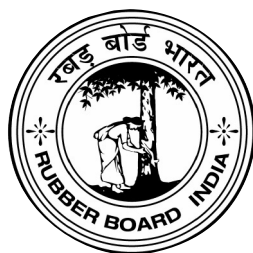


ANNUAL REPORT
2016 - 2017



THE RUBBER BOARD
MINISTRY OF COMMERCE & INDUSTRY
GOVERNMENT OF INDIA
KOTTAYAM – 686 002

CONTENTS

PART - I	INTRODUCTION	1
PART - II	CONSTITUTION AND FUNCTIONS	6
PART - III	RUBBER PRODUCTION	8
PART - IV	ADMINISTRATION	28
PART - V	RUBBER RESEARCH	43
PART - VI	PROCESSING & PRODUCT DEVELOPMENT	56
PART - VII	TRAINING	62
PART - VIII	FINANCE & ACCOUNTS	77
PART - IX	LICENSING AND EXCISE DUTY	79
PART - X	MARKET PROMOTION	84
PART - XI	STATISTICS AND PLANNING	86
PART - XII	LIST OF MEMBERS OF RUBBER BOARD	88





PART - I

INTRODUCTION

The Rubber Board was constituted by Government of India under the Rubber Act 1947 with the primary objective of overall development of rubber industry in the country. The Board established a strong development and extension network and as a result, the natural rubber (NR) plantation sector achieved impressive growth over the years. Simultaneously, the Board took up research activities on rubber and established Rubber Research Institute of India (RRII) in 1955 for ensuring biological and technological

improvement of NR in the country. Rubber Training Institute (RTI) established in the year 2000 acts as the link between research and extension activities for technology transfer.

India occupies sixth position in world ranking in terms of production of NR, by accounting for 5 per cent of the total supply of 12.40 million tonnes during 2016. India continued to be the second largest consumer of NR, by accounting for 8.2 per cent of the global demand of 12.60 million tonnes during the same year.

Performance of the NR and SR Sectors during 2016-17

NATURAL RUBBER (NR)

Production

The country produced 691,000 tonnes of NR during the year 2016-17 compared to 562,000 tonnes during 2015-16, recording a growth of 23%. This high growth in production is attributed to several factors such as measures taken by the Rubber Board to increase production and productivity, improvement in rubber prices, and continuation of Rubber Production Incentive Scheme (RPIS) launched by Government of Kerala for ensuring a price of ₹ 150 per kg. Measures taken by the Board included popularization of low frequency tapping (LFT), thereby reducing cost of production and extending economic life without reduction in yield; formation of Tapper Banks attached to Rubber Producers' Societies (RPSs) to ensure supply of tappers for growers; supply of inputs, especially rainguarding materials

through Board promoted companies; harvesting untapped areas with the help of RPSs and companies and campaign programmes conducted in non-traditional areas for improving productivity. Share of untapped area in the total tappable area declined to 24 % in 2016-17 from 30 % in 2015-16.

Consumption

The domestic consumption of NR was 1,044,075 tonnes during 2016-17, higher by 5 per cent from the quantity of 994,415 tonnes consumed during 2015-16. This represents a 6.6 % rise in NR consumption in the dominant auto tyre manufacturing sector and 1.8 per cent growth in the general rubber goods sector. Auto tyre manufacturing sector accounted for 67.7% of the total quantity of NR consumed in the country during the last fiscal.

**Import and Export**

Though the import of NR had been consistently increasing for the past few years, it declined during 2016-17 by 7% to 426,434 tonnes from 458,374 tonnes during 2015-16. The volume of exports increased to 20,920 tonnes during the year 2016-17 from a meager 865 tonnes exported in the previous year. Export of NR was mainly in the form of latex concentrates (66%) and block rubber (31%).

Stock of NR

Estimated total stock of NR with growers, processors, traders, and manufacturers at the end of March 2017 was 264,000 tonnes, notably up from 224,000 tonnes held at the same point of time a year ago.

NR Prices

Average price for domestic RSS 4 grade in 2016-17 was ₹ 13,549 per 100 kg

compared to ₹ 11,306 per 100 kg in 2015-16. During 2016-17, the average price of international RSS 3 grade was ₹ 13,178 per 100 kg and it was ₹ 9,636 per 100 kg during 2015-16. Domestic RSS 4 price peaked at ₹ 16,150 per 100 kg on 15 February 2017 while international price of RSS 3 peaked at ₹ 20,089 per 100 kg on 31 January 2017. Domestic RSS 4 price ruled above international RSS 3 price from April to October 2016, but a reverse trend was observed throughout the remaining part of the year. Towards the end of 2016-17, both domestic and international rubber prices improved on account of supply tightness due to repeated floods in Thailand, firming up of US Dollar against Asian currencies, increase in futures market prices, increased demand from China, etc. Table 1 summarizes key performance indicators of the Indian NR sector during 2016-17 in comparison with 2015-16 and 2014-15.

Table 1: Performance of NR Sector in India

Year	Production		Consumption		Imports (Tonnes)	Exports (Tonnes)	Closing stock (Tonnes)	Average Price (₹/kg)	
	Quantity (Tonnes)	Growth (%)	Quantity (Tonnes)	Growth (%)				RSS 4 Kottayam	RSS 3 Bangkok
2014-15	645,000	-16.7	1,020,910	4.0	442,130	1,002	252,000	132.57	112.71
2015-16	562,000	-12.9	994,415	-2.6	458,374	865	224,000	113.06	96.36
2016-17	691,000	23.0	1,044,075	5.0	426,434	20,920	264,000	135.49	131.78

SYNTHETIC RUBBER (SR)**Production**

Synthetic Rubber production increased to 222,744 tonnes during 2016-17 from 199,845 tonnes during 2015-16, registering a growth of 11.5% against a growth of 31.6% during 2015-16. Shares of styrene butadiene rubber (SBR) and poly-butadiene rubber (PBR) were 43.4% and 52.3% respectively during 2016-17.

Consumption

SR consumption increased to 598,580 tonnes during 2016-17 registering a growth of 8.2% against 553,370 tonnes consumed during 2015-16. The automotive tyre sector consumed 417,728 tonnes of SR during 2016-17 as against 377,090 tonnes during 2015-16, recording a growth of 10.8%. During 2016-17, the ratio of consumption between NR and SR in India was 64:36.



Table : 2 Consumption of NR and SR in different Sectors (tonnes)

	2016-17p	2015-16	Growth (%)
NR Total	1,044,075	994,415	5.0
Auto-tyre sector	707,355	663,495	6.6
General rubber goods sector	336,740	330,920	1.8
SR Total	598,580	553,370	8.2
Auto-tyre sector	417,728	377,090	10.8
General rubber goods sector	180,852	176,280	2.6
NR & SR Total	1,642,655	1,547,785	6.1
Auto-tyre sector	1,125,063	1,040,585	8.1
General rubber goods sector	517,592	507,200	2.0

p: provisional

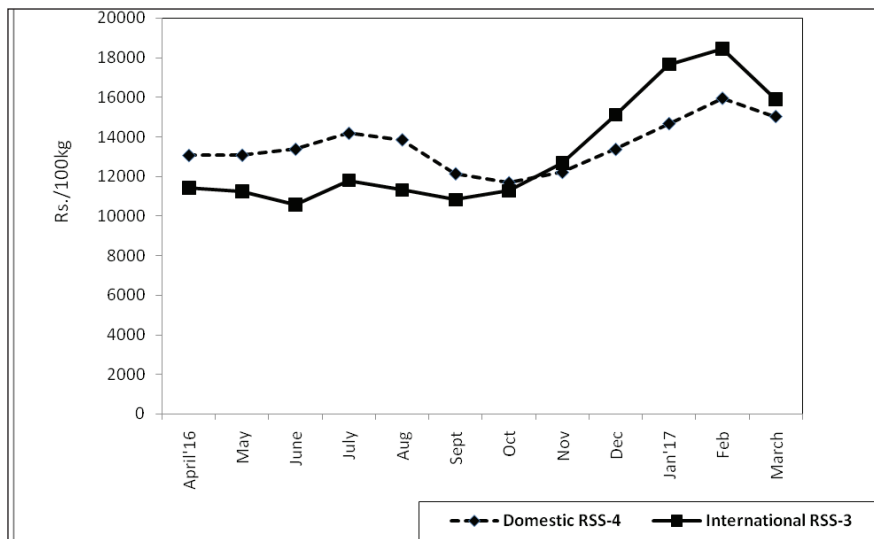
Import of SR by rubber goods manufacturing industry during 2016-17 increased to 379,791 tonnes compared to 351,301 tonnes during the year 2015-16.

PRICE OF NATURAL RUBBER

Annual average price for domestic RSS 4 grade rubber for 2016-17 was ₹ 13,549 per 100 kg compared to ₹ 11,306 per 100 kg in 2015-16. During 2016-17, the average price of international RSS 3 grade was ₹ 13,178 per 100 kg and it was ₹ 9,636 per 100 kg during 2015-16. Domestic RSS 4 price peaked at ₹ 161.50 per kg on 15 February 2017 and

international price of RSS 3 peaked at ₹ 200.89 per kg on 31 January 2017. Domestic RSS 4 price was ruling above the international RSS-3 price from April'16 to October'16 and the reverse trend was observed throughout the remaining part of the year.

Towards the end of 2016-17, both domestic and international rubber prices improved on account of supply tightness due to repeated floods in Thailand, firming up of US Dollar against Asian currencies, increase in futures prices, increased demand from China, etc



PRICE OF NATURAL RUBBER 2016 – 17

Global Natural Rubber Scenario in 2016

Production

According to the International Rubber Study Group (IRSG), world NR production during 2016 was 12.40 million tonnes as against 12.27 million tonnes produced in 2015 registering a marginal increase of 1.1%. During 2016, NR production in main producing countries viz, Thailand, China and Malaysia decreased, whereas production in Vietnam, Indonesia and India increased. India continued to be the sixth largest producer of NR in 2016 with a share of 5.0% of world production. India occupied the second position in the world in productivity during 2016, Vietnam occupying the first position.

Consumption

World NR consumption increased to 12.60 million tonnes in 2016 recording a

growth of 3.8% compared to 12.14 million tonnes in 2015 with a negative growth of 0.3%. Consumption of NR in China, India, Thailand, Indonesia and Malaysia increased by 3.9%, 4.0%, 8.2%, 14.5% and 4.7% respectively during 2016 on previous year. NR consumption in USA, Japan and Republic of Korea showed negative growth of 0.5%, 2.0% and 1.7% respectively during 2016 compared to 2015. World SR consumption increased to 14.94 million tonnes during 2016 from 14.64 million tonnes during 2015, recording a growth of 2.0%. World NR and SR consumption ratio during 2016 was 46:54 whereas, it was 45:55 during 2015.

According to IRSG, the world supply-demand balance of NR showed a deficit of 199,000 tonnes during 2016.

Table : 3 Country-wise production of NR ('000 tonnes)

Country	2016	2015	% Growth
Thailand	4,469.0	4,473.3	-0.1
Indonesia	3,208.1	3,145.4	2.0
Vietnam	1,032.1	1,012.7	1.9
China	774.0	794.0	-2.5
Malaysia	673.5	721.5	-6.7
India	624.0	575.0	8.5
Others	1,620.3	1,549.1	4.6
World Total	12,401.0	12,271.0	1.1

Table : 4 Country-wise consumption of NR ('000 tonnes)

Country	2016	2015	% Growth
China	4,863.2	4,680.0	3.9
India	1,033.5	993.3	4.0
U.S.A.	932.0	936.5	-0.5
Japan	677.0	691.0	-2.0
Thailand	649.9	600.6	8.2
Indonesia	583.3	509.4	14.5
Malaysia	497.2	474.7	4.7
Brazil	427.6	404.5	5.7
Rep.of Korea	381.3	387.7	-1.7
Others	2,555.0	2,462.3	3.8
World Total	12,600.0	12,140.0	3.8

Source: Rubber Statistical Bulletin (April-June 2017) of International Rubber Study Group



STATISTICAL TABLES

Table:5 Monthly Trends in Production, Consumption, Import, Export and Average Prices of Natural Rubber in India

Month	Production (tonnes)		Consumption (tonnes)		Import (tonnes)		Export (tonnes)		Average price of RSS-4 at Kottayam (₹/100 kg)	
	2015-16	2016-17p	2015-16	2016-17p	2015-16	2016-17p	2015-16	2016-17p	2015-16	2016-17p
April	40000	39000	80815	83750	36957	34550	8	91	12058	13062
May	45000	46000	81765	86775	36964	35445	0	98	12510	13076
June	47000	50000	80955	88065	38923	37336	6	44	13098	13375
July	47000	52000	83400	88340	41917	41258	39	42	12537	14177
August	48000	58000	82725	87000	37413	48853	155	28	11665	13850
September	50000	60000	81600	84000	42713	52974	25	222	11218	12142
October	52000	62000	82650	85000	43276	44601	113	125	11410	11692
November	53000	65000	77880	87765	35226	40831	88	640	10954	12214
December	58000	70000	85250	85280	45586	25076	23	2232	10279	13370
January	52000	72000	84875	84600	39512	24279	214	6329	9780	14666
February	37000	62000	84320	87500	31864	15690	161	6212	9355	15942
March	33000	55000	88180	96000	28023	25541	33	4857	10812	15024
Year Total	562000	691000	994415	1044075	458374	426434	865	20920	11306	13549

Table : 6 Trends in Synthetic Rubber and Reclaimed Rubber (tonnes) - 2016-17

Month	Synthetic Rubber			Reclaimed Rubber	
	Production	Import	Consumption	Production	Consumption
April 2016	22090	27400	47050	9600	9625
May	20143	38102	50450	10270	9745
June	18382	32373	50895	11675	9960
July	19112	34233	51350	10010	10095
August	17352	32998	50015	10495	10650
September	14422	32083	49825	9950	9830
October	18910	28545	50130	10460	10200
November	16909	32526	49655	10440	10530
December	19158	22472	49460	10050	10145
January	20916	29329	49710	9875	9705
February	18427	30823	47990	9685	9480
March 2017	16923	38907	52050	10385	10270
Year Total	222744	379791	598580	122895	120235



PART - II

CONSTITUTION AND FUNCTIONS

The Rubber Board, established under the Rubber Act, 1947, has been promoting the development of the Indian rubber industry through various measures. The Rubber (Amendment) Act, 2009 notified in the Gazette on 22 January 2010 brought about the latest amendments to the Act.

Sub-section (3) of Section 4, provides for the constitution of the Board as follows:

The Board shall consist of:

- a) A Chairman to be appointed by the Central Government;
- b) Two members to represent the State of Tamilnadu, of whom one shall be a person representing the rubber producing interests;
- c) Eight members to represent the State of Kerala, six of whom shall represent rubber producing interests, three of such six being persons representing small growers;
- d) Ten members to be nominated by the Central Govt., of whom two shall represent manufacturers and four labour;
- da) Three members to be nominated by the Central Govt., of whom two shall be from the Department of Commerce and one from the Department of Agriculture and Co-operation;
- e) Three members of Parliament, of whom two shall be elected by the Lok Sabha and one by the Rajya Sabha;
- ee) The Executive Director (ex-officio); and
- f) The Rubber Production Commissioner (ex-officio).

Since the tenure of the last Board was completed on 28 February 2014 and as no

new Board was constituted, there was no Board in existence during the year 2016 – 17.

Section 8 of the Rubber Act 1947 lays down the functions of the Board as follows:

- (1) to promote by such measures as it thinks fit the development of rubber industry
- (2) 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) the supply of technical advice to rubber growers;
 - d) improving the marketing of rubber;
 - da) improving the quality of rubber and implementing the standards for quality, marking, labeling and packing for the rubber produced or processed in, imported into, or exported from India;
 - e) the 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 under rules made under the Act.
- (3) It shall also be the duty of the Board
 - a) to advise the Central Government on all matters relating to the development of rubber industry, including the import and export of rubber;



- b) to advise the Central Government with regard to participation in any international conference or scheme relating to rubber;
- c) to submit to the Central Government and such other authorities as may be prescribed annual report on its activities and the working of the Act; and
- d) to prepare and furnish such other reports relating to the rubber industry as may be required by the Central Government from time to time.

The Rubber Rules 1955 were amended as per Notification No.G.S.R 668(E) dated 04 July 2016 of the Government of India, Department of Commerce, published in the Gazette of India (Extraordinary) Part II, Section3, Sub Section (i) dated 05 July 2016.

Dr. A. Jayathilak, IAS, continued as the Chairman upto 04 May 2016 when he handed over charge to Shri. A. Ajith Kumar, IAS. As per DoPT (Department of Personnel and Training) order Shri. Ajith Kumar took charge as Executive Director, demitting the office of the chairman, on 06 December 2016. Later he also assumed the additional charge of Chairman on 10 February 2017.

Executive Director exercises administrative control over all the Departments and Offices of the Board. Total physical strength of officers and staff in the Board as on 31 March 2017 was 1,565 consisting of 322 Group 'A',

637 Group 'B' Officers, 604 Group 'C' staff and two Group 'D' staff recruited on compassionate ground.

ORGANISATIONAL SET UP

Activities of the Rubber Board are carried out through nine departments namely Rubber Production, Rubber Research, Administration, Processing & Product Development, Training, Finance & Accounts, Licensing & Excise Duty, Statistics & Planning and Market Promotion; headed respectively by the Rubber Production Commissioner, Director (Research), Secretary, Director (Processing & Product Development), Director (Training), Director (Finance), Director (Licensing & Excise Duty), Joint Director (Statistics & Planning) and the Chairman. The Publicity & Public Relations Division, Internal Audit Division, Planning Division and Vigilance Section are functioning directly under the Chairman.

Headquarters of the Board along with Administration, Rubber Production, Finance & Accounts, Licensing & Excise Duty and Statistics & Planning Departments are located at Keezhukunnu, Kottayam-686002. The Departments of Rubber Research, Processing & Product Development and Market Promotion are located at Rubber Research Institute of India (RRII) campus at Puthupally, Kottayam-686009 and the Department of Training is at Rubber Training Institute (RTI) adjacent to RRII campus.

Activities of the different departments are summarized in the forthcoming chapters.



PART - III

RUBBER PRODUCTION

Introduction

Extension and development activities aiming at inclusive rural development are formulated and implemented by Rubber Production (RP) Department. The Government of India's 12th Five Year Plan had set the goal of faster, sustainable and more inclusive growth. Sustainability has been mainstreamed as a core objective of India's development strategy. The mission of 'Sustainable & Inclusive Development of Natural Rubber Sector' envisaged in the 12th Plan Scheme, is accomplished through the extension network of 157 field stations spread over the rubber growing tracts of the country, 48 Regional Offices and 4 Zonal Offices which are coordinated from the Head Office at Kottayam.

The major service rendered by the department is technology transfer to cater to the seed to market needs of nearly 1.3 million

growers in Indian NR sector. The Department also serves as the information provider and facilitator for other functions of the Board through collection of baseline/statistical data, feedback information etc.

Activities and achievements in 2016-17

As a result of the impact of various activities undertaken by the department, the rubber plantation sector in India achieved commendable progress in increasing the production and productivity during the sunset year of 12th Plan period, 2016-17.

As per 12th Plan Scheme, RP Department implemented two major sub components:

1. Rubber plantation development and extension in traditional & Nontraditional area (RPDETNT)
2. Rubber plantation development and extension in North-East (RPDENE)

I. Rubber Plantation Development & Extension in Traditional (Kerala and Tamil Nadu) & Non Traditional area (Karnataka, Goa, Maharashtra, Gujarat, Andhra Pradesh, Chhattisgarh, Odisha, Jharkhand, West Bengal and Andaman & Nicobar Islands)- RPDETNT (except NE)

1. Plantation Development

Expansion of rubber area by cultivating rubber in agro-climatically suitable land and replanting existing old uneconomic plantations are the long term production enhancement activities. Rubber Board promoted planting activity by providing technical guidance and financial support as planting grant.

As total area planted under the scheme far exceeded the physical target set under Rubber Plantation Development Scheme, by the end of fourth year of the 12th plan period itself (up to 2015-16), Rubber Board did not

invite application for planting subsidy for areas planted during the year 2016-17.

Table : 7 Target and achievement of planting activity during 12 th Plan

Year	Target (Ha)	Achievement * (Permit area) Area in Ha
2012-13	6,000	10,047.71
2013-14	4,000	8,409.20
2014-15	4,000	7,875.65
2015-16	1,500	2,972.06
2016-17	800	2,212.00
Area in Ha	16,300	31,516.62

*Area inspected and issued permit for financial assistance.



a) *Replanting and New Planting subsidy permits and subsidy disbursement*

Table : 8 Subsidy permits & payments

Details	2015-16	2016-17
No of permits issued	4,512	3,610
Total area under permits (ha)	2,972	2,212
a) Replanting (ha)	1,700	1,606
b) New planting (ha)	1,272	606

Permit area includes cases of previous year plantings processed in 2016-17 also. Subsidy sanctioned during the year 2016-17 was ₹ 9.35 Crore including committed payments of permits issued in previous years.

b. *Plantation Project for SC/ST*

This project is implemented with the financial support from concerned state governments. Existing immature plantations

under this project are managed as per MOU signed between the Board and respective State Governments.

