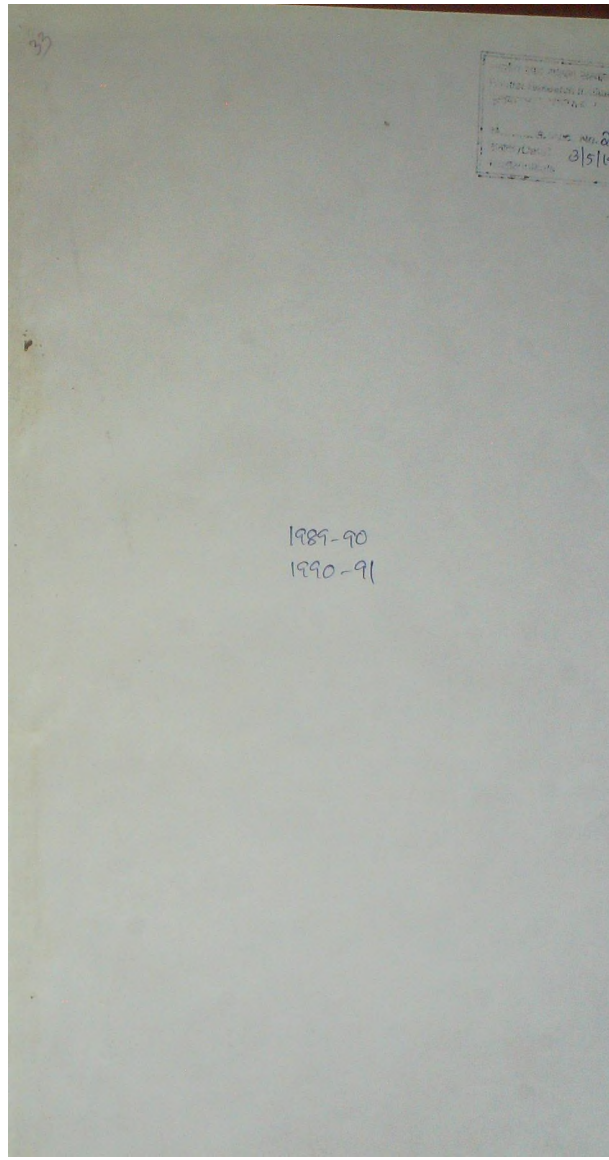
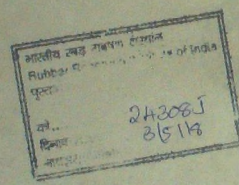


1989-90
1990-91

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


Rubber Board
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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 leguminous 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.

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.

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 definitevely in 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 whom shall be representing the rubber producing interests, th of such being persons representing the small growers;

(c) Ten members to be nominated by the Central Governme 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 affai affecting the rubber industry and make recommendations to th 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.

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 Nurseri 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 Guwahat 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 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 Factor located at Chethackal are run by the Department of Rubber Processing. The Department of Training is currently establish a pilot plant for Radiation Vulcanisation of Natural Rubber at Chethackal.

/Kottayam and the Pilot Latex Centrifuging factory located at

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 inceptio 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.(re pl in
2.	Reimbursement of cost of planting materials ..	Rs. 19,61,735.(
3.	Assistance for soil conservation work ..	Rs. 1,31,437.(

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.56,101.6 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.

(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.

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 certificat are issued through Rubber Board offices. The Board has taken Master Policies on behalf of rubber growers and issued individu certificates to particpating growers. Claims for compensation were investigated by the Boafd'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 tr
" 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 amount of compensation. For the newly planted rubber the insurance claim takes effect after a waiting-in period of one y and for other plantations this would be only 30 days. For th immature rubber, the insured grower has to bear 10% of the lo and in the case of mature rubber this is 10% or Rs.1,000/- whi ever is higher.

Individual policies worth Rs.12,99,987.05 covering an im mature area of 3126.23 ha were issued to 3,891 proposals for period upto 31.3.1990. For mature area individual policies w Rs.2,08,577.29 were issued to 465 proposals covering an area o 446.31 ha. An amount of Rs.27,082/- towards compensation had 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

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 Demonstrator 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 relat 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 tapper were conducted in batches of 20 to 25 in selected small holdin 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 40% subsidy for construction of 85 kg capacity smoke houses. During the period small growers constructed 250 smoke houses wi 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 scheme for giving financial assistance against capital investme incurred by rubber growers for establishing irrigation faciliti

The scheme evoked tremendous response and the entire applicants could not be serviced. A total subsidy of Rs.9,99,9 had been disbursed to 555 rubber growers in the traditional are 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 getti young rubber plants established in the field in the early years due to the menace from cattle and trespassers. Hence in order 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 are

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 plantir 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 are The Growers are experiencing great difficulties in getting them In order to help small growers in non-traditional areas to acqu these materials the Board implemented a scheme to purchase the quired 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 materi 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.

i" progress.

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.

Foloilow-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 HRS, 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. Past 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.

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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 caroide 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 Tjir 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.

9. 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 repating 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. Rhizosphere 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 effluent

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 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.

Meteorology

The agro-climatic 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 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 209,114kg.

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 investigations 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 Ganolgre. 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, 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 11,118 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. hungabhadr?

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 Director

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 abread. 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.

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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
GRANT 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.

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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 theccase 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.

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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

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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 belowwere 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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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.

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.

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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.

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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:

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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	

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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.91,50[illegible]/- 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.

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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 maintai 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, NREIC 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 offhcial 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

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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
NREIC, Andamans ...	0.75
NERDS, Research Component	0.80
NERDS, Dev.Component ...	0.46
NERDS, NREIC ...	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.

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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.

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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 arrang ed 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.

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(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	5,509	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

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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	53,427**	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

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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.	

ANNUAL REPORT OF THE RUBBER BOARD FOR THE YEAR 1990-'91

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 1990/91

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ANNUAL REPORT OF THE WORKING OF THE RUBBER BOARD FOR 1990/91

PART I - INTRODUCTION

This is the annual report of the Rubber Board on its working for the year 1990/91. This contains a summary of the activities from 1st April 1990 to 31st March 1991

Rubber plays an important role in the industrial and economic development of the country. Cultivation of rubber was introduced to the countryduring the first decade of this century. Large planters were the pioneers. 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.

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 technology 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 practices, 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 329,600 tonnes by 90/91. Growing the crop with leguminous ground cover, application of fertilizers 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.

Rubber plantation industry has recorded all round progress during 1990-91. Production of natural rubber during the year was 329,600 tonnes compared to 297,300 tonnes in 1989-90, recording a growth of 11%. Productivity measured in terms of yield per ha. has improved to 1075 kg.(provisional) from 1029 kg. during 1989-90. Consumption of rubber increased by 6.5% to 364,300 tonnes. During the year, State Trading Corporation of India imported 31,699 tonnes of rubber to bridge the gap between production and consumption. In addition, 20,243 tonnes was imported by manufacturers against REP/ Additional licences.

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

(a) promotion of newplanting and replanting of rubber

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(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.

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 planting rubber upto 5 hectares in traditional areas and for areas in the non-traditional regions without any ceiling in planted extent. 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.

2. Rubber Price

Government of India revised the fair price of natural rubber with effect from 15th January 1991. The revised price for RMA IV grade rubber is Rs.2145 per quintal. The fair price, which is also known as the benchmark price, is announced under the provisions of the buffer stocking scheme. The price in force prior to the revision was Rs.1780 which was introduced in September 1988. The lower ceiling and upper ceiling prices are fixed at a difference of Rs.50/- per quintal below and above the benchmark price as in the previous fixation. Accordingly the lower and upper trigger levels of market intervention in mopping up operations and for the release of rubber to the domestic market are Rs.2095/- and 2195/- respectively.

After introcution of the revised prices, market price of RMA-4 grade rubber has firmed up to the lower trigger level. However, the market price of RMA-5 grade continued to rule low. So STC entered the market on 8th February 1991 and started procuring rubber at the rate of Rs.2045/- which is the lower ceiling for RMA-5 grade. The price operation was continued upto 29th April, 1991, as a result of which 7,700 tonnes of RMA-5 was procured.

The market price of rubber during the year recorded an upward trend till the middle of June and thereafter it showed a downward trend owing to the commencement of peak production season. The average price during 1990-91 was Rs.2129/- per quintal for RMA-4 grade.

International developments

The world production of natural rubber during 1990 declined to 4.95 million tonnes from 5.11 million tonnes in

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1989. The fall in production was mainly due to the fall in price in the international market. The average price of rubber in Kuala Lumpur market for RSS 3 grade (equivalent to RMA-4 in India) during 1990 was M $ 220.40 in 1990 as against 247.70 in 1989 and M$ 301.20 in 1988. In fact, Malaysia, which is the world's largest producer, has recorded a steady fall in production from 1.66 million tonnes in 1988 to 1.42 million tonnes in 1989 and again to 1.29 million tonnes in 1990. World consumption of rubber during 1990 declined to 5.16 million tonnes from 5.21 million tonnes in 1989.

The 32nd Assembly of the International Study Group was held in Ottawa, Canada in September, 1990. The Assembly projected the global production during 1991 at 5.42 million tonnes and consumption 5.51 million tonnes. An 'International Rubber Forum' was held in conjunction with the Assembly, where a wide spectrum of subjects were discussed. The deliberations on emulsion Styrene butadiene Synthetic (SBR) vs solution SBR indicated that solution elastomers hold better prospects in the future. Specialised synthetics particularly engineering elastomers and thermoplastic elastomers were identified as growth areas in the coming decades. According to majority of experts, the continuing problems in the Gulf and consequent increase in oil price would adversely affect the consumption of rubber. Radialisation of tyres results in more consumption of NR, but long life of tyres virtually tells upon the overall natural rubber consumption in the long run. Both radialisation and downsizing of automobile/ would negati- /tyre
vely affect the rubber consumption.

The Committee Meetings of the Association of Natural Rubber Producing Countries (ANRPC) held in July-August 1990 decided to organise the next Assembly of ANRPC at Ministerial level during the first quarter of 1991. Major structural changes have taken place in the production, processing, marketing and consumption sectors of the NR industry, and these changes have greatly affected the NR market and its price determining mechanism. So the Special Meeting of the Executive Committee felt that there was need to review the role of the ANRPC in the light of the developments and problems faging the NR industry as well as the changing priorities and objectives of the member countries. During the year two meetings of the Committee on processing, quality and marketing were held. The deliberations indicate that rubber producing countries are giving great importance to upgradation of the quality of processed rubber. The discussions disclosed that Liberia and Cote d' Ivoire (Ivory Coast) process almost 100% of their crop in block rubber (technically specified rubber). Indonesia processes about 86% of the production in block form while for Malaysia it is 70%. In Thailand and Sri Lanka, block rubber production is as low as 13% and 16% respectively, while in India, the percentage is only 6. Leading rubber producing countries are giving greater attention to eliminate from their production sheet rubber of low grades like RMA-4 and 5 through quality improvement.

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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. 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 functions under the Ministry of Commerce of the Government of India. The Board has at pfesent a full time Chairman as principal executive officer responsible for implementing its decisions and for discharging 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 the 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 Executive Director has not been created so far.

List of the members of the Board as on 31.3.1991 is given at the end of this report.

One of the members is elected as Vice Chairman. Various Committees are formed to review existing programmes, to examine proposals for development of natural rubber industry and to make recommendations to the Board. Seven such Committees viz. Executive Committee, Research and Development Committee, Planting Committee, Statistics and Import/Export Committee, Market Development Committee,

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Labour Welfare Committee and Staff Affairs Committee were constituted.

Shri PC Cyriac, IAS was the Chairman until 30 June, 1990. Shri CT Sukumaran, IAS took over from him and held charge for a short while in addition to his position as Chairman of the Marine Products Export Development Authority. The Central Government appointed Smt. J Lalithambika, IAS, as Chairman of the Board. She took over charge on 19th July 1990 and continued to hold office during the reporting period.

Shri A Kunheeran, member representing plantation labour was the Vice Chairman till August 1990 and Shri K Joseph Monippally from 27 November 1990, after re-constitution of the Board.

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.

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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 115th meeting on 27.6.90 and the 116th meeting on 27.11.1990.

b) Committee meetings - The Executive Committee, Statistics & Import/Export Committee, Staff Affairs Committee, Labour Welfare Committee, Research and Development Committee and Planting Committee met during the year to review programmes under implementation, examine new proposals and make recommendation to the Board.

5. Organisational set up

The activities of the Rubber Board were 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 (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-686 001. There are eight Sub/Liaison Offices under the Administration Department. The Rubber Production Department has 33 Regional Offices, 160 Field Offices, 20 Regional Nurseries and 35 Tappers' Training Schools located at different rubber growing regions. The Zonal Offices at Bhubaneswar and Guwahati and the Nucleus Rubber Estate cum Training Centres at Agartala and South Andamans also come under the Department of Rubber Production.

The Research Department, the Department of roduct Processing and the Department of Training function in the elop- Board's own buildings at Kottayam-9. The Research Depart- nt ment 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 Kottayam and the Pilot Latex Centrifuging factory located at Chethackal were run by the Department of Processing and Product Development, which is currently establishing a pilot plant for Radiation Vulcanisation of Natural Rubber.

The Chairman exercises administrative control over all the departments and offices. The total officers and staff under the Board as on 31.3.1991 were 1916; 170 under Group 'A', 499 under Group 'B', 1106 uncer Group 'C', 128 under Group 'D' and 13 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

The Rubber Production Department discharged the following main functions during the year under report :

i) Registration of rubber estates

ii) Planning, formulation and implementation of schemes for expansion, development and modernisation of rubber plantations.

iii) Rendering advisory & extension services

iv) Production, procurement and distribution of high yielding planting materials

v) Facilitation of distribution of other agro-inputs requiring popularisation

vi) Training of tappers

vii) Demonstration and training in scientific planting and production of rubber in non-traditional rubber growing areas

viii) Insurance of rubber plantations

Organisational set up

The Rubber Production Commissioner exercised overall control and supervision of the department. He was assisted by 4 Joint Rubber Production Commissioners, 10 Deputy Rubber Production Commissioners and a complement of other officers and staff.

The field activities of the department were managed through 33 regional offices grouped under 4 zones, namely north zone and south zone in South West India, eastern zone and north eastern zone. The zonal level activities were co-ordinated and supervised by Dy. Rubber Production Commissioners. While two of those Dy. Rubber Production Commissioners operated from separate zonal offices at Guwahati and Bhubaneswar, the two others had their headquarters at the Central Office of the Board. The operations in north eastern region having been extensive, the zonal office at Guwahati was headed by a Jt. Rubber Production Commissioner. Under the regional offices, there were 160 field offices, 20 regional nurseries and 35 rubber tappers' training schools operating during the year under review. A list of regional offices, their service areas and field offices is given in Annexure II.

Other field establishments consisted of a Nucleus Rubber Estate & Training Centre (NRETC) each in Tripura and Andamans. The former was in charge of a Joint Rubber Production Commissioner assisted by a Dy. Rubber Production Commissioner and the latter in charge of a Dy. Rubber Production Commissioner.

A Central nursery continued to function under the direct control of the central establishment of the department.

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At the central office, the department continued to function under two wings, namely Development Wing and Extension & Supplies Wing under a Jt. Rubber Production Commissioner each.

Close collaboration in the department's work was obtained from Rubber Promotion & Publicity Division and Statistics & Planning Division under other departments. Technology transfer from Research Department (RRII) to rubber growers continued to be channelled through the Rubber Production Department.

REVIEW OF ACTIVITIES

1. Registration of Rubber Estates.

This is a statutory function enjoined on the Board by the Rubber Act, 1947.

During 1990-91, a total of 10,283 plantation units were newly registered and additional areas were registered under existing units covering an aggregate total area of 6,778.68 ha. Areas removed from records by way of cancellations covered 1,007.73 ha. The total area progressively registered as on 31.3.1991 was 308,474.95 ha and total registered units numbered 252,764. A large number of units and extensive areas remained to be registered.

The Board had earlier decided to recommend to the Government that the practice of registration might be altogether discontinued, excepting in the case of large estates, and that the work of collection of statistics of area under cultivation, production etc might be gathered through periodical census operations. This is in view of the fact that in the face of extensive proliferation of units the Board is no more in a position to physically complete the registration work. The matter would be taken up with the Government for a favourable decision.

