand and acceptance of illegal gratification , collection of large sums from private persons under the pretext of providing jobs in the Board, failure to maintain integrity/devotion to duty etc. In all the complaints enquiries were caused, appropriate action was taken against the erring officials and grievances of the parties concerned were redressed.

Major penalty proceedings against 6 officials and minor penalty action against 5 officials were taken. Administrative action was also taken against 8 officials.

9. Legal matters

The functions of drafting legal documents, rendering advice/opinion, taking steps to initiate prosecution under the Rubber Act, assisting conciliation proceedings in labour matters, tax cases etc. and arranging appearance of lawyers in litigations against the Board formed the major legal activities.

Sixty cases are pending in various courts for and against the Board. Steps were taken to safeguard the interests of the Board in all these cases. Effective assistance was given to the Police, Public Prosecutors and Sales Tax authorities in the prosecution instituted under the Rubber Act.

The Companies promoted in the RPS Sector to process small growers rubber were rendered assistance/guidance in the matter of Company Law applications. Also prepared and filed the Memoranda and Articles of Association and statutory forms of six such Companies and verified the documents relating to land proposed to be purchased for setting up of the factories.

10. Internal Audit

Internal Audit/Inspection was conducted in 15 units including 11 Regional Offices, Sub Office Calcutta, NRETC Agartala, HQ Canteen and RRII Library and detailed reports were prepared.

Follow-up action on the previous inspection reports was actively pursued and compliance was watched.

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Quarterly review reports were prepared on the basis of Statements/Returns received from the various offices/sections/divisions on: i) Office vehicles ii) Outstanding Advances (ie. TA/LTC & Suspense) and iii) Annual stock Verification.

Audit on the accounts of the Rubber Board for the year 1988-89 was conducted during May-August 1989 by the A.G.Kerala. During the Audit all pending paras for the year 1972-73 to 1987-88 were got reviewed. Out of 183 paras pending as on 1.4.1989, 93 were got dropped leaving a balance of 90 paras as on 31.3.1990. The audit report for the year 1988-89 was received on 20.9.1989 and a reply for the same was furnished on 31.10.1989.

11. Hindi work

Hindi workshops were conducted in the Regional Offices of the Board at Nagercoil, Trivandrum, Pathanamthitta, Kanjirappally, Kottayam, Thodupuzha, Trichur, Palghat, Calicut and Kanhangad. A total of 260 employees participated in the workshop in writing notes and making correspondence in Hindi.

Hindi classes were conducted at the Headquarters Office and 52 employees appeared for the examination conducted by Ministry of Home Affairs. Among them 42 became eligible for cash award and Personal pay was granted to 23. Twelve employees were nominated for the Hindi typewriting class.

Hindi week was celebrated from 14th September 1989. Competitions in Essay, Elocution, Translation, Letter writing, noting and drafting, quiz and Hindi typewriting were conducted. Separate competitions were conducted for the children of the employees. Certificates and token prices were awarded to the winners.

An official language seminar was conducted in the Head Quarters of the Board. Four issues of the quarterly bulletin in Hindi (Rubber Samachar) were published during the year. Hindi books valued Rs.3000/- were purchased during the year for the Hindi Library.

Two meetings of the OLI Committee of the Board was held. It was decided to take action for the implementation of the various provisions of the OL Act and Rules.

Quarterly progress reports from the various offices of the Board showing the progress regarding use of Hindi were collected, tabulated and furnished to the Ministry.

Annual Report, Audit Report and statement of accounts were issued bilingually. All the forms and Headings of Registers were also printed bilingually.

12. Sub/Liaison Offices

There are 8 Sub Offices in the major rubber consuming centres outside Kerala; at Ahemadabad, Bangalore, Bombay, Calcutta, Jalandar, Kanpur, Madras and New Delhi. These are manned by Excise Duty Officers/Asst. Excise Duty Officers. They function also as Liaison Officers of the respective regions providing a link between the Board and the local Government offices and institutions.