Survey on New planting and Replanting during 2016-17

In the wake of over achievement in the target, applications were not invited by the Board in 2016-17. In order to assess the planted area during 2016-17, a comprehensive survey was conducted and the area estimated using statistical tools. The data on new planting and replanting in the country (Traditional & Non Traditional area including North Eastern Region) in 2016-17 is tabulated below.

Table :10 New planting and replanting

Planting Activity	Area (ha)
New planting	8,000
Replanting	10,000
Total	18,000

Table : 9 State-wise Plantation Projects for SC and ST

State	Cumulative total as on 31-03-2016		Planting during 2016-17		Cumulative total as on 31-03-2017	
	Area (ha)	No. of beneficiaries	Area (ha)	No. of beneficiaries	Area (ha)	No. of beneficiaries
Kerala (SC)	79.94	121	--	--	79.94	121
Kerala (ST)	2,619.29	7,673	--	--	2,619.29	7,673
Karnataka (SC)	250.00	418	--	--	250.00	418
Andhra Pradesh (ST)	384.51	411	--	--	385.51	411
Odisha (ST)	853.08	1,548	35.00	90	888.08	1,638
Total	4,186.82	10,171	35.00	90	4,222.82	10,261

2. Cluster Development and Capacitating Market Linkage

The Indian rubber plantation sector is dominated by smallholdings, which accounts for almost 88% of area and production (of these 95% of production is from Kerala.) The preponderance of small and marginal growers makes the sector vulnerable to exploitation by middlemen, fluctuations in price and also difficulties in gaining access to technology and information. To overcome these

difficulties and strengthen the sector, the Rubber Board promoted a group management system by encouraging formation of Rubber Producers' Societies (RPS) since 1985.

Formation of RPS imparted dynamism in all spheres of cultivation activities among the small and marginal rubber growers. In the wake of globalization, when the small holding sector has to compete in the international market, the need for formation and strengthening/rejuvenating the RPS sector becomes imperative.



Aiming at cluster development of small and marginal farmers, the Board has been promoting cluster based implementation of development and extension activities through RPS/SHGs/companies. The activities envisaged are formation and strengthening of farmer groups, establishing Group Processing Centres (GPCs), women empowerment, capacity building, input supply etc.

Rubber Board conducted training for small growers in advanced planting techniques, harvesting and processing technology, capacity building etc. Technical and financial support is provided for formation of new RPS, SHGs, construction of latex collection centres, group processing centres, office building etc. Programmes like Sastradarsan, exposure visits, seminars and exhibitions were also conducted.

2.1. Formation & Strengthening of RPS/SHG

During 2016-17, 12 RPS and 14 SHGs were formed. Nearly 35% of the small farmers now come under the umbrella of RPS.

Table : 11 Details of Statutory meetings of RPS held during 2016-17

Programme	2016-17	
	RPS	Participants
BOD meetings	2,819	25,158
AGB meetings	739	30,375
Total	3,558	55,533

2.2. Rejuvenation of clusters

Performance of a considerable number of RPS and SHGs was not up to the envisaged level. During the reporting year, 178 RPS and 52 SHGs were rejuvenated by the Board.

2.3. Establishment and maintenance of Group Processing Centres

Community processing at the Group Processing Centres (GPCs) set up by RPS proved to be an effective way forward for sustainability in the present scenario.

The extension activities are now focused on productivity enhancement measures to reduce the cost on the one hand and realization of premium farm gate price for the produce through quality improvement on the other.

The objectives under the subcomponent are collective processing of latex at RPS level to scale up the quality for fetching premium price through collective marketing and group empowerment for competitive advantage. Activities are setting up of eco-friendly GPCs, additional facilities to GPCs and developing infrastructure facilities.

a) Setting up of Eco-friendly GPCs

RPS having 20 cents of land were supported for establishing GPCs. The Board's assistance was limited to 50% of the actual cost limited to ₹ 20 lakh for construction and ₹ 2 lakh for land development. During the year Rubber Board provided assistance (₹5,15,000) to one RPS in Kanhangad Region.

b) Additional facilities to GPCs

Financial assistance was provided to GPCs to set up additional facilities such as additional smoke house, replacement of damaged furnace, purchase of utensils, sheeting battery, repair & maintenance of GPC and biogas plants. During the year an amount of ₹ 1,73,133 was disbursed to 2 RPS.

c) Scheme for developing infrastructure for various activities

This provides for extending technical and financial support to RPS for setting up of infrastructure facilities for taking up activities for the common benefit of the members.

(i) Support for input distribution centres

This supports RPS/SHGs to set up plantation input distribution centres in remote villages to ensure the availability of estate inputs at the doorstep of small growers at right time which will facilitate better adoption of agro-practices. ₹ 2,89,650 was disbursed to 49 RPS during 2016-17.



- (ii) Incentive for common service centre
The common service centers with computers and internet connectivity set up by the RPS under the scheme could provide several services to the members and their families.
- (iii) Support for labour bank
Shortage of tappers and general workers in rubber plantation areas is a very serious issue. In order to address this issue to some extent, setting up of labour banks under RPS was promoted. Workers registered in the labour banks of RPS will work in the small holdings of member growers. These workers were trained in Good Agricultural Practices (GAP) in rubber plantations. Free training is given to all the registered workers as and when needed.
- (iv) Support for latex collection centre/ RPS Complex
The Board provided assistance to set up training facilities for capacity building of stakeholders, latex collection centre for promoting group marketing and improving the quality of the produce in the small holding sector to achieve market competitiveness. The Board has provided incentive to RPS for quality sheet production by way of transportation subsidy for the produce transacted through the RPS.

Table:12 Details of financial assistance disbursed during 2016-17

Activity	No. of RPSs/ Companies	Amount (₹)
Training facilities	1	2,27,500
Latex collection centre	1	2,30,020
Transportation subsidy		
Support to RPS	12	1,65,612
Support to companies	1	8,91,510
TOTAL	15	15,14,642

2.4 Labour Bank/ Rubber Tapper Bank(RTB)

The objective of the RTB is to generate a pool (bank) of rubber tappers based on individual tapper registrations at the RPS and it envisages more active involvement of the rubber tappers in the training as well as welfare programmes of the Board. During the year 22 RTBs were formed under 15 Regional Offices with 297 tappers as members and 1.31 lakh rubber trees of 405 holdings were tapped.

3. Women empowerment

As a result of the recent shift from the tree centric to farmer centric extension strategy, it has become imperative to implement empowerment programmes for women through formation of activity groups/labour banks to ensure increased women participation. There is ample scope for involving women in various activities such as plantation maintenance, processing field latex, rain- guarding, latex harvesting and ancillary income generation activities (eg:apiculture) as the conventional work force is diminishing in the sector. For the optimum utilization of the resources, their capacity building is important. They are organised under group Self Help Groups and imparted training in various aspects.

For the empowerment, SHG members were given training in the field of apiculture and for making wood products. Trainings in capacity building for the women were also imparted through these SHGs. During the reporting year, an amount of ₹ 85,410 was disbursed for promoting apiculture to 9 RPS/ SHGs.

4. Critical input supply and price concession

The objectives of the scheme are:

- To control the market price of inputs
- To motivate the growers for the adoption of critical agro practices.



Adoption of critical agro-practices is a scientifically proven short term measure for productivity enhancement. Rainguarding is essential to realize optimum number of tapping days while adopting low frequency tapping (LFT) which ensures year round employment to tappers. Prophylactic spraying, another productivity enhancement measure, is inevitable to control fungal diseases and spontaneous disease outbreak. Small growers are generally averse to these practices due to high cost of inputs and difficulty in timely availability. To promote the adoption of agro-practices facilitating productivity enhancement, the Board distributed inputs through RPS utilizing a revolving fund of ₹ 10 Crore. Handling charge of 10% on cost price is given to the Board-sponsored Companies and RPS in a 1:1 ratio. During the year, inputs worth ₹ 1.79 Crore were distributed through 269 RPS.

Table:13 Details of input supplied to small growers (2016-17)

Inputs	Quantity distributed	Area covered (Ha)	Distribution price ₹ per Unit
Copper Oxy Chloride (kg)	23,678	2,960	308
Spray Oil (lit)	1,08,570	2,714	58
Rainguarding plastic (kg)	31,772	2,647	135

5. Rubber Agro-Management Units

Agro-management demonstration units were set up where adoption of five package of practices (discriminative fertilizer application, spraying, soil conservation, rain-guarding and scientific tapping) was practised. Financial assistance under the scheme was ₹ 20,000 per ha. During 2016-17, an amount of ₹ 72,480 was disbursed to 4 RPS towards committed payment. Assessment of impact of demonstration plots revealed a yield hike of 12 per cent to 15 per cent.

6. Farm Mechanization

Assistance was extended to RPS for the purchase of farm machines like low volume sprayer, weed cutter, chain saw, hole digger etc during the initial periods of the 12th Five Year Plan to address the issue of labour shortage. Assistance for purchase of farm machines was not given during 2016-17 due to reprioritization of fund.

Table :14 Use of farm machines in T & NT area- 2016-17

Type of equipment	Utilization	
	Area (ha)	Beneficiaries (No)
Weed cutter	5,312.58	7,236
Sprayer	8,536.56	11,223
Chain saw	180.45	198
Pit Maker	145.00	150
Total	14,174.59	18,807

7. Generation of planting materials

7.1. Rubber Board Nurseries

Quality of the planting material is the prime factor influencing production and productivity. Even though the Board is in a position to meet only around 10% of the total planting material requirement in the country, it is necessary to maintain Board's nurseries for the following objectives:

- Ensuring quality control
- checking unscrupulous trade practices by private nurseries
- demonstration & training for stakeholders

The Board has one central nursery and five regional nurseries in the traditional area (Kerala). Since 2014 the Board's nurseries have been producing good quality green budded stumps (GBS), brown budded stumps (BBS), polybag plants (PBP), root trainer plants (RTP) and bud wood following good nursery practices (GNP).

**Table:15 Planting material generation during 2016-17**

Type of planting material	Quantity (in lakh numbers)
Brown budded stumps	1.56
Polybag plants	0.05
Root trainer plants	5.76
Total Production	7.37
Budwood (Mts)	63,719

7.2. Private Nursery sector

Major share of the planting material requirement is met by private sources at present. Institutional intervention in propagation during the period from 1949 to 1986, in terms of approval of nurseries after regular visits and technical support, had been effective in ensuring the quality of planting materials. Subsequent to the suspension of approval of rubber nurseries in 1986, planting material generation and trading became profit oriented without much attention on quality or ethics. There are widespread concerns about supply of spurious planting materials by private nurseries.

7.3. Nursery registration & certification of planting material for quality assurance

Quality conscious farmers and stakeholders look forward to quality assurance of planting materials through certification. Quality of planting material is crucial in improving productivity and performance of plantations. Therefore the Board initiated certification programme in the Board's own nurseries during 2014. Modalities for standardization of nursery practices and certification of planting materials were formulated and guidelines for Good Nursery Practices (GNP) were approved. This

programme will enhance the use of good quality planting materials. Pending the enactment of Seed Bill 2004, the Board launched the programme for voluntary registration of nurseries and certification of planting materials to ensure quality in private nursery sector in September 2016.

7.4 Facilitating research activities of RRII

Rubber Board nurseries facilitated experiments undertaken by RRII. New clones evolved and released by RRII were multiplied and distributed to stakeholders.

7.5 Sale of planting materials

With a view to ensuring distribution of entire planting materials produced at the Board nurseries during the season itself, Board started advance booking of planting materials in 2016-17. Achievements during the inception period of the scheme are shown below:

Table:17 Details of planting materials booked during 2016-17

Type of planting material	No. of planting materials booked
Budded Stumps	840
Poly Bag Plants	9,836
Root Trainer Plants	1,10,389
Total	1,21,065

7.6 Training in nurseries for stakeholders

Various skill development programmes for stakeholders were conducted at the Board's nurseries such as budding school, nursery management, production of root trainer plants etc. Rubber Board Central Nursery at Karikkattoor is a centre for Training & Visit for foreign delegates and growers and also officials from Soil Conservation Department of Tripura and other NE States.

Table: 16 Details of nurseries registered and estimated production of planting materials

Number of nurseries applied for registration	Estimated planting material production as per application (Nos)			
	Budded Stumps (BS)	Poly bag plants (PBP)	Root Trainer Plants (RTP)	Total
261	1,83,200	12,60,450	5,39,000	19,82,650

Table : 18 Details of training conducted at the Boards Nurseries

Sl No	Topic	Duration	No of batches	No of participants	Stakeholder details
1	Nursery practices; field visit; budding; RT cup filling	One day	7	52	Growers and nursery owners
2	Nursery practices; field visit; budding; RT cup filling	One day	2	41	Sastradarsan- Growers (SC/ST) and Officials from NE
3	Nursery practices; field visit; budding; RT cup filling	One day	1	18	Sastradarsan RPS Kasaragod
4	Nursery practices; field visit; budding; RT cup filling	One day	2	17	Rubber Board Extension Officials
5	Nursery practices; field visit; budding; RT cup filling	One day	1	37	RPL Participants
6	Nursery practices; field visit; budding; RT cup filling	Half Day	1	4	Foreign delegates (Ethiopia)
Total			14	169	

8. Certification of Rubber Plantations

As per Section 10 of the Rubber Act 1947, registration of rubber plantations was

mandatory. However, the Board discontinued this in 1986. Hence, optional certification of plantations was launched in 2014.

Table : 19 Status of applications received for certification of plantations

No. of applications (as on 01.04.2016)	2016-17				Cumulative No. of certificates issued as on 31.03.2017	Cumulative area as on 31.03.2017 (ha)
	No. of applications received	No. of cases inspected and processed	No. of certificates issued	Total Area certified (ha)		
3,028	1,407	881	1,493	1,108.8	1,698	1,381.22

9. Advisory and Extension Services

There is a well structured field establishment under the Rubber Production Department which renders free advisory and extension services to rubber growers on all aspects of rubber cultivation, production, processing and marketing and simultaneously attends to implementation of various development schemes.

9.1. Advisory visits to holdings

Field inspections carried out by extension officers are really advisory visits, with them coming into direct contact with growers and teaching them methods of scientific plantation management, harvesting and processing

good quality sheets. This is a very useful interpersonal exercise for technology dissemination. 1,62,799 farmers were benefited during the year 2016-17.

9.2 Group approach

Considering the large size of the grower population numbering more than 1.3 million, the Board adopted group approach to obtain the widest possible reach with fair efficiency. The specific means adopted are village level group meetings, seminars, study classes, demonstrations and exhibitions organized either directly or under the auspices of Rubber Producers' Societies (RPS).



(i) *Group Meetings, Seminars etc.*
Though inter-personal interaction is the most effective approach for advisory and extension services, the Board also adopted group approach to obtain the widest outreach. RPS, the grassroots level organizations of small growers play a very prominent role as agencies bringing together the Board and the growers for effective two-way communication. The department also utilized farmer resource persons in the various seminars and meetings in a bid to promote farmer led extensions.

Table :20 Growers meetings conducted during 2016-17

Type of meeting	2016-17	
	No. of meetings	No. of participants
Seminars	498	24,407
Group meetings	1,614	31,474
Other RPS meetings	838	17,967
TOTAL	2,950	73,848

(ii) *Annual Mass Contact Programme*
The Board regularly adopts once every year, a campaign approach for taking across to growers selected extension messages of topical importance. The meetings are organized in association with RPS at various centres continuously for about a month. These campaigns create a widespread awareness of the subject dealt with. The programmes help in obtaining first hand information on the problems and issues faced by small growers. During the year, the theme of the programme conducted in 879 centres was “Weekly tapping (s2d7)”.

(iii) *Exposure Visits*
Exposure visits enable farmers from different regions to interact with each other and learn practical examples of sustainable practices in farms. Exposure

visits were organized to popularize weekly tapping among the aspirant growers as a follow up of annual mass contact programme.

(iv) *Farmer Education Programmes- On farm demonstrations*
Various on-farm demonstrations/training programmes were conducted at RPS level aiming at capacity building of stakeholders.

Table:21 Details of Annual Mass Contact Programme & Exposure Visits

Type of meeting	2016-17	
	No of meeting	No of participants
Campaign	879	57,319
Exposure Visits	225	3,386

Table:22 Details of on-farm training conducted during 2016-17

Type of training	No of Training	No of Participants
Apiculture	11	257
Low Frequency Tapping	487	6,717
Rain Guarding	109	2,759
Tapping & processing	248	4,462
Nursery certification	7	149
Others	265	3,899
Total	1,127	18,243

(v) *Demonstration cum Nursery Project (DCNP) at Rukhi in Maharashtra*
Farmers in the non-traditional areas are taking up rubber cultivation for the first time and hence regular training/demonstration programmes are to be conducted on all aspects of rubber cultivation and processing. The Board established one Demonstration Cum Nursery Project (DCNP) at Rukhi in Maharashtra aiming at rubber plantation development in the suitable lands in the Konkan belt of Goa and Maharashtra in collaboration with



Dr. Balasaheb Sawant, Konkan Krishvidyapeeth, Dapoli. DCNP raised 4.56 ha of model plantation for demonstration purpose.

Around 2500 entrepreneurs, students of Agricultural Universities, schools and colleges visited the project so far.

10. Quality up-gradation of sheet rubber in Group Processing Centres (GPCs)

The shift from homestead processing to group processing brought about remarkable improvements in the quality of rubber sheets. Most of the sheets produced by the RPS were of RSS 1X grade. The improvement in quality was conspicuous as the small rubber growers were not able to produce superior grades of rubber without adopting group approach.

Table: 23 Details of grade-wise quality upgraded sheet rubber produced during 2016-17

No. of GPC'	Total quantity of sheet rubber (MT)			
	RSS I	RSS II & III	RSS IV	Total
153	3,093.1	142.0	1,825.2	5,060.3

11. Skill Development

11.1 Skill Development in Latex Harvesting (Tapping)

Rubber tapping is a skilled job. Its efficiency is influenced by a number of parameters/factors and the skill has to be acquired through structured training. In the context of shortage of skilled labour, skill development programmes have to be continued more vigorously as new plantations are becoming ready for tapping. For tappers, two types of training are being conducted by the Board.

(i) *Tapping Skill Development School (TSS)*

This 30 day training is meant for imparting new skill in latex harvesting & processing for fresh candidates. The Board has TSS at four locations.

(ii) *Tapper' Intensive Skill-improvement Programme (TISP)*

This short term intensive on-farm training for 8 days on tapping and processing is well accepted by the grower community being the most farmer-friendly programme.

Table:24 Details of tappers training programmes during 2016-17

Type of Training	2016-17		
	No. of Batches	No of Beneficiaries	Assistance (₹ in lakh)
TSS	13	176	3,96,000
TISP	65	970	Nil

11.2. Facilitation for Human Resource Development of stakeholders and Extension officers

(i) *Growers & RPS office bearers*

RP Department supported Training Department of the Board through mobilization of rubber growers for participation in training programmes on various aspects of rubber cultivation and plantation management. RP department facilitated capacity building programmes to improve skills in entrepreneur-ship, accounting, problem solving and other leadership qualities of RPS Director Board members by nominating them for training programmes.

Table:25 Details of category/duration/batches/beneficiaries of training programme

Participants	Duration (days)	No. of batches	No. of participants
Members of RPS	2	2	31
Collection Agents of RPS	2	1	6
Rubber Growers	5	2	17
Rubber Growers	2	4	58
Rubber Growers	1	13	174
Total		22	286

(ii) *Human Resource Development for Extension Officials***Table: 26 Details of training for Extension Officers**

Participants	Duration (days)	No. of batches	No. of participants
Training in e-extension	3	1	22
Training in management skill	3	1	19
RPL/PMKVY Training of Trainers	2	4	202
Refresher training for FOs (NE)	3	1	34
Total		7	277

12. Various surveys

Field level sample survey for collecting production, sale and stock of rubber, productivity, stakeholder survey on implementation of Rubber Production Incentive Scheme (RPIS) and survey for conducting study on impact of implementation of Rubber Agro-Management Unit scheme were conducted.

13. Crisis/Disaster Management(i) *Corynespora Task Force*

The Task Force was in action to tackle location specific epidemic – *Corynespora* leaf disease, seen mainly in Karnataka and some part of Kasaragod and Kothamangalam Taluks. Awareness creation among growers in these regions in control measures is the main focus. The Task Force conducted field visits, provided technical support and arranged inputs for prophylactic spraying at competitive price.