2. Replanting Subsidy Scheme

The Scheme introduced in 1957 had been discontinued after introduction of Rubber Plantation Development Scheme in 1980. All spill-over payments due had been completed by 1989-90.

A total of 53,605 ha had been got replanted under the scheme under 34,822 individual permits. A total of Rs.19.35 crores had been disbursed as cash assistance and Rs.2.38 crores by way of additional incentives for inputs to weaker sections of growers.

3. Loan Schemes

Three loan schemes had been successively implemented by the Board from the years 1962-63, 1963-64 and 1966-67 for the benefit of small growers for expansion of their holdings into viable units and scientific maintenance of immature areas. These were respectively newplanting Loan Scheme, Upkeep Loan Scheme and Revised Integrated Loan Scheme. Loans under the first two were interest free whereas the one under the third carried a nominal interest of 5 per cent per annum. The last of the schemes had been discontinued with the introduction of Rubber Newplanting Subsidy Scheme in 1979-80.

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An uptodate summary of the results of the Schemes is presented in the following table:

Name of the Scheme	Extent newplanted/ maintained	Amount disbursed as loans & other assistance	Amount repaid/recovered with penal interest
	ha.	(Rs./lakhs)	(Rs./lakhs)
Newplanting Loan Scheme	439.01	7.34	7.93
Upkeep Loan Scheme	304.73	2.63	2.68
Revised Integrated Loan Scheme	3113.38	80.36	90.04
Total :	3857.12	90.33	100.65

During the year under report, an amount of Rs.102,428.80 was got repaid/recovered under the Revised Integrated Loan Scheme and accounts under 13 permits closed. As at the close of the year, there were 2 cases under Upkeep Loan Scheme and 43 cases under Revised Integrated Loan Scheme pending for full repayment. Most of these cases involved defaults and were under legal process for recoveries.

4. Rubber Newplanting Subsidy Scheme, 1979

Introduced in 1979 as a one year pilot scheme, this aimed at promoting newplanting of rubber in the small holding sector. The target fixed was 4,000 hectares. The incentives and assistance offered comprised a capital subsidy of Rs.7500 per ha for growers owning upto 2 ha of rubber/Rs.5000 per ha for growers owning above 2.00 ha and upto 20.23 ha, payable in 7 annual instalments as laid down, certain input subsidies to growers owning upto 6 ha of rubber, interest subsidy @ 3% on credit availed of from banks for the planting purpose and free technical assistance.

Actual planting carried out under the Scheme was 6,532 ha contributed by 10,984 permit holders. Total subsidies paid under the scheme had amounted to Rs.462.30 lakhs. All payments due had been completed by 1989-90.

5. Rubber Plantation Development Scheme - Phase I

This scheme aimed at integrated promotion of newplanting and replanting of 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.

(i) Capital subsidy @ Rs.5000/- per ha to growers owning upto 20 ha including any area planted under the scheme and Rs.3000/- per ha to growers owning more than 20 ha.

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(ii) 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.

(iii) The beneficiaries could avail of long term agricultural credit from banks under NABARD's refinancing scheme to supplement the assistance from Board. 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 was repayable in 5 instalments from the 10th to the 14th years of planting. The interest accrued upto the 7th year was payable during the 8th and 9th years. During repayment only current interest was payable.

(iv) The rate of interest on loans was 12½%. The Board subsidised 3% interest to all categories of growers subject to limitations on the quantum on loans.

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

The cumulative progress of the scheme as on 31.3.1991 is summarised below:

	Years to which plantings related					Total
	1980	1981	1982	1983	1984	
No. of subsidy permits issued	17,544	19,152	18,937	21,432	25,262	102,627
Area covered by permit(in hectares)	12,098	13,586	13,869	15,522	17,482	72,557
No. of cases pending final action	nil	12	14	41	233	300

During the year under review, an amount of Rs.234.15 lakhs was disbursed as subsidy. The total disbursement of subsidies since the inception of the scheme came to Rs.3,996.18 lakhs as on 31.3.1991.

6. Rubber Plantation Development Scheme - Phase II

The Rubber Plantation Development Scheme - Phase II was implemented from 1985 onwards for a period of 5 years. 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.5000/- 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 ha. Growers in the traditional region having more than 5 ha of rubber and carrying out planting under the scheme were also eligible to receive this assistance.

(3) The beneficiaries could avail of bank loans under the agricultural refinance scheme of NABARD. The loans were advanced in 7 annual instalments and were 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 was payable during the 8th and 9th year. During the repayment of loan, only the current interest was payable.

(4) The normal rate of interest for the loan was 12½% per annum. The Board subsidised 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:

	Year to which the applications relate					Total
	1985	1986	1987	1988	1989	
Total no. of applications received	32,298	29,336	29,205	30,661	28,895	150,395
No. of cases in which planting had been carried out	32,265	29,200	29,124	30,493	28,653	149,735
No. of cases inspected in the field	31,895	28,797	28,632	30,233	26,953	146,510
Balance pending for field inspection	370	403	492	260	1,700	3,225
Permits issued	22,924	20,602	20,913	21,516	18,309	104,264
No. rejected/ withdrawn	8,356	6,870	6,521	6,307	4,334	32,388
Area covered by permits(ha)	15,062	13,935	14,658	14,994	13,209	71,858
Applications pending processing after field inspection	615	1,325	1,198	2,410	4,310	9,858

During the year, a sum of Rs.71,198,117.00 had been paid as subsidies. The total disbursement of subsidy since inception of the scheme amounted to Rs.3,387.80 lakhs.

7. Rubber Plantation Development Scheme - Phase III

Pending approval of the 8th Five Year Plan proposals the Board has not been able to formulate Phase III of the Rubber Plantation Development Scheme. However, in view of the fact that Annual Plan within a broad framework had been approved and budget provision also granted, the Board tentatively implemented the Phase III for 1990-91 on the same lines as approved for Phase II.

The results of the implementation are summarised and presented below:

	1990 planting
No. of applications received	25,952 nos.
No. of cases in which planting had reportedly materialised	24,271 nos
No. of cases inspected in the field	17,454 nos
Balance pending for inspection	6,777 "
Permits issued	8,536 "
No. rejected/withdrawn	1,020 "
Area covered by permits	6,440 ha.
Applications pending disposal	7,898 nos.

Amount paid as subsidy as on 31.3.1991 totalled Rs.228.51 lakhs.

8. Insurance for rubber plantations

The insurance scheme drawn up in collaboration with the Public sector National Insurance Company Ltd and launched during 1988-89 was continued to be implemented during the year under review. Under arrangement with the insurance Company who are the insurer, the Board takes out a master policy in advance and arranges to issue thereunder policy certificates to individual rubber growers who desire to obtain insurance cover for their rubber plantations and make due remittance of premium amounts to the Board. Claims arising are investigated in the field by Board's field personnel and reports furnished to the insurer. The latter in turn settles admitted claims through the Board. Thus, as the Board undertakes and discharges the bulk of the administrative work, the insurer is enabled to keep down premium rates and to effect claim settlement quickly and effectively.

The perils covered are fire, fire resulting from explosion, lightning, bush fire and forest fire, wind, storm, tempest, hurricane, land slide, hailstorm, rock-slide and subsidence. The Scheme covers all immature plantations under Rubber Plantation Development Scheme as well as all mature plantations upto 22 years of age.

The maximum liability of the insurer for plantations in the age group of 1 to 8 years is Rs.45,000 per ha and varies from Rs.41 to Rs.166 per tree depending upon the age and Rs.60,000 per mature trees which again varies from Rs.200 to Rs.250 per tree depending upon the age. No salvage value of trees destroyed is deducted from the amount of compensation. Claims can be admitted after an initial waiting in period of one year for newly planted rubber and 30 days for established plantations. The insured grower has to bear 10% of the loss in the case of immature rubber and 10% or Rs.1,000 whichever is more in the case of mature rubber.

The rates of premium are as follows:

	Rs./ha
Immature rubber:	
Less than 1 year old for 8 years	500
Between 1 to 2 years for remaining period to attain 8 years	440
Between 2 to 3 years for remaining period to attain 8 years	380
" 3 to 4 "	330
" 4 to 5 "	270
" 5 to 6 "	200
" 6 to 7 "	150
" 7 to 8 "	90
Mature rubber	
Between 8 to 22 years for a period of 3 years	473

As on 31.3.1991, the Board had obtained 2 master policies covering 4,900 ha of immature area and 1,050 ha of mature area and issued a total of over 5,000 individual policy certificates for 4820.98 ha of immature area and 978.19 ha of mature area. Premium amount paid for the master policies amounted to Rs.29.46 lakhs. Amount recovered against issue of policy certificates to individual growers was Rs.22.39 lakhs.

The insurer had paid an amount of Rs.446,817.30 as compensation to 92 certificate holders as at the close of the year.

9. Production, procurement and distribution of planting materials.

It is well known that use of high yielding planting materials contributes maximum to increase in productivity

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of plantations. The Board draws up an exhaustive categorised list of high yielding planting materials approved for use for each year and publishes it together with notes on merits and demerits of each for information and guidance of the planting public. To ensure easy availability of such planting material at reasonable prices, the Board continued to maintain departmental rubber nurseries at all important rubber growing localities. Although supplies effected from these formed only about 15 per cent of the total industry-wide annual requirements, those helped immensely in maintaining high levels of quality and price in the general market.

Particulars of nurseries maintained by the Board during the year under review are furnished below:

Sl. No.	Name of the Nursery	Total extent	Location	Controlling establishment
TRADITIONAL AREAS		(ha)		
1.	Central Nursery Karikkattoor	20.23	Kottayam Dist. Kerala	Central Office
2.	Regional Nursery Kadakkamon	4.04	Kollam Dt. Kerala	Reg.Office, Punalur
3.	Regional Nursery, Perumpulikkal	4.00	Pathanamthitta Dist. Kerala	Reg. Office, Adoor
4.	Regional Nursery, Kanhikulam	4.88	Palakkad Dt. Kerala	Reg. Office Palakkad
5.	Regional Nursery, Manjeri	2.00	Malappuram Dt. Kerala	Reg. Office Nilambur
6.	Regional Nursery Peruvannamoozhy	3.60	Kozhikode Dt. Kerala	Reg. Office Kozhikode
7.	Regional Nursery, Ulikkal	5.20	Kannur Dt, Kerala	Reg. Office Thalassery
8.	Regional Nursery, Alakode	3.41	-do-	Regional Office, Taliparamba
	Sub total :	47.36		
NON-TRADITIONAL AREAS				
1.	Regional Nursery, Devarappally	2.00	East Godavari Dist,Andhra Pradesh	Reg. Office Berhampur
2.	Regional Nursery, Rani baro	8.00	Ganjam Dist, Orissa	Regl. Office Berhampur
3.	Nursery at Nucleus Rubber Estate & Training Centre, Andamans	1.85	South Andamans, A & N Islands	NRETC, Andamans
4.	Regional Nursery, Shoalbay	2.29	South Andamans, A&N Islands	Reg.Office, Port Blair

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5. Nurseries at Nucleus Rubber Estate & Training Centre, Tripura	7.00	West Tripura District, Tripura	NRETC, Tripura
6. Regional Nursery, Rangutia	5.27	West Tripura District of Tripura	Reg.Office Agartla
7. Regional Nursery, Derrangiri	10.62	Golpara Dist, Assam	Reg.Office Guwahati
9. Regional Nursery, Tesso Ajur	5.00	Karbi Anglong District, Assam	Reg. Office Diphu
9. Regional Nursery, Mijundisha	14.00	-do-	-do-
10. Regional Nursery, Balacherra	13.30	Cachar Dist, Assam	Reg.Office, Silchar
11. Regional Nursery, Hillara	14.32	-do-	-do-
12. Nursery at District Development Centre, Jengitchakgri	3.60	West Garo Hills Dist, Meghalaya	Zonal Office, Guwahati
Sub Total :	87.25		
Grand Total :	134.61		

Although the total extent of lands acquired for the nurseries in non-traditional areas was as shown above, they were only under phased development. As such, the effective developed area as in 1990-91 was only about 50 per cent of the total.

The planting materials raised in Board's nurseries are made available to growers on a no loss no profit basis. Annual costing exercises are made for the purpose. So far, the nurseries in traditional areas only have been subjected to cost examination. Prices so fixed are applied also for sales of planting materials effected from nurseries in non-traditional areas. In future, the costing would cover all nurseries.

Under a separate scheme implemented by the Board, the small growers were supplied the planting materials at concessional prices. Certain institutions and groups were also given limited free supplies for planting for research, demonstration etc. purposes.

For the year 1990-91, the prices fixed for various planting materials were as follows:

Planting material and unit	Cost price Rs.	Concessional price for small growers (Rs)
Green budded stumps (per stump)	2.50	2.50
Brown budded stumps (per stump)		
a) supplied upto 31.8.90	3.00	2.75
b) supplied after 31.8.90	3.50	3.25
Polybagged plants (per plant)	8.00	8.00
Budwood (per metre)	6.00	4.00

The total quantities of planting materials supplied from the nurseries during the year were as given below:

Green budded stumps	: 107,764 nos.
Brown budded stumps	:1517,359 nos.
Polybagged plants	: 2,362 nos
Budwood	: 26,506 metres.

The total cost subsidised during 1990-91 by way of distribution at concessional prices or free of cost was Rs.187,973.50.

The Board, in earlier years, used to be procuring budded stumps and budwood from private nurseries in traditional areas and despatching to and distributing in non-traditional areas in order to make up the deficits there. During 1990-91, no such supplies had to be made to any non-traditional area other than Goa and Maharashtra as the local nurseries owned by the Board and private entrepreneurs were able to meet the entire requirements. Supplies to Goa and Maharashtra effected through the Regional Office in Goa amounted to 103,427 budded stumps.

The Board continued the activity of procuring assorted clonal rubber seeds from Kanyakumari District of Tamilnadu and supplying to Board's own nurseries and private nurseries in non-traditional areas for raising stock seedlings for budding. During the year under review, a total of 140.10 lakh seeds were thus procured and supplied. In addition to these 8.60 lakh seeds were also procured from sources in Tripura and distributed in North Eastern States.

10. Advisory and Extension Services.

All technical officers in the department continued to visit estates and holdings for implementation of various development schemes as well as for imparting advice on scientific methods of rubber cultivation, production and processing. Such visits for schemes implementation and simultaneous advisory and extension work had numbered 165,660 during the year. Visits exclusively for advisory and extension work came to an additional 4,199. Apart from visits to individual estates/holdings, technical officers met growers in groups and conducted meetings,

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seminars, group discussions etc. 1605 group interactions were thus conducted during the year in which 43,422 growers had participated.

Officers in the department also participated in 29 radio talks/discussions on technical subjects of interests to growers.

11. Demonstration of tapping, processing of crop and treatment of tapping panel diseases.

Rubber Tapping Demonstrators attached to most regional offices at the rate of one each continued to visit rubber plantations and to give advice and demonstration on scientific methods of crop exploitation, crop processing and control of tapping panel diseases. The total of such visits conducted during the year came to 8,546.

12. Training for rubber tappers and growers

Regular training of tappers/growers in tapping and related activities at Tappers' Training Schools conducted by the Board continued on an enhanced scale. As at the close of the year, there were 27 schools functioning in traditional areas and 8 in non-traditional areas, as per the list given below:-

Regional Office under which the school functioned	Location of T.T.School
1. Nagercoil	Padappacha
2. Thiruvananthapuram	Karippur
3. Adoor	Kalanjoor
4. Punalur	Vettikkavala
5. "	Pattazhy
6. Pathanamthitta	Mandiram
7. Changanacherry	Thazhathuvadakara
8. Kottayam	Madathiparambu
9. Kanjirappally	Vanchimala
10. Palai	Pizhaku
11. Thodupuzha	Vengalloor
12. Kothamangalam	Panamkuzhy
13. Ernakulam	Veliyanad
14. "	Vadavucode
15. "	Oorakadu(Karukulam)
16. Trissur	Puliyanam
17. Palakkad	Velikkad
18. Kozhikode	Mukkom
19. Nilambur	Chulliode
20. Talassery	Manantawady
21. "	Maloor
22. "	Chathirroormala
23. Taliparamba	Mangara
24. "	Padiyoor
25. "	Pulingome
26. Kanhangad	Vellarikundu
27. "	Chullikkara
28. Mangalore	Gandibagilu
29. "	Udane
30. Agartala	Paticherry

31.	Agartala	Pathalia
32.	"	Juri
33.	Udaipur	Sachirampari
34.	Guwahati	Ougury
35.	Diphu	Dhillai

The training given was for a duration of 8 weeks (60 working days in non-traditional areas) during which the trainees were provided free dormitory type accommodation and nominal stipends. Rubber trees and buildings required for the purpose were availed of on lease. The schools were itinerant in nature in so far as their locations were changed from place to place depending upon demands for training. Each school conducted 5 courses of training per year, each batch accommodating about 20 trainees. Accordingly, 2,807 growers/workers were given training in 150 batches during the year.