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The officials assessed suitability of rubber dealers and rubber goods manufacturers to possess licences to deal in/purchase natural rubber and verified at random the books of accounts and records to ensure that all rubber procured were brought to book and subjected to excise duty assessment. Surprise/squad inspections were conducted at premises of certain dealers/manufacturers in order to detect unlicensed dealing/manufacturing in rubber in contravention of the Rubber Act and Rules.

Collection of arrears in excise duty was pursued and the activities had a great bearing in surpassing the cess collection target of Rs.13.75 crores and the ultimate achievement of Rs.14.15 crores during 1989-90.

Part VII - Finance And Accounts

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The Finance & Accounts functions consist of the following:-

1) Formulation of the budget, performance budget and foreign exchange budget and exercising budgetary control.

2) Preparing the accounts of the Board, getting the same audited by the Accountant General, and presenting the audited accounts to the Government/Parliament.

3) Placing demand for grant from the Govt. and distribution of the allocation including resources generated internally for various activities as per requirements.

4) Advising the financial propriety and regularity of transactions.

5) Making available to the Government and Planning Commission details regarding the financial achievements under Plan and Non-Plan allocations.

6) Costing and preparation of financial statements for project reports and schemes.

7) Attending to taxation matters.

8) Electronic Data Processing of various activities including financial accounting, pay roll preparation, subsidy payment etc.

1 Budget and Funds release from the Govt.

The revised budgets for the year 1989-90 and budget estimate for 1990-91 were drawn up with a total outlay of Rs.34 crores and Rs.38 crores respectively. These were sent to the Government. As against this, the total release for the year 1989-90 was Rs.22.09 crores. This is in addition to the utilisation of Rs.0.1 crore for meeting the difference between the indigenous and international prices of natural rubber used for production of rubber goods for export, under the Natural Rubber Subsidy Scheme. The entire release of funds as well as internal resources have been utilised during 1989-90.

2 Plan Expenditure

As against the original Plan allocation of Rs.53 crores, the total Plan expenditure during the 7th Five Year Plan was Rs.74 crores showing an increase of 40% over the original plan allocation.

3 Funds of the Board

Under the Rubber Act, the Board maintains 2 funds ie.General Fund and Pool Fund. All amounts, paid to the Board by the Central Government under Sub Section 7 of Section 12 of the Rubber Act against budgets is credited to General Fund. The internal resources generated including cost of collection of cess retained by the Board forms part of the General Fund. In addition to the above 2 funds, the Board is dealing with other funds such as Rubber Board General Provident Fund, Rubber Board Provident Fund and

.....62/-

Rubber Board Employees Pension Fund. The Board is also maintaining a Group Insurance Scheme linked with LIC for the benefit of employees and a Workers Group Insurance Fund for the benefit of Rubber Plantation Workers under Labour Welfare Schemes.

4 Collection of Cess

The Board collects cess on indigenous production of natural rubber at the rate of Rs.500/- per tonne under Section 12(1) and (2) of the Rubber Act. These collections are immediately remitted to the Consolidated Fund of India through Central Bank of India, Kottayam, after retaining 2% as collection charges as per orders of the Government. As against the budgeted collection of cess during 1989-90, Rs.13.75 crores, actual cess collected was Rs.14.15 crores.

5 Expenditure position

The expenditure for the period from 1.4.1989 to 31.3.1990 is provisionally worked out as follows:-

Non-Plan:	(Rs.in crores)
Administration ...	1.43
Research ...	1.98
Development ...	3.02
Works ...	0.50
Labour Welfare ...	0.24
Advance to Employees ...	0.21
Contribution to CPF/Pension ...	0.57
Department of Training...	0.04
	7.99

Plan:	
RPD Schemes ...	8.89
Special Component Plan & Tribal Sub Plan	0.61
NRETC, Andamans ...	0.75
NERDS, Research Component	0.80
NERDS, Dev.Component ...	0.46
NERDS, NRETC ...	0.40
Regional Nurseries ...	0.28
Eastern India RDS ...	0.09
Western India RDS ...	0.10
Promotion of irrigation...	0.15
Boundary protection ...	0.07
Research Schemes ...	0.54
Extension, Training & Supplies	2.21
Processing & Marketing...	0.86
	16.21

Thus the gross total expenditure for the year 1989-90 under Non-Plan and Plan put together is Rs.24.20 crores.