(ii) *Thread Blight disease Control*

The Board effectively intervened in awareness creation among growers on the control measures in case of Thread Blight disease outbreak in certain parts of Kothamangalam region.

14. Convergence initiatives**14.1 Skill Development in association with RSDC**

Training under the Pradhan Mantri Kaushal Vikas Yojana (PMKVY)

Pradhan Mantri Kaushal Vikas Yojana is the flagship scheme of the Ministry of Skill Development and Entrepreneurship (MSDE), with a budget allocation of ₹12,000 Crore, instituted with the objective to develop, improve and certify the skill of Indian youth. Assessment and recognition of prior learning is also undertaken by PMKVY.

National Skill Development Corporation (NSDC) is a public private partnership (PPP) firm, under the Ministry of Skill Development and Entrepreneurship established with the aim of promoting skill development. NSDC has been set up as part of a National Skill Development Mission to fulfill the growing need in the country for skilled manpower across various sectors and to narrow down the existing gap between the demand and supply of skills.

412 job roles were identified and 32 sector skill councils were registered under PMKVY for various sectors. One such sector skill council is Rubber Skill Development Council (RSDC) set up for rubber by AIRIA & ATMA under the aegis of NSDC, to ensure availability of skilled human resources to rubber plantation industry.

Recognition of Prior Learning - 3 days

Individuals with prior learning experience or skills shall be assessed and certified under the Recognition of Prior Learning (RPL) component of the Scheme. Rubber Board has been approved by NSDC as the Project Implementing Agency (PIA) for conducting a program on RPL in Kerala with the participation of RSDC on two job roles, viz Latex Harvest Technician



and Latex Processing Technician. The project was implemented jointly by Rubber Training Institute (RTI) and Rubber Production (RP) Department. Rubber Training Institute was entrusted with the task of course material development, Training of Trainers, project

management and monitoring of the project. Task related to mobilization of trainees, enrollment through SDMS, counseling, practical training, pre training and post training skill assessment, feedback etc were undertaken by Rubber Production Department.

Table : 27 Details of beneficiaries under RPL programme (2016-17)

Job role	No. of batches	Trainees successfully completed RPL		
		Men	Women	Total
Latex Harvest Technician	309	7,757	1,523	9,280
Latex Processing Technician	25	608	112	720
Total	334	8,365	1,635	10,000

14.2. Rubber Production Incentive Scheme (RPIS)-Convergence with Government of Kerala

Under the scheme, the difference between the support price of ₹ 150 and the daily reference price of RSS 4 grade published by the Board would be credited to the bank account of the farmer on the basis of purchase bills furnished by the farmer through RPS and duly certified by the extension officers of the Board. This incentive is offered as a part of intervention to support rubber farmers in Kerala during the low price period and to

encourage rubber production. Farmers having a total area of 5 ha. are eligible, but the assistance is limited to two ha with a production ceiling of 1800 kg per ha/ annum. Assistance is being provided for RSS 4 and higher grades and latex. The budget sanction for 2015-16 was ₹ 300 crore and that for 2016-17 was ₹ 500 crore. The cumulative amount released for the first phase of the scheme was ₹ 596.24 crore. The second phase of the scheme was implemented through the Regional Offices and Field Stations of the Board during 2016-17.

Table : 28 Achievement of RPIS–Second Phase (July 2016 to June 2017)

No. of RPS involved	Cumulative No. of applications received	No. of bills confirmed	Amount released (Cr)**
1864	4,36,696*	10,50,867	99.70

Data up to 23 June 2017 as the scheme period is from July to June.

*Including 70,215 new applications received during 2016-17. **Outstanding amount for EBT= 151.32 Cr

14.3. Women Labour Group- Convergence with Kerala Kudumbashree Mission (Women empowerment and initiative for addressing labour shortage in latex harvesting/plantation management)

There is enormous scope for harnessing women power for accomplishing activities in connection with plantation management,

harvesting, processing and ancillary income generation by opening up job opportunities to Kudumbashree members. This acquires importance in the context of the emerging labour shortage. Initiatives have been taken by the Board in collaboration with Kudumbasree Mission to form women labour groups under Rubber Producers’ Societies.



The scheme was piloted by Regional Office, Muvattupuzha. A women labour group of 15 Kudumbashree members was formed. Their training (30 days on-farm Training) was at Ramamangalam with the participation of Grama Panchayat, CDS, Kudumbashree Ernakulam District Mission and Ramamangalam RPS. The trained group, **Haritha**, is ready for engagement in rubber plantations identified by the RPS.

It has been decided to replicate this in the areas of all regional offices in Kerala in the ensuing years.

14.4. Convergence with MGNREGS for Rubber Plantation Development

Roughly 1,500 man-days, mostly of unskilled nature, are required to raise 1 hectare rubber plantation, and to make use of the Mahatma Gandhi National Rural Employment Scheme (MGNREGS) is an option.

The Board will identify the land suitable for cultivation and prepare the list of beneficiaries under MGNREGS, who are eligible to work on private land. The village panchayat will be given this list, and the eligible beneficiaries interested in the scheme will form a self help group to carry out the work of the plantation. Additionally, MGNREGS workers who are not eligible to work on private lands will be able to take up the specific tasks like clearing, planting and fertilizer application. This will be managed by the village panchayat as part of its work under rural employment scheme.

MGNREGS will bear the cost of wages for the unskilled labour, and some of the semi-skilled labour and material components, accounting for 52% of costs for developing a hectare of rubber. Rough estimates of the costs to be borne by the rural employment scheme works out to be ₹ 1,71,540 (52% of total cost) per hectare in Kerala.

Table : 29 Details of convergence activities

Activity	Area (ha)	No of beneficiaries
Rubber Plantation Activities (planting, terracing etc)	75.06	131
Tribal plantation	57.10	162
Total	132.16	293

14.5. Convergence with Kerala government and line departments for intercropping fruits and vegetables in young rubber plantations

Convergence with schemes being implemented by Government of Kerala for intercropping of fruits and vegetables in young plantations can increase their production in the state and provide an additional income for rubber growers.

Objectives of the scheme are as follows:

- i. To increase production of safe to eat fruits and vegetables in the state by adopting scientific intercropping of banana, pineapple, ginger, turmeric, tubers and vegetables in young rubber plantations.
- ii. To generate income for rubber smallholders during immature phase of plantations

Project formulation, discussions with Ministry of Agriculture, Government of Kerala, other line departments and stakeholders were initiated and completed during 2016-17. The project was approved by the Government of Kerala which made announcement in 2017-18 budget.

15. Special drive for enhancing NR production and productivity

India's natural rubber production came down to 563,000 MT in 2015-16, the lowest of two decades. The downtrend in natural rubber production in India continues as farmers abstain from harvesting in the context of the



low rubber prices. In this backdrop, a special drive for enhancing production and productivity gained significance. It is proven that scientific adoption of agropractices together with rectification of tapping defects increases productivity significantly. Substantial reduction in cost of production and improvement in per tap yield are essential for ensuring sustainable income.

Strategies

1. Identification of target group and awareness creation
 Smallholdings, especially plantations untapped for various reasons were identified for promoting adoption of productivity augmenting agro practices with the help of RPS. Conducted preharvesting advisory visits in holdings which are ready for tapping to ensure scientific commencement of harvesting. Group meetings and on-farm trainings were conducted for creating awareness on adoption of agro practices for production enhancement and reduction of cost of production.
2. Facilitation for adoption of agro-practices
 - a) *Prophylactic spraying & disease management*
 Spraying mature rubber plantations against the most common disease, abnormal leaf fall and management of other diseases will enhance productivity by 15% to 30%. Rubber Board distributed

inputs for spraying under the scheme component Critical input supply and encouraged the utilization of sprayers supplied to RPS/SHGs under the scheme component Farm Mechanization for disease management.

- b) *Rain-guarding with panel protection*
 This practice fetches 20-30 additional tapping days in a year by permitting tapping during rainy days, with 15% increase in productivity. Year round regular tapping at optimum intervals is essential for sustainable yield. So rainguarding is an inevitable agro-practice for ensuring regular tapping. Rainguarding materials were supplied under the scheme component Critical input supply and special drive was made for popularizing the practice of rain guarding the mature plantations to extract the production potential during the year 2016-17.
- c) *Controlled Upward Tapping (CUT) in suitable plantations*
 Controlled Upward Tapping can be practiced for longer exploitation of the virgin bark above the basal panel. Higher yield can be obtained for many years as there is neither any bark-island effect nor any injury to cambium. Around 50% increase in yield can be achieved by adopting CUT. The Board took special effort to popularize this practice.

Table : 30 Achievements of adopting agropractices

Agro-practice	No. of holdings	Area (ha)
Spraying	29,371	22,134.37
Rainguarding with panel protection	2,32,938	1,55,155.02
Controlled Upward Tapping (CUT) Smallholdings	170	190.24
Estate	2	1,410.80
Total	2,62,481	1,78,890.43



Planting material – Root Trainer Plants



Intercropping in immature rubber plantation



Haritha Labour Group, Ramamangalam



Rain guarding training in Green RPS under RO Asia

Rain-guarding Training



Group Processing of Sheet Rubber



RSS 1X – Sheet Rubber production



16. Special drive for sustainability through reformation of harvesting systems

a) Rectification of tapping defects for potential yield realization

Defective tapping causes decline in economic life-span of the plantation and heavy crop loss. Crop loss due to defective tapping is roughly estimated to be 6% of the total production. In this context, rectification of tapping defects gains relevance in productivity enhancement.

On-farm demonstrations/workshops, trainings, etc were conducted aiming at the skill improvement of tappers for rectifying the tapping defects. Recognition of Prior Learning (RPL) programmes under Pradhan Mantri Kaushal Vikas Yojana (PMKVY) conducted for the job role Latex Harvest Technician contributed significantly to this.

b) Weekly Tapping- for cost effectiveness

Among the Low Frequency Tapping systems, weekly tapping (s2 d7 tapping) is best for reducing wages to nearly 45% compared to alternate daily (s2d2) tapping. The main theme for Annual Mass Contact programme for 2016-17 was 'weekly tapping without compromise in yield'. Weekly tapping was promoted with the twin objectives of reducing tapping wages, the major cost factor, and prolonging economic life of plantations. Innovative growers adopted weekly tapping on experimental basis and many other growers upgraded their tapping system to s2d3/s2d4.

Table:31 Impact of campaign programme on LFT/weekly tapping

Tapping system	No of holdings	Area (ha)
LFT (s2d3/s2d4)	2,857	2,378.84
Weekly tapping (s2d7)	533	465.52
Total	3,390	2,844.36

II. Rubber Plantation Development & Extension in North-East (RPDENE)

1. Plantation Development

1.1. New planting & replanting

The total area planted under the scheme was 37,776 ha from 2012-13 to 2016-17. The achievement under the plantation development activity in NE Region up to 2016-17 was 89% higher than the target set up for the entire 12th Plan period (2012-13 to 2016-17).

As the achievement far exceeded the target Rubber Board did not invite application for subsidy for areas planted during 2016-17. However, applications received during the previous years were examined and permits granted in eligible cases. Total subsidy sanctioned during 2016-17 including committed payment is ₹ 15.49 Crore.

Table:32 Achievement under planting activity

Year	Target (Ha)	Achievement (Permit area) (Ha)*
2012-13	4,000	9,779
2013-14	4,000	8,588
2014-15	4,000	8,611
2015-16	4,000	6,575
2016-17	4,000	4,223
Total	20,000	37,776

* Permit area includes cases of previous years plantings processed during the financial year.

1.2. Tribal rehabilitation planting

Table : 33 Achievements in Block Rubber Plantation Projects

Planting up to 2015-16		2016-17		Cumulative total up to 31.03.2017	
Area (ha.)	No. of Beneficiaries	Area (ha.)	No. of Beneficiaries	Area (ha)	No of Beneficiaries
3,774.25	3,546	25	23	3,799.25	3,569

2. Planting material generation

2.1. Rubber Board Regional Nurseries/ Nurseries in District Devt. Centre.

The Board established five nurseries in NE region, which are maintained as models for facilitating supply of good planting materials as well as providing training to stakeholders in nursery management. They are listed below:

- Regional Nursery, Tulakona
 - DDC, Jenggitchakgre
 - DDC, Darrangiri
 - Regional Nursery, Boko
 - Nursery, Kathiatholi
- Around 400 private nurseries are functioning in NE region.

Table:34 Planting material generation in the Board's nurseries- 2016-17

Particulars	Quantity produced (in lakh/M)
Brown budded stumps	1.79
Poly bagged Plants	0.31
Total	2.10
Bud wood (Mts)	71,337

2.2. Private Sector- Nursery registration & certification for quality planting material

In September 2016, the Board launched a programme for optional registration of nurseries and certification of planting materials in NE Region also.

Table:35 Nursery registration and certification during 2016-17

Number of nurseries applied for Registration	Estimated planting material production as per application (Nos)		
	Budded Stumps (BS)	Poly bag plants (PBP)	Total
76	2,31,875	3,40,150	5,72,025

3. Skill Development Programmes

Rubber being a relatively new crop in the NE region, efficient extension support is required to motivate farmers for adopting scientific agro management practices. On-farm demonstration and training is the best way to familiarize scientific methods. Structured training programmes on various aspects of scientific cultivation and harvesting were conducted at the following training centres/establishments of the Board under the Zonal Offices at Guwahati and Agartala for new entrepreneurs.

1. Nuclear Rubber Estate and Training Centre (NRETC), Agartala
2. Rubber Research and Training Centre (RRTC), Hahara
3. District Development Centre, Darrangiri
4. District Development Centre, Jenggitchakgre
5. Tapping Skill Development School (TSS), Darrangiri
6. Tapping Skill Development School, Amtali
7. Tapping Skill Development School, Jurie
8. Tapping Skill Development School, Diphu
9. Tapping Skill Development School, Hahara

**Table:36 Training programmes conducted in NE region during 2016-17**

Type of training	Number of programs	Number of trainees
Rubber cultivation and estate management at RRTC/DDC	26	374
Tappers Skill development School (TSS)	18	230
Tappers Intensive Skill development Programme(TISP)	76	1,165
Training in marketing by NIAM	2	48
Skill development programmes in collaboration with RSDC	2	60
Total	124	1,877

4. Cluster formation and Group Empowerment

Majority of the growers in NE region are small and marginal growers. Therefore, it is imperative to make them self-reliant in managing their plantations starting from planting to harvesting, processing and marketing through group management. Empowerment of rubber growers through cluster formation under RPS and SHGs is the focus. At present, there are 438 RPS in NE region including 14 new RPS formed and 9 defunct RPS rejuvenated during 2016-17.

Table:37 Statutory meetings conducted for empowerment

Programme	2016-17	
	RPS (Nos)	Participants (Nos)
BOD meetings	258	1,442
AGB meetings	58	2,254
Total	316	3,696

5. Farmer education using conventional and modern tools

The Department provides advisory and extension services to growers on all aspects of rubber cultivation and processing by meeting farmers individually and by organizing group meetings/seminars, demonstrations and on-farm trainings to scale up the adoption level of innovative technologies. During 2016-17, the extension officials interacted with 33275 stakeholders in person in connection with technology diffusion. Focused development by technology transfer through campaign mode is a unique extension strategy adopted successfully by the Board. Details of different types of meetings organized in Agartala and Guwahati Zone during 2016-17 are given below:

Table:38 Achievement of farmer education programme

Type of meeting	2016-17	
	No. of meetings	No. of Participants
Campaign meetings	90	6,434
Seminars	65	1,992
Group meetings	656	9,442
Other meetings	147	3,908
Total	958	21,776

6. Quality upgradation through Group Processing

RPS emphasize on activities which improve the processing and marketing facilities of small growers., Training classes were conducted for production of better grade RSS. Facilities for processing good quality rubber were also provided on a group basis. It helped in producing RSS of uniform grade and export quality. Realization of higher prices for better grades had made the small growers 'grade-conscious', leading to improvement in the quality of the sheets.

**Table:39 Details of support provided for decentralized processing**

Infrastructure	No of Growers	Amount (₹)
Smoke House	9	1,65,000
Rubber Roller	92	13,70,499
Effluent Treatment Plant	1	11,750
Total	102	15,47,249

Table: 40 Quantity of Rubber Processed at GPCs

No. of GPC	Total quantity of sheet rubber (MT)		
	Higher grade (RSS I to III)	RSS IV	Total
44	86.31	1,399.18	1,485.49

7. Certification of Rubber Plantations

The Board invited applications from rubber growers for optional certification of rubber plantations in NE region. During the year, 428 applications were received out of which 28 were inspected and processed. The Board issued 17 certificates covering 17.12 ha.

8. Activities for enhancing production and productivity

8.1. Awareness creation & capacity building programmes

Group meeting and on-farm trainings were conducted to create awareness in adoption of GAP for production enhancement, reduction of cost, ancillary income generation, certification of planting materials etc.

8.2. Facilitation for adoption of productivity augmenting agro-practices

Short term agro-practices for productivity augmentation such as disease management (spraying), rainguarding, controlled upward tapping (CUT) and low frequency tapping (LFT) etc are not in general practice among growers in the

NE. Many innovative growers adopted the practices in their holdings on trial basis as a result of activities undertaken for popularizing these practices.

Table:41 Details of various awareness programmes conducted

Type of training	No of Training	No of Participants
Apiculture	1	20
Low Frequency Tapping	5	66
Rain Guarding	24	398
Tapping and processing	123	1,345
Nursery certification	4	41
Others	16	709
Training & Visit (Exposure visits)	4	82
Total	177	2,661

Table:42 Details of agro-management practices adopted in NE region

Agro-practice	No. of holdings	Area (ha)
Spraying	110	115.00
Rain Guarding with panel protection	152	256.00
Controlled Upward Tapping (CUT)	13	11.78
Low Frequency Tapping (LFT)	47	20.59
Total	322	403.37

III. Insurance of Rubber Plantations

Insurance scheme for compensating the loss against natural calamities occurred in the already insured mature and immature rubber plantations, was under operation in collaboration with the National Insurance Company.

Table : 43 Details of plantations insured and compensation paid

Details	Cumulative total as on 31-03-2016	Achievement 01-04-2016 to 31-03-2017	Cumulative total as on 31-03-2017
Immature area insured (ha)	2,80,807.33	0*	2,80,807.33
No of holdings	4,47,622	0	4,47,622
Mature area insured (ha)	16,232.57	0	16,232.57
Number of holdings	9,469	0	9,469
Compensation paid (₹ in lakh)	1,342.89	199.48	1,542.37
Number of beneficiaries	26,299	2,704	29,003

* Scheme discontinued with effect from 01.04.2016

IV. Labour welfare of Rubber Tappers

Rubber Production Department was entrusted with the implementation of various labour welfare schemes. Applications for assistance under the welfare schemes were received at Regional Offices, field inspections/enquiry for the needy cases and processing of applications for disbursing the eligible assistance were carried out.

Table:44 Achievement of labour welfare schemes in terms of applications

Scheme	No of applications	
	Received	Sanctioned
Education stipend	3,386	2,242
Merit award	382	368
Medical attendance	209	169
Insurance- cum-Deposit	1,414	1,414
GLITBS	7,073	7,073
PAIS	8,933	8,933
Total	21,397	20,199

V. Model offices the “centres of excellence in NR sector”

The Rubber Board has a well spread development and extension network of

Regional Offices and Field Stations all over the rubber growing states in India. The grassroots level extension official is Field Officer posted at a one-man office at village level. The Board’s extension delivery system has undergone focus shift, since the inception of RPS in 1985 through group approach with a focus on institution building at grassroots level.

As a result of the liberalization and consequent removal of Quantitative Restrictions (QRs) under the WTO mandated regime several changes occurred in the sector. In a sector like rubber which is dominated by small and marginal farmers, appropriate policy intervention is required to equip the sector to meet the challenges. Production has to be cost competitive and of international quality. Though IT enabled services can help to transfer technology, this alone will not take care of the need for bringing about changes and building up of grassroots level institutions. This can be achieved only through professional extension and the extension machinery should be elevated to the status of change agent as well as a knowledge manager.



In this backdrop it is the need of the hour to give a facelift to Regional Offices & Field Stations as “centres of excellence in NR sector”, which could act as a single window to cater the needs of local stakeholders. With this intention, during the reporting year, two Regional offices and nine Field Stations in Kerala, two Field Stations in NT area and 4 Field Stations in NE Region, were upgraded to the status of “Model Offices”. These Offices showcased the services offered and maintained updated information relating to the sector.

An elaborate training programme was organised at Rubber Training Institute for the concerned officers on topics like planning, resource management etc.