The total expenditure incurred besides salary of staff was Rs.772,693 for 1990-91.

Apart from the regular training, the Board conducted short term refresher training for tappers already on the job in batches of 20 to 25. Such courses were held in selected small holdings under each regional office and had durations of three hours per day for upto six days per batch. This went a long way in giving a scientific orientation to the work of tappers. A total of 1983 such refresher training camps were conducted during the year drawing participation of 46,491 tappers. The Board did not have to incur any expenditure on individual trainees for the purpose.

13. Procurement and distribution of leguminous cover crop seeds

In order to popularise the use of Pueraria as a leguminous ground cover in small holdings of rubber, the Board continued to operate a scheme for bulk procurement of the seeds and distributing in small polythene packets through regional offices with about 25% subsidy in price to small growers in traditional and non-traditional areas. During the report year, 13,109 kg of cover crop seeds was procured by the Board for distribution. Out of this, 8,421 kg was distributed to small growers.

During the period under report, Board also procured 6.700 kg of Mucuna seeds from Tripura and distributed to small growers through Board's various regional offices in packets of 10 gm each at Re.0.25 per packet. This had not involved any concession.

14. 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 105 low volume sprayers/dusters were supplied to rubber producers' societies, co-op. Societies and individuals. A sum of Rs.719,750/- was spent during the year for subsidising the cost of the machines. The subsidies allowed amounted to less than 50 per cent for organisations and

less than 25 per cent to individuals.

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

With a view to improving the quality of the produce 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 specifications. Due to paucity of funds the entire applications received could not be processed. A total amount of Rs.999,500/- was granted as financial assistance for the purchase of 952 rollers during the period. The cost of rollers was about Rs.8000/- per set. The financial assistance given was a nominal Rs.1,500/- each for the first 95 sets and Rs.1000/- each for the balance 857.

16. Promotion of bee-keeping

Rubber Plantations are a good source of honey during refoliation period following annual wintering and offers immense potential for bee keeping. This generates additional income to small growers from the honey produced. Hence, in order to popularise this concept, the Board had implemented a scheme for granting financial assistance in the form of subsidy fixed at the rate of 70% and 90% of the cost of standard bee-keeping units purchased and installed to general category and SC/ST category of growers respectively. The standard units consisting of 4 bee hives, bee colonies and honey extraction equipments cost Rs.1750/-each. During the period, 869 growers had availed of the benefit amounting to Rs.988,988.90.

17. Financial assistance to individual small rubber growers for construction of small smoke houses.

In order to persuade and help the small rubber growers to adopt improved processing and curing technique, Board implemented a scheme for offering technical guidance and financial assistance in the form of subsidy for construction of smoke houses of 85 kg capacity. During the period, 284 smoke houses had been got constructed under the scheme for which an expenditure of Rs.851,000/- was incurred. The subsidy in this case had amounted to about 25 per cent of the cost.

18. Financial assistance for irrigation in rubber plantations.

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

The scheme evoked very good response, so much so, all the applications received could not be disposed of.

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An amount of Rs.590,300/- had been disbursed to 272 rubber growers in the traditional areas. In the non-traditional areas, a sum of Rs.4.73 lakhs had been disbursed among 63 growers. The financial assistance granted was at the following rates :

Traditional area	-	Rs.2,500 per ha for small growers and Rs.1,000 per ha for large growers both limited to Rs.5000/-per grower
Non-traditional area	-	Rs.2,500 per ha for all categories of growers limited to Rs.5000/- per grower.

19. 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 establishing young rubber plants in the field during the early years due to the menace of cattle and human tresspassers. In order to establish rubber successfully, it is necessary to protect the plantation with proper boundary barriers. But due to heavy expenditure involved, the small and marginal farmers are not able to afford the investment on this. Therefore, to motivate them, the Board implemented two schemes for offering financial assistance at two different rates for SC/ST categories and general category of growers for fencing on standard pattern in non-traditional areas.

During the period, firm orders had been placed for the supply of 165 M. Tonnes of barbed wires worth Rs.2,699,520/-. Out of this, the firm could supply only 50.12 M.Tonnes value at Rs.753,157/-. The quantity was distributed to beneficiaries under SC/ST category sufficient to fence 210 ha. An amount of Rs.422,988/- was also disbursed to 119 growers belonging to general category for fencing an area of 483 hectares in North Eastern Region. The scales of assistance were as follow:

Category of holdings	Scale of assistance to SC/ST grower per ha.	Scale of assistance to general category per ha.
Upto 1 ha	Rs.4,000	Rs.1,500
Above 1 and upto 2 ha	Rs.3,000	Rs.1,200
Above 2 and upto 5 ha	Rs.2,000	Rs.1,000

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20. Scheme for supply of plantation requisites to small growers in non-traditional areas.

Majority of the rubber growers in the non-traditional areas are small and marginal growers who have taken up rubber planting with the aid/assistance from the Rubber Board. A fairly good number of the plantations have reached 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 and the growers are experiencing great difficulties in getting them.

The above scheme therefore provided for procurement of these materials at competitive rates from sources in traditional areas, transportation to non-traditional areas and distribution to needy small growers, meeting expenditure on transport and handling on Board's account.

The following materials were accordingly supplied to the various offices of the Board in non-traditional areas for distribution to the eligible growers during 1990-91.

Sl. No.	Item	Quantity
1	Rubber Sheeting roller	47 nos.
2	Tapping knife	185 nos
3	Plastic cup	30000 nos
4	Aluminium sieve	60 nos
5	Aluminium dish	1200 nos
6	Rubber coat	900 kg
7	Emissan	30 kg
8	Cup hanger	22000 nos
9	Spout	22,000 nos

A sum of Rs.463,386.65 had been spent on cost of these items. The subsidy element of the scheme came to Rs.1,87,419.50.

21. North Eastern Rubber Development Project

The Project for Accelerated Development of Rubber Plantations in North Eastern Region had been formulated by the Board and submitted to the Government in August, 1982. The project had aimed at acceleration of expansion and development of rubber plantations through implementation of its three components, namely:-

i) Strengthening of Board's organisational machinery by way of expansion of existing regional offices at Agartala and Guwahati, adding a regional office at Silchar and opening a new Zonal Office at Guwahati.

ii) Setting up a research complex with headquarters at Guwahati and four regional stations, one each in Tripura, Assam, Meghalaya and Mizoram.

iii) Establishing and running a 1,000 ha Nucleus Rubber Estate and Training Centre (NRETC) in Tripura.

It was envisaged to have the expansion of rubber cultivation in 24,000 ha over a six year period at the rate of 3,000 ha/year during the first 3 years and at 5,000 ha/year during the next three years. Components (i) and (iii) were taken up for implementation by the Rubber Production Department and component (ii) by the Research Department.

The total financial outlay for the project for 6 years was Rs.618 lakhs. The project had been approved by the Government in mid 1984-85. Owing to the late approval of the project, there was an initial slippage of one year in project implementation. However, the physical achievements were as follow :-

Year	Target for planting (ha)	Extent actually got planted (ha)
1984-85	3,000	1,150
1985-86	3,000	1,800
1986-87	3,000	3,000
Sub Total	9,000	5,950
1987-88	5,000	4,560
1988-89	5,000	5,645
1989-90	5,000	7,000
Sub Total	15,000	17,205
Grand Total	24,000	23,155

The project implementation had to overcome many problems that had doggedly beset its progress. These may be summarised as follows:-

a) Grant of approval for project implementation only late in the year 1984-85.

b) Recurring socio-political disturbances and natural calamities in almost all states/union Territories of the region.

c) Non-availability of adequate planting material within the region. The State Governments were expected to set up nurseries with the financial help of the North Eastern Council and to make available the full requirements of planting materials. This had actually materialised only to a very small extent.

d) Delays in obtaining assignments of lands required for setting up the NRETC in Tripura as well as for construction of buildings for offices and residential quarters at all centres.

e) Constraints posed by strict implementation of Forest Conservation Act and consequently non-availability of even denuded and degraded lands classified in records as forest lands.

f) Destruction of plantations by freely grazing cattle.

The Board had to implement the project virtually by resorting to means verging on crisis management. In respect of planting materials, supplies were procured from all available sources in traditional areas and transported to the region and made available to growers. Simultaneously, steps were taken to establish a series of departmental nurseries as well as commercial nurseries in the private sector. As extensive plantations under estate sector could not take shape owing to constraints imposed by the Forest Conservation Act, the short-falls in physical targets had to be made good by motivating and assisting small entrepreneurs to take up rubber cultivation on scales much larger than those originally envisaged. Such small entrepreneurs were found to be so financially weak that they could not even afford to pay for and obtain supplies of planting materials. They were therefore given initial free supplies and costs thereof adjusted in subsequent subsidies payable. In order to stem the grazing cattle menace, a new special scheme for assisting small growers in creating boundary fencing with barbed wire was formulated and got implemented. The most trying experience was with regard to obtain land for NRETC in Tripura. After protracted negotiations with the local State Government a 15 ha plot and another a 400 ha plot were initially assigned to the Board in 1986-87 and 1987-88 respectively. Subsequently, all but 100 ha of the latter was taken back by the Government and another plot of 400 ha land at a different and far-away location was assigned to the Board in 1990-91, after the expiry of the project period. The first 115 ha was developed during the project period. Development of the other 400 ha was started in 1990-91.

All the above called for undertaking development activities on scales much more intensive as well as extensive than those provided for under the project. This, in turn, necessitated establishment of 8 regional nurseries in N.E.Region as already stated under the sub heading on

planting materials. By 1990-91, these nurseries as well as nurseries promoted in the private sector were in a position to meet the entire local requirements of planting materials. Besides regional offices and field offices as provided for in the approved project, the Board had also to open additional regional offices at Udaipur, Tura, Diphu and Jorhat and field offices thereunder. Construction of buildings for regional offices and residential quarters for staff were taken up on lands got assigned by State Governments at Agartala and Tura.

During 1990-91, the project was continued in its extended implementation. A continuation project is to be drawn up and got approved, pending finalisation of the 8th Five Year Plan. Plantings carried out during the years are estimated to cover about 3,000 ha. A number of farmers' training programmes were undertaken by the NRETC. A tappers' training school was also established at Pathicherry in Tripura where comprehensive training in tapping, processing of crop and control of tapping panel diseased was imparted to 148 workers in 5 batches. NRETC plantations were extended in 23 ha in 400 ha plot which was got assigned last.

The project implementation has resulted in creation of extensive awareness in the whole N.E.Region about the benefits of rubber cultivation. Thousands of small land owners are now coming forward to take up rubber cultivation. A fast pace has thus been set for future development. The infrastructure already created would stand in good stead in facilitating such future development. Accordingly, under the 8th Plan, it has been proposed that 50,000 ha be got newly planted with rubber in N.E.Region.

22. Eastern India Rubber Development Project

Considering the vast scope for rubber plantation development in the non-traditional areas of Orissa, Coastal Andhra Pradesh, West Bengal and Bastar District of Madhya Pradesh, the Board had in 1987 submitted comprehensive proposals for organised development of the potential. The Government had accordingly sanctioned in 1988 a project with the following components:-

i) Establishment of a 200 ha research farm in Orissa.

ii) Establishment of a 250 ha Nucleus Rubber Estate and Training Centre (NRETC), and

iii) Assisting development of rubber plantations in 1,000 ha in the region by the end of the 7th Five Year Plan period (1989-90).

The components (ii) and (iii) above were to be implemented by the Rubber Production Department.

The region did not have any establishment of the Board till then. In 1988 itself, the Board opened a Zonal Office in Bhubaneswar followed by three regional offices at Baripada (Mayurbhanj District), Bhubaneswar (Puri District) and Berhampur (Ganjam District) with skeletal staff. The establishment included a field office manned by an Asst. Development Officer at Maredumille in East Godavari District of Andhra Pradesh. A regional nursery each was also established at Ranibaro in Ganjam District in Orissa and at

Maredumille in East Godavari District of Andhra Pradesh both under the Berhampur regional office. It has not been possible to take up work on the NRETC as the Board has so far not been able to obtain land for the purpose from the State Government.

Extension and development activities carried out by the Board in the region upto the close of 1989-90 had resulted in establishing rubber plantations as follow:-

Orissa	200 ha
Andhra Pradesh	160 "
Madhya Pradesh	2 "
Total	362 ha

In full acknowledgement of the potential held forth, the Orissa State Government had issued orders to its three public sector corporations engaged in forests and other Plantation Development activities to take up rubber plantation development in1,000 ha each under a phased programme. Two of the corporations started the programme in denuded forest lands but were compelled to stop it in the face of ban on planting rubber in forest lands under Forest Conservation Act. In Andhra Pradesh, rubber planting is being undertaken under tribal development programme by the concerned Government agencies. In Orissa, private land owners are evincing keen interest to take up rubber cultivation in small holdings.

During the year 1990-91, expansion of rubber cultivation had taken place in the region as follows :-

Orissa	56 ha
Andhra Pradesh	43 ha
Total	99 ha

It is expected that more impressive gains would be possible in the years to come.

23. Nucleus Rubber Estate and Training Centre in Andamans

The Rubber Board had planted and maintained a 202.55 ha Rubber Research Cum Development Station (RRDS) during the years from 1965 to 1974 in South Andaman Island of Andaman & Nicobar Islands. Originally conceived as a pilot project for promoting rubber plantations in the islands, it was also made use of for rehabilitating Indian repatriates from Burma. The entire expenditure for establishing the plantations had been met by the Government of India in the Rehabilitation Ministry. Subsequently, in 1975, the station was handed over to the full control of Board for being run as a demonstration plantation. In 1985, the Board proposed development of the station into a Nucleus Rubber Estate and Training Centre in order to serve the training and demonstration needs of the entire islands. The proposals were approved by the Government of India in 1986. The total estimated cost of the project was Rs.114 lakhs. It was due to be completed by the close of the 7th Five Year Plan period in 1989-90.

The project implementation suffered severe set backs owing to refusal of local agencies including the Andaman Public Works Department (a unit of CPWD) to take up the required civil construction and other works and prevalence of protracted industrial disputes with the plantation labour. It is now expected that the infrastructure development for starting the IGSTC would be completed by early 1992-93.

During 1990-91, the civil construction and other works entrusted with the National Buildings Construction Corporation Ltd made substantial progress. The industrial dispute with the plantation labour which remained pending disposal with Calcutta High Court on Board's appeal on orders issued by the Island's Industrial Tribunal, continued to cause severe discontentment and unrest. The workers discreetly adopted go-slow tactics in their work which in turn resulted in poor productivity and production. Continued efforts are being made to settle the disputes amicably out of court.

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PART IV RUBBER RESEARCH

RESEARCH DEPARTMENT

The Rubber Research Institute of India concentrated on need based research activities both for the traditional and for the non-traditional zones. Various aspects connected with increase in productivity, agromanagement practices and post harvest technology were under investigation. Emphasis was given to prompt advisory assistance and on the spot study of problems.

AGRONOMY/SOILS DIVISION

The Agronomy and Soils Division continued investigations on nutritional requirement of different clones in immature and mature stages at various agroclimatic regions, irrigation and moisture management, intercropping, forms and methods of fertilizer application and lysimeter studies to find out the water requirement of rubber.

In the experiments on nutritional studies, treatment imposition, recording of observations and collection of soil and leaf samples and their analysis were done. Two experiments with clones RRII 105 and PB 235 indicated that application of nitrogen at 30 kg N ha^{-1}, phosphorous at 30 kg P_2O_5 ha^{-1} and potassium at 20 kg K_2O ha^{-1} gave highest growth in terms of girth. Higher doses were not beneficial and that at the mature phase response to applied fertilizers depend to a great extent on the soil and leaf nutrient status in individual cases. Initial results of experiments comparing the efficiency of different sources of fertilizers indicated that straight fertilizers, fertilizer mixtures and complex fertilizers are equally good as sources of nutrients for mature rubber.