.....63/-

6. Audit of Accounts

Annual accounts for the year 1988-89 were finalised and submitted to audit within the prescribed time limit. Hundred copies of the Audit report for 1988-89 received from the A.G, together with replies to the audit points were prepared bilingually and sent to the Ministry for placing before the Parliament.

7 Cost Accounts

The following were the cost accounts function undertaken.

a) Up-dated cost of cultivation/production of natural rubber

b) Conducted a study of cost of production of planting materials for fixing the selling price.

c) Handled Agricultural Income Tax and Sales Tax matters and filed statements and returns periodically.

d) Processed Management Information Reports in respect of the Rubber Plantations of the Board.

e) Provided information regarding cost of plantations, rubber prices, yield etc. to Govt. agencies for evaluating rubber area for the purpose of acquisition.

8 Electronic Data Processing

Processed Financial Accounting, Pay rolls and Subsidy Payments of a few Regional Offices. Output data such as Monthly Trial Balance, Quarterly/Ledger, Journal,/statement, Cash Book, Bank Book etc. were prepared. Statistical reports collected by the field survey were also processed. Financial statements and 4 project reports were also processed.

...64/-

Part VIII - Training

The following training programmes were conducted during 1989-90.

1. TRAINING COURSES

(a) Short-term training course on rubber culture & estate management.

Two batches of this course of three weeks duration were held, one in July 1989 and the other in February-March 1990. Forty one participants from Kerala, Meghalaya, Tripura and Mizoram attended the course.

(b) Training Course on Rubber Processing

Forty four participants attended this course held in three batches in the months of April 1989, September, 1989 and February-March 1990.

(c) Training course for rubber goods manufacturers

Separate training courses were convened for the rubber goods manufacturers on manufacture of products from rubber latex and dry forms of rubber. Five batches of the course on latex products manufacture and four batches of the course on dry rubber goods manufacture were held in which 174 manufacturers were trained including seven belonging to scheduled caste/scheduled tribe communities.

(d) Training for Small-holders

Under this five-day course in rubber cultivation, production and processing, three batches were held exclusively for the representatives of various Rubber Producers' Societies in which 49 persons including 6 Presidents of the Societies took part. Another batch of this course was held for the 27 fieldmen of State Farming Corporation of Kerala Ltd.

(e) Workshop on treatment of effluents from rubber processing factories.

This two-day workshop was conducted on 29th and 30th of June 1989 for 25 nominees from various rubber factories of Kerala.

(f) Training on Sheet Grading

Three batches of this two-day course were held for 25 participants including one scheduled caste candidate.

(g) Preservation and testing of rubber latex

This training course was held for eight representatives from various agencies at different intervals during the reporting period.

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(h) Training course on Examination Gloves

This course was held for eleven officers of the Hindustan Latex Ltd., Trivandrum between 8th & 10th January,1990.

(i) Training on analysis and testing of rubber and rubber products.

This five-day course was arranged for the officers of Bureau of Indian Standards from 18th to 22nd September 1989. One candidate from Andhra Pradesh was admitted to the course alongwith the five officers of BIS.

(j) Training on Marketing of Rubber

One Dy.Manager(Commercial) from Rehabilitation Plantation Ltd. was given training on marketing of rubber during the month of November-December 1989.

(k) Training on rubber cultivation and processing

A group of 38 field staff of Tripura Rehabilitation Plantation Corporation was given free training at Tripura on various aspects of rubber cultivation and processing.

Collected Rs.2,22,420/- towards fee for various training courses.

2. TRAINING PROGRAMMES FOR INSERVICE PERSONNEL

(a) Refresher Training for Asst.Farm Supdts/ Farm Assts/Field Assts. of Rubber Board

Two batches of this training were held in Agartala and Gawhati from 24.4.89 to 28.4.89 and from 1.5.89 to 5.5.89 respectively in which eleven Field Assistants attended.