VI. Summary of achievements of extension oriented activities for improving production & productivity in the country

During 2016-17, apart from rubber plantation development through promotion of replanting and new planting, RP Department had been concentrating on extension oriented activities, for improving production and productivity. The activities mainly focused on productivity enhancement by facilitating small growers to maintain their plantations economically viable through adoption of short term productivity boosting measures and reduction of cost of production through reformation of tapping system. Summary of production and productivity of NR during 2015-16 and 2016-17 are furnished below.

Table : 45 NR production and productivity in India

Year	Production (lakh MT)	% growth	Productivity (Kg. per hectare)	% growth
2015-16	5.62	-12.87	1,431	-2.7
2016-17	6.91	+22.95	1,563	+9.22

Highlights of achievements during 2016-17

- Paradigm shift to productivity enhancement oriented extension activities.
- Overall 22.95% growth in NR Production and 9.22% growth in NR Productivity.
- Quality up-gradation of sheet rubber- through group processing in RPS. Sheets processed were of higher grades and beneficiaries realized better price through collective marketing.
- Implementation of Rubber Production Incentive Scheme (RPIS).
- Skill Development of Tappers in collaboration with RSDC under PMKVY.
- Generation and distribution of certified planting materials.
- Launching of nursery registration and certification of planting materials in private sector for quality assurance.
- Rubber Tappers Bank for addressing skilled tapper shortage.
- Initiatives for Labour Group Formation in collaboration with Kerala Kudumbashree Mission.
- Initiatives for convergence with Kerala Agricultural Department for integrated farming (scheme for intercropping vegetables and fruits in young rubber plantations).
- Promotion of weekly tapping for reducing production cost.



PART - IV

ADMINISTRATION

The Administration Department consists of the following Sections and Divisions:

- 01 Establishment Division
(Board Secretariat, Personnel,
Entitlement and General Administration)
- 02 Labour Welfare Division
- 03 Legal Section
- 04 Hindi Section

1. ESTABLISHMENT DIVISION

a) Board Secretariat

Main activities of Secretariat include coordinating the meetings of the Board and its sub-committees, assisting in reconstitution of sub-committees, preparation of notes on agenda and minutes of the said meetings, monitoring implementation of their decisions and compilation and printing of the administrative annual report of the Board.

No meeting of the Board and its sub committees were held during 2016-17, as no Board was in existence.

b) Personnel and Administration

During 2016-17, all direct recruitments / creation of new posts were suspended as a part of austerity measures and so, only five persons were appointed under Special drive recruitment for persons with disabilities for NE region through direct recruitment. 206 regular promotions were awarded, of which 18 incumbents declined. Besides, the applications received for the post of Junior Assistant under categories of SC and Visually Handicapped persons are under processing.

Seven Selection Committees/ Departmental Promotion Committees (DPC) were constituted and selection lists were prepared in accordance with relevant Recruitment Rules for promotion. Government orders/ guidelines on service matters were strictly followed. Periodical returns on recruitment/ promotions at reservation points were sent to the Government. 86 Group A, B and C officials were awarded higher grade under MACP scheme. No assessment was made for Scientists under MFCS owing to the case pending in the Court.

Besides, five proceedings / office orders and deployment orders covering 42 employees were issued during the year. For the purpose of transfer, credit points of individuals based on their service in out-stations & home-stations were calculated and published in the intranet. New transfer norms were drafted, got vetted by employees' unions and published on the intranet.

Representations received from employees, service organizations and public were examined and appropriate actions were taken. Comments for case files were prepared and furnished to the Department of Commerce and Board's standing counsel for preparing counter affidavit in court cases.

On the basis of the recommendations of Expenditure Management Commission (EMC), the Department of Commerce directed the Board to review and restructure major functions as laid down in 208 of GFR. Accordingly, the Board took the following measures.



- Discontinued outsourcing of personnel and engagement of casual/contract labourers.
- Stopped all recruitments from 2015 onwards and promotions from 1 December 2016.
- Merged uneconomical regional offices with nearby ones for viability. Regional Office Kothamangalam and Ernakulam were abolished and merged with Regional Office Muvattupuzha. Action initiated to abolish Regional Office Kottayam and to merge it with Regional Office Changanassery.
- Closed Guest houses attached to Sub Offices at Chennai, Bangaluru and Mumbai.
- Shifted various rented offices to smaller buildings with less rent.
- Centralized all Administrative and Finance & Accounts functions of the Board at Head Office under a single umbrella.
- Action initiated to abolish Processing & Product Development and Market Promotion Departments and to change their status as divisions.
- Initiated action to wind up NRETC project in Andamans owing to high operating expense.
- Started rationalizing staff strength by reducing to 1100.

c) Entitlement

Advances

₹ 2.54 lakh was disbursed to an employee of the Board as house building advance and ₹ 2.65 lakh as computer advance during the year 2016-17.

Re-conveyance deeds were executed for 6 cases and original title deeds returned to 32 employees on completion of recovery/ refund of earlier advances.

Retirement benefits

Retirement benefits were disbursed to 63 employees. In addition, family pension was granted to the families of two employees who died in harness and in case of one compulsory retirement. As on 31.03.2017 the Board had 1,272 pensioners, including 316 family pensioners.

Thirty employees were confirmed on completion of probation. Seventy nine applications were forwarded to various departments / organisations for deputation. 307 officials of the Board were insured in NE region under personal accident scheme.

d) General Administration (GA)

The GA Section deals with the issue of office orders and circulars, inward and despatch, stationery, maintenance of assets and vehicles, running of canteen & telephone exchange, allocation of staff quarters (120), arranging national pledges & retirement farewell functions, execution of lease agreements for sub-offices & its guest houses and security service & housekeeping activities for the headquarters. The Section issued 3 Office orders and 37 Circulars during the year 2016-17. GA Section remitted ₹ 23.48 lakh towards electricity bills, telephone charges, franking/ postage charges, insurance & road tax for vehicles, land rent, building and property tax during 2016-17. Further, an expenditure of ₹ 25.27 lakh was incurred towards repair & maintenance of vehicles/equipment, AMC charges, printing and stationery, procurement of consumables / books & periodicals/ electrical & electronic equipment/ furniture, cable, pest control and housekeeping. There are in addition to payments pertaining to vehicle hire charges, canteen and upkeep.

**I. Overall manpower strength**

The number of officers and staff as on 31.03.2017 was 1,565, as against the sanctioned strength of 1,977.

Table : 46 Department-wise and group-wise staff strength as on 31 March 2017.

Name of the Department	Group A	Group B	Group C	Group D	Total
Rubber Production	168	405	311	2	886
Research	91	91	157		339
Licensing & Excise Duty	21	45	35		101
Administration	15	38	56		109
Processing & Product Devt.	9	15	15		39
Finance & Accounts	5	22	9		36
Training	5	6	13		24
Statistics & Planning	6	9	5		20
Market Promotion	2	6	3		11
Total	322	637	604	2	1,565

II. Group-wise female employees**Table:47 Group-wise female employees as on 31 March 2017**

Group	Total staff strength	No. of female employees	Percentage to total
A	322	111	34.47
B	637	312	48.98
C	604	148	24.50
D	2	Nil	N.A
Total	1,565	571	36.49

2. LABOUR WELFARE DIVISION

Section 8(2) (f) of Rubber Act 1947 stipulates that the Board should implement measures to secure better working conditions and provisions for the improvement of amenities and incentives for rubber plantation workers.

Accordingly, the Board disbursed ₹ 107.48 lakh for labour welfare schemes during 2016-17, as given below:

1. Educational stipend

This provides for stipend to children of rubber plantation workers undergoing different courses of studies. The benefits

include educational stipend and hostel / boarding fee to a maximum period of eight months in an academic year.

Table : 48 Educational assistance

Name of the Course	Annual Stipend	Monthly Hostel/ Boarding fees
Class XI & XII	1,200	500
Degree Course	1,400	500
Post Graduate	1,700	600
<i>Professional/Technical Courses</i>		
Certificate Course	1,700	500
Diploma Course	3,250	500
Degree Course	6,250	700
Post Graduate	6,500	700
Ph D/Post	6,750	700
Doctoral Course		

During 2016-17, ₹ 59.91 lakh was disbursed to 2,242 beneficiaries.

2) Merit Award:

This provides two type of assistance

i) Merit award for academic excellence

Assistance ranging from 1,250 to 5,500 was provided to children of rubber plantation workers who excelled in their studies.

Table : 49 Merit award for different academic streams

Name of Course	Minimum Marks/Grade	Maximum amount (₹)
SSLC or equivalent	80%/ A for all subjects	1,250
Class XII or equivalent	60%/ B for all subjects	1,500
Degree Courses	60%	2,500
Post Graduate Courses	60%	3,500
Professional/Technical Courses		
Certificate Courses	60%	2,000
Diploma Courses	60%	2,500
Degree Courses	60%	4,500
Post Graduate Courses	60%	5,500

ii) Cash award for achievements in sports/ games and arts

Cash awards were given to children of rubber plantation workers, in the age group of 10 to 23 years and studying in Class V and above for exceptional achievements in sports/ games and arts.

Achievement in sports/ games/arts	Quantum of award
Winning 1st place at District/University level	₹ 4,000
Winning 2nd place at District/University level	₹ 3,500
Winning 1st place at State/University level	₹ 5,000
Winning 2nd place at State/University level	₹ 4,500
Winning 1st place at National/Universities	₹ 6,000
Winning 2nd place at National/Universities	₹ 5,500

During 2016-17, ₹ 6.77 lakh was disbursed to 368 beneficiaries as merit award.

3. Medical Attendance

The objective of this is to provide financial relief to tappers who undergo treatments for various diseases. Expenses under allopathic/ ayurvedic systems of medicine up to ₹ 2,500 per tapper per annum in the unorganized sector

were reimbursed. Compensation was paid for absence from work due to illness up to a maximum of 20 days @ 50 per day from the said amount. In addition to this, expenses up to ₹ 20,000 were reimbursed for major diseases involving high expenditure, as onetime payment during a Plan period (five years). ₹ 7.95 lakh was disbursed to 169 beneficiaries during the year.

4. Housing Subsidy

Under this, assistance is provided to workers / tappers in the organized sector and tappers in unorganized sector, for construction of house on own land.

Table : 50 Housing subsidy

Category	Rate of Assistance (₹)
Tapper in unorganized sector and all categories in in the organized sector	18,000
Tappers belonging to SC / ST category	21,000
Tappers in NE region	20,000 / 21,000

5. Worker's Group Insurance-cum-Deposit Scheme (GIS)

This provides coverage against deaths in accidents and temporary/ total disabilities due to accidents, for tappers in unorganized sector. This is operated with the contributions



from both tappers and the Board. Part of the contributions is deposited in the names of members to encourage savings. Under this, a tapper has to contribute ₹ 250 every year and the Board, in turn, ₹ 250 per tapper. From the total contribution of ₹ 500, ₹ 38 is spent on insurance as premium and the balance of ₹ 462 is invested, so that maximum benefit can accrue for the tapper. Each phase of the scheme will run for a period of 10 years and the total deposit will be released in the end. An amount of ₹ 3.54 lakh was contributed for 1,414 tappers under the seventh and eighth phases during the year.

6. Group Life Insurance cum Terminal Benefit Scheme (GLITBS)

This was launched in collaboration with LIC of India in August 2011. The benefits included death cover (for both natural and accidents) and compensation for disabilities due to accidents, terminal benefit to members. A scholarship to children of the members from IX to XII class is also given to 15% of the total group. Under this, each tapper has to contribute a minimum amount of ₹ 300 per annum and the Board in turn will contribute ₹ 400 per tapper. From this, ₹ 487.64 will be invested for terminal benefit, ₹ 112.36 will be paid as insurance premium and 100 for Janasree Beema Yojana.

₹ 27.67 lakh was contributed for 7,073 tappers under GLITBS Phase I to IV. During 2016-17, the insurance company paid compensation of ₹ 2.96 lakh as claim for 11 tappers and disbursed scholarships amounting to ₹ 6.50 lakh to 494 children of the tappers.

7. Personal Accident Insurance Scheme (PAIS)

This was introduced for tappers/ workers in the unorganized sector with a coverage of one lakh. PAIS is managed by M/s National Insurance Company. The Board remitted ₹ 1.64 lakh for 8,933 tappers, at the rate of ₹ 18.40 per tapper.

Table :51 Performance of various labour welfare sub components during 2016-17

Name of sub-component	No of beneficiaries	Financial Achievement (₹ in lakh)
Educational stipend	2,242	59.91
Merit Award	368	6.77
Medical Attendance	169	7.95
Insurance cum Terminal Deposit (Board's share)	7,073	27.67
Group Insurance cum Deposit (Board's share)	1,414	3.54
PAIS	8,933	1.64
Total	20,199	107.48

3. LEGAL SECTION

Legal section rendered proper legal advice and timely support for cases referred from all departments and scrutinized draft documents like MOU, agreements, lease deeds, indemnity bonds etc. to be executed by the Board. During the year, 26 new cases were filed in various courts namely, High Courts of Kerala & Guwahati, and consumer courts. Steps were taken through lawyers to defend the interest of the Board in pending cases and provided support to the Department of Commerce in matters wherein the Central Government is made party to the petition.

Detailed comments and instructions were given to the Standing Counsels of the Board and the Central Government Pleaders in cases pending in courts. The Section represented the Board before quasi judicial forums like Labour Court and took initiative to settle pending cases. Provided assistance in dealing with the matters posted before district legal services authorities and Arbitrators.



4. HINDI SECTION

The Rubber Board is a notified office under Rule 10(4) of Official Languages Rule, 1976.

1. Commerce Ministry Shield

The Rubber Board received Utham Rajbhasha Shield Yojana (second prize) for Commendable Implementation of Official Language among offices under the Department of Commerce, for 2015 – 16. Shri. E.A. Mathew, Deputy Director, Sub Office, New Delhi received the Trophy from Smt. Rita Teatota, Commerce Secretary in a function held at Udyog Bhavan, New Delhi on 19 April 2017.

2. Official Language Implementation Committee (OLIC)

During the year, four meetings (89th to 92nd) of the Official Language Implementation Committee (OLIC) were held and Shri. A. Ajith Kumar, IAS, Executive Director presided over the first three meetings of OLIC and Shri. N. Rajagopal, Secretary-in-Charge presided over the last.

Annual Programme issued by the Department of Official Language and Quarterly Progress Reports received from various offices of the Board were reviewed in the meetings.

Official Language Implementation Committees were formed in various subordinate offices of the Board and regular meetings were held.

3. Hindi Month / Hindi Day Celebrations

Hindi Month was celebrated from 6 to 30 September 2016 at Head Office, Rubber Research Institute of India, Rubber Training Institute and Processing and Product Development Department of the Board. Competitions in eleven items were conducted in which 150 employees participated.

Hindi Day was celebrated in 41 subordinate offices. Various competitions were conducted. Eminent personalities in the locality attended as guests/judges.

4. Rajbhasha Sammelan

Shri. Kalpetta Narayanan, well known Malayalam writer, inaugurated Rajbhasha Sammelan on 15 March 2017 and Shri. A. Ajith Kumar, Executive Director presided over. Prizes and certificates to the winners of various competitions conducted during 2016 and trophies to the subordinate offices for best implementation of official language were distributed.

5. Rubber Samachar / Rubber Statistical News

Issues of bi-monthly Hindi bulletin "Rubber Samachar" were brought out. Write-ups of officers/employees/their family members and other items such as prize winning essays were featured. The scheme of honorarium was continued for contributing Hindi articles for the "Rubber Samachar". Monthly "Rubber Statistical News" issues were published bilingually through the Board's website.

6. Hindi Teaching Scheme

Since there is no centre for Hindi Teaching Scheme (Typewriting and Stenography) functions in Kottayam, Hindi Section organized Hindi typewriting classes at Head Office. Seven employees underwent typewriting training and attended examination. Cash awards and personal pay were given to officials who passed the examination.

7. All India Noting and Drafting Competition

All India Noting and Drafting Competition was conducted during March 2017. 68 officials participated in the competition. Encouraged the officials to do original noting in Hindi, through incentive scheme. Cash awards were given to 73 officials who wrote noting in Hindi.



8. Hindi Workshop

One day Hindi Workshops were conducted in 14 subordinate offices and 191 officials attended. Thirteen officials attended the Joint Hindi workshop organized by Kottayam TOLIC.

Four weekly Hindi workshops were conducted at Board's Head Office and RRIL, in which 67 officials were trained in "Official Language Policy and Noting/Drafting in Hindi". Spoken Hindi training programme was also organized at Head Office.

9. Town Official Language Implementation Committee (TOLIC)

Executive Director of the Board acts as Chairman, Kottayam TOLIC. Assistant Director (OL) of the Board continued as Member Secretary. Two meetings of the TOLIC were conducted during the year. Shri. George T Mathai, ITS, Principal General Manager, BSNL, Kottayam presided over the meeting conducted in August 2016 and Shri. A. Ajithkumar IAS, Executive Director, Rubber Board presided over the one in January 2017.

Shri. Narendra Singh Mehra, Assistant Director (Implementation), Regional Implementation Office, Kochi represented the Department of Official Language, Ministry of Home Affairs in these meetings.

Two meetings of TOLIC Core Committee, one day Joint Hindi workshop and Joint Hindi Week Celebrations were conducted. Officials of member organizations of the TOLIC and employees of the Board actively participated.

10. Quarterly Progress Reports

Quarterly Progress Reports (QPRs) were compiled and forwarded to the Ministry. QPRs were also filed on-line to Regional Implementation Office, Kochi.

11. Other Activities

The Board continued writing Aaj Ka Shabda at HO and subordinate offices and conducted inspections in 14 subordinate offices. Trilingual facility (Malayalam, Hindi and English) of the Board's website is regularly updated.

Hindi video CD library and CDs of famous Hindi classics were available for officials of the Board. Hindi daily the "Milap" and Hindi journals "Vanitha" monthly and "India Today" weekly were subscribed.

12. General

As per Section 3(3) of the OL Act, documents such as office orders, circulars, memoranda etc. were translated into Hindi. Translation, proof reading and printing of different bilingual forms were undertaken. The Board received the trophy for securing second highest points in competitions conducted during Joint Hindi Week celebration of Kottayam TOLIC.

Division assisted in preparing new name plates at Head office/RRIL and subordinate offices and provided most of the computers with bilingual facility. A clause has been added in the quotation notice for ensuring purchase of bilingual computers. Guidelines were provided to officers/staff for doing Hindi work on computers utilizing in-built Unicode facility. Translated Annual Report and Annual Accounts of the Board and various reports/ answers to questions for presenting to Parliamentary Committees/Ministry. Trilingual EPABX welcome system and Trilingual price information system continued.

A Hindi session was added to the periodic meetings of Heads of Department/Divisions to revision the activities of the Board. Classic Hindi songs or speeches are presented with translation of the text.



5. EDP DIVISION

Electronic Data Processing (EDP) Division functioning under the Administration Department takes care of application of information and communication technologies in various departments/offices of the Board. In addition to various computerisation programmes, it undertakes data processing jobs such as payroll processing, GPF and pension contribution processing, processing of subscription to publications, financial accounting, preparation of nominal rolls, etc. Procurement of hardware, software, consumables and computer stationery for various departments and offices, maintenance of hardware, development and deployment of

application software, inter-networking of offices etc., are the various jobs managed by the Division.

During the year, the Division installed e-Governance applications for labour welfare schemes, and introduced digital licences from 31.03.2017. Web based applications were developed for campaigns/reviews and for a “Pilot scheme for promoting deliberate processing of block rubber from latex coagulum”. Computerization of financial accounting solution and asset & stores management solution are under final testing. Revamping of the Board’s websites was completed and mobile applications developed for rubber growers.



DIVISIONS UNDER THE DIRECT CONTROL OF THE EXECUTIVE DIRECTOR

I. PUBLICITY & PUBLIC RELATIONS DIVISION

The P&PR Division undertook the following activities during 2016 - 2017.

1) Publications

The Division brought out 12 issues of 'Rubber' magazine (Malayalam). The average monthly circulation was 19,702 of which 11,980 were life subscriptions and 6,505 annual. The Division received 112 advertisements and raised revenue of 6.24 lakh. Twelve issues of 'Rubber Statistical News' and one issue of "Rubber Board Bulletin" were brought out during the year.

1,000 copies each of technical booklets on "Weekly tapping", "Controlled Upward Tapping (CUT)" and "Summer Protection of Rubber" were printed.

2) Press Releases and Advertisements

The Division issued 260 press releases (Malayalam and English) on important developments in rubber sector and issue three advertisements (display and classified) and four tender notifications on behalf of the Board.

3) Seminar, Meetings and Exhibitions

The Division participated in four domestic exhibitions and eight seminars/ meetings.

4) Right to Information Act 2005

The Division co-ordinated the implementation of RTI Act in the Board. Twenty-seven applications were received and disposed of. Regular reports such as monthly, quarterly and yearly reports on RTI applications were furnished to the Department of Commerce and published on the website.