In the field experiment on density of planting, stand ranging from 445 to 598 plants per hectare indicated no significant difference in the girth at the initial stage. Differential requirement of fertilizers also was not indicated. Observations on light interceptions also did not show any definite pattern according to density.

Imposition of treatments and recording of various observations were carried in the trials on irrigation and moisture management as per schedule. In the case of immature rubber, daily drip irrigation (micro irrigations) during summer months was found to enhance growth. In the case of rubber under tapping, no significant increase in yield was observed due to drip irrigation during summer. Lysimeter study indicated that for a two year old rubber plant, the daily water requirement during the summer season for 1990 (January to May) is 4.92 mm day^{-1}, which is equivalent to about 40 l of water per day. In the experiment on soil and water conservation, it was observed that the soil conservation methods like contour terraces, contour trenches, silt pits, cover crops and biological bunds by growing pineapple along the contours are effective in minimising soil erosion. Water run off was also negligible.

In the observational trial on intercropping in immature rubber, growth of rubber was better when grown without intercrops. In the case of coffee and cocoa intercrops where Acacia also was maintained initially as shade tree, the growth of rubber was affected to a great extent. When black pepper was intercropped without planting shade trees the adverse effect was minimum. The growth of cocoa was very poor under the unirrigated condition. The coffee plants have started bearing but pepper is yet to come into bearing. In the experiment in mature rubber where two varieties of coffee (Robusta and

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Cauvery) were planted, the growth of rubber is not seen affected. However, the coffee plants though established well have not set fruit even after four years of growth.

Dissolution pattern of different indigenous rock phosphates was under study. It was found that wa-ter soluble form was better for enhancing growth during early years. In the field study to compare different nitrogenous fertilizers, results of glass house study indicated that coated forms are superior to uncoated forms for the uptake of nitrogen. In the nursery trial on comparison of ammonium sulphate and urea, ammonium sulphate registered high soil sulphur status and a higher growth. Utilization of DRIS (Diagnosis and Recommendation Integrated System) approach the yield data collected from six clones were tabulated. The foliar analytical values for N, P, K, Ca and Mg of 800 samples were tabulated and important ratios were worked out. A Fortran computer programme for deriving the foliar norms was obta-ined.

Investigations were continued to refine tissueanalysis being followed in the mobile laboratories. A new method to estimate K, Ca and Mg in rubber leaves by extracting the powdered leaf with double hydrochloric acid was tried in 30 samples. The results were in close confirmity with the conventional method. The da-ta are under analysis.

Fertilizer recommendations were offered based on the analysis of 11,611 soil and 1,600 leafsamples, and 1,333 leaf samples and 1,005 soil samples were analysed for experimental purpose. Four scientific papers were published/accepted for publication during the year.

BOTANY DIVISION

The Botany Division continued to concentrate on tree improvement through breeding and ortet selections. Investigations on propagation, anatomy and cytogenetics were also in progress.

1. Breeding and Selection

We selected 148 clones from 1986 hybridization programme and established them in eight small scale trials at the Central Experiment Station, Chethackal during 1990. Based on premature yield at 5½ years growth of 1982 HP clones, 15 clones which showed 20% yield increase over RRII 105 were selected for laying out a large scale trial. In addition, 262 selected seedlings resultant of 1990 hybridization programme involving RRII 105, RRIM 600 and GT 1 as female parents and selected clones from 1981 Brazilian germplasm as male parents were established in the nursery.

Ortet selection programme was being continued. From the small scale trial of 61 ortet selections at Cheruvally estate, 20 clones showed more vigour in comparison to RRIM 600, RRII 105 and GT 1 in girth measurement. From Koney estate 50 clones were selected, multiplied and established in source bush nursery. They were further multiplied for laying out trials during 1991 planting season. Based on yield and other secondary characters 50 mother trees were selected from Kodumon estate. From small holdings, 10 ortet selections were multiplied for laying out small scale trial.

Monthly yield recordings, annual girth measurements and recording of secondary characters are done in all field trials. In the 1973 clone trial RRII 208 and RRII 203 were the top yielders having 57.12 and 55.14 g $tree^{-1}$ tap^{-1} over first six years of tapping. Among 11 clones in the 1978 clone trial two clones

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(HP 427 and HP 115) recorded promising yield. RRII 176 and RRII 178 recorded more yield than GT 1 in the 1977 clone trial. Early results of prepotency study revealed that it is possible to identify likely prepotents based on seedling progeny analysis. Juvenile yield of the 1987 trials on estimation of genetic parameters involving open pollinated progenies of 10 clones and their parents have indicated that progenies of five clones are showing superiority in yield over their parents. A trial on open pollinated progenies of 12 clones and their parents was laid out at Hevea Breeding Sub Station at Nettana.

2. Propagation and planting methods

Budding trial for finding out the optimum seasons for budding at Tripura was continued. Studies on depth of planting were in progress. Polybags of different types were kept in the nursery, both burried and exposed, to find out weathering effects. A trial was laid out to study the effect of planting bag plants with the bud union burried in the soil.

Annual girth measurements and secondary characters were recorded in the trial area with 14 different stock-scion combinations laid out during 1984. Among the different stock scion combinations RRII 203 budgrafted on clonal seedling stock of RRII 203 as well as on assorted seedlings recorded the highest growth.

3. Anatomy

Bark of 11 clones was studied at the fourth year of planting and data were collected for early predic-tion of yield and other secondary characters. Detailed analysis of the data on anatomical parameters has revealed high heritability and genetic advance for the number of latex vessel rows which showed the involvement of additive gene action and hence effectiveness of this trait as a selection parameter. Total number of latex vessel rows and total bark thickness showed inverse relationships with the unexploited latex vessel rows in the residual bark. On quantitative basis, virgin and renewed bark differ significantly for certain bark anatomical traits resulting in a reduced quantity of laticiferous tissue and highly zig-zag orientation of laticifers in renewed bark. Deeper tapping of renweed bark is suggested for better yield.

The data on stomatal characters of drought tolerant and susceptible clones at the juvanile stage was summarised and small stomatal aperture was observed as a character of drought tolerant clones. The studies on the interclonal variability of leaf anatomical traits were continued. To study the wood quality of stimulated rubber wood work is under progress. Porocity study of the wood of the clone PB 86 was continued.

4. Cytogenetics

Yield recording and annual girth measurements were carried out in trials with irradiated and polyploid materials. Based on yield and secondary characters 10 clones were selected from 1977 clone trial (irradiated), multiplied and budgrafted plants were raised in polybags. The selected clones from the progenies of male sterile clones and mutagen treated plants were multiplied and raised in polybags for further evaluation. Comparative cytomorphological studies on spontaneous and synthesized triploid were carried out and a paper was presented in the International Symposium on genetic research and education. The spontaneous triploid exhibited autotriploid nature characterised by the presence of a maximum of 18 trivalents in 5% cells.

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The growth attributes of the polybag budded plants of RRII 105 having divergent root systems and variation in growth was noted. The polybag plants were planted in the field. With a view to evolving high yielding clone with short stature a total of 4,000 hand pollinations were carried out, incorporating the genetic variant and its progenies.

The Division published 15 scientific papers during the year under review.

BIOTECHNOLOGY DIVISION

Several tissue culture propagation systems were developed for several clones of rubber. During June 1990, 90 more plants were planted in the field for further trials. **Anther** culture studies were initiated in order to bring out plants with new character combinations which are beyond the reach of conventional plant breeding. A few of such plants were regenerated and are growing in the field.

Protoplast culture programme has been initiated during the later part of 1990 in order to fully utilise the scientific merits associated with techniques involving protoplast/cell as an operational unit for cellular manipulations. Such manipulations involve cell fusion between clones as well as genetic changes by physical incorporation of 'foreign' genetic material leading to new character combinations. Several enzyme systems in the tissue culture derived plants versus non-tissue culture derived plants were studied to ascertain occurrence of specific variations, if any, in tissue culture plants.

GERMPLASM DIVISION

The Germplasm Division is concentrating on the introduction, collection, conservation and evaluation of Hevea germplasm. Action was in progress to build up laboratory and other facilities.

During the period under report 275 wild genotypes of Brazilian germplasm were introduced from the Rubber Research Institute of Malaysia. The materials were subjected to strict plant quarantine measures, multiplied and planted in the source bush nursery at Central Experiment Station. A total of 4702 Brazilian germplasm accessions are now being maintained. They are under different stages of characterisation and evaluation.

Three in situ conservation gardens comprising of threatend old clones and popular clones are maintained. Regular collection of data is being continued and utilised for crop improvement programmes. As a part of the introduction of high yielding exotic clones, a bilateral clone exchange programme was agreed and schedule of import was drawn out between RRII and IRCA, Ivory Coast.

PLANT PHYSIOLOGY AND EXPLOITATION DIVISION

The Division conducted experiments in the fields of exploitation (tapping), environmental plant physiology, biochemistry and **medicinal** plants. In the field of exploitation, the ongoing experiments were continued and a new experiment on controlled upward tapping was started.

In clone RRII 105, third daily tapping of half spiral cut continued to yield equal to that of alternate daily tapping of the half spiral cut. Brown bast was less in the third daily tapped trees. One third spiral cut tapped alternate daily, was also

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stand to be promising with less incidence of brown bast. A new slong handled gauge knife was fabricated and was found suitable for controlled upward tapping with less bark consumption and less bark damage.

The medicinal plant Strobulanthus haenianus yielded 5.3 tonnes/ha in the mature plantation after two and a half years growth. The yield from Adathoda vasica and Plumbago rosea were 4.2 and 4.4 tonnes/ha respectively. A new trial was started to evaluate the effect of medicinal plants on the yield of rubber trees.

In Dapchari (Maharashtra) clones RRIM 600, RRII 612, Tjir 1 and PR 107 continued to show higher growth. Tapping was started for the first time in the station in these clones. At Mudigere (high elevation) clones RRIM 703, RRIM 612, RRIM 600 continued to show better growth. In Wayanad (high elevation) clones RRII 118, RRII 203, RRIM 612 and RRIM 600 continued to grow better.

Lower yield in the Malabar region was found to associate with lower soil moisture stress, lower turgor pressure and lower sugar and thion contents. Irrigation experiments at Dapchari indicated higher water requirements. Irrigation at the rate of ETC 1.0 resulted only in 50% rate when compared to growth rate in wet season. In Hevea photosynthesis is severely inhibited during summer. Clonal variations in photosynthesis/unit leaf area were not evident both in summer and wet seasons, indicating changes in leaf area and duration to be more important.

Under the Dapchari conditions when sufficiently grown plants are field planted, shading is not essential in the ensuing summer season if the plants are given life saving irrigation. However, shading results in significant increase in growth. Contact shading is cheaper than conventional shading.

The Division is now able to characterise certain clones using iso-enzyme patterns.

In connection with early prediction, additional findings made were: (a) two extra proteins in the lutoid membranes of high yielding clones, and (b) a fast indirect method to measure plant moisture status within five minutes. It was found that by employing very high intensive tapping, susceptibility of clones to brown bast can be quant'fied.

During the period under review five research papers were published.

MYCOLOGY AND PATHOLOGY DIVISION

On the control of abnormal leaf-fall disease, a new experiment was started to evaluate clonewise and regionwise recommendation of dosage of copper fungicide for rubber spraying. This experiment is being conducted at two locations on the clone RRII 105. The improved IOC spray oil for retaining copper for a longer period did not prove to be effective in large scale testing. In the high volume spraying experiment, 3000 litres per hectare of bordeaux mixture was found to give 71% leaf retention in RRII 105 at Palapilly area. A power sprayer was field tested and found to be useful for rubber spraying. It can cover an area of one hectare a day under high volume.

In the studies on crop loss due to abnormal leaf fall disease at the Central Experiment Station, Chethackal, leaf fall was noticed in RRIM 600. There was no leaf fall in clones RRII 105, RRII 118 and GT 1. Leaf retention in the unsprayed plot was 36.8% compared to 69.96 in the sprayed plots. Considerable girth

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reduction was noticed in crown budded plants in the trunk of PB 311. Due to the poor canopy size of crown budded plants, extra application of fertilizer and one more round of weeding were done.

An experiment on prophylactic spraying for the control of pink disease was initiated but no clear advantage was observed. In the repeated field trial, Dithane M-45 was found to be a most effective and economical fungicide for the control of Gloeosporium leaf spot. Onfarm trials in 14 estates were in progress to demonstrate the effectiveness of two isolates of Rhizobium. Rubber wood saw dust and crumb factory sludge produce 2100 ml and 1850 ml of bio gas per kg of substrate, respectively.

The biological control agent Beauveria spp. and Bacillus popilliae were found to be as effective as insecticides for the control of root grubs. Portulaca spp. were identified as a potential source of nectar and pollen for off-seasonal bee manage. The intensity of various diseases are regularly recorded in the germplasm materials and hand pollinated seedling collections. Meteorological observations were regularly recorded in eight observatories.

RUBBER CHEMISTRY, PHYSICS AND TECHNOLOGY DIVISION

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

Primary processing

Further studies on the use of sulphuric acid as a coagulant for NR latex showed that it can safely be used for sheet rubber production, provided precautions are taken. Cost of coagulation using sulphuric acid is almost one tenth compared to that using formic acid. In order to increase the efficiency of drying of sheet rubber, the solar drier (800 kg capacity) is being modified by increasing the collector area by 50% and reducing chamber volume by 25%. In collaboration with ANERT a small solar cum firewood drier (200 kg capacity) is being installed.

Chemical modification of NR

Epoxidised NR of 25 and 50 mole per cent epoxidation shows good reinforcement with silica without adding silane coupling agents but the ageing properties are poor. The design for a pilot plant for the production of ENR has been completed. Studies on the kinetics of epoxidation of NR latex showed that the rate determining step is the formation of performic acid.

Rubber Technology

Latex films from transparent rubber band formulation are having comparable strength and ageing properties with those of films from a conventional rubber band formulation. The effect of different antioxidants, plasticisers and solvents on the bond strength of NR based adhesives has been studied. Compression set of NR vulcanizate with peroxide cure system is higher than either efficient vulcanisation or conventional system below 10°C and vice-versa at higher temperature. Fillers increase the compression set: napththenic oil has no marked effect on compression set and antioxidant somewhat impaired the compression set. Blending of PASO with EPDM and the effect of different cure system on the belnds have been studied.

Ageing studies of neoprene vulcanizate showed that the strength properties are not affected by phosphoric acid ageing whereas a drop in strength was observed in the case of distilled water ageing. The effect of strain in NR on its ageing properties due to different cure systems, antioxidant and filler has been

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studied. Blending studies of NR and Ethylene Vinyl acetate (EVA) showed that EVA improves the tear strength and abrasion resistance of NR and adversely affects the compression set and resilience. A mixed cure system gives better properties for the blends containing higher proportions of NR. Complete protection against ozone attack is obtained for the blends containing 40% or more of EVA. Studies on short sisal fibre-rubber composites showed that acetylation of the fibre improved the strength of the composites considerably.

The effects of three retarders on the kinetics of vulcanization, curing time and physical properties of NR compounds were evaluated. NR compounds containing N-(Cyclo hexyl thio) Phthalimide (CTP) as retarder required higher activation energy for vulcanization and the first order rate constant of the compound containing benzoic acid (BA) is lower than that of compounds containing CTP or N-Nitrose diphnyl amine (NDA). BA and CTP prolonged the optimum cure time of the compounds. Higher dosages of NDA and CTP affected some of the physical properties of MOR accelerated compounds.

Externally funded projects

UNIDO project on pre-cured tyre retreading

The evaluation of road performance of 76 pre-cured retreaded cross ply tyres received from UK have been completed. Results indicated that all the experimental compounds have similar wear performace and were inferior to the control (SBR-BR compound) by about 10 to 15 per cent.

Flex seal compound for VSSC

For developing a 'flex seal' for use in GSLC rockets, 20 compounds were screened and a selected compound was sent to VSSC, Thiruvananthapuram for evaluation at their end.

Development of rubber products

A rubber brush suitable for cleaning automobiles, floors etc has been developed and the technology transfer was made to M/s. Hevea and lining Pvt. Ltd. For developing rubber sealants for electrolytic capacitors, samples were sent to Keltron for evaluation.