(b) Training on Effective Office Management

This three-day training was arranged for the Asst.Secretaries/Administrative Officers/Section Officers of the Board from 19.4.89 to 21.4.89. Classes on Effective Office Management were taken by the officers of the National Productivity Council, Bangalore. Twenty nine officers attended this programme.

(c) Practical Oriented Refresher Training Programme for Field Officers/Junior Field Officers.

Two hundred and eleven Field Officers/ Jr.Field Officers of the Board were trained under this programme in nine batches. During this training the officers were also given a one-day training on management aspects by the representatives of Kerala State Productivity Council.

.....68/-

(d) Training for newly recruited Jr.Field Officers

Two batches of Jr.Field Officers were given training in rubber culture and processing. Twentyone officers attended the two batches together.

(e) Training for newly recruited Field Assistants

A group of eight newly recruited Field Assistants were given training on rubber cultivation and processing between 2.11.89 and 15.11.89.

(f) On-the-job training for Sweepers

An on-the-job training on operation and maintenance of pumpset was given to five sweepers of the Board.

3. OTHER ACTIVITIES

The Government of India has approved a project for establishing a pilot plant for producing radiation vulcanised natural rubber latex with financial support of the Board of Research in Nuclear Science (BRNS). An amount of Rs.11.5 lakhs was released by BRNS for installation of equipments and machinery for the project.

A proposal to get Japanese assistance for improving R&D work in Rubber Technology has been submitted to Government of India.

.....67/-

PART - IX

STATISTICAL TABLES

TABLE-1

PRODUCTION, IMPORT AND CONSUMPTION OF NATURAL RUBBER

(Tonnes)

Month		Production	Import	Consumption (Indigenous & Imported)
April	1989	20,550	12,063	26,780
May	"	26,740	2,287	27,980
June	"	16,280	1,550	27,795
July	"	16,685	7,706	27,430
August	"	22,955	1,498	27,530
September	"	28,445	1,312	28,765
October	"	29,160	1,011	27,645
November	"	34,430	1,858	30,360
December	"	37,330	433	29,650
January	1990	32,290	935	29,180
February	"	15,700	3,509	28,255
March	"	16,735	8,799	30,470
	TOTAL	297,300	44,071*	341,840

* Provisional

TABLE-2

STOCK OF NATURAL RUBBER AT THE END OF EACH MONTH

(Tonnes)

		Growers & dealers	Manufacturers	STC	Total (Rounded)
April	1989	24,055	22,025	28,969	75,050
May	"	27,305	22,450	26,379	76,130
June	"	21,325	22,660	22,266	66,250
July	"	20,835	20,670	20,199	61,705
August	"	25,325	21,670	14,209	61,200
September	"	29,075	24,365	8,533	61,970
October	"	32,840	23,250	8,078	64,170
November	"	36,775	25,185	8,078	70,040
December	"	41,550	28,720	8,078	78,350
January	1990	42,280	31,975	8,078	82,330
February	"	34,120	30,515	10,631	75,265
March	"	25,460	27,360	16,796	69,610

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TABLE-3

GRADEWISE STOCK OF NATURAL RUBBER AT THE END OF EACH MONTH

	April 1989	May 1989	June 1989	July 1989	Aug. 1989	Sept. 1989	Oct. 1989	Nov. 1989	Dec. 1989	Jan. 1990	Feb. 1990	March 1990
RMA Grades	49400	51560	45735	40145	38705	39090	40825	44765	50930	51980	48460	46025
Estate Brown Crepes & Remilled crepes	7520	6980	5335	4890	5590	5540	5560	5740	5860	7305	7020	4870
Latex concentrates(drc)	5990	5730	5140	4765	5465	6025	5430	6070	7485	8030	7405	6580
Pale Latex Crepes	740	600	495	445	455	490	480	680	915	1030	985	720
Block Rubbers	5465	5055	4115	5890	5290	4590	5330	5030	5045	5230	4790	5625
Scraps(drc)	5850	6135	5330	5470	5560	6090	6350	7560	7980	8565	6440	5700
Other grades	85	70	100	100	135	145	195	195	135	190	165	90
TOTAL(Rounded)	75050	76130	66250	61705	61200	61970	64170	70040	78350	82330	75265	69610

pt

TABLE - 4

PRODUCTION, IMPORT, CONSUMPTION & STOCK OF SYNTHETIC RUBBER

(Tonnes)