5) Social media – Twitter, Facebook and WhatsApp

The Board launched official Twitter and Facebook accounts, and created an official WhatsApp group "The Rubber Board info" during the year for the benefit of stakeholders and employees of the Board.

6) Media Alert

The Division subscribed to 14 Malayalam and 7 English Dailies. 2788 Press clippings

related to rubber sector were scanned, compiled and forwarded to Executive Director and senior officers of the Board.

7) All India Radio/TV

Officers of Division gave talks on different technical topics on rubber and participated in live phone-in-programme of All India Radio, Thiruvananthapuram.

The Division produced a documentary video on "Weekly tapping" and telecast three other programmes on "Low Frequency Tapping (LFT)", "New Clones" and "Intercropping" in Manorama channel.

8) Call Centre

The Board established a Call Centre at Head Office with the objective of functioning as a centralized contact point for telephone calls from rubber growers and other stakeholders seeking technical advice on all aspects of rubber cultivation and the Board's services.

9) RPL Project

The Division assisted in the publicity of "Recognition of Prior Learning (RPL)" programme under PMKVY project for rubber plantation sector covering five states namely Kerala, Tamilnadu, Karnataka, Assam and Tripura, and also for its inauguration by Shri. Rajiv Pratap Rudy, Union Minister of State for Skill Development and Entrepreneurship.

10) General

Deputy Director of the Division functioned as Editorial Board member of PCC newsletter of the Department of Commerce. Officers of the Division functioned as committee members for various events organized by the Board. The Division liaised with EDP Division for revamping of the Board's website and also, attended works related to publications, digital indexing of articles, and established regular contacts with the offices of the Board through digital media.



II. VIGILANCE DIVISION

Vigilance Division enquired/ investigated twelve complaints against six officers of Group A and B status and six officials of Group C status during the reporting year. Complaints varied in nature and on completion of the investigation, appropriate action was recommended / taken against erring Board's officials, wherever found required/necessary.

1. Cases/Suspension

During 2016-17, the Board initiated one major penalty proceeding against one official under the Rubber Board Service (CCA) Rules, 1961. The Division assisted the Disciplinary Authority in processing/initiating the aforesaid seven disciplinary cases. Three major penalty orders and one minor penalty orders were issued in cases instituted during the previous year. Three officials were placed under suspension for indulging in unbecoming conducts and upon review the suspension was revoked in two cases during the year.

2. Surprise Inspections

Surprise inspections were carried out at various offices of the Board as part of preventive vigilance and suggestions submitted.

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

Annual Immovable property statements as on 31.12.2016 were called for and received from 1,574 officials. The Division also processed 37 applications relating to transactions in immovable property and 74 applications pertaining to transactions in movable property.

4. Comments/Advice

115 files/cases were referred to the Vigilance Division from other divisions/ sections/offices of the Board for comments/ advice. All these files/matters were properly dealt with comments/advice thereon.

5. Other activities

As instructed by the Central Vigilance Commission, 'Vigilance Awareness Week' was observed in the Board from 31.10.2016 to 05.11.2016 in a befitting manner. The Week commenced with administration of the pledges on 31.10.2016 in all the offices of the Board. There was an inaugural ceremony at the Head Office with participation of all officers and staff of the offices in Kottayam and Smt Bindhukumari VS, Hon'ble Additional District and Sessions Judge, Kottayam, delivered a talk. There was wide news coverage in the dailies regarding observance of Vigilance Awareness Week in the Board. Elocution competition on the subject "Public participation in promoting integrity and eradicating corruption" was conducted for Higher Secondary School students, employees of the Board (Central Zone), Kottayam and for employees of the Board in other zones at Thiruvananthapuram, Kozhikkode, Mangalore and Silchar. Poster competition was conducted for college students in Kottayam on "Moral values, ethics, good governance practice, etc". Meetings were also arranged at Guwahati and Agartala with the participation of employees under their jurisdiction concerned/ other stakeholders of the rubber sector.

In the valedictory function conducted in Kottayam, Shri K Roy Paul, IAS (Retd), former Secretary to Govt. of India and former UPSC Member delivered a speech and distributed prizes to the winners of the poster/ elocution competitions.

The monthly and quarterly returns on departmental inquiries and vigilance cases and complaints etc. dealt with in the Vigilance Division were submitted regularly to the Department of Commerce and Central Vigilance Commission.



III. INTERNAL AUDIT DIVISION

According to Section 24(2) of the Rubber Act, 1947 Accounts of the Board shall be audited annually by Auditors appointed by the Government of India. Audit of the accounts of the Board has been entrusted with the Controller and Auditor General of India under Section 20 (1) of the Controller and Auditor General's (Duties, Powers and Conditions of Service) Act 1971.

As Statutory Audit cannot look into everything within a short span, it has to depend largely on the effectiveness of the Internal Audit System that exists.

The Internal Audit Division has been conducting scrutiny of bank reconciliation statements of 37 units and voucher verification of 63 units, in addition to the Audit of 3 units under different Departments. The replies to the Internal Audit reports were scrutinized ensuring that the expenditure incurred were with due regard to broad and general principles of financial propriety.

Internal Audit and Inspection Reports issued during the year were examined by the

C&AG/Department of Commerce. Number of paras outstanding from the previous inspection reports issued by C&AG, Kerala and Internal Audit, Ministry of Commerce were 42 and 16 respectively. The Division did all liaison work in connection with these audits and arranged timely replies.

This Division is also entrusted with the verification of service books of employees for the calculation of pension and other benefits. Division verified 203 files relating to service book verification/retirement benefits and files referred from other Departments/Divisions on service and other matters.

Economy in maintenance of vehicles and consumption of fuel was ensured by obtaining and scrutinizing monthly statement in respect of all Offices. Follow up action was initiated for timely settlement of TA/LTC/Contingent advances in all units. Consolidated statements were prepared and submitted to higher authorities for taking corrective measures.

IV. PLANNING DIVISION

Activities of Planning Division during 2016 -17 are summarised under the following seven heads.

1. Formulation, Monitoring and Evaluation of Plan Schemes

The Division collected and consolidated information on progress in the implementation of Plan Scheme for preparing routine and other reports for internal purposes and submitting to the Department of Commerce.

The documents pertaining to Plan Schemes prepared included the following.

- Reports on progress of Plan Scheme of Rubber Board.
- Output-Outcome framework 2016-17.
- Outcome Budget for 2017-18 with details of Plan Scheme, reform measures, policy initiatives and review of past performance.

- Note on self-financing and review of user charges in commodity boards.
- Sunset dates for scheme components.

Internal evaluation of 12th Plan Scheme

Internal Committees were constituted in scheme implementing Departments/Divisions for critically evaluating the existing schemes and introduction of new components.

External evaluation of 12th Plan Scheme

An Expert Committee was constituted for external evaluation of 12th Plan Scheme as follows.

- i. Dr. P Rajendran, Vice-Chancellor, Kerala Agricultural University – Chairman



- ii. Dr. D Narayana, Director, Gulati Institute of Finance & Taxation, Trivandrum.
- iii. Prof. M. Udayakumar, Professor Emiritus, UAS Bangalore.
- iv. Dr. R.K.Matthan, Director Polymer Consultancy Services P Ltd, Chennai.
- v. Dr. Oommen V Oommen, Chairman, Kerala State Biodiversity Board, Trivandrum.

The Division coordinated the functioning of the Committee and served as its Secretariat. Evaluation report of the committee was submitted to the Department of Commerce.

Medium Term Frame Work Plan for the period 2017-18 to 2019-20

The Division coordinated the formulation of EFC Memorandum of Rubber Board "Sustainable and inclusive development of natural rubber sector" for Medium Term Frame Work Plan for the period 2017-18 to 2019-20. The EFC Memorandum was submitted to the Department of Commerce and the Division handles subsequent correspondence in this regard.

Allotment of funds for scheme activities

The Division coordinated allotment of funds for scheme activities of the Board on a monthly basis and monitored progress.

Pilot Scheme for Promoting Deliberate Processing of Block Rubber from Latex Coagulum (LC)

The Division coordinated the formulation of proposal and follow-up for the Pilot Scheme for Promoting Deliberate Processing of Block Rubber from Latex Coagulum (LC) with involvement of growers, Rubber Producers Societies (RPS), processors and tyre companies with an outlay of ₹ 25.74 Crore. The Scheme was subsequently approved by the Department of Commerce.

2. Parliamentary Matters and PMO/VIP References

The Division supplied materials to the Department of Commerce on parliament related matters and PMO/VIP references.

- Materials for framing replies to 60 Parliament Questions related to production, consumption and productivity of NR, export and import of NR and NR products, insurance scheme for plantation workers, reconstitution of Board, planting subsidy, special package for rubber marketing, impact of AIFTA on India's balance of trade, closing of field offices, price stabilization, National Rubber Policy, import duty, price of NR, impact of climate change on production, rubber parks, NRPPD, problems in rubber sector due to demonetisation, status of NE region and Rubber Soil Information System.
- Materials for framing replies to VIP references and matters raised under Rule 377
- Materials for framing replies to PMO references related to rubber sector.
- Materials for Action Taken Report on 124th Report on ATN on recommendations of the Parliamentary Committee contained in 119th Report on Rubber Industry in India.
- Replies to the paras concerning Rubber Board in the questionnaire on Demands for Grants 2017-18 of the Parliamentary Standing Committee.
- Note for the Parliamentary Consultative Committee meeting held in Parliament House in December 2016.
- Note for the Department Related Parliamentary Standing Committee on Commerce to Kochi in January 2017 on the subject "Trade with Association of South-East Asian Nations (ASEAN)
- Action Taken Reports/comments of Rubber Board on para No.66 of 25th Report on Demands for Grants 2016-17 (Demand No.11) of Department of Commerce.



3. Assisting in policy formulation

The Division assisted in framing and providing Board's views on policy matters related to rubber industry to the Department of Commerce and other agencies as indicated below.

- Views on representations received from rubber producing, trading, consuming and other sectors.
- Implications of Regional Trade Agreements and other forms of international cooperation on domestic rubber sector.
- Tariff policy on rubber and rubber products.
- Monitored developments in WTO and FTA/RTA.
- Provided policy related information and statistics.
- Formulated pre-budget proposals of Rubber Board.
- Updated induction notes on Rubber Board and Indian natural rubber sector.
- Status reports on development/initiatives in rubber sector in different states.
- Background notes and presentations on rubber sector for the meetings of Members of Parliament and Stakeholders conducted by Department of Commerce.
- Background notes on the issues to be taken up with the states during the visits of Commerce Secretary.
- Monitored developments in domestic natural rubber and related sectors and developments in other rubber producing and consuming countries.
- Status of the Rubber Act 1947 (24 of 1947) and related matters.

4. Coordination of committees, meetings and other activities

The Division coordinated the functioning of different committees including preparation of documents, handling of correspondence and conducting of meetings.

- Expert Committee on Formulation of Natural Rubber Policy (ECFNRP) constituted by the DoC
 - ◆ Prepared note on financial implications on the recommendations.
 - ◆ Prepared Status Note on the Report of the Expert Committee for Formulation of National Rubber Policy.
- Coordinated the following meetings.
 - ◆ Meeting of Hon'ble Commerce and Industry Minister with Members of Parliament from rubber growing states and stakeholder representatives on 22 August 2016, Udyog Bhawan, New Delhi.
 - ◆ Three meetings of stakeholder associations in rubber sector at Rubber Board Head Office to discuss issues confronting the sector on 21 June and 20 September 2016 and 27 January 2017.
- Planning Division continued to serve as the Secretariat of India Rubber Meet (IRM).
- Planning Division coordinated several other activities in which more than one Division or Department is involved including special studies, quick surveys, project formulation, technical correspondence etc.
- Prepared notes and presentations for several meetings held at the Department of Commerce for reviewing the activities of commodity boards.
- Formulated Annual Action Plan of the Board for participation in international trade fairs for export promotion, intergovernmental meetings of ANRPC, IRSG and ISO and meetings of IRRDB for 2016-17.
- Coordinated deputation of officials abroad and submission of quarterly returns to the Department of Commerce in this regard.



5. Restructuring of the establishment of Rubber Board

The Board continued restructuring of the establishment of the Board in 2016-17. The measures for restructuring are formulated and implemented without compromising services being rendered to stakeholders and with a view to improve efficiency in the delivery of services. The Division has been assisting Executive Director in formulating plans for restructuring the activities of various departments/divisions and other related works.

The present establishment of the Board got formed over the previous decades mainly based on the erstwhile situations in the sector and Board. The present situation with more and more use of IT enabled services, centralisation of financial and administrative functions and improvement in transport and communication facilities provides ample avenues for rationalising establishment expenses without compromising on services rendered to stakeholders and instead leading to more efficient and fast delivery of services. The following developments may be noted.

- Payments to stakeholders are only through DBT mode and centralised. Preparation and distribution of cheques on financial benefits from Regional Offices stopped.
- Payments to personnel of Rubber Board centralised and payments are centralised. Earlier, payments were made by the concerned Regional/other offices.
- Applications for major promotional schemes for growers are made online. Licenses issued to dealers, processors and consumers are made online. Earlier, all these processes were done manually.
- Call Centres opened at Kottayam and Guwahati for providing technical advice and other consultations.

- Online Web-Clinic facility launched to diagnose incidence of diseases and recommendations on counter measures with WhatsApp facility.
- Online fertilizer recommendations launched. Mobile application also would be developed.
- Mobile application to provide technical advisories was scheduled to be launched.
- All the Field Offices are scheduled to be connected through internet.

The Division coordinated the activities in this regard and prepared detailed action plan and reports/notes on restructuring related matters for submission to the Department of commerce and Expenditure Management Commission.

6. Activities related to international organisations

India is a member of International Rubber Study Group (IRSG) based in Singapore and Association of Natural Rubber Producing Countries (ANRPC) based in Kuala Lumpur, Malaysia. The Division coordinated the activities related to India's participation in these organisations.

- Notes were prepared on documents circulated by the ANRPC and IRSG Secretariats on various issues related to the organisations and rubber industry.
- Arrangements made for remitting India's membership contribution to ANRPC & IRSG
- The Division coordinated the participation of Indian delegations in ANRPC and IRSG meetings. During the reporting period, Indian delegations participated in the following meetings.
 - ◆ Third Meeting of ANRPC Expert Group on NR Price Stabilization, 18 to 20 August 2016, Colombo, Sri Lanka.



- ◆ Annual Meetings of ANRPC, Guwahati, Assam, 17-22 October 2016.
- ◆ IRSG Annual Meetings and World Rubber Summit 2017, Singapore, 20-24 March 2017

ANRPC Annual Meetings 2016

Government of India hosted the Annual Meetings of ANRPC from 17 to 22 October 2016 at Guwahati, Assam through Rubber Board. The meetings were scheduled in the following order.

9th ANRPC Annual Rubber Conference

The 9th ANRPC Annual Rubber Conference was held on 17 October 2016. The Conference with the theme “Preparing for Paradigm Shift” was attended by industry experts, policy makers, analysts and stakeholders of the rubber industry from Brazil, Cambodia, China, France, India, Malaysia, Myanmar, Philippines, Singapore, Sri Lanka, Thailand and Vietnam. Out of 265 participants, 64 were from overseas.

39th Session of ANRPC Assembly

Session of the 39th Assembly of ANRPC was held on 18 October 2016. Delegates from Cambodia, China, India, Malaysia, Philippines, Sri Lanka, Thailand and Vietnam attended the Session. Government of Brazil, Government of Myanmar, International Rubber Study Group (IRSG), International Tripartite Rubber Council (ITRC) and International Rubber Research and Development Board (IRRDB) attended the Session as Observers.

India elected Chairman of ANRPC

Mr. A. Ajith Kumar (India) was elected as Chairman of ANRPC in the Session of the Assembly. The Session also elected Dr. NguyenNgocBich (Vietnam) as Vice Chairman.

The following meetings also were held.

- *2nd ANRPC Public-Private Meet*
- *10th meeting of Information and Statistics Committee (ISC)*
- *10th Meeting of Industry Matters Committee (IMC)*
- *46th Meeting of Executive Committee (EXCO)*

The Division coordinated the conduct of the ANRPC events.

Strategic Review Working Group of IRSG

At the 50th Assembly of Nations of IRSG, held in March 2017, a Strategic Review Working Group was constituted to formulate recommendations for defining the role and structure of the organisation in the present context. India is also a member of the Working Group.

7. Other Activities and Developments

Joint Director (Economics), Planning Division continued to serve as a nominated member of Commodity Derivatives Advisory Committee (CDAC) of Securities and Exchange Board of India (SEBI), Mumbai.

Joint Director (Economics), Planning Division gave a talk on Evolution, Status and Prospects of Indian Rubber Industry in Fourth Hainan Rubber Industry Development Forum, Haikou, China on 18 November 2016 as invited speaker.



PART - V

RUBBER RESEARCH

Rubber Research Institute of India (RRII), the Research Department of the Board, has its headquarters in Kottayam, Kerala with nine Regional Research Stations (RRS) in the states of Kerala, Tamil Nadu, Karnataka, Maharashtra, Odisha, West Bengal, Tripura, Assam and Meghalaya. Field experiments of RRII are conducted in the Central Experiment Station (CES) at Chethackal near Ranni, Pathanamthitta District, Kerala, which has an area of more than 250 ha. Owing to constraints in land availability, many experiments and on-farm evaluation trials for validation of research from the laboratory and research farms of RRII are carried out in growers' fields/ large estates. Each RRS has research farms of nearly 40 to 50 ha, in which location-specific research work is undertaken including developing high yielding rubber clones and farm practices for different agro-climatic regions where these stations are located.

Outcome of the research is communicated through research publications. RRII publishes a peer reviewed international scientific journal named 'Rubber Science'. Besides this, research articles are also contributed to other peer reviewed international and national scientific journals as well as popular magazines, newspapers etc. In addition to publishing the research findings through various journals and magazines, scientific recommendations are given for adoption by growers after these are approved by the Scientific Advisory Committee (SAC) of RRII. RRII and its regional stations are involved in active research programmes under the major Plan Scheme "Strengthening of Rubber Research".

Activities are broadly classified under 13 research components as listed below.

1. Genetic improvement of *Hevea brasiliensis* for developing ideal clones
2. Advanced Centre for Molecular Biology and Biotechnology
3. Rubber-based farming systems and farm management
4. Use of remote sensing and geographic information system (GIS) in natural rubber plantation sector
5. Development of plant protection protocols in NR
6. Environmental protection and climate studies
7. Socio-economic dimensions of the Indian NR sector
8. Primary processing of latex and dry rubber and development of speciality rubber compounds for specific industrial applications
9. Technical support services
10. Linkages with national and international centres of excellence
11. Overseas training and research fellowship scheme
12. Activities in the regional research stations are coming under 'Strengthening of Regional Research Stations other than North East (NE)'
13. Strengthening of Regional Research Stations North East (NE) Region

Summary of the performance and salient achievements of research schemes under various Research and Development components during 2016 – 17 are furnished in the following sections.



1. Genetic improvement of *Hevea brasiliensis* for developing ideal clones

- Released clone RR11 208 for North East regions.
- Participatory Clone Evaluation (PCE): Under Phase V of the project, field planting of the Central Researcher Trial, which is a large scale trial (LST) incorporating 20 pipeline clones and three checks at CES, Chethackal and simultaneously on-farm trials (OFTs) at Paalali Estate Kanyakumari, Arasu Rubber Corporation (ARC) Plantation Kanyakumari, Cheruppittakkavu and Chithalvetty Estates of State Farming Corporation of Kerala (SFCK), Punalur, Kulathupuzha Estate of Rehabilitation Plantations Ltd. (RPL), Punalur and Karnataka Forest Development Corporation (KFDC), incorporating the same batch of clones was done in 2016. Growth performance of various pipeline clones was assessed in the 3 LSTs and 24 OFTs established at different locations under the PCE Project Phases I, II and III. Gap filling was accomplished in the Phase IV trials. Dry rubber content (DRC) of pipeline clones was recorded from 2008 PCE LST at CES for April and May 2016 and it ranged from 26-42 per cent.
- Eight promising hybrids with heterosis to the tune of 43 – 65 per cent for rubber yield were evolved by recombination breeding using two genetically divergent parents *viz.* RR11 105 and RR11 118. Results were published in the journal "Rubber Science".
- *International Clone Exchange*: Under Multilateral Clone Exchange programme, five clones each from Sri Lanka and Ghana and two clones each from Cambodia and Myanmar were imported and budgrafted. Out of five clones imported from Côte d'Ivoire, only IRCA 331 gave budding success as the budwood received was in poor condition. Exported RR11 400 series clones to Côte d'Ivoire, Sri Lanka and Myanmar and imported 44 clones from 10 countries. Source bush nurseries of newly introduced clones were planted at CES and RR11 campus.
- Yield recording continued in PCE 2008 LST at CES, Chethackal and OFTs at Kutikul Estate, Koottickal, Mundakkayam, Gokul Estate Perinthalmanna, PCK Athirappally, Mooply Estate, Trichur and Calicut Estate, Mukkom, Kozhikode.
- Pollen germination study using stored pollen was continued.
- Attempts were made to use callus from air pruned roots as explants for root stock cloning.
- Screened OP seedlings of Fx 516 for *Corynespora* toxin and a few tolerant plants were obtained under lab conditions.
- 150 Hybrid and 160 OP seedlings from the breeding orchard and putative hybrids and OP collected from CES were planted in seedling nursery at RR11.
- Completed hand pollination for the year 2017 under various breeding using different cross combinations at CES and breeding orchard at RR11.
- The drought survived seedlings from nursery trial at Dapchari and unselected control plants from Central Nursery (CN), Karikkattoor, bud-grafted with RR11 105 were planted in field at Dapchari in connection with development of drought tolerant root stocks.
- Conservation of 183 Wickham clones, 3576 wild accessions and 5 other species of *Hevea* in field gene banks, including annual cutting back and renewal of identity by paint marking in the nurseries/ arboreta was done.