AGRICULTURAL ECONOMICS DIVISION

Study of the evaluation of planting materials under commercial planting was in progress. Yield evaluation of important clones was continued and the third report of the study is under publication. A survey on the use of planting materials in the estate sector has been conducted and data were collected from 95 large estates covering around 40,000 hectares. Data were collected from 20 important rubber wood consuming units in Kerala, Tamilnadu, Karnataka and Andhra Pradesh to estimate the consumption of rubber wood. Studies were also made to estimate the production of rubber seed oil and the production of rubber honey.

Collected details from 12 factories in Kerala, Tamilnadu, Karnataka and Andhra Pradesh for a study of reclaimed industry. The study on management of rubber small holdings at different levels of input, was continued and draft report of the findings was prepared. Census of unregistered small holdings in a ward in Puliyannoor village revealed that 34.5% of the total area under rubber is unregistered in the village. Survey on the incidence of brown bast in RRII 105 has been initiated. Another survey on adoption of improved planting and processing method by small rubber

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growers is in progress. Clone wise time series details of 22,000 small holdings were collected. For a study of profit maximization/utility maximization of rubber growers, a sampling frame was constructed using the data collected from Erumeli and Mundakayam villages in Kottayam district.

Studies on utilisation of input subsidies and changes in cultural practices was completed and draft report was prepared. Quantity of rubber transported from Kerala by road/rail/ship and from estates/dealers/processors/manufacturers were collected and the data are being studied.

The Division published five research papers during the period under review.

CENTRAL EXPERIMENT STATION, CHETHACKAL

This station at Chethackal, near Ranni, received a rainfall of 3132.7 mm during April 1990 to March 1991. Crop production during the period was 209,048 kg. An area of about 12 ha was planted afresh for different experimental purposes of which 1.5 ha is under Brazilian germplasm for evaluation of the genotypes.

The strength of the permanent workers and casual workers in the rolls was 201 and 220 respectively. The total mandays engaged for different operations in the station during 1990-91 was 67,450. During the period, 11,722 patients from CES and Central Nursery (Karikkattoor) utilised the services of the CES dispensary.

A one day medical camp was conducted in January 1991 at the Station in which experts from medicine, gynaecology and community medicine departments of Medical College, Kottayam participated, when 179 patients availed of the services.

NORTH-EASTERN RESEARCH COMPLEX AND REGIONAL RESEARCH STATIONS

The research complex for the North-Eastern region of the country has its headquarters at Guwahati and apropriately located Regional Research Stations in Assam, Tripura, Meghalaya, Mizoram and West Bengal States.

The Regional Research Station at Guwahati has been concentrating mainly on evaluation of clones, nutritional requirements of rubber during mature and immature phases, onfarm performance of clones, survey of diseases and pests and their control, etc. Conventional and non-conventional breeding techniques were attempted to generate variability and select genotypes tolerant to cold. Efforts were being made to standardise techniques for plant regeneration of cover crops from callus tissues. Agro-meteorological studies were taken up to ascertain the relationship of environmental parameters with growth and yield in rubber. The RRS has been maintaining about 1100 wild genotypes introduced from the Malaysian germplasm centre and 35 belonging to the Wickham series. Survey of pests and diseases was carried out in 65 locations of the rubber growing tract in Assam, Meghalaya and Mizoram and the intensity was assessed by scoring method.

All the ongoing research programmes at RRS, Tripura were continued. The nurseries and experimental areas were maintained properly. Areas under three field experiments (clone evaluation, nutritional studies and planting techniques) were opened for tapping and the yield performance is being monitored. Initial

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results indicate a performance more or less comparable to that in the traditional zone. The trees affected by hailstorm gave lower yield on the bark regenerated after hailstorm injury. It was observed that rubber plantations adopting proper agromanagemen sequently improved physical properties such as bulk density, soil porosity, moisture retention and infiltration.

Six experiments on botanical, agronomical and physiological aspects as well as on mushroom culture were in progress at the Ganolgre farm of RRS, Meghalaya. Clonal differences were noted in growth vigour in the 1985 and 1986 trials. To study the effect of low temperature on rubber plants an experiment in 'Polyhouse' was initiated. It was observed that budsprout in RRIM 600 could be substantially increased when the budded stumps are raised withi the polyhouse. Drying of plants and die back symptoms were noted in the Darachigre farm.

Preliminary trials showed encouraging results on the use of chemicals for weed control at RRS, Mizoram. The problematic lalang grass (Imperata cylindrica) could be checked with glyphorate at the rate of 5 to 7.5 litres per hectare. Studies on nursery maintenance, performance of clones, physiography, intercropping and raising of advanced planting materials were also in progress at the Station.

Nutritional studies were initiated at RRS, West Bengal (Nagarakata). Effect of cold on bud sprout and survival of budded stumps, performance of clones, availability of genetic variability were also taken up in the station during the period under review.

Ongoing research projects in the RRS, Maharashtra (Dapchari) were continued. Seasonal changes in physiological characteristics and yield were studied in newly opened trees of clones GT 1 and RRIM 600 at Parali in North Konkan region. In this non-traditional area the crop experiences severe drought in summer. The extreme soil and atmospheric moisture deficits results in very low plant moisture status and high plugging indices. Stomatal conductance and transpiration rates were also severely inhibited throughout the day.

Seedling nursery, budwood nursery of experimental clones and a polybag nursery were maintained at the RRS, Orissa (Dhenkanal) Regular cultural operations were carried out in the fields. Three new field trials were laid out in the station during July-August 1990, one each on irrigation requirements, adaptability and planting density. The onfarm trial was also continued.

Trials on growth, yield and exploitation systems (1987 and 1988 planting), selected ortet clones (1988 planting) large scale trial of modern clones (1989) were continued in the Hevea Breeding Sub Station, Karnataka. A clone trial and a field experiment for estimation of genetic parameters were also laid out. Test tapping of polyclonal seedlings was initiated. An onfarm trial with six clones is being taken up. In the Hevea Breeding Sub Station, Tamilnadu, the breeding orchards were properly maintained. A large scale trial on stability analysis was also laid out during the year under report.

PART V - RUBBER PROCESSING & PRODUCT DEVELOPMENT

Department of Rubber Processing established in 1977 was mainly providing engineering and quality control services to the crumb rubber factories established under the Kerala Agricultural Development Project (KADP). The activities were subsequently expanded to cover new areas of work like factory management, technical consultancy services for the rubber goods manufacturing industry, raw rubber price monitoring and marketing of rubber and rubber products. The Department is now redesignated as Department of Processing and Product Development. The Head of the Department is designated as Director (Processing and Product Development). The different functions were handled by 6 separate divisions namely, Engineering, Quality Control, Technical Consultancy, Factory Management, Economics & Finance and Marketing & Administration.

The work done during the year ended 31st March, 1991 is briefly given below:-

1) Activities of the Engineering Division

The civil works entrusted to the NBCC in constructing office complexes and staff quarters in NRETC, South Andamans, NRETC, Surendranagar in Tripura, Regional Research Station in Kolazib, Mizoram, Office cum Lab. Complex at Agartala, Tripura, Research & Dev. units in Burnihat in Assam, Tura in Meghalaya and Nagarkatta in West Bengal, and deposit work of the CPWD at RRII, Kottayam, Central Experiment Station in Chethackal, Research Complex in Tura, Processing factory at Dapchari and Laboratory and other buildings at Nettana in Karnataka were monitored and supervised.

The Division continued to provide engineering and technical assistance to the 6 crumb rubber factories established under KADP. The quantity of rubber produced by the different factories during the period is given below:

Production of KADP factories during 1990-'91

(In Metric Tonnes)

1.	Malabar Crumb Rubber Factory, Kozhikode	- 845.25
2.	Palghat District Co-op. Rubber Marketing Society	- 1010.63
3.	MRM Crumb Rubber Factory, Muvattupuzha	- 1666.78
4.	Co-rubber Crumb Rubber Factory Thodupuzha	- 1346.98
5.	KSCRMF Chenappady Factory	- 1649.45
6.	Indiar Crumb Rubber Factory, Pala	- 698.23

Provided support to the following private limited companies in setting up of rubber processing factories.

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1) Pazhassi Rubbers:

Civil works connected with this company was completed. All the machinery for production in the factory were erected and commissioned. Electrical connection was also obtained and the factory started production by March, 1991.

2) Pamba Rubbers:

Civil works connected with the factory is progressing. Machinery were selected and orders were placed. Part of the machinery were received at site. Tenders were floated for the electrification work of the factory.

3) GAICO factory:

Estimates for the civil work were prepared, and assistance was provided in selection of machinery and electrification work.

4) Chittarickal latex centrifuged factory:

Civil work is progressing. Assistance was provided in the preparation of tender document for the electrification work.

5) Vaipur Centrifuged and Crepe Mill:

Assistance was provided for the construction of the factory building. Tenders received were evaluated and recommendations were given for awarding work.

6) Periyar Latex Limited:

Civil work commenced during April, 1990. The various drawings for the factory building were examined and suggestions were given for modifications as necessary. Details of miscellaneous items, equipments and tools were prepared and given along with tender documents for electrifications and steps were taken for getting the electrification work done.

7) Sreekantapural Latex:

Civil works were awarded for execution. Part of the machinery was procured. Steps were taken to change the product mix from latex concentrate to pale latex crepe (PLC) using the facilities already built up.

8) TFDPC Latex centrifuging factory and crepe mill:

Rendered assistance in setting up of the latex centrifuging factory and crepe mill for the Tripura Forest Development Plantations Corporation. Equipment needed in the sheet factory were procured and forwarded to them. Assisted them also in the supervision of civil construction works for the processing factories.

9) Rehabilitation Plantation Limited:

The factory for producing crumb rubber under Rehabilitation Corporation, Punalur is now ready for production. Trial run for production was taken.

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10) Ponmudi Rubbers:

This factory for producing crumb rubber is also being set up by the rubber producers' societies. The factory lay out plan was prepared. The land acquired was surveyed and guidance was given in locating the factory building in the site.

11) Kavanar Latex Ltd.:

The project report for the factory was prepared and contour survey for the land acquired was made.

Other major activities:

Consultancy was provided to the Meenachil Rubber Processing factory for the electrification of the effluent treatment system.

Prepared specifications for the intermix and mixing unit to be procured by the Kerala State Co-operative Rubber Marketing Federation for their inter mix plant to be set up at Kaduthuruthy. Engineering services were provided to the radiation vulcanisation of natural rubber latex plant under establishment by the Rubber Board.

Consultancy service was provided to Malankara Rubbers in the expansion of their crumb rubber and for setting up a centrifuging factory.

Quality Control Division:

The Central Laboratory provided analytical services to the crumb rubber factories and concentrated latex producers for standardization and quality control of their produce. Rubber and latex samples were analysed for 32,759 parameters. Under the ISI scheme for inspection and testing conducted 484 inspections and analysed latex and rubber samples for 4,870 parameters.

In addition participated in the International Round Robin cross check scheme on crumb rubber and conducted inter laboratory Round Robin testing on crumb rubber and concentrated latex.

Provided assistance in designing effluent treatment plants to be set up in rubber processing factories.

Eighteen analytical trainees were given training of six months.

FACTORY MANAGEMENT DIVISION

The Pilot Crumb Rubber Factory at the RRII and the Pilot Latex Processing Centre at Chethackal came to full production capacity. The crumb rubber factory produced 290 tonnes of rubber and the PLPC produced 214 tonnes of concentrated latex.

TECHNICAL CONSULTANCY DIVISION

Technical assistance and consultancy services were provided to rubber growers, rubber processors and rubber goods manufacturers. A brief account of the major activities is given below.

Completed 24 project reports relating to processing of natural rubber latex into crumb rubber, centrifuged latex and creamed latex and 6 project reports on manufacture of different rubber products. Advice was given on manufacture of products like latex backed woollen carpets, elastic thread, surgical gloves, examination gloves, coir foam etc.

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Developed knowhow for production of 17 different items and transferred the technology to the entrepreneurs on consultancy basis.

Quality control assistance was provided to the rubber goods manufacturers in marketing rubber products as per the specifications of the Bureau of Indian Standards. Rubber products received from different centres were tested and results were communicated to the BIS.

Technical bulletins were prepared on 6 products namely, radiator hose, printing rollers, surgical gloves, foam products, latex adhesives and hawai chappals.

Market survey analyses were conducted for product like solvent Naphtha for the Cochin Refineries.

Seminars were conducted in different rubber consuming centres for popularising the uses of technically specified rubber and low ammonia preserved concentrated latex.

MARKETING DIVISION

1) Price support operation

Co-ordinated the activities connected with the price support operation of the State Trading Corporation for ensuring fair price to rubber growers for RMA 5 grade of sheet rubber. The price of RMA 5 grade of sheet rubber fell below the trigger level and the Government of India asked the State Trading Corporation to initiate price support operations. The STC purchased RMA 5 grade of rubber sheet through various warehouses. Quality control of 5264 tonnes of rubber thus purchased was monitored.

2) Price collection and monitoring:

Collected the daily prices of RMA 4 and ungraded sheet rubber from Kottayam and Kochi markets. Price of scrap rubber was collected twice a week. Weekly average prices of RMA 1 to 5 and the weekly and monthly prices of centrifuged latex were also collected. The prices collected on different kinds of rubber sheets were sent to Central Government and released to the Press for publication in the dailies.

3) Natural rubber subsidy and export assistance:

Exporters of rubber products are eligible to get subsidy from Government of India on account of price difference in natural rubber between the domestic and the international market. The Division compiled the extent of this price difference on a monthly basis and passed on to the Ministry of Commerce, CAPEXIL, Sports Goods Export Promotion Council and various offices of the Controller of Imports and exports.

4) Marketing support operations:

Provides marketing support operations to the various trading companies and the processing companies set up by the Rubber Producers' Societies. All the processing companies and trading companies were actively associated with the price support operations implemented by the STC for keeping the price of RMA 5 above trigger level. Provided assistance to 103 rubber producers' societies in determination of dry rubber content

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of rubber latex by correct procedures and also to the RPSs who have established smokehouses in operation of the smoke houses.

ECONOMIC AND FINANCE DIVISION

Provided financial assistance to 49 rubber producers' societies for setting up of latex collection centres incurring Rs.376,320/- for acquiring 3 items of equipment namely platform balance, chemical balance and air oven. Under the scheme for providing assistance to RPSs for setting up of sheet/scrap collection centres, 27 RPSs were given assistance amounting to Rs.93,069/-. The scheme for construction of smoke houses was discontinued during 1990-91 but an amount of Rs.205,432/- was paid to 6 RPSs towards payment of pending instalments of assistance for setting up smoke houses approved during previous year. An amount of Rs.50,000/- was paid to the Ujire Marketing Society towards share capital contribution for marketing. The Kerala State Co-operative Rubber Marketing Federation was paid Rs.10 lakhs as share capital contribution for establishment of an intermix unit and Rs.15,800/- was paid to the Pothanicad RPS as share capital contribution under the scheme of establishing village level industrial units. During the year the Board received the following amounts as refund of assistance under the various schemes:

	Rs.
1) Working capital loan	: 241,508.00
2) Loan for Testing Lab.	: 50,000.00
3) Loan for Bee keeping	: 559,600.00
4) Share capital contribution	: 19,010.00
5) Interest on loan	: 74,364.00

PART VI - ADMINISTRATION

The major functions of the Dept. of Administration consists of constitution/reconstitution of the Board and its committees. These committees give policy guidelines to the Board's 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. also form part of the administrative functions.

The functions of the Dept. are carried out through the following sections/divisions/offices:

1) Establishment (General administration & Board secretariat , personal admn. and entitlements.)
2) Excise duty
3) Market intelligence
4) Licensing
5) Statistics & Planning
6) Publicity
7) Labour welfare
8) Internal audit
9) Legal
10) Vigilance
11) Official language implementation
12) Rubber promotion division and
13) Sub offices and Liaison offices.

The Statistics and planning division, Rubber promotion division and the Vigilance Sections function directly under the Chairman. The other sections and the sub offices in Madras, Bombay, Calcutta, New Delhi, Jullundar, Bangalore, Ahmedabad and Kanpur are controlled by the Secretary.

1.1 General Admn./Staff welfare/Labour welfare:

The activities of the Board for the year 1989-90 were documented through Annual Report which was presented to the Govt. as required under clause 8(3)(c) of the Rubber Act.

The children of rubber plantation workers were granted educational stipend amounting to Rs.19,25,985/- as a labour welfare measure. Apart from this the Board could effect payment of Rs.2,85,484/- towards medical attendance, personal accident cum deposit, housing subsidy scheme as labour welfare measure. Eligible employees were granted children's educational allowance/ reimbursement of the tuition fee etc.