		Production	Import*	Consumption	Stock at the end of the month
April	1989	3,354	2,340	7,175	14,350
May	"	3,787	4,390	7,270	15,255
June	"	4,605	3,632	7,670	15,820
July	"	4,680	2,754	7,760	16,140
August	"	4,041	2,640	7,455	15,365
Sept.	"	2,660	3,808	7,805	13,380
October	"	4,751	3,594	7,745	13,780
November	"	4,300	3,317	7,995	13,245
December	"	5,029	3,002	7,745	13,580
January	1990	4,716	3,249	7,560	13,985
February	"	3,546	2,546	7,195	12,380
March	"	4,956	1,228	7,680	13,380
	TOTAL	53,423**	36,500	91,055	

* Provisional

** Including a quantity of 3057 tonnes, for which monthwise breakup is not available.

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TABLE-3

GRADEWISE STOCK OF NATURAL RUBBER AT THE END OF EACH MONTH

	April 1989	May 1989	June 1989	July 1989	Aug. 1989	Sept. 1989	Oct. 1989	Nov. 1989	Dec. 1989	Jan. 1990	Feb. 1990	March 1990
RMA Grades	49400	51560	45735	40145	38705	39090	40825	44765	50930	51980	48460	46025
Estate Brown Crepes & Remilled crepes	7520	6980	5335	4890	5590	5540	5560	5740	5860	7305	7020	4870
Latex concentrates(drc)	5990	5730	5140	4765	5465	6025	5430	6070	7485	8030	7405	6580
Pale Latex Crepes	740	600	495	445	455	490	480	680	915	1030	985	720
Block Rubbers	5465	5055	4115	5890	5290	4590	5330	5030	5045	5230	4790	5625
Scraps(drc)	5850	6135	5330	5470	5560	6090	6350	7560	7980	8565	6440	5700
Other grades	85	70	100	100	135	145	195	195	135	190	165	90
TOTAL(Rounded)	75050	76130	66250	61705	61200	61970	64170	70040	78350	82330	75265	69610

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TABLE - 4

PRODUCTION, IMPORT, CONSUMPTION & STOCK OF SYNTHETIC RUBBER

(Tonnes)

		Production	Import*	Consumption	Stock at the end of the month
April	1989	3,354	2,340	7,175	14,350
May	"	3,787	4,390	7,270	15,255
June	"	4,605	3,632	7,670	15,820
July	"	4,680	2,754	7,760	16,140
August	"	4,041	2,640	7,455	15,365
Sept.	"	2,660	3,808	7,805	13,380
October	"	4,751	3,594	7,745	13,780
November	"	4,300	3,317	7,995	13,245
December	"	5,029	3,002	7,745	13,580
January	1990	4,716	3,249	7,560	13,985
February	"	3,546	2,546	7,195	12,380
March	"	4,956	1,228	7,680	13,380
	TOTAL	53,482**	36,500	91,055	

* Provisional

** Including a quantity of 3057 tonnes, for which monthwise breakup is not available.

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TABLE-5

PRODUCTION, CONSUMPTION & STOCK OF RECLAIMED RUBBER

(Tonnes)

	Production@	Consumption	Stock at the end of the month*
April 1989	3,545	3,515	2,830
May "	3,650	3,395	3,155
June "	3,265	3,415	3,005
July "	3,535	3,500	3,040
August "	3,575	3,610	3,005
September "	4,010	3,760	3,110
October "	3,785	3,705	3,190
November "	3,855	3,735	3,315
December "	4,010	3,800	3,525
January 1990	3,745	3,820	3,450
February "	3,820	3,815	3,455
March "	3,705	3,865	3,365
TOTAL	44,500	43,935	