- In the comprehensive germplasm arboretum being established at Teksrage farm, Tura, Meghalaya, 442 wild and Wickham accessions in three plantings are being conserved. The next set of 82 wild accessions and 10 Wickham clones were multiplied at CN, Karikkattoor, transported to Teksrage farm, Tura and raised in polybag nursery.
- A separate collection, designated as the Germplasm Working Collection (GWC) comprising all the “plus” wild accessions identified from time to time, was initiated in order to ensure their conservation, as well as ready availability of sufficient budwood for field trials and other scientific investigations. The first set of 24 “plus” wild accessions were field planted and polybag planting of the next set of 62 accessions (980 plants) was done.
- Alternative sources of natural rubber-11 Ceara rubber (*Manihot glaziovii*) germplasm accessions - are being conserved at RR II.
- A mapping population for QTLs for important traits in *Hevea* has been generated and out of the 306 hybrid seedlings derived from an inter-specific cross, 255 are now surviving in the nursery. Genotyping using the first set of 86 progenies from the 2009 HP was completed (Genome lab). Nursery phenotyping for test tap yield, girth, NLV, ATP and disease tolerance for this set of accessions was done and QTLs for *Phytophthora* were identified. Three potential yield recombinants were identified.
- Ortets collected from different agro-climatic conditions were evaluated for growth and early yield performance. Ortet clones namely RRSA 98, RRSA 585, GH 9 and DAP 1 recorded higher girth. Test tapping yield was higher in RR II 430 and ortet RRSA 98. Lowest summer yield was recorded in ortets namely, GH 3 and NGK 1.
- Under cold stress condition, significant clonal variations were observed in parameters viz. root to shoot ratio, leaf area and biomass partitioning. Clones RRIM 600 and RR II 422 were on par with each other for cold related responses.
- Proline (osmolyte) content in the leaves was significantly higher in drought tolerant clones/ accessions (RR II 430, RRIM 600, RO 3184 and RO 1425) than susceptible clones/ accessions (RR II 105, RR II 414, RO 3242 and MT 1619) under stress conditions. Among the wild accessions, the highest proline content was observed in RO 3184 and the lowest in RO 3242.
- Chlorophyll fluorescence studies under low temperature condition indicated that clones SCATC 88/13 and RR II 208 had better vitality index under chilling stress compared to RR II 105 showing their relative cold tolerance potential.
- Physiological evaluation of field planted root trainer and polybag plants was conducted during peak summer period. The photosynthetic rate was higher in root trainer plants than polybag plants. The drought casualty was more in root trainer as well as polybag plants of RR II 105 compared to RR II 430.
- In a high elevation trial at Haileyburia Tea Estate, Elappara, Idukki Dist., the poly clonal seedlings planted in between the rows of tea continued to perform better than clonal budgrafted plants.
- Pre-treated field plants (before planting) with a growth regulator, paclobutrazol showed better survival percentage and plant vigor than control plants of RR II 430 and RR II 105 after overcoming first year summer season at RRS, Padiyoor.
- For validating the transcriptome sequencing data in relation to cold responses in *Hevea*, qPCR analyses of 10 cold related transcripts were done.



- DNA laddering was found to be relatively more in RR11 414 (drought susceptible) than RR11 430 (relatively drought tolerant) when leaf discs from the respective clones were subjected to 40 per cent PEG incubation along with high light stress.
 - The gene expression analyses in latex samples from high and low yielding clones (3 nos. each) with and without ethephon stimulation indicated over expression of HMGR 1 and sucrose transporter in high yielding clones.
 - Analysis of data on effect of stimulant application at different locations of the trunk and tapping panel indicated that utilization of sucrose was better in trees with 5 per cent ethephon application above and below the tapping panel compared to normal stimulation in clone RR11 105 under d3 system of tapping. However, 5 per cent ethephon application showed more stress effects in terms of antioxidant components compared to normal 2.5 per cent application.
 - Newly opened trees of clone PB 260 under d3 system of tapping recorded higher level of thiol and protein contents and lower level of ATP than clones RR11 105 and PB 217 during soil moisture stress period.
 - Differential responses of clones to ethephon application were observed. High rate of activity of glutathione reductase and thiol content (stress components) in latex was observed in clones RR11 105 and PB 217 after stimulation under d3 system of tapping which indicated setting of oxidative stress. It was found that response of clone PB 217 to ethephon application was low compared to RR11 105
 - Immediate effect of stimulation on yield and stress tolerance potential was studied in four high yielding and three low yielding clones by analyzing biochemical composition and enzymes in latex. Low yielding clones, viz., RR11 33 and RR11 38 showed high sucrose, low ATP and glutathione reductase activity after stimulation compared to clones RR11 105 and PB 217.
 - Embryogenesis obtained from newly inoculated anther cultures in picloram supplemented medium and embryos derived from leaf cultures were matured and kept for germination.
 - For in vitro screening of drought tolerance, five Hevea clones with susceptibility and tolerance to drought were subjected to PEG stress under in vitro conditions and callus induction is awaited.
- ## 2. Advanced Centre for Molecular Biology and Biotechnology (ACMBB)
- Sequencing and annotation of the whole genome of Hevea, assembly of Hevea sequence data is in progress. Transcriptome analysis has been completed. Open Reading Frames (ORFs) were predicted for 15 RNA-Seq assemblies.
 - In the Molecular marker development programme, SNP frequency in eight rubber biosynthesis genes was studied. SNP analysis of latex biosynthesis genes revealed that the upstream genes like HMGS, HMGR, MVK and PMVK are highly conserved compared to the genes which are functionally more specific to Hevea like REF and CPT genes with very high SNP frequency rates.
 - REF had the highest number of SNPs (32) and the highest frequency (1 SNP/53 nucleotides) as well as highest number of non-synonymous SNPs (15) among eight rubber biosynthesis genes.



- Initiator molecule synthesising genes *viz.*, FDPS and GGDPs were moderately conserved. Interestingly FDPS and HMGR didn't harbour any non-synonymous SNPs. FDPS had the highest number of SNPs from non-coding regions.
 - SNP based markers were generated from MVK (HbMVK2628A/G, HbMVK3297C/T), PMVK (HbPMVK1786C/T), HMGS (HMGS3059A/G) and CPT (HbCPT1438C/T) genes.
 - 34 SSR loci based on NBS-LRR transcripts (R genes) generated from disease transcriptome were assessed for polymorphisms and 18 were found polymorphic which could be used as genic SSR markers.
 - In the Linkage Map Construction Programme, a total of 7692 markers (markers without missing values) were processed using Lep-MAP2. Eighteen linkage groups with LOD score 3 were obtained with these filtered data set. Running Lep-MAP2 with multiple parameters for further refinement is in progress.
 - Studies on stress biology of Hevea, Physiology, Gene discovery and allele mining from wild and Wickham genetic pools programme and functional characterisation of NAC transcription factor gene were studied and recombinant protein production from NAC cDNA (cloned from both RR11 105 and RRIM 600) was observed in bacterial system. Stress related transcriptomes, RNA-Seq data analysis was performed to identify differentially expressed transcripts from different rubber clones subjected to biotic and abiotic stresses and also affected with TPD. All the differentially expressed transcript were documented. HSP and TCTP sequence analysis (stress responsive genes), HSP and TCTP domain containing sequences with full length Open Reading Frame (ORF) were extracted from drought (B), cold (C) and *Corynespora* challenged (T2) transcriptomes. Genes encoding three 17.5 kDa, two 18.2 kDa and one 15.7 kDa HSP family protein were identified. Three translationally controlled tumor protein (TCTP) genes were also identified.
 - DNA methylation sequencing was performed for the bisulfite treated PCR amplified partial promoter regions of HMGS (3 samples) and HMGR (11 samples) in order to identify methylated cytosines in the promoter regions of latex biosynthesis genes from RR11 105, RRIM 600 and RRIC 100 under cold stress. The analysis is in progress.
 - Cloning and characterisation of lignin biosynthesis gene studies had successfully cloned both genomic and cDNA fragments of coniferaldehyde 5-hydroxylase (EC 1.14.13) from rubber that catalyses the 5-hydroxylation step required for the production of syringyl units in lignin biosynthesis.
 - A project on microbial metagenomics from rubber soil was initiated in collaboration with a CSIR institute - National Environmental Engineering Research Institute (NEERI), Nagpur.
- ### 3. Rubber based farming systems and farm management
- Results of fertilizer trials conducted at various locations, soil fertility mapping and experiments on secondary and micronutrients were presented in Scientific Advisory Committee (SAC) and ad hoc recommendations on fertilizer skipping and secondary and micronutrient applications were approved.



- Web based fertilizer recommendation was evolved in collaboration with Indian Institute of Information Technology and Management (IIITM), Kerala overlaying different soil fertility parameters and soil depth following the guidelines of discriminatory fertilizer recommendation.
- Launching of Rubber Soil Information System (RubSIS) for rubber growers: Smt. Nirmala Sitharaman, Hon'ble Minister of State for the Ministry of Commerce & Industry, officially launched the RubSIS, an online fertilizer recommendation system for rubber growers, at a function held at Udyog Bhawan, New Delhi on 23 January 2017. RubSIS, initially launched for Kottayam district, was developed by RRII in collaboration with Indian Institute of Information Technology and Management (IIITM), Kerala, ICAR and ISRO. RubSIS will be refined based on stakeholder consultations and mobile application will be developed. Additional Secretary of MOC, Executive Director of the Board, Director (Plantations), representatives of National Bureau of Soil Survey and Land Use Planning, ICAR, IIITM, Kerala and others had attended the function.
- RubSIS was demonstrated to about 800 growers in group meetings organized in Rubber Producers Societies (RPS) with the support of Rubber Production Department and feedback was collected. Development of Mobile App and translation to vernacular languages are in progress.
- Preparation of the project of soil fertility mapping of rubber growing soils of Northeast India is in progress.
- Detailed write-up on possibilities of intercropping in rubber plantations was submitted to revise the policy of Rubber Board on intercropping.
- A project on intercropping fruits and vegetables in young rubber plantations was prepared after detailed consultations with Department of Agriculture, State Horticulture Mission (SHM) and Vegetable and Fruit Promotion Council Keralam (VFPC). The project was presented in meetings convened by Hon'ble Minister of Agriculture, Government of Kerala and was submitted to State Government after modifications as per the suggestions.
- A nursery experiment to develop a fertilizer management schedule for root trainer plants in the nursery was initiated.
- A workshop on intercropping was conducted with officers of various State Government Agencies involved in cultivation and marketing of fruits and vegetables in Kottayam district and growers to discuss the various aspects involved in the convergence scheme of intercropping.
- Experiments on intercropping and cropping systems, nutrient management, soil and water conservation, ground cover management and reducing gestation period were in progress.
- A survey on the adoption of agro-management techniques in rubber plantations showed that soil and water conservation measures are adopted by 92 percent of the growers.
- Analysis of biochemical parameters in bark and latex of clone RRII 105 indicated that application of 5 percent ethephon (three locations:-above panel only, below panel only and both above and below) resulted in more stress effects compared to normal 2.5 per cent application.
- Survey report on drought management of young plants during summer in traditional region indicated that about 18 per cent of the respondents irrigated their young plants during summer in Kerala.



- Steps were continued for patenting the tapping knives supplied for evaluation.
- A large scale trial on LFT in clone RR11 430 was laid out in 20 ha area at HML, Palappally estate, Thrissur and stimulation treatments were imposed and DRC sampling carried out as scheduled.
- Implemented large scale OFT on Low Frequency Controlled Upward Tapping (LFCUT) in weekly tapping in 12 tapping blocks at Kanthimathy Estate, Kulasekharam, Tamil Nadu.

4. Use of remote sensing and geographic information system in NR plantation sector

- GIS based overlay analyses were carried out for Tripura Tribal Area Autonomous District Council Zones (TTAADC) and spatial distribution of rubber in Tripura. NR area was estimated for each zone of TTAADC.
- Vegetation temperature condition index (VTCI) of Kerala and Kanyakumari district of Tamil Nadu was analyzed for the month September 2016. It was found that there was widespread drought stress in most parts of Kerala and Kanyakumari district during September 2016 which is a highly unlikely period within monsoon season.
- Mapping of rubber plantations in Meghalaya state and acreage estimation of NR plantations in West Garo Hills and South-west Garo Hills districts of the state were completed. Satellite-based area under rubber (three years old and above) in West Garo Hills district of Meghalaya for the year 2015 was 2791 ha.
- Mapping of the existing rubber plantations and areas suitable for its cultivation in Assam was completed using high resolution satellite images for 2011-2012. The estimated area under existing rubber

plantations extended to about 16,872 ha and wastelands suitable for rubber cultivation was 24,783 ha in different districts of Assam.

- In the project on GIS based soil fertility mapping, RR11 completed the report preparation for Idukki district.

5. Development of plant protection protocols in NR

- New generation fungicides viz. thiophanate methyl and SAFF were recommended for control of *Corynespora* leaf disease.
- Modified method was initiated for raising root trainer plants for crown budding
- DST scheme on “Quantitative Trait Loci (QTL) mapping for analyzing genetic determinism of disease resistance and development of DNA marker-based selection tools for resistance breeding in rubber tree (*Hevea brasiliensis*)” was sanctioned with an outlay of 45 lakh.
- Studies on yield loss in clones RR11 414, RR11 429, RR11 422 and PB 260 revealed no serious impact due to low disease severity during the previous season.
- Evaluation of nursery crown-budded plants indicated higher yield in crown-budded than control.
- Launched “WhatsApp” facility for disease advisory and a total of 1631 cases were attended.
- *Corynespora* Task Force and survey during 2017 disease season assessed the disease progress and situation in North Kerala and South Karnataka.

6. Environmental protection and climate studies

- Trial runs of Maxent models to test the habitat suitability of *Hevea* in Kerala were conducted with the help of experts from Kerala Forest Research Institute.



- Data collection and analysis of carbon dioxide flux from Eddy Covariance Systems installed at RRII campus were carried out.
 - Trend analysis carried out for traditional rubber regional stations observed that the maximum temperature showed significant increasing trends for all the stations studied.
 - Completed the climate change study for eight rubber growing stations in India as a function of rainfall. While Agartala and Guwahati in the non-traditional region showed significant change in the long term seasonal rainfall during winter. For CES, Chethakal the change detected was during pre-monsoon and for Nettana, Karnataka during the post-monsoon period.
 - Data analysis indicated that warming occurrence probability was high during the monsoon and post monsoon periods for the traditional as well as in the non-traditional regions.
 - Proved the hypothesis that thermal regime in Northeast region of India during the South West monsoon period was remaining high which can be detrimental to the yield by analysing the yield data along with the climate data.
 - El Nino indicator and Southern Oscillation Index (SOI) data notified by Australian Bureau of Meteorology were analyzed. No significant association of 12 months individual SOI to the regional rainfall was observed. Characteristics of strong, moderate and weak El Nino's were studied and established the relationships with that of temperature time-series.
 - Aridity indices were worked out for all the 10 states of Left Wing Extremism (LWE) affected areas in India (285 districts) for evaluating the suitability of areas for rubber cultivation. The indices showed that compared to Kottayam none of the districts were found suitable for rubber cultivation. However, a few districts in north of W. Bengal were identified as moderately suitable.
- 7. Socio-economic dimensions of the Indian NR sector**
- Report on Cost of Cultivation and Cost of Production of NR in different states in India was prepared.
 - Based on the proposal for "Optional control of rubber nurseries in India" by the Division, the "Scheme for Registration of Nurseries and Certification of Planting Materials in the Private Sector" was initiated and implemented by Rubber Board in September 2016.
 - The Division had got an external funded project from State Horticulture Mission, Kerala for ₹ 4.9 lakh for the study on "Pollination support through beekeeping".
 - Provided consultancy services to estate sector and smallholdings on estimation of timber volume and upset value and received ₹ 151,251 as service charges for the consultancy work.
 - Policy advisories on trade policy issues in rubber and rubber products related to multilateral trade negotiations, Regional Trade Agreements (RTA), trade policy reviews of WTO and other aspects related to foreign trade were provided.
- 8. Primary processing of latex and dry rubber and development of specialty rubber compounds for specific industrial applications**
- Laboratory development of Low Viscosity rubbers using peptizing chemicals was attempted. Batches of deproteinised natural rubber (DPNR) from ammoniated latex using varying concentration of enzyme, soap at varying time intervals were prepared. DPNR of varying nitrogen content from 0.44 to 0.05 could be achieved.
 - Technological properties of NR Latex-Silica master batches were compared with that of the corresponding dry mixes. Properties of these two composites were comparable. Laboratory level preparation



of NR Latex-Silica masterbatch was standardized. Contacted different tyre companies for scaling up and industrial evaluation of NR Latex-Silica composites developed. Two tyre industries expressed willingness to work jointly with RRII for developing NR Latex-Silica masterbatch. Prepared five batches of NR-Silica masterbatch for evaluation at the factory.

- Three new batches of Latex-Carbon black masterbatch were prepared and its evaluation was conducted. Industry-RRII joint evaluation of the progress of the project was carried out. Based on the industry interaction, new experiments were initiated. Four laboratory scale batches of NR-carbon black with 50 phr filler loading were prepared and evaluated (three were latex masterbatch with different stabilizers and the fourth by dry mixing) for technological properties. Scaled up production of Carbon black masterbatch (containing 45 phr ISAF and 5 phr silica) with surfactant SAL and compared with the corresponding dry mix. NR Latex-carbon black masterbatch prepared from centrifuged latex (dry mix and masterbatch) was evaluated for technological properties in comparison with masterbatch from field latex.
- A semi-pilot scale (150L) study of skim latex coagulation was evaluated at the centrifuging factory. The skim latex after chemical treatment was coagulated to skim rubber lump using 10 per cent sulphuric acid.
- Steps were taken for renewing E-license for radiation vulcanized NR latex (RVNRL) plant from Atomic Energy Regulatory Board (AERB), Mumbai. Calibrated the radiation safety equipments and obtained license for operation of Gamma Chamber 5000 unit. E-Lorra application was submitted to AERB for license. AERB conducted regulatory inspection and completed the follow-up action to comply

with the inspection report. Report on Board of Research in Nuclear Sciences (BRNS) project "Effect of gamma radiation induced gel content of NR latex and blending of synthetic latex in quality improvement of radiation vulcanized NR latex" was finalised.

9. Strengthening of Regional Research Stations (RRS) (Other than NE Region)

- At HBSS, Nettana, monthly yield recording by cup coagulation was done for all the evaluation trials. Yield data from the on-farm trials indicated that clones RRII 430, RRII 429 and RRII 422 continued to be promising in the region. In LST 2000, mean yield over seven years was the highest for RRII 430 (70.5 g/t/t), a drought tolerant clone and was significantly superior to RRII 105 (48.99 g/t/t).
- At HBSS, Nettana, the growth recording was carried out in LSTs 1990 and 2000 and SSTs 1991 and 2003. Analysed immature growth performance of 14 clones in LST 1989 and observed that RRII 203 (82.9 cm) had the highest girth at 12 years after planting and was significantly higher than RRII 105 (67.65 cm). Annual girth increment during the immature period was also highest for RRII 203 (6.4 cm/year) and was significantly higher than check clone RRII 105 (5.5 cm/year). Among the 14 clones evaluated in the LST initiated during 1989, RRII 203 (49.2 g/t/t) and PB 255 (42.3 g/t/t) had higher yield than RRII 105 (38.9 g/t/t) in 2015. Polyclonal population showed better growth in terms of girth. Around 200 seedlings were raised and planted in polybag from open pollinated seeds collected from 1995 and 1991 trials.
- At RRS, Denkanal, location specific clone evaluation trials were continued during the year to screen and evolve the clones for the dry sub humid region. RRII 208, SCATC 88/13 and RRIM 600 were found



comparatively better in the region. Further evaluation of selected 10 ortet elite clone trees is under progress. Rubber yield performance of RR11 300 series and IRCA clones commenced. RR11 351 and IRCA 109 reported good performance in terms of yield.