During the period 32 employees were given financial assistance for the construction of their houses by advancing Rs.20,39,860/- as per the approved scheme and Rs.4,66,560/- to 64 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. The Board owned 80 vehicles which were maintained in good condition. The services of the post, telegraph, telephone and telex and computer were harnessed to the Board's advantage for providing good communication facilities between the Board and its clientele.

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1.2 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 the merits/skills of the candidate while vacancies on the Board's establishment were filled up. Periodical returns on the personnel recruited were sent to the Govt. and to the Employment Exchange. Service Books, Leave Accounts and personal files of employees in the Admn. Dept. were maintained. Retirement benefits were given to all the employees who superannuated during 1990-91 in time.

The total No. of officers and staff under the Board as on 31.3.91 was 1916 as detailed below:

Name of Department	Group A	Group B	Group C	Group D	On consolidated pay	Total
Administration Department	26	63	174	18	Nil	281
Rubber Production Department	70	297	678	74	2	1121
Research Department	54	107	187	30	11	389
Department of Rubber Processing	15	24	45	5	Nil	89
Finance & Accounts Department	4	5	19	1	Nil	29
Department of Training	1	3	3	Nil	Nil	7
GRAND TOTAL	170	499	1106	128	13	1916

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 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 to acquire natural rubber, and 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 normally made.

A. Issue of licence:

Licences are issued to prospective manufacturing units, which are renewed for the subsequent years. Some manufacturers after exhausting the licensed quantity apply for licence for acquiring additional quantity of rubber and in such cases, supplementary licences are issued.

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The details of licences issued during the period under report for the year 1990-91 are given below:-

a)	Fresh licences	- 558
b)	Renewal licences	- 1107
c)	Supplementary licences	- 46
	Total	- 1711

During the previous period, the licence in respect of 3364 manufacturers were renewed. With this the total number of licences issued for the year 1990-91 was 5075 (3364 + 1711).

During the period, the licence in respect of 6 manufacturers were suspended on account of serious irregularities and malpractices detected in their business, and the licence of 1 unit was cancelled at the request of the unit. Thus, deducting the supplementary licences issued to 46 manufacturing units and the one unit whose licence was cancelled, the total number of manufacturers as at the end of 31.3.91 was 5028. The state-wise distribution of licensed manufacturers, is furnished hereunder:

Sl.No.	Name of the State/Union Territory	No. of units
1	Kerala	816
2	Maharashtra	569
3	Punjab	538
4	Uttar Pradesh	504
5	West Bengal	494
6	Tamilnadu	491
7	Delhi	377
8	Gujarat	304
9	Haryana	252
10	Karnataka	221
11	Andhra Pradesh	158
12	Madhya Pradesh	85
13	Rajasthan	66
14	Bihar	47
15	Chandigarh	24
16	Goa Daman Dieu	24
17	Orissa	19
18	Pondicherry	16
19	Himachal Pradesh	12
20	Jammu & Kashmir	4
21	Assam	3
22	Tripura	3
23	Sikkim	1
	Total:	5028

Also prepared and supplied the list of licensed manufacturers from time to time for reference to the rubber dealers and other public, and issued 3922 licences (20 licences to new manufacturing units and 3902 to the existing units by way of renewal of licence) for 1991-92.

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

Registered 1089 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 application received from the manufacturers, 6 new branches/purchase depots were registered.

4. Letter of authorisation to purchase rubber:

Issued 11 special authorisations to organisations/ institutions to acquire rubber for experimental purpose, after collecting the relevant cess in advance.

B. Assessment of Excise Duty on rubber:

Obtained 9710 half yearly returns from various rubber goods manufacturers and Sole Crepe Producers during 1990-91. Received 1368 individual reports on inspection of the books of accounts of manufacturers from the various Liaison Officers and other inspecting officials. On the basis of the reports and those of the Market Intelligence Section, furnishing discrepancies detected in the books of accounts of manufacturers and cross checking of their monthly returns of dealers etc., additional assessments were made in 180 cases on a quantity of 1,541,312 kg of rubber involving a cess amount of Rs.7,70,656/-. The total amount of cess assessed during the period was Rs.14.37 crores.

C. Collection of Excise Duty on rubber:

The target of cess collection fixed for the year 90-91 was Rs.15 crores. Against this the actual collection of cess came to Rs.14.735 lakhs which represents 98.2% of the target. The shortfall of 1.8% in the collection was mainly due to the increased distribution of imported rubber by the State Trading Corporation and direct import by the manufacturers under the Export Entitlement Scheme. Even though the assessment of cess on rubber during the period had fallen short by Rs.63 lakhs, this was made good by the vigorous efforts in collection of arrears.

The amount was duly remitted to the Bank for being credited to the Consolidated Fund of India.

D. Court Cases:

During the period, a claim petition was filed before the Official Liquidator, High Court of Madras preferring claim for a sum of Rs.188,709/- towardscess on rubber due from M/s. Ruby Rubber Works (Madras) Ltd., Madras, under liquidation. Besides, a manufacturer in Bangalore obtained an order from the Hon'ble High Court of Karnataka, staying the revenue recovery proceedings initiated by the Board for recovering a sum of Rs.8,625/- towards arrearsof cess on rubber. Counter affidavit was filed for vacating the stay order and for recovering the cess dues.

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3. Licensing of rubber dealers:

Licences are issued to rubber dealers and processors under Section 14 of the Rubber Act and Rule 394 of the Rubber Rules 1955.

The strength of rubber dealers was 6886 at the beginning of the year which rose to 7280 at the close of the year. The number of processors has gone up from 113 to 127.

A. Dealers Licence:

During the year 1433 Dealers licences were issued, including 1054 new licences. Since applicants failed to satisfy the Board's requirements with regard to issue of licences 108 applications were rejected.

Of the 1433 licences issued, 1273 were sanctioned for one year with validity up to 1990-91 (1048 fresh licences and 225 renewal cases), 34 for a duration of 2 years with validity of 1990-92 (one fresh and 33 renewal licences) and 126 licences were granted for 3 years with validity of 1990-93 (5 fresh and 121 renewal licences). Also 26 short period licences were issued.

In addition, 2097 licences were granted valid from 1.4.91 onwards. Of this 1263 were for the years 1991-92, 190 for the years 1991-93 and 644 for the years 1991-94.

B. Suspension/Revocation of Dealers Licence:

During the period 18 licences were suspended on account of serious irregularities committed in business. However, the order of suspension of a licence was later recinded after receiving satisfactory explanation/documentary evidance from the dealer concerned. Five licences were revoked on account of the violation of the provisions of the Rubber Act and the Rubber Rules 1955. Due to death of licensees 42 licences were cancelled.

After accounting for the suspension, cancellation and revocation of licences effected, there were 7280 licensed rubber dealers all over India. The State-wise and district-wise distribution of dealers (Kerala) as on 31.3.1991 is shown below:

KERALA STATE

Sl.No.	Name of District	No. of dealers
1	Kottayam	2033
2	Eranakulam	1005
3	Pathanamthitta	857
4	Kollam	771
5	Thiruvananthapuram	477
6	Idukki	324
7	Kannur	262
8	Malappuram	226
9	Kozhikode	164
10	Palakkad	113
11	Thrissur	84
12	Kasargode	51
13	Alappuzha	37
14	Wyanad	35
	Total:	6439

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OUTSIDE KERALA

Sl.No.	Name of the State/ Union Territory	No. of dealers
1	Tamilnadu	192
2	Delhi	161
3	Punjab	119
4	West Bengal	91
5	Maharashtra	77
6	Uthar Pradesh	59
7	Karnataka	51
8	Haryana	34
9	Gujarat	21
10	Tripura	12
11	S. Andamans	5
12	Chandigarh	4
13	Bihar	3
14	Assam	3
15	Madhya Pradesh	3
16	Rajastan	2
17	Meghalaya	2
18	Orissa	1
19	Jammu & Kashmir	1
	Total:	841
	Grand Total: (6439 + 841)	7280

C. Processors Licence:

Granted 36 Processors licences; 15 fresh and 21 renewal licences. Besides 16 licences were issued with validity effective from 1.4.1991 onwards. Of these 6 were for the year 1991-92, one for 1991-94, 3 for 1991-95 and 6 for 1991-96.

As on 31.3.91 there were 127 licensed rubber processors all over the country. The State-wise/District-wise distribution of licensed Processors as on 31.3.91 is given below:

KERALA STATE

Sl.No.	District	No. of units
1	Kottayam	45
2	Eranakulam	12
3	Malappuram	10
4	Thrissur	8
5	Pathanamthitta	6
6	Kannur	5
7	Palakkad	4
8	Thiruvananthapuram	3
9	Kasargod	3
10	Kozhikode	3
11	Kollam	3
12	Idukki	3
13	Alappuzha	1
	Total:	106

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OUTSIDE KERALA

Sl.No.	Name of State/Union Territory	No. of units
1	Tamilnadu	14
2	Karnataka	7
	Total:	21
	Grand Total: (106 + 21)	127

D. Registration of Branches:

During the year 375 branches of the dealers and Processors were registered. As on 31.3.91 there were 978 registered branches of the dealers and Processors.

E. Registration of agents:

On the basis of letter of authorisation received from dealers 442 agencies were registered to purchase rubber on commission basis. As on 31.3.91 we had 510 registered agents.

F. Collection of cess on rubber from dealers and forfeiture of bank guarantee:

An amount of Rs.57,975/- has been collected from dealers towards cess on rubber and bank guarantees worth Rs.100,000/- was forfeited for violation of the conditions of the licences issued to them.

G. Supply of list of licensed rubber dealers & manufacturers:

Thirteen books of I batch and 15 books of 2nd batch of the list of licensed rubber dealers for the year 1989-90 were supplied, besides 46 books of I batch, 38 books of 2nd batch and 34 books of 3rd batch of the list of licensed manufacturers. An amount of Rs.2375/- was collected towards the sale of lists.

H. Supply of N form declarations regarding inter-state transport of rubber:

Declarations regarding inter-state transport of rubber ie. N1, N2, N3 and N4 were supplied to various estates, dealers processors and manufacturers situated within the jurisdiction of Kochi office. The details of forms supplied during the year are given below:-

Type of Declaration form	No. of units/parties to whom supplied	No. of books
N1	154	602
N2	2163	1447.2
N3	17	9.4
N4	2146	2473.4
	Total:	4532.0

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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 for ascertaining the actual quantity of rubber acquired, to prevent evasion of cess and eschew malpractices etc. formed the major portion of market intelligence work. Inspections are also conducted for ascertaining the suitability of the applicants and their business premises to issue licences to deal in rubber, registration of branches of the dealers and approval of new/additional premises.

Detection of irregular transactions:

To curtail bogus transactions and to detect bogus dealers, timely watching and scrutiny of Form N declarations and connected returns were undertaken. As a result, suspicious transaction of certain dealers were detected and reported to the Liaison Officers for immediate enquiry and report. This resulted in the timely prevention of bogus transactions causing loss of revenue to Government. Licences of 15 dealers and 4 manufacturers were suspended.

Detection of unlicensed dealing in rubber/illicit transport of rubber:

As a result of the surprise inspections 45 unlicensed dealings and 4 illicit transport of rubber were detected. As the quantities of unlicensed dealings were small, prosecution steps were not initiated against them. They were warned of the consequences of unlicensed dealings. Subsequently, they stopped such dealings and obtained licences.

Due to the timely action 4 consignments of rubber clandestinely transported could be detained at Howrah, Bombay Ahmedabad and Ernakulam railway stations. The consignments detailed at Ahmedabad and Ernakulam Railway Stations were later produced before the Courts there and taken in to judicial custody.

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Twenty consignments of rubber arrived at the Board's 3 checkposts with defective declarations and incorrect documents were detained and later released after getting the defects rectified. In the case of 2 consignments, release of rubber was made only after collecting the cess due as the transport was in contravention of the conditions of the licence. Another case in which creamed latex was despatched in a different name, the material was released only after realising the entire value of the latex.

Prosecution under the Rubber Act, 1947/Court Cases:

Consent was given for prosecuting 4 accused on the basis of report furnished by the Sub Inspector of Police, Sullia Police Station, on seizure of 700 kg of rubber, and 7 others for illegally transporting rubber. Revision petition against the order of Chief Judicial Magistrate, Kalpetta acquitting an accused was filed before the Hon'ble High Court of Kerala. As per directions of the 1st Class Magistrate Court, Palakkad, 600 kgs of rubber illegally transported through Walayar Check post was sold at Rs.12,000/- and the amount was deposited in the Court.

Cross checking of returns/Form N declarations:

Cross checking of monthly returns of 102 dealers, 40 manufacturers, one (1) processor and 6 estates with those of their suppliers/purchasers were carried out, as a result of which unaccounted transactions were detected and a sum of Rs.8,53,642/- was realised from the parties concerned. An amount of Rs.75,000/- furnished towards Bank Guarantee by 4 dealers was forfeited on account of serious malpractices detected in the rubber business.

Supplied 11,878 number of N books to various estates (1489)/processors (840)/dealers(3845)/manufacturers (5704). Scrutinised 51,179 copies of Form N declarations. Wherever discrepancies were noticed, explanations/clarifications were called for from the concerned parties. As per the daily statements received from Walayar, Kavalkinar and Manjeswaram checkposts 30,114 consignements of rubber had passed through the check-post. These consignments were cross verified with the returns of the concerned parties in doubtful cases.

5. Statistics & Planning:

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 to ascertain the monthly variation in production, stock etc. The data collected 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 VIII of this report.

Monitored supply, demand and price of rubber periodically for presenting appropriate recommendations. The Statistics & Import/Export Committee of the Board was convened two times to review the demand and supply of rubber. Continued to furnish information to the various organisations connected with the rubber industry as in the previous periods. "Rubber Statistical News" (Monthly) covering among other things details of

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production, consumption, import and stock position of natural, synthetic and reclaimed rubber and price of natural rubber was regularly published.

Almost all the tables of Indian Rubber Statistics Vol.19 were made up-to-date and got ready for printing.

The census work of rubber area initiated in March 1988 was continued. Data pertaining to 1,23,478 small holdings were collected.

Planning:

The Annual Plan for 1991-92 was prepared. The 8th Five Year Plan and Annual Plan for 1991-92 in respect of Tribal Sub Plan and Special Component Plan were prepared and furnished to the Ministry. The 8th Five Year Plan for rubber was redrafted based on the suggestions received from Ministry/ Planning Commission. The outlay proposed under the revised Plan is Rs.200 crores.

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 32nd Assembly of the IRSG was held from 10th to 14th Sept. 1990 in Ottawa, Canada. It was attended by delegates and advisers from 23 member countries and observers from 8 countries and 11 international organisations. Smt. J Lalithambika, Chairman, Rubber Board represented India at the Assembly, who presented the National Statement of India at the Assembly.

The 13th meeting of the Committee of Experts and a special meeting of the Executive Committee of ANRPC were held in Kuala Lumpur, Malaysia, from 31st July to 3rd August 1990. Shri P Mukundan Menon, Rubber Production Commissioner and Shri CA Bhaskaran, Under Secretary, Ministry of Commerce represented India at the meetings. An important decision taken at the meeting was to organise the next Assembly of the ANRPC at Ministerial level during the first quarter of 1991 to review the role of ANRPC in the light of the developments and problems currently facing the natural rubber industry. The first meeting of the Committee on processing, quality and marketing and the first Preparatory meeting of the Senior Officials of ANRPC member countries were held in Phukat, Thailand from 30th October to 2nd November 1990. Smt. J Lalithambika, Chairman Rubber Board represented India at the meetings, who presented the National Statement of India on processing, quality and marketing. The second meeting of the Committee on processing, quality and marketing and the second preparatory meeting of senior officials of ANRPC were also held in Kuala Lumpur from 4th to 8th March 1991. Shri A Krishnaswamy, Second Secretary, High Commission of India, Kuala Lumpur represented India at the meetings.