@ Indigenous purchase by manufacturers

* Stock with manufacturers

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ANNEXURE - I

LIST OF MEMBERS OF THE RUBBER BOARD AS ON 31.3.1990

01	Sri PC Cyriac, IAS	Chairman, Rubber Board.
02	The Agricultural Production Commissioner, Kerala, Trivandrum - 695 001.	Nominated by the Govt. of Kerala to represent that State.
03	The Chairman, Plantation Corporation of Kerala Ltd., Kottayam - 686 001, Kerala.	
04	The Chairman-cum-Managing Director, Arasu Rubber Corporation Ltd., Vadassery, Nagercoil, Tamil Nadu.	Nominated by the Govt. of Tamil Nadu to represent them.
05	Sri George John, Thamarappally Rubber Company Ltd., Ancheril Bank Buildings, Kott ayam-686 001, Kerala.	
06	Michael A Kallivayalil, Kuttikkanam P.O., Peermade, Idikki Dist. Kerala.	Elected by the Large Growers in the State of Kerala.
07	Sri K Jacob Thomas, Managing Director, Vaniampara Rubber Company Ltd., Vazhakkala Buildings, Kottayam-686 001, Kerala.	
08	Sri R Subramonian, Veerabhadra Gardens, Pattom Palace P.O. Trivandrum - 695 004, Kerala	Elected by large growers in the State of Tamil Nadu.
09	Vacant	Elected by the Lok Sabha
10	Vacant	
11	Sri Kamalendu Bhattacharjee MP 19 North Avenue, New Delhi - 110 001.	Elected by Rajya Sabha

.....72/-

12. Sri K Padmanabhan,
Konnanath House,
Chelakkode P.O.,
(via) Pazhayannur,
Trichur Dist.,Kerala.

13. Sri Sridam Sutradhar,
Secretary,
Tripura Rubber Shramik
Union, P.O Kailashahar,
CPI (M) Office,
North Tripura - 799 277.

14. Sri A Kunheeran,
General Secretary,
Kerala State Plantation
Workers Federation,
Kondotty P.O, Malappuram.

15. Sri N Narayana Pillai,
General Secretary,
Kumari Estate Workers Union
22 A/13 AP Road,
Nagercoil, Tamil Nadu.

Nominated by the Central Govt. to represent Labour.

16. Sri P Mukundan Menon,
Rubber Production Commissioner

Rubber Board, Sastri Road,
Kottayam - 686 001.

(Ex-Officio)

17. Sri K Joseph Monippally,
General Secretary,
Indian Rubber Growers
Association,
34/1802, Kadavanthara,
Cochin - 682 016, Kerala.

18. Sri MK Vidyadharan,
Uthamam,
LIC Lane,
Pattom Palace P.O
Trivandrum - 695 004, Kerala.

19. Sri M Assainarkutty,
Malickandath,
Chapparapadavu,
(via) Taliparamba,
Cannanore Dist.,Kerala.

Nominated by the Central Govt. to represent small Growers of Kerala.

20. President,
All India Rubber Industries
Association,
Lamington Road,
Bombay - 400 008.

Nominated by the Central Govt. to represent rubber goods manufacturers.

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21. President, Automotive Tyre Manufacturers Association, 2nd Floor, 9A Cannaught Place, New Delhi.	Nominated by the Central Govt. to represent rubber goods manufacturers.
22. Sri ET Varghese, President, Rubber Dealers' Association, C/o.United Rubbers, KK Road, Kottayam - 686 001, Kerala.	
23. Managing Director, Karnataka Forests Plantation Corporation, No.6, Kumara Park East, Bangalore-560 001.	
24. Sri RG Ketkar, Director, Sudhagad Rubber Industries, Rahem Mansion, No2, 1st floor, 44-S Bhagath Singh Road, Bombay - 400 039.	Nominated by the Central Govt. to represent 'Other interests'.
25. Sudhir Majumdar, MLA, Tripura Secretariat, Tripura.