- At RRS, Dapchari, trials on vertical mulching and controlled upward tapping are in progress. Vertical mulching conserved soil moisture during summer.
- In HBSS, Kanyakumari, the initial yield over three years of tapping from the OFTs on the 400 series clones revealed that the clones RR11 430 and RR11 422 were better than RR11 105 in the region. The assessment of the vigor of trial clones in the three participatory clone evaluation revealed that P 10, P 21, P 27, P 44 and P 102 were more vigorous than the control clones. Experiment planting consisting of 19 trial clones and three check clones under the Phase V of the participatory clone evaluation program was carried out at Chithar Division of the ARC Ltd.
- Attempted 2486 hand pollinations for six cross combinations, of which 69 hybrids were initially realized and a final of 23 hybrids have been raised in the seedling nursery. Two selections from the earlier HP program were pollarded for further evaluation.
- Around 1800 polyclonal seedlings obtained from the seeds collected from the polyclonal seed garden were raised for seedling nursery evaluation. Test tapping was initiated on the polyclonal seedlings of the earlier season.

10. Strengthening of RRS (NE Region)

- In the clone evaluation programme, at Palthalia, the on farm trial had the highest annual yield or clone RR11 429 (35.4 g/t) followed by RR11 600 (33.3 g/t). The lowest yield was recorded in clone RR11 422 (21.6 g/t).
- A multi-cropping demonstration trial with different crops viz. upland rice, cowpea, banana, pineapple, sesame and Guinea grass (*Megathyrus maximus*) were planted in gaps available between two rows of rubber at Taranagar farm. A total 3 tonnes per ha of cowpea, 170 kg per ha of sesame and 1.5 tonnes per ha of upland rice were harvested from the intercropped area. Fodder crop-guinea grass harvested from this trial during the year was 22.5 tonnes per ha (fresh weight).
- A short duration trial on popular green leafy vegetables was initiated during middle of December in 19 year old mature rubber plantation. Leafy vegetables, viz. Pea and Pakchoi seedling were sowed in gaps available between two rows of rubber. 120 kg per ha (wet weight) of pea leaves and 640 kg/ha (wet weight) of Pakchoi were harvested during that period.
- In the soil fertility mapping project, 395 soil samples were analyzed for Organic Carbon (OC), available P, K, pH, conductivity and soil texture.
- An experiment was initiated during October with polybag rubber plants to study the effect of bio-char (a charcoal rich in carbon and made from raw rice husk via pyrolysis at 250°C for 6 hours) amended soil on plant growth and soil property. In ecosystem study, the niche distribution of natural rubber (*Hevea*) and Guayule (*Parthenium Argentatum*) was generated using Maxent ecological niche modeling approach. High altitude regions of northern part of India and semi-arid zones of western India are appeared to be better niche for Guayule rubber.
- In the on-farm evaluation of selected ortets in grower's field in Assam, girth of ortets at 30 cm height was at par with RR11 600 at 20th month of field planting. Girth in RRS3 3 ranked first followed by



RRSG 1. In the observation trial in grower's field in Assam, evaluation of the performance of clone RR11 429 with RR11 600 found the girth of both the clones comparable.

- Annual average girth of seedlings from the four sources (Nagrakata, Kanyakumari, Tura and Guwahati) at 8th year was similar. Mean yield of plants raised from seeds of different sources was similar in the 1st year of tapping.
- Experiment on performance of rubber in high pH soil recorded girth of plants in normal pH area higher than that of high pH area indicating that growth of plants was adversely affected by the high pH of soil after 5th year of planting.

11. Research Fellowship Scheme

Under RR11 Fellowship scheme only one JRF worked during the reporting year.

12. Scientific Advisory Committee Recommendations

- Three best growing fodder crops viz., Guinea grass, Signal grass and *Stylosanthes* were recommended as fodder intercrops during the immature period of rubber for NE region.
- Adoption of reduced spiral tapping system S/4 d3 6d/7 ET 2.5% Pa (6/y) @ 45 days interval during May to January, in clone RR11 105 with trunk girth of 45cm or above. The system ensures yield comparable to S/2 d3, longer economic life and compact blocks. Adoption of this system for regular tapping ensures more years of virgin panel tapping (7x4 = 28 yrs) and possibility of enhancement of task size by at least 25 per cent than the conventional system.
- The SAC recommended use of Wood Pecker HTP power sprayers viz., WPH 21K and WPH 30K for high volume spray to control leaf diseases in rubber plantations having height about 21 feet and 30 feet respectively.

- Use of oxo-degradable polythene manufactured by M/s Everest polymers was recommended for rainguarding rubber trees. Rainguarding with this material served the purpose of protecting the tapping panel effectively without degradation during both the monsoon seasons (SW and NE monsoons, a total of seven months) and degraded completely thereafter in the next 5-6 months.

13. Linkages with national and international centres of excellence and overseas training

Collaborative projects of RR11 with national centres/industries

- Collaborated with the National Bureau of Soil Survey and Land Use Planning (NBSS & LUP), ICAR on soil fertility mapping and soil health monitoring of traditional rubber growing region.
- Collaborated with M/s Apollo Tyres Ltd. for technology transfer of latex carbon black masterbatch and MRF Ltd. for technology transfer of NR polymeric filler system.
- Collaborated with Harrisons Malayalam Ltd. for technology transfer of DPNR.

External funded projects

- Indian Council of Agricultural Research (ICAR): Identification of genes involved in disease resistance for abnormal leaf fall disease caused by *Phytophthora* Spp and mapping of QTL for disease resistance in rubber (*Hevea brasiliensis*).
- Board of Research in Nuclear Sciences (BRNS), under Atomic Energy: Quality improvement of Radiation Vulcanized Natural Rubber Latex (RVNRL).
- Chitarangan Locomotive Works (under Indian Railways): Development of rubber components for Indian Railways.
- State Horticulture Mission, Kerala: Evaluation of Pollination support through Beekeeping.

14. RR11 Publications – 91 Nos.



15. Research Support Services

Scientists from RRII functioned as faculty in various training programmes conducted by Rubber Training Institute of the Board. During 2016–17, RRII collected ₹ 84.75 lakh as testing charges and consultancy fee. Besides, RRII offered advisory service to 3,490 stakeholders.

Supporting services such as the Library, Computer Centre, Instrumentation section and Maintenance wing provided logistic support to all research laboratories and regional research stations. Regular updates were provided for Rubber Board website “www.rubberboard.org.in”.

16. Events

16.1 Awards received by the scientists of RRII

- Dr James Jacob, Director of Research received the C.S. Venkataram Memorial Distinguished Scientist Award for the contribution in the field of Plantation Crops Research during National Symposium on Plantation Crops PLACROSYM XXII organized by Central Plantation Crops Research Institute, Kasaragod, from 15-17 December 2016.
- Dr. C. Bindu Roy, Senior Scientist, Pathology division received the Best Woman Scientist National Award of the Indian Society of Mycology and Plant Pathology at the Annual Conference and 38th National Symposium held at Kolkata during 24-26 November 2016.
- Dr. C. Bindu Roy received the Dr. R. L. Narasimha Swamy Memorial Award for the second best oral paper during National Symposium on Plantation Crops - PLACROSYM XXII organized by Central Plantation Crops Research Institute, Kasaragod from 15-17 December 2016.
- Mr. Pradeep B received the ‘Young Scientist Award (YSA)’ of International Rubber Research & Development Board (IRRDB), 21 - 22 November 2016. Siem Reap, Cambodia.

- Dr. Mercy M.A. received the Best paper award at the National Seminar on Natural Resources Management for Horticultural Crops under Changing Climatic Conditions, 16-17 March 2017, CWRDM, Kozhikode.

16.2 RRII Scientific Seminar

RRII conducted 11 scientific seminars in which twenty-eight research papers, five project proposals and one project report were presented and discussed.

16.3 Highlights / Exceptions

- Scientists from Crop Improvement, Agronomy/Soils, Fertilizer Advisory Group, Latex Harvest Technology, Crop Protection and Rubber Technology attended the RRII-RP interaction meeting at Kasaragod, Palakkad and Thiruvananthapuram and made presentations on research updates/ findings in the respective disciplines.
- RRII conducted Annual Review of the research programs and also, released clone RRII 208 for North East regions.
- Ms. Rita Teatota, Commerce Secretary, Department of Commerce, MOC&I inaugurated the Diamond Jubilee Block to house the Advanced Centre for Molecular Biology & Biotechnology Division. She also inaugurated the second phase of International Clone Museum of RRII by planting a root trainer plant.
- A project proposal on intercropping fruits and vegetables in young rubber plantations was prepared after detailed consultations with Department of Agriculture, State Horticulture Mission and VFPCCK in the meetings convened by Hon. Minister of Agriculture and submitted to State Government for consideration. A workshop on intercropping was conducted with officers of various State Government Agencies involved in cultivation and marketing of fruits and vegetables in Kottayam district and also, discussed the various aspects involved in the convergence scheme of intercropping.



Mrs. Nirmala Sitharaman, Hon'ble Minister of Commerce & Industry launched the Online fertilizer recommendation for rubber growers at Udyog Bhawan, New Delhi on 23rd January 2017



Sri A. Ajith Kumar IAS, Executive Director of the Board released newly developed high yielding hybrid rubber clone RR11 208 in the ANRPC Annual Meeting at Guwahati and handed over a plant to Shri. Hareesh Chandra Raj, President, North Sulmara RPS

**Mrs. Rita Teatolia IAS ,
Commerce Secretary
inaugurated the International
Clone Museum Phase II at
Rubber Research Institute
of India on 17th March 2017**

**PART - VI****PROCESSING AND PRODUCT DEVELOPMENT**

Processing and Product Development (P&PD) Department is responsible for enhancing competitiveness and viability of the Indian rubber and rubber wood processing sector in the global environment, through focused development by effective transfer of technology and quality support services.

The Department has four Divisions *viz.*, Engineering, Factory Management, Processing & Quality Control (P&QC) and Rubber Processing & Market Development (RP&MD). In addition to this, two factories *viz.* Pilot Latex Processing Centre (PLPC) located at Central Experiment Station (CES) at Chethackal, Ranni and Model Technically Specified Rubber (TSR) Factory at Manganam, Kottayam and one Central Wood Testing (CWT) Laboratory at Manganam, Kottayam are also under the administrative control of the Department.

Major objectives

- Provide technical and engineering services to rubber processors and manufacturers
- Demonstration of the latest processing technology
- Implementation of the renewable energy technologies
- Implementation of plan schemes for technology upgradation and quality improvement of rubber and rubber wood processing sector
- Consultancy services

- Engineering support for troubleshooting in processing factories
- Analytical and technical service to rubber and rubber wood processors
- Promotion of rubber wood as an eco-friendly alternative to conventional timber
- Testing services for rubber and rubber wood at NABL accredited laboratories
- ISI marking of latex and block rubber in collaboration with BIS
- Enforcement of quality standards and export/import inspections
- Technical guidance to group processing centres and training to rubber smallholders for quality improvement
- Design and execution of engineering works of Rubber Board

The Division is giving special emphasis to attain international standards in quality and packing of rubber.

1. Major Activities

The major activities of the Division during the year were implementation of Plan components and disbursement of financial assistance under (i) the new scheme "Pilot scheme for promoting deliberate processing of Block Rubber from latex coagulum (LC)" and (ii) Market Development scheme.

Other activities include:

- ▶ Execution of major constructions, modifications/repair of buildings and roads at Board's establishments, across India



- ▶ Quality certification of NR produced in, imported to and exported from India
- ▶ Technology upgradation, quality improvement, cost reduction and strengthening of environmental protection system in block rubber processing, latex centrifuging and rubber wood processing units
- ▶ Implementation of BIS Scheme for testing and inspection for the benefit of rubber processors
- ▶ Providing testing facilities for rubber, chemicals and water samples for rubber smallholders
- ▶ Technical support in producing high quality sheet rubber and its grading.
- ▶ Demonstration and training to rubber processors to meet customer requirements
- ▶ Quality control and environmental protection at rubber processing factories
- ▶ Promote processing and value addition of rubber wood, which save forest and ensure additional income to rubber growers
- ▶ R & D activities in rubber wood processing

1.1. Civil Engineering

The Civil Engineering Unit executed major constructions/modifications and repair works in Board's establishments, residential quarters/complexes, roads, etc. all over India. During the year, major civil works were carried out at Rubber Research Institute of India (RRII), Kottayam, Rubber Board Head Quarters at Kottayam and establishments in NE region viz., Agartala and Guwahati.

The laboratory block (657 sq.m.) constructed by the Unit, to house the Advanced Centre for Molecular Biology and Biotechnology (ACMBB), was inaugurated by Smt. Rita Teotia, Secretary, Ministry of Commerce & Industry, in March 2017. The

Unit evaluated construction of latex collection centre, Group Processing Centres (GPC) of Rubber Producers' Societies (RPS), etc. and various proposals of different departments of the Board. During the year, the Unit inspected and evaluated GPC construction in 16 locations and sanctioned ₹ 1.3 crore to RPS.

During the reporting year, the Unit executed ongoing projects worth of ₹ 2.22 crore and civil works worth ₹ 3.13 crore under the Infrastructure Development scheme. The Unit also provided consultancy service to set-up one GPC and smoke houses of various types such as tunnel type, trolley type and conventional type, on chargeable basis.

1.2. Electrical Engineering

Electrical Engineering Unit executed electrification works in new constructions, repairs/rewiring in residential buildings, offices, etc. and standardization of electrical installations at various establishments of the Board all over India. The unit also carried out proper liaison with State Electrical Inspectorate, Central Electrical Authority and State Electricity Board for electrification and obtained approval from Electrical Inspectorate.

During the year, the Unit installed 110 KVA transformers at Central Wood Testing Laboratory at Manganam and completed electrification of the new ACMBB laboratory and maintained two 50 KWp solar power plants at RRII and Rubber Training Institute (RTI) and Diesel Gensets/transformers at various establishments of the Board.

1.3. Mechanical Engineering

Mechanical Engineering Unit undertook various works including preparation of bid documents and bid evaluation for machineries and equipment, supervising erection/commissioning of machinery, imparting training to factory personnel on machinery



operations and maintenance, project evaluation and advisory work for rubber and rubber wood processing units and monitoring the maintenance of Board's vehicles. The Unit provided consultancy services on modern mechanized Ribbed Smoked Sheet (RSS) processing with technical knowhow, technical guidelines on the functioning of effluent treatment plant, setting-up of a rubber product manufacturing facility at Rubber Mark, use of alternate fuel for smoke houses, etc. The unit prepared and submitted Project Reports to set-up one PLC factory for M/s. UNPARubbers, Kothamangalam and one TSR factory for M/s. Southern TSR, Assam, during the year.

The Unit developed processing machinery to process cup lump at small grower and RPS level by adopting cost effective method. The salient feature of the machine is the provision to collect and take away the waste water squeezed out of the lump so that the floor area of the plant can be dry and clean and can be used for storing the processed cup lump.

1.4. Pilot Scheme for Promoting Deliberate Processing of Block Rubber

Government of India approved a new scheme titled "Pilot Scheme for Promoting Deliberate Processing of Block Rubber from Latex Coagulum" for a period of two years, i.e., during 2016-17 and 2017-18, with an outlay of ₹ 25.74 crore. The Board is promoting processing of quality block rubber from fresh cup-lump through three factories viz., M/s Kavanar Latex Ltd., Pala, M/s Indiar Crumb Rubber Factory (Pala Marketing Society) at Pala and Rubber Mark Crumb Rubber Factory at Chenappady. Fresh cup lumps are collected from individual growers and transported to processing factory by RPS. Under this scheme, growers are given an incentive of 10 per kg of dry rubber content (DRC) with a view to improving the quality of block rubber and as compensation for the losses incurred when compared with the

prices of RSS 4 grade sheet rubber. The incentive to the growers will be credited directly (as direct benefit transfer). RPS and processing factories are eligible for an incentive 2 per kg of DRC for the transportation of cup lump from smallholders and its processing.

Under this scheme, 328 smallholders were registered as on 31 March 2017 and incentives worth ₹ 0.89 lakh were released against the sanctioned financial assistance of ₹ 2.41 lakh for 2016-17.

2. Processing and Quality Control (P&QC) Division

P & QC Division is running a full-fledged laboratory to assess the quality of rubber, rubber chemicals and other materials used in rubber sector. The Division undertakes commercial testing of preserved field latex, concentrated latex, dry rubber, chemicals used in rubber processing, rubber product manufacturing and plant protection, fertilizers and organic manures, effluent water generated from rubber processing industry and drinking water and water for civil construction.

An amount of ₹ 13.10 lakh was collected as testing fee from April to November 2016. Besides, the Division inspected rubber and issued 3,040 NOCs for the import of ₹ 2.92 lakh tonnes of NR in to the country up to November 2016.

As a part of restructuring of the establishment of the Board, the P&QC Division was transferred to the administrative control of RRII from 01 December 2016 with a view to synergizing all testing facility under a single roof.

3. Central Wood Testing (CWT) Laboratory

The Central Wood Testing (CWT) Laboratory, which is an NABL accredited laboratory, was engaged in the following activities during the year under reporting:



3.1. Testing and quality control

The CWT Laboratory facilitates testing of samples from various processors/ users and provides advice regarding quality control. During the year, 1755 samples (64 batches) were received. In addition to Indian customers, the Laboratory served two foreign customers viz., M/s Forestry Innovation, Canada and M/s Swedish Wood Corporation, Sweden.

3.2. Training and technical advice

Central Wood Testing (CWT) Laboratory provides training to graduate/post graduate/ doctorate students. During the year, the Laboratory imparted training to students from different universities on wood processing, quality control and testing and provided technical advice to about 25 stakeholders.

3.3. NABL reassessment

CWT Laboratory successfully completed the NABL reassessment audit in April 2016 and extended NABL accreditation up to June 2018. The Laboratory provided consultancy service on ISO certification for preparing necessary documentation as per ISO/IEC 17025:2005 to obtain NABL accreditation. During the year, CWT laboratory continued the documentation process for NABL accreditation at M/s Kerala Metals and Minerals (KMML), Kollam for TSP QC / MS QC laboratories.

3.4. R&D projects

- ▶ Conducted a study of wood impregnation using wood perfume on Ooth wood for a private entrepreneur.
- ▶ Completed study on physical and mechanical strength evaluation of three eucalyptus clones of M/s ITC, Bangalore. Further, CWT designed and developed furniture prototype and analyzed recovery, strength, and wood working properties.
- ▶ CWT Laboratory had extended scope of testing for plywood, particle board and wood polymer composite (WPC)

- ▶ The Laboratory had prepared necessary documents for BIS laboratory recognition scheme for various grades of plywoods and block board testing.

3.5. Conferences/ Research Papers

E.V. Anoop, C.R. Sindhumathi, C.M. Jijeesh and C.E. Jayasree (2016). Radial variation in wood properties of Nedun (Pericopsismooniana), an introduced species to South India. Journal of Tropical Agriculture, 54 (1): 27-34. (Research paper co-authored by C.E. Jayasree, Laboratory Assistant (Chemistry) from CWT Laboratory).

4. Rubber Processing and Market Development (RPMD) Division

4.1. Training Programme for graders of dealers

During the year RPMD Division conducted quality awareness programmes for graders of dealers at five zones in Kerala viz. Iritty, Nilambur, Thodupuzha, Kottayam and Kottarakkara, benefitting 370 dealers and representatives from tyre companies. This programme was jointly organized by the Board and Indian Rubber Dealers Federation (IRDF) with the objective to mentor and channelize the graders to understand the need for quality improvement of sheet rubber. This re-skilling programme benefits the rubber graders and dealers to learn various aspects in the visual grading of RSS. The programme sensitized the participants on the requirement of good quality NR for tyre radialization and manufacturing of different products.

4.2. Training programme for tappers and growers

In collaboration with RP Department and Rubber Training Institute (RTI) of the Board, the Division provided faculty support for training programmes for tappers and growers at regional offices in Kerala and Tamil Nadu for improving the quality of sheet rubber.



4.3. Quality upgradation programme in Northeast Region

The Division organized training programmes on latex collection and preservation, sheet rubber processing and grading and effluent treatment in North East region. Evaluated three sets of sheet rubber samples from NE region. Identified the actual problems in production and were rectified. Two "Quality Upgradation Programmes" were conducted at Santarampara RPS and Hrishi Das Colony RPS in Tripura. Officials from the Division visited RRS Taranagar farm of RRII and suggestions were made for improving the quality of sheets. Faculty training was organized at regional offices in NE region at Agartala, benefiting 26 officers of the Board.