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6. Publicity and Rubber Promotion:

Journals and publications:

'Rubber' the Malayalam monthly, recorded an average of 10,315 copies a month. The scheme for enrolling perpetual subscribers was continued. A total of 68 perpetual subscribers were enrolled and the final figure touched 3975. Four issues of the 'Rubber Board Bulleting' were brought out each with 1100 copies. Five thousand copies of the fourth revised edition of the Malayalam book 'Rubber Vithu muthal Vipani vare' and another 5000 copies of the book 'Rubber enna kalpadhenu' incorporating 48 lessons on rubber cultivation and processing, broadcast over All India Radio were brought out. The lessons broadcast formed part of the prestigious programme of the AIR entitled 'Rubber School on AIR'. The second revised edition of the book on Rubber Tapping in Malayalam was published. One lakh copies of the book were got printed. Leaflets on various aspects were got printed and published during the period.

Press Releases, Farm Features & Advertisements:

Press hand outs on various topics were released to the national as well as local dailies which secured wide coverage. A total of 85 press releases and 78 advertisements were issued. Farm features were also prepared and released to "Karshika Rangam" page of the Malayalam dailies.

Rubber Producers Societies:

Organising Rubber Producers' Societies (RPS) throughout the rubber growing tracts was continued. The number of approved RPSs increased from 883 in 1989-90 to 1158 in 1990-91.

Exhibitions and Seminars:

Organised 126 seminars. Also arranged two exhibitions, one at Killur in Belthangady Taluk of D.K. District, Karnataka and another at Mannuthy near Thrissur in Kerala.

Rubber School on AIR - Rubber Enna Kalpadhenu:

Made elaborate arrangements with the active co-operation of All India Radio, Thrissur 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 50 week programme concluded in June 1990.

Polybag nurseries:

Arrangements were made to raise five lakhs of high yielding budded stumps in polybags during the period through 250 selected RPSs. This helped in ensuring availability of high yielding planting materials of advance growth to the planting community and at the same time served as a check on private nursery owners who charge exorbitant rate on planting materials.

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7. LABOUR WELFARE

In order to realise the objective 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 implemented the Educational Stipend, Medical Attendance, Housing Subsidy and Group Insurance cum Deposit Schemes during the year. An amount of Rs.22 lakhs was ear-marked in the non-plan budget for the payment of Educational Stipend, Group Insurance and Medical Attendance Schemes. An amount of Rs.10 lakhs was provided in the annual plan to implement the Housing Subsidy Scheme.

1. Educational Stipend Scheme

The Scheme provides educational assistance to children closely related to Rubber Plantation Workers for undergoing recognised courses in Arts, Science, Commerce, Engineering, Agriculture and Medicine. The stipend covers tuition fee, hostel/Boarding fee and a lumpsum grant for purchase of books,instruments etc. An amount of Rs.19,25,987/- was paid to 11,544 workers towards educational stipend.

2. Group Insurance cum Deposit Schemes(Phase I and II)

The objectives of the scheme are to provide compensation to workers of rubber holdings not covered by the provision of plantation Labour Act, 1951, against death/injuries by accidents and develop a habit of savings among them on a long term basis. The Scheme enables the workers to work with a better sense of security as it provides insurance coverage in a variety of circumstances. A Group Insurance cum Deposit Scheme was implemented as Phase II during the year by enrolling 1200 workers. The existing scheme implemented from 1987 onwards was continued and 870 workers renewed the insurance cover during the year. An amount of Rs.207,000/- was remitted towards board's share in the names of the insured under the Phase I and Phase II schemes. The insurance company disbursed Rs.714/- during the year to two workers as accident compensation.

3. Medical Attendance Scheme

It provides grant of financial aid for treatment of prolonged illness exceeding two weeks in duration to workers employed in rubber plantations not governed by the provisions of the Plantation Labour Act and whose wages do not exceed Rs.1500/- per mensem. An amount of Rs.78,484/- was disbursed to 122 workers as medical reimbursement.

4. Housing Subsidy Scheme

The Board has placed a proposal to the Government for implementing a Housing Subsidy Scheme during the 8th Plan period with a financial outlay of Rs.50 lakhs. Pending its approval, the scheme was implemented during 1990/91. Since there were a number of claims pending at the end of the year 1989-90 for servicing, no fresh applications were invited. The applications pending were processed as per the 1989-90 scheme, under which a worker having land in own name when constructs a house with a plinth area ranging from 20 to 70 sq. mts. at an estimated cost not exceeding

Rs.70,000/- will become eligible for subsidy of Rs.5000/- or 25% of the estimated cost whichever is less if such construction reaches upto --- and including the roof level. An amount of Rs.5,32,375/- was paid to 152 workers during the year.

8. Vigilance

During the period under report, the Vigilance Division of the Board took up 19 complaints against 6 officers of Group A and B status and 13 employees of Group C & D status for inquiry/investigation. The allegations mainly related to falsification of accounts, misappropriation of Board's funds, cheating the Board by deceitfully receiving the subsidy cheques meant for the growers and managing to encash a few such instruments, settlement of contingent advance by submitting false/fictitious voucher, false claim of TA/DA, habitual unauthorised absence etc. All the complaints were verified and appropriate action taken against the erring officials.

Cases

Major penalty proceedings against three officials and minor penalty action against 11 officials were taken during the year. Administrative action was also taken against 2 officials.

Acquisition/disposal of immovable/movable property

Annual statements of immovable property as on 31.12.90 of Group A & B (Class I and II) Officers received were scrutinised. During the year, 65 applications of Board's employees for sanction to acquire/dispose of immovable property and 63 applications pertaining to acquisition/disposal of movable properties such as motor cars, two-wheelers, refrigerators, television etc were dealt with/processed.

Vigilance Flying Squad

In order to maintain constant vigil against delays, possible malpractices and corruption and to inculcate devotion to duty among staff working in the field, a small Anti-corruption Cell (Vigilance Flying Squad) consisting of a Dy. Rubber Production Commissioner, a Development Officer and a Survey Officer was constituted. During the year the Squad overchecked 253 scheme connected cases in the field to find out the correctness of reports submitted by the field staff. Surprise inspections were conducted in 145 offices (Regional Office/Field Office), 5 tappers' training schools and 3 Regional Nurseries. Ten complaints against officers were enquired into and appropriate action was taken.

9. Legal matters

The Legal section renders advice/opinion to Departments and sections, drafts legal documents, takes steps to initiate prosecution under the Rubber Act 1947, assist the departments in conciliation proceedings in labour matters, tax cases etc and arrange appearance of Legal Advisors on behalf of the Board in litigations.

During the year advice/opinion was given in 400 files. Seventy cases were pending in various courts for and against the Board, in all of which steps were taken through lawyers to safeguard the interest of the Board. Effective assistance was given to the police, public prosecutors and sales tax authorities in the prosecution instituted under the Rubber Act.

In addition, prepared and filed statutory forms, other documents of the private limited companies floated as a joint venture of the Rubber Board and the Rubber Producers' Societies and rendered assistance to Rubber Producers' Societies in defending the proceeding launched under Kerala General Sales Tax Act.

10. Internal Audit

The Internal Audit/Inspection was conducted in 11 units including the audit/inspection of PCRF, RRII and detailed reports were presented.

Previous inspection reports were actively pursued and compliance was watched. Replies to the report of review of Attendance Register for the calender year 1989 received from Departments/Sections located in Kottayam were reviewed and objections were settled.

Receipt and scrutiny of monthly returns of vehicles/ fuel consumption were watched to ensure strict economy in the use of office vehicles, consumption of fuel and the repairs.

Audit on the accounts of the Rubber Board for the year 1989-90 was conducted during May-August 1990 by the A. G., Kerala Suitable reply to the inspection notes was furnished. During the audit previous reports were reviewed and about 22 paras could be got dropped.

A draft scheme on Liberalised Medical Reimbursement to the employees of the Rubber Board was prepared for implementation. During the year training was imparted to 4 batches:

1st batch	- 17.9.1990	through 9.10.1990
2nd batch	- 22.10.90	through 12.11.'90
3rd batch	- 13.11.90	through 03.12.'90
4th batch	- 17.12.90	through 07.01.1991

Under the 'Suggestion Award Scheme' two cases were disposed of after thorough scrutiny.

Two Office Manuals - one on General Procedure , and the other on Delegation of Powers were prepared and got printed.

11. Hindi Section

Official Language Implementation Committee held two meetings during the year. Annual Official Language Programme was prepared to implement various schemes for the progressive use of Hindi.

Hindi classes for Pragya and Praveen under the Hindi Teaching Scheme were conducted and a total number of 75 employees appeared for the examination conducted by the Ministry of Home Affairs. Training in Hindi Typewriting was given to twelve employees. Thirtysix employees became eligible for cash award and personal pay was granted to 25 employees for passing Hindi Pragya/ Hindi Typewriting examinations.

Four issues of the Hindi Bulletin "Rubber Samachar" were published. Hindi books worth Rs.8000/- were purchased for Hindi Library/Reference/Hindi Teaching Scheme.

Quarterly progress reports showing the progress in use of Hindi were furnished to the Ministry.

12. Sub/Liaison Offices

There are 8 sub offices in the major consuming centres outside Kerala ; at Ahmedabad, Bangalore, Bombay, Calcutta, Jalandhar, Kanpur, Madras and New Delhi. Suitability of rubber dealers and rubber goods manufacturers to possess licences to deal in/purchase natural rubber were assessed and verified at random, books of accounts and records of dealers/manufacturers to ensure that all rubber procured were brought to book and subjected to excise duty assessment. Surprise inspection were conducted to detect unlicensed dealing/manufacturing of rubber in contravention of the provisions in the Rubber Act and Rules.

Services were also rendered from four of these offices to the rubber products manufacturing units to solve their problems in production technology. Problems that required deeper examination and analysis were referred to the Research Department for giving suitable advice to the Manufacturers.

PART VII - FINANCE & ACCOUNTS

The Finance & Accounts Department handles the following items of work:

1. Prepares budget, performance budget, foreign exchange budget etc and exercises budgetary control.

2. Maintains the accounts of the Board, prepares annual accounts and gets the same audited by the Accountant General, Kerala and presents the audited accounts.

3. Places demands for grant from the Government from time to time, collects and distributes funds to various departments as per requirements.

4. Advices financial propriety and regularity in all transactions.

5. Furnishes details regarding financial targets and achievements under Plan and Non Plan allocations.

6. Assists the Cost Accounts Branch of the Ministry of Finance in ascertaining cost of production and in fixing price of rubber.

7. Prepares financial statements for project reports and schemes

8. Deals with taxation matters.

9. Process data using computers in the field of financial accounting, pay roll and subsidy payment

Important activities during the year

Annual Accounts 1989-90

The Annual Accounts of the Board pertaining to the year 1989-90 were drawn up and given for audit on 27.5.1990. The audit report and the audit certificate on the Annual Accounts 1989-90 were received on 22.1.1991 and the same were forwarded to the Ministry with Hindi Translation, on 4.3.1991.

Funds Management 1990-91

Releases amounting to Rs.27.65 crores received during the year 1990-91 have been fully utilised. Internal resources of about Rs.1.6 crores also has been utilised. Investment of funds in the General Provident Fund and Pension Fund were reviewed periodically. Under the estate inputs distribution scheme Rs.4.59 crores was collected from RPSs through 19 Regional Offices and payments made to suppliers of inputs.

Price Fixation

During the year, the Cost Accounts Branch of the,

Ministry of Finance conducted a quick study and recommended price for declaration of a benchmark price. In this study, extended assistance by arranging the field study in respect of small holdings and by sending questionnaire to estates for furnishing cost data.

Advisory Committee of RPSs and working on joint Sector Companies.

The Advisory Committee of RPSs met 3 times during the year. The Committee discussed various aspects of working of RPSs and gave suggestions especially in the field of maintenance of accounts in RPSs, auditing, Sales tax matters connected with the distribution of inputs and procurement of rubber etc. Also assisted the Companies promoted in the RPS sector through advice and Secretarial assistance. Out of 13 companies, 8 were provided with Secretaries.

Budget & Expenditure

The revised budget for 1990-91 and budget estimates for 1991-92 were prepared and submitted to the Government. The budget sanctioned for the year 1990-91 under Plan was ₹.21.10 Crores and that for Non-Plan was ₹.8.25 Crores. As against this, the provisional expenditure for the year 1990-91 under Plan was ₹.20.69 crores and under Non Plan ₹.8.30 crores. The budget sanctioned for the year 1991-92 is ₹.25.20 crores under Plan and ₹.8.75 crores under Non Plan.

Cost Accounts

Assisted the Cost Accounts Branch of Ministry of Finance in conducting the study on cost of production of natural rubber for fixation of price for market support operations. The data collected from the small holding sector is processed by the Cost Accounts Section for furnishing to CAB of Ministry of Finance. The cost of development of rubber plantation is periodically revised taking into account the changes in wage rates and cost of inputs. Conducted a study of cost of production of planting materials for fixing issue price of planting materials. Handled Sales tax and agricultural income tax matters pertaining to the Board. Prepared financial statements for the preparation of Project Reports.

Electronic Data Processing

Maintained the ongoing activities like preparation of pay roll, processing financial accounts and processing permit and subsidy cases pertaining to Ernakulam and Kottayam regional offices. In addition processed 65,000 Census reports. A complete list of manufacturers and dealers is prepared on the computer. New software packages were developed for wages of workers of PCRF and PLPC, seniority list of personnel, recovery of dues to Co-operative society etc. Financial statements for the preparation of 30 project reports were also prepared on the computer.

PART VIII - TRAINING

A summary of the activities during the period 1st April 1990 to 31st March 1991 is given under.

1. Short-term Training Course on Rubber Culture and Estate Management.

Three batches of this 18-day course were convened for nominees from company estates and public sector undertakings, from the plantations of State & Central Governments in which 63 participants from Meghalaya, Arunachal Pradesh, Tamil Nadu, Tripura, Manipur, Assam and Kerala attended.

2. Training Course on Rubber Processing

Three batches of this four-day training course were held for 31 participants including nine Senior Managers from M/s. Harrisons Malayalam Ltd., nine officers from M/s. AV Thomas & Co. Ltd. and others from small rubber farmers.

3. Training course for rubber goods manufacturers

Separate courses were convened for the rubber goods manufacturers on manufacture of products from rubber latex and those from 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 conducted in different months of the reporting period, when 174 persons were trained including two candidates belonging to SC/ST. The participants were from Maharashtra, Tamil Nadu, U.P., Karnataka, Delhi and Kerala.

4. Training course on rubber sheet grading

Two representatives from Karnataka State were given training on rubber sheet grading.

5. Training course on mushroom culture

This one-day course on the aspects of mushroom cultivation was held on 9th December, 1990 for ten participants from Kerala

6. Training on analysis and testing of rubber latex.

This eight-day course was arranged for seven representatives. The participants were from M/s. Saravana Rubbers (P) Ltd., M/s. Premier Latex (P) Ltd and M/s. Taba Gloves (P) Ltd respectively. The training was held at different intervals.

7. Training on testing and quality control of examination and surgical gloves.

One representative from M/s. Taba Gloves (P) Ltd, Cochin was given training on testing and quality control of examination and surgical gloves during August 1990.

8. Training on modern methods of tapping

A one-day training on modern methods of tapping was imparted to the personnel from Mundakkayam Estate of M/s. Harrisons Malayalam Ltd. on 18th October, 1990 at their estate.

9. Training for Pump Operators/ Asst. Pump Operators.

A three-day training on operation and maintenance of pump sets of Rubber Board was arranged for the four Pump Operators/Asst. Pump Operators in June 1990.

10. Training for Junior Field Officers

Training programme on various aspects of rubber cultivation, manuring and processing were given to 24 Junior Field Officers in two batches during the months of July and October 1990.

11. Refresher training to Security Watchmen

A refresher training on foot drill marching, saluting, dressing and turnout, discipline, fire fighting, precaution and duties and responsibilities was given to the Security Watchmen.

12. Training on office clerical efficiency

A three-day intensive training on office clerical efficiency was held from 6th to 8th August 1990 for the thirty Assistants/Jr. Assistants Gr.I/Junior Assistants . The faculty were from the Kerala State Productivity Council, Kalamassery, Cochin.

ACHIEVEMENTS

Organised the national seminar "Rubber Planters' Conference - India 1990" on 19th April 1990 at Kottayam in which more than 450 delegates participated and eleven papers were presented. The sponsors of the Conference were M/s. PPCL, Arasu Rubber Corporation Ltd., General Insurance Co. and GNFC. FACT also joined as an associated sponsor.

The proposal to get Japanese assistance for improving Research and Development work in Rubber Technology submitted to Government of India was followed up.