4.4. Quality Inspection of sheet rubber / evaluation of smoke house / furnace

The Division did joint quality inspections of sheet rubber procured by NMCE at various godowns of Central Warehousing Corporation (CWC), on payment basis. Besides, the Division evaluated the performance of smoke house and cast iron furnace designed by M/s Lohasilpi and issued certificate.

4.5. Technical consultancy

Consultancy services were provided to M/s Kamadhenu Estates, Kulasekharam, Tamil Nadu on RSS and TSR production, M/s. Devika Latex, Thiruvilwamala, Kerala on CENEX, M/s. Zach Rubber Pvt. Ltd, Kerala on operations of effluent treatment plant and to M/s. Ideal Crumb Rubber Factory, Palakkad on TSR production. The Division conducted field evaluation of Aurosap VP 568, a releasing agent supplied by M/s. Auropol India (P) Ltd., to test the effectiveness of reduction of stickiness in RSS.

4.6. Phone in programme and Radio programme

Officers of the Division attended 'phone-in programme' at Rubber Board Call Centre, Kottayam and provided technical guidance to farmers. Besides, the officials of the Division

participated in the interview on "Processing of rubber and rubber wood" as part of the 'Vayalum Veedum' programme broadcasted by All India Radio, Thiruvananthapuram.

4.7. Inspection for issue of Processors' licence

Conducted inspection for issuing licence to six rubber processing companies, of which two were in Tamilnadu and four in Kerala.

4.8. General

The RPMD Division provided faculty support services for conducting "Farmers awareness programmes" jointly organized by NMCE and Kasargod District Rubber Marketing and Processing Co-operative Society. The officials of the Division functioned as coordinators as well as faculties in ASAP programme being jointly conducted by RTI and Government of Kerala for Junior Rubber Technician and Laboratory Chemist courses.

The Division took the initiative for recovering outstanding dues from Co-operative Societies and Processing Companies and collected ₹ 36.42 lakh, including interest worth ₹ 7.43 lakh.

5. Factory Management Division (FMD) – PLPC and MTSR Factory

Factory Management Division had set up a latex centrifuging factory as Pilot Latex Processing Centre in 1987 at CES, Chethackal for processing latex collected from own field and from RPSs in the neighbourhood into cenex. FMD had also setup Model Technically Specified Rubber (MTSR) Factory in 2001 at Manganam, Kottayam.

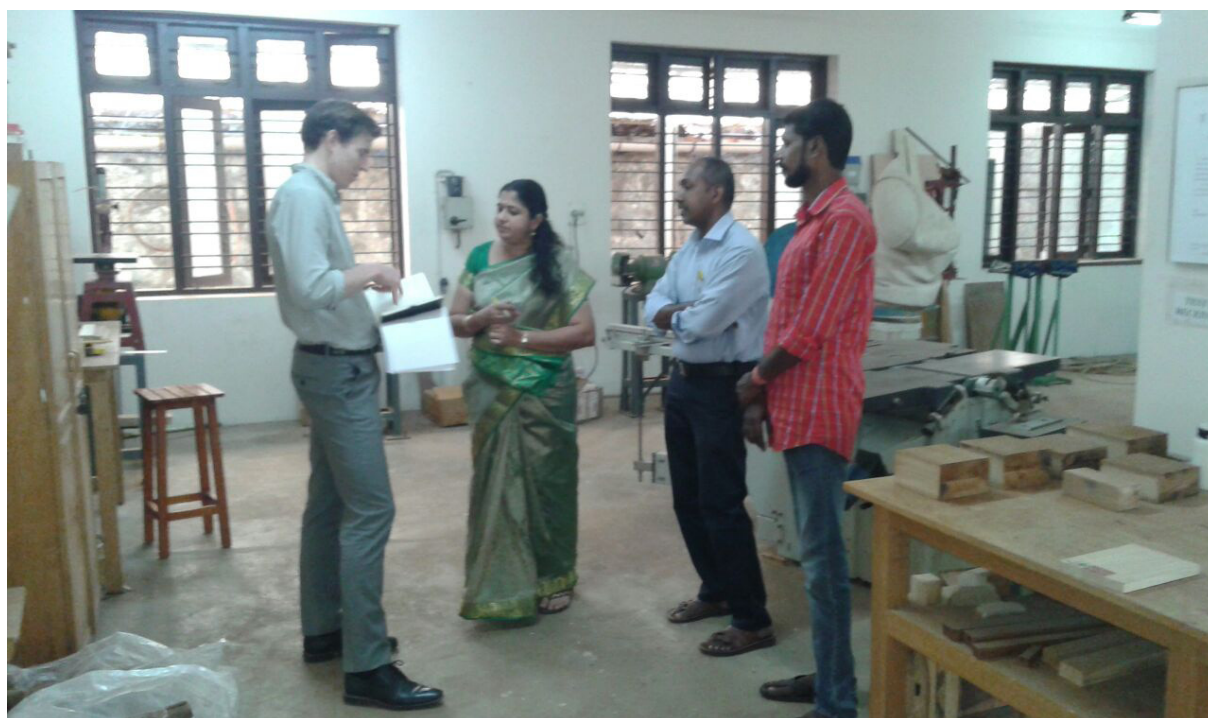
Due to heavy accumulated losses and negative net worth, the operations of PLPC and MTSR factory were stopped. Currently, PLPC is leased by M/s. Zach Rubber Pvt. Ltd for five years for an amount of ₹ 6.65 lakh. Regarding MTSR factory, the future scope and the financial status of the factory was reported to the Ministry and the revival of MTSRF is under consideration of the Ministry of Labour, Government of India.

Internal and Extra Budgetary Resources (IEBR) fund generation

The IEBR fund generated by Rubber Board through P&PD Department during the reporting year was ₹ 70.28 lakh. The break-up of sources are furnished below in Table-52.

Table- 52 IEBR generated by Rubber Board through P&PD Department in 2016-17

Sl. No.	Head of account	IEBR generated (₹ in lakh)		
		Up to February 2017	During March 2017	Up to March 2017
1	Refund of WC loan - Co-operative Societies	5.55	0.00	5.55
2	Refund of WC loan - Processing Companies	0.00	23.49	23.49
3	Interest received - Co-operative Societies	0.46	0.00	0.46
4	Interest received - Processing Companies	0.00	6.97	6.97
5	Consultancy- Engineering	0.26	0.00	0.26
6	Consultancy - RP&MD	1.09	1.08	2.17
7	Consultancy - Rubber Wood Laboratory	3.58	0.00	3.58
8	ISI marking fee	3.15	0.00	3.15
9	Lease rent	3.34	3.31	6.65
10	Testing fee - P&QC Laboratory	12.92	0.00	12.92
11	Testing fee - Rubber Wood Laboratory	1.97	0.51	2.48
12	Other receipts	2.53	0.07	2.60
Total IEBR generated (₹ in lakh)		34.85	35.43	70.28



Discussion with Mr. John Larson from M/s Swedish Wood Corporation on testing of Swedish wood



PART - VII

TRAINING

The Rubber Training Institute (RTI), the Department of Training of the Board, addresses the growing training requirements of the rubber sector in the country. Training is one of the priorities of Rubber Board under the Rubber Act. The Institute, established in the year 2000, has the mandate for human resource development in all sectors of the NR industry comprising production, processing, marketing and product manufacture.

The range of clientele of the RTI is from small farmers to large plantation companies and from cottage industry entrepreneurs to large manufacturing companies. Rubber dealers, processing companies, marketing firms, farmers and co-operative initiatives are all clients of the RTI. The range of personnel to be trained spreads from students to experienced rubber technologists/ industrialists, tribal farmers to plantation executives, village level rubber dealers to exporters, rural women's self-help group (SHG) members to corporate executives.

The Institute has designed more than 70 different course modules of widely varying subjects and periods. Besides, specialized/ advanced follow up trainings are designed and delivered according to specific demands from industry. The RTI is an ISO 9001-2008 certified establishment committed to meet the training needs of the sector so as to ensure availability of skilled manpower.

The Quality Policy of the Institute is to continually improve the effectiveness of the training programmes through the Quality Management System to ensure satisfaction of the clients.

1. Objectives of the Institute

- Improvement of technical knowledge and skill of stakeholders consisting of farmers, processors, product manufacturers and traders for achievement of cost and quality competitiveness and developing competent manpower for rubber plantation, processing, marketing and rubber product manufacturing sector.
- Entrepreneurship development for rubber based small and medium scale industry
- Skill development training to youth for employment and to meet skilled manpower requirement.
- Re-skilling/up-skilling programmes to existing manpower in these sectors to make up their skill gap and adopt scientific/cost effective practices.
- Leadership development on improving the business skill of Rubber Producers' Societies (RPSs), Rubber Marketing Co-operative Societies and SHGs.
- Academic curriculum linked training of students for improving employability.
- Updating technical competitiveness and improvement in the efficiency of officers and staff of Rubber Board
- Sharing of knowledge and skills through international training programmes

2. The Structure

For focused planning and execution, the Institute has four Divisions viz.,

- Rubber Plantation Development (RPD)
- Rubber Industry Development (RID)
- Rubber Extension Development (RED)
- Human Resources Development (HRD)



Annual Training Calendar, incorporating programmes of all Divisions is prepared in advance and programmes are conducted as per the schedule for the various target groups. Besides, need based and collaborative focused programmes are also organized. Being adjacent to the Rubber Research Institute of India, RTI is benefited by the excellent laboratory and library facilities of RRII. The Institute has three demonstration laboratories for: i) latex product manufacturing, ii) dry rubber product manufacturing, and iii) quality control of latex and dry rubber based compounds and products. It also has state of the art training halls, computer laboratory, library, well equipped auditorium and a hostel. The RTI has a core faculty of four senior officers besides 125 senior scientists/ engineers/ technical personnel/ officers of the Board, specialized in various fields of the rubber sector. A faculty bank is also maintained by RTI, comprising experts from external sources in various disciplines.

3. Course planning

Course objective is fixed based on the training needs of the clientele and accordingly content is developed. Further modifications, if required, are made based on the need analysis of the participants on the first day. Course materials/ training aids are prepared and pre/ post evaluations are carried out.

Training methodology followed include:

- i) Lecture session using PowerPoint presentation, ii) Field/practical demonstration, iii) Video films, iv) Estate/ Factory visit and Interaction, v) Group discussions, Case studies / brain storming session, etc.

4. External funded projects for skill development

Apart from the above, RTI undertook the following external funded projects for skill development.

4.1. Rubber industry sector- Collaborative project with M/s ASAP, Govt. of Kerala

RTI undertook collaborative projects with Additional Skill Acquisition Programme (ASAP), Higher Education Department, Government of Kerala, to enhance employability of students, such as:

- Lab Chemist Course on Incoming raw material testing for B.Sc. students
- Junior Rubber Technician Course for plus two students

RTI imparted training for 174 students with a project cost of ₹ 20.00 lakh during the year and got approval for 225 students at an outlay of ₹ 26.50 lakh for 2017 – 18.

4.2. Rubber plantation sector – Programmes under PMKVY scheme of GOI

The Institute launched a new project in collaboration with Rubber Production Department of Rubber Board, under the Pradhan Mantri Kaushal Vikas Yojana of Government of India (GOI). RTI submitted two state specific projects to the Ministry of Skill Development and Entrepreneurship (MSDE), GOI, to address the skill gap and shortage of skilled manpower, in the job roles of tapping and processing, through re-skilling/ up-skilling and new skilling programmes respectively. The two projects submitted are:

- **Recognition of Prior Learning (RPL) Programmes:** Re-skilling/up-skilling of Latex Harvest Technicians/Processing Technicians in Kerala.
- **Short Term Training Programme:** For new skilling of unemployed youth in Kerala, Tripura and Assam.

Of these, the Ministry approved the former programme for Kerala for 10,000 persons. On successful completion of the first phase of the RPL Project in Kerala, the Ministry gave approval for 22,040 participants from five states viz., Kerala, Karnataka, Tamil Nadu, Tripura and Assam for providing RPL training



in four job roles. The financial outlay for RPL was ₹ 2.80 crore for the Phase I and ₹ 6.17 crore for Phase II, inclusive of all costs. The special project submitted to MSDE, for

imparting new skill to 16,500 persons in Kerala, Tripura and Assam, for different job roles with total project cost of ₹ 13.20 crore, is under consideration.

5. Training programmes

Details of programmes organised during the year 2016-17 are furnished in Table 53.

Table : 53 Highlights of Training Programmes of RTI : 2016-17

Sl. No.	Programmes	No. of trainings	No. of participants	No. of mandays
A. Calendared programmes of RTI				
1	Plantation Development Programmes	45	935	1,541
2	Rubber Industry Development Programmes including ASAP courses	114	1,108	3,534
3	Rubber Extension Development Programmes	39	2,296	4,057
4	Human Resource Development Programmes	23	826	1,191
5	International Training Programmes	3	7	62
	<i>Sub-Total (A)</i>	<i>224</i>	<i>5,172</i>	<i>10,385</i>
B. External funded skill projects				
1.	ASAP Project, GoK- Industry sector	3 Courses in 6 batches	174	6,680
2.	PMKVY-RPL Project, GoI- Plantation sector: Collaborative Project with RPD	2 Job roles in 334 batches	10,000	30,000
	<i>Sub-Total (B)</i>	<i>340</i>	<i>10,174</i>	<i>36,680</i>
Grand total (A) + (B)		564	15,346	47,065

5.1. Rubber Plantation Development Division

This Division focuses to impart scientific knowledge for proper location specific rubber cultivation practices for achieving increased production and productivity at reduced cost without compromising quality. Latest research findings in the fields of cultivation and processing were given due emphasis in the programmes. The highlights were the trainings given to:

- Officers of the Bodoland Territorial Council, Assam

- Tribal trainees along with Project Officers from Integrated Tribal Development Agency (ITDA), Odisha on location specific crop production.
- SC categories from Tripura and Assam under the regional training programme for productivity enhancement and quality upgradation.

Thrust was given on low frequency tapping (LFT) and intercropping combined with field demonstrations and skill upgradation. The activities of the Division are grouped under six major heads.



5.1.1. Rubber Plantation Development Programmes

- i. Short term training in rubber cultivation for small growers.
- ii. Short term training in rubber cultivation for estate sector.
- iii. Short term training in rubber cultivation for growers from Northeast and Non-Traditional (NT) region in India (need based).
- iv. Advanced training in rubber cultivation and plantation management (need based).
- v. Specialized training in rubber plantation management (need based).
- vi. Training in rubber cultivation for government officials/agricultural officers of State government and NT region.
- vii. Specialized training in testing of soil/ organic manure

5.1.2. General Training Programmes

Focused training in various aspects of rubber cultivation and processing are organized as per schedule and on need basis. The areas of training are:

- i. Beekeeping in rubber plantations
- ii. Mushroom culture (using rubberwood waste)
- iii. Spraying and maintenance of sprayers
- iv. Bio gas generation from effluent
- v. Latex harvest technology
- vi. Nursery management
- vii. Pests and disease control
- viii. Budding techniques
- ix. Modern clones
- x. Rubber wood processing, furniture making and quality control

- xi. Root trainer plants
- xii. Clone identification
- xiii. Soil and water conservation in rubber plantations
- xiv. Rain guarding
- xv. Low frequency tapping (LFT) and Controlled upward tapping (CUT)
- xvi. Manuring
- xvii. Lining, pitting, terracing and planting
- xviii. Intercropping
- xix. Planting and upkeep

5.1.3. Training programmes for students

Short term programmes are arranged in cultivation and plantation management, on need basis, for students from Agricultural Universities / other academic institutions.

5.1.4. Outstation programmes

Regional training programmes are arranged, including for SC category, in NE/ NT regions.

5.1.5. Sastradarshan programmes

Visit cum interaction programmes for students from Agricultural/VHSC/Botany disciplines are organised to RTI and RRII for familiarising with the activities/ laboratories and also to have interaction with experts.

5.1.6. International training

- i. Advanced training on Rubber Cultivation and Plantation Management (need based).
- ii. Overseas training in rubber cultivation

Achievements of the RPD Division are provided in Table 54



Table : 54 Training imparted under RPD Division: 2016-17

Course code	Course Title	Participants	Duration (days)	No. of batches	No. of participants	Mandays
a) Rubber Plantation Development Programmes						
RC 01	Short term training in rubber cultivation for small growers (in Malayalam)	Rubber Growers /Farmers	5	1	6	30
RC 02	Short term training in rubber cultivation for estate sector		5	1	11	55
RC 03	Short term training in rubber cultivation for growers from NE/NT region	ITDA trainees from Baripada, Odisha	5	1	35	175
RC 05	Specialized training in cultivation for estate sector	From estate sector	3 -10	2	2	13
RC 06	Regional programme for SC category for NE region on productivity enhancement and quality upgradation	Officials from Soil Conservation Dept., Kokrajhar, BTC, Assam	3	1	7	21
Sub total				6	61	294
b) General Training Programmes						
GT 01	Bee-Keeping	Rubber Growers /Farmers	1	1	35	35
GT 03	Spraying and maintenance of sprayers		1	1	12	12
GT 05	Latex Harvest Technology (LHT)		2	4	58	116
GT 07	Pest and disease control	Rubber Growers /Farmers	1	1	5	5
GT 08	Budding techniques		1	1	7	7
GT 09	Modern clones		1	1	9	9
GT 14	Rain guarding	Rubber Growers /Farmers	1	1	16	16
GT 15	Low frequency tapping and controlled upward tapping		1	2	37	37
GT 16	Manuring		1	1	2	2
GT 18	Intercropping in rubber	Growers/ interested persons	1	3	49	49
GT 20	Specialized training on Latex Harvest Technology	Rubber Growers /Farmers	1	1	2	2
Sub Total				17	232	290
c) Training programme for students						
ED 04	Rubber cultivation and plantation management	Students	1	1	54	54
ED 08	Internship (Skill course) -Floriculturist (Protected cultivation) of ASAP	ASAP students	16	1	13	208
Sub total				2	67	262



d) Out station training programmes						
DT06	Regional programme for SC category for NE region for productivity enhancement & quality upgradation	SC growers from South Anandanagar and Haridas colony RPS, Agarthala, West Tripura,	3	2	40	120
	Nursery, tapping & processing	SC growers from Hahara, Guwahati	3	1	20	60
Sub Total				3	60	180
e) Sastradarshan						
VT 01	Sastradarsan programme	Students from Botany/ Agricultural/ VHSC/	1	17	515	515
Grand total				45	935	1,541

5.2. Rubber Industry Development Division

The Division addresses training needs of processing, product manufacturing and marketing sectors of rubber industry. Major thrust areas are technical updation, quality improvement and cost reduction which indirectly contribute in improving marketability of NR. The Division also conducts entrepreneur development and educational programmes towards employment generation and in meeting the technical as well as skilled manpower requirement of rubber industry.

RTI collaborated with professional bodies and Universities in India for conducting advanced programmes for industry personnel and academic students respectively. Programmes to be highlighted are: specialized training in testing and quality control of rubber and rubber products for defense personnel, Entrepreneur Development Programme (EDP) /quality improvement programmes, skill development programme funded by ASAP for employability enhancement of students, and international training programmes. RTI provided placement support for needy candidates. Activities are grouped under nine major heads.

5.2.1. Rubber processing and quality improvement programmes

- i) Short term training in rubber processing and quality control.
- ii) Training in sheet rubber processing and grading.
- iii) Specialized training on processing of block rubber/cenex (need based).
- iv) Training in Total Quality Management (TQM) and ISO 9000 Quality System (need based).
- v) Training in effluent treatment and pollution control (need based).

5.2.2. Rubber industrial development programmes

- i) Short term training in latex goods manufacture.
- ii) Short term training in dry rubber goods manufacture.
- iii) Advanced training on rubber products development and manufacture (need based).
- iv) Specialized training in testing and quality control of rubber and rubber products (need based).



- v) Specialized training in latex and dry rubber products (need based).
- vi) Training in entrepreneur development in rubber Industry (need based).

5.2.3. Training programmes for students

Programmes are arranged in rubber product manufacture and testing for Diploma / PG Diploma / B.Tech / M.Tech students.

- i) Short term training in rubber products manufacture and testing
- ii) Training in rubber technology for B.Tech./ M.Tech. students (need based)
- iii) Specialized training in rubber technology for P.G. Diploma students and other students (need based)
- iv) Faculty improvement programme in rubber technology
- v) Short term training in entrepreneur development in rubber industry.
- vi) Project work in rubber technology

5.2.4. Market and export development programmes

- i) Short term training in marketing and export management
- ii) Training in export management
- iii) Training in agriculture marketing in association with NIAM.

5.2.5. Outstation training programmes

Need based programmes in entrepreneur development and quality control in industry are organized.

- i) Orientation training in rubber based industry.
- ii) Training in quality control of different marketable forms of NR

5.2.6. Sastradarshan Programmes