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The civil works for the project plant for producing Radiation Vulcanized Natural Rubber Latex (RVNRL) attained momentum after the foundation stone was laid on u7th August 1990. The structural design for the biological shield was got approved by the Atomic Energy Regulatory Board (AERB), after which casting of the water pool, biological shield etc were completed with all the wall and roof embedments in position. The design and fabrication of the mechanical and control systems for the source movement are nearing completion at Bombay under the overall supervision of Bhabha Atomic Research Centre. The ventilation system and product movement system are fabricated locally and are ready for installation. This includes the rails, turntables and ventilation ducts in GI. Electrification work has been awarded to a Cochin based Company. Kerala State Electricity Board has been approached for power allocation for the pilot plant as a new consumer. Order has been placed for the supply and installation of the radiation source (Co^{60}) of strength 10000 Ci with M/s. BRIT, Bombay. The distinguished visitors to the Project site include Dr. R. M. Iyer, Director, Chemical and Isotope Group of BARC on 8th November 1990.

During the period under report this Department collected an amount of Rs.198,000/- towards fee from various training courses conducted.

PART - IX

STATISTICAL TABLES

TABLE-1

PRODUCTION, IMPORT AND CONSUMPTION OF NATURAL RUBBER

(Tonnes)

Month		Production	Import	Consumption (Indigenous & imported)
April	1990	23,590	11,248	29,040
May	"	20,570	8,223	29,215
June	"	18,310	8,580	29,350
July	"	20,520	2,753	31,040
August	"	25,260	5,000	29,420
September	"	34,850	6,334	29,140
October	"	37,965	1,901	30,335
November	"	37,885	1,211	31,405
December	"	39,840	2,133	31,585
January	1991	35,650	1,358	31,530
February	"	16,265	1,200	30,870
March	"	18,910	2,001	31,380
	TOTAL	329,615	51,942	364,310

TABLE-2

STOCK OF NATURAL RUBBER AT THE END OF EACH MONTH

(Tonnes)

		Growers & dealers)	Manufacturers)	STC	Total (Rounded)
April	1990	25,550	25,185	24,251	74,990
May	"	26,860	26,600	21,108	74,570
June	"	23,730	28,790	19,632	72,150
July	"	23,475	26,965	13,923	64,365
August	"	26,165	25,760	13,281	65,205
September	"	35,100	23,750	16,891	75,740
October	"	40,410	27,940	16,891	85,240
November	"	50,015	25,965	16,891	92,870
December	"	55,720	30,720	16,891	103,330
January	1991	59,295	33,580	16,891	109,765
February	"	42,225	35,795	18,341	96,360
March	"	30,230	34,045	22,155	86,430

TABLE-3

PRODUCTION, IMPORT AND CONSUMPTION OF SYNTHETIC RUBBER

(Tonnes)

	Production	Import*	Consumption
April 1990	3,590	3,342	7,130
May "	4,102	3,053	7,745
June "	4,268	3,668	8,115
July "	4,970	3,746	8,350
August "	3,423	4,418	8,475
September "	3,845	3,357	8,210
October "	4,475	3,785	8,420
November "	4,560	4,920	8,590
December "	5,721	4,815	8,795
January 1991	5,297	4,608	8,610
February "	4,835	3,625	8,580
March "	5,194	3,000*	8,480
TOTAL	57,280**	46,000*	99,500

* Provisional

** Including a quantity of 3000 tonnes, for which monthwise breakup is not available.

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TABLE-4

PRODUCTION AND CONSUMPTION OF RECLAIMED RUBBER

(Tonnes)

	Production*	Consumption
April 1990	3,415	3,430
May "	3,425	3,610
June "	3,530	3,540
July "	3,765	3,905
August "	3,875	3,780
September "	3,775	3,520
October "	3,660	3,810
November "	4,050	4,010
December "	4,185	4,075
January 1991	4,160	4,080
February "	3,770	3,750
March "	4,175	4,150
TOTAL	45,785	45,660

* Indigenous purchase by manufacturers

pt

ANNEXURE - I

LIST OF MEMBERS OF THE RUBBER BOARD AS ON 31.3.1991

01	Smt J Lalithambika, 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 PK Abdullakutty, Managing Director, KMA Estate & Timbers, Pallikkandy Road, Kallai, Kozhikode-673 003		Elected by the Large growers in the State of Kerala
06	Michael A Kallivayalil, Kuttikkanam PO, Peermade, Idukki Dist, Kerala		
07	Sri K Jacob Thomas, Managing Director, Vaniampara Rubber Company Ltd., Vazhakkala Buildings, Kottayam - 686 001, Kerala		
08	Sri A. Kurian, Ooppoottil, Parvathipuram, Nagercoil		Elected by large growers in the State of Tamil Nadu
09	Vacant		Elected by the Lok Sabha
10	Vacant		
11.	Sri MM Jacob, 4, Kaushik Road, New Delhi - 110 011		Elected by Rajya Sabha

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12	Sri K. J. Sohan, Ex-Mayor, Cochin Corporation, Ernakulam	Nominated by the Central Government to represent Labour
13	Sri Charupara Ravi, Vasanthavilasom, Vithura PO, Nedumangad	
14	Sri A Kunheeran, General Secretary, Kerala State Plantation Workers Federation, Kondotty PO, Malappuram	
15.	Sri R. S. Unni, UTUC Office, Curzon Road, Kollam - 13	
16	Shri 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-682016,Kerala	Nominated by the Central Government to represent small growers of Kerala
18	Sri MK Vidhyadharan, Uthamam, LIC Lane, Pattom Palace PO Trivandrum - 695 004	
19	Sri M Assainarkutty, Malickandath, Chapparappadavu, Via. Taliparamba, Cannanore Dist, Kerala	
20	President, All India Rubber Industries Association, Lamington Road, Bombay - 400 008	Nominated by the Central Government to represent rubber goods manufacturers
21	President, Automotive Tyre Manu- facturers Association, 2nd Floor, 9 A Cannaught Place, New Delhi	

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22	Sri Gagan Behari Jena, Village Rampur, PO Ramchandrapur, Cuttack, Orissa	Nominated by the Central Government to represent 'Other interests'
23	Sri N J Mathew, Nambiaparambil, Advocate, Thodupuzha	
24	Sri RG Ketkar, Director, Sudhagad Rubber Industries Rahem Mansion, No.2, 1st Floor, 44-S Bhagath Singh Road, Bombay - 400 039	
25	Prof. K. R. Raman Kartha, Kuthiathode, Alleppey	

ANNEXURE - X

LIST OF REGIONAL OFFICES AND FIELD OFFICES AS ON 31/3/1991.

Sl. No.	Location of Regional Office	Service area	Location of Field Office	No. of Field Officers/Jr.Field Officers		
				At Regional Office	At Field Office	Total
1	2	3	4	5	6	7
	TAMILNADU					
1.	Nagercoil	Kanyakumari, Tirunalveli, and Madurai districts.	1. Kulasekharam 2. Kuzhithurai	1	2 1	4
	KERALA					
2.	Thiruvananthapuram	Thiruvananthapuram district.	3. Neyyattinkara 4. Nedumangad 5. Venjarammoodu 6. Palode 7. Kattakkada 8. Vithura 9. Kilimanoor	-	2 2 3 2 2 1 1	13
3.	Punalur	Shencotta district of Tamilnadu and Pathanapuram and Kottarakkara taluks of Kollam district	10. Chadayamangalam 11. Anchal 12. Pattazhi 13. Pathanapuram 14. Kadackal 15. Kottarakkara 16. Kulathupuzha 17. Pooyappally	2	1 2 1 1 1 2 1 1	12
4.	Adoor	Kollam and Kunnathur taluks of Kollam district Chengannur, Mavelikara and Karthikappally taluks of Alappuzha district and Adoor taluk of Pathanamthitta district.	18. Kalluvathuckal 19. Bharanicavu 20. Pandalam 21. Kochalummoodu 22. Koodal	2	1 1 1 1 1	7

1	2	3	4	5	6	7
5.	Pathanamthitta	Pathanamthitta, Kozhencherry and Ranni taluks of Pathanamthitta district.		3		
			23. Konni		1	
			24. Ranni		1	
			25. Vadasserikkara		1	
			26. Vechoochira		1	
			27. Naranammoozhi		1	
			28. Kaippattoor		1	
			29. Kozhencherry		1	10
6.	Changanacherry	Kuttanad, Mallappally and Tiruvalla taluks of Alappuzha district and Changanacherry taluk of Kottayam district		2		
			30. Tiruvalla		1	
			31. Mallappally		2	
			32. Vakathanam		1	
			33. Karukachal		2	
			34. Vazhoor		1	
			35. Pathanad		1	10
7.	Kottayam	Kottayam and Vaikom taluks of Kottayam district.		1		
			36. Pampady		1	
			37. Manarcad		1	
			38. Poovathilappu		1	
			39. Kooreppada		1	
			40. Pallickathode		1	
			41. Ettumanoor		1	
			42. Kaduthuruthy		2	
			43. Peruva		1	10
8.	Kanjirappally	Kanjirappally taluk of Kottayam district and Peermade taluk of Idukki district.		2		
			44. Ponkunnam		1	
			45. Manimala		2	
			46. Erumeli		1	
			47. Koorali		1	
			48. Parathode		2	
			49. Mundakkayam		4	13

1	2	3	4	5	6	7
9.	Erattupetta	Poonjar South, Poonjar Nadubhagom, Poonjar North Erattupetta, Kondoor, Teekoy Talappalam, Moonnilavu and Melukavu villages of Meenachil Taluk in Kottayam District.		1		
			50. Melukavu		1	
			51. Poonjar Nadubhagom		1	
			52. Poonjar South		1	
			53. Thidanad		1	
			54. Teekoy		1	
			55. Moonnilavu		1	7
10.	Pala	Lalam, Bharananganam, Ramapuram, Vellilappally, Veliyannoor, Meenachil, Poovarany, Vallichira Kurichithanam, Elakkad, Kuravilangad, Kanakkari and Vazhoor villages of Meenachil Taluk in Kottayam District.		2		
			56. Ramapuram		2	
			57. Kuravilangad		1	
			58. Marangattupally		2	
			59. Bharananganam		1	
			60. Kadanad		1	
			61. Kidangoor		1	
			62. Paika		1	
			63. Monippally		1	12
11.	Thodupuzha	Thodupuzha and Udumpanchola taluks of Idukki District.		4		
			64. Kattappana		1	
			65. Moolamattam		1	
			66. Karimannoor		1	
			67. Karimkunnam		1	8
12.	Moovattupuzha	Moovattupuzha taluk of Ernakulam District		4		
			68. Pampakuda		1	
			69. Ramamangalam		1	
			70. Vazhakulam		1	
			71. Piravam		1	
			72. Koothattukulam		1	9

.....4/-

1	2	3	4	5	6	7
				3		
	. Kothamangalam	Devikulam taluk of Idukki District, Kothamangalam taluk and eastern part of Kunnathunad taluk (Vengoor, Vengoor West, Kombanad Koovappady, Kodanad, Asamannoor, Rayamangalam and Perumbavoor villages) of Ernakulam District.	73. Adimali		1	
			74. Oonnukal		1	
			75. Pothanicad		1	
			76. Perumbavoor		2	8
				-		
	4. Ernakulam	Kanayannur, Aluva, Parur taluks and western part of Kunnathunad taluk of Ernakulam District.	77. Mulanthuruthy		2	
			78. Puthenkurissu		1	
			79. Kolencherry		2	
			80. Pattimattam		1	
			81. Kumarapuram		1	
			82. Perumbavoor		1	
			83. Kalady		2	10
				4		
	15. Thrissur	Thrissur District.	84. Chalakkudy		1	
			85. Kodakara		1	
			86. Wadakkanchery		1	
			87. Chelakkara		1	
			88. Thiruvilwamala		1	9
				2		
	16. Palakkad	Palakkad District and Coimbatore and Salem Districts of Tamilnadu.	89. Vadakkencherry		3	
			90. Ottappalam		1	
			91. Thiruvazhiyode		1	
			92. Kangad		1	
			93. Pattambi		1	
			94. Mannarkkad		2	
			95. Kalladikkode		2	13

2	3	4	5	6	7
. Nilambur	Malappuram District and Nilgiri District of Tamilnadu.		4		
		96. Perinthalmanna		1	
		97. Manjeri		2	
		98. Karuvarakundu		1	
		99. Wandoor		2	
		100. Edakkara		3	13
. Kozhikode	Kozhikode and Koilandy taluks of Kozhikode District.		-		
		101. Thamarasserry		2	
		102. Balussery		1	
		103. Perambra		2	
		104. Mukkam		2	
		105. Thiruvampady		2	
		106. Kodencherry		2	11
. Thalasseri	Vadakara taluk of Kozhikode district, Thalasseri taluk of Kannur district and Wayanad district.		-		
		107. Koothuparamba		2	
		108. Kuttiadi		1	
		109. Peravoor		3	
		110. Iritty		2	
		111. Karikkottakari		1	
		112. Manantavady		2	
		113. Kalpetta		1	12
0. Taliparamba	Kannur and Taliparamba taluks of Kannur district.		2		
		114. Ulickal		1	
		115. Sreekantapuram		2	
		116. Chemberi		1	
		117. Pulikurumba		1	
		118. Naduvil		1	
		119. Payyannoor		1	
		120. Alakode		2	
		121. Karthikapuram		1	
		122. Cherupuzha		1	
		123. Mathil		1	
		124. Pulingome		1	
		125. Perumpadavu		1	
		126. Thadikkadavu		1	17

....6/-

2	3	4	5	6	7
Kanhangad	Kasargode district		1		
		127. Malakkallu		2	
		128. Chittarickal		1	
		129. Vellarikkundu		1	
		130. Bandadka		1	
		131. Bheemanadi		2	
		132. Panathoor		1	
		133. Mulleria		1	10
KARNATAKA					
Mangalore	Karnataka State excluding Belgaum district.		1		
		134. Sullia		2	
		135. Belthangady		1	
		136. Puthur		2	
		137. Kundapur		1	7
GOA					
Ponda	Belgaum district of Karnataka, Goa and Maharashtra.		3		
		138. Sawantwadi (Manned by an Asst.Development Officer)		-	3
ORISSA					
Berhampur	Ganjam and Koraput districts of Orissa, Bastar district of Madhya Pradesh and Andhra Pradesh.		1		
		139. Maredumille (Manned by an Asst. Asst.Development Officer)		1	2
Bhubaneshwar	Cuttack, Dhenkanal Phulbani and Puri districts of Orissa.		1		
		140. Dhenkanal		2	3

.....7/-

1	2	3	4	5	6	7
26.	Baripada	Balasore, Mayurbhaj and Keonjargarh districts of Orissa and southern districts of West Bengal.		1		1
	TRIPURA					
27.	Agartala	Tripura West and Tripura North districts of Tripura.	141. Dharmanagar	2	1	
			142. Kamalpur (Halalli)		1	
			143. Kumarghat		1	
			144. Khowai		1	
			145. Sonamura		1	7
28.	Udaipur	Tripura West district of Tripura.		1		
			146. Belonia		1	
			147. Amarpur		1	
			148. Santir Bazaar		1	4
	ASSAM					
29.	Guwahati	Golpara, Kamrup, Nowgong, Nalbari, Barpeta, Dhubri, Kokrajar, Pragjyotishpur, Bongaigaon, Morigaon, Dhemaji and Sonipur districts of Assam and northern districts of West Bengal.		1		
			149. Agia		1	
			150. Nowgong		1	3
30.	Jorhat	Jorhat, Darrang, Golaghat, Sibsagar, Dibrugarh, Tinsukia and North Lakhimpur districts of Assam and Mokochung, Wokha and Mon districts of Nagaland.		1		
			151. Tezpur		1	
			152. Golaghat		1	
			153. Tinsukia		*1	4

.....8/-

1	2	3	4	5	6	7
31.	Diphu	Karbi Anglong district of Assam and Kohima, Dhek, Tuensang and Zeinheboto districts of Nagaland.	154. Dimapur 155. Jalukie	2	1 1	4
32.	Silchar	North and South Cachar, Hailakandi and Karimganj districts of Assam and Mizoram and Manipur States.	156. Karimganj 157. Jiribam 158. Kolasib	2	1 1 1	5
	MEGHALAYA					
33.	Tura	Meghalaya State		2		2
	ANDAMAN & NICOBAR Is.					
34.	Port Blair	Andaman & Nicobar Islands		1		1
			TOTAL	59	205	264

pvk/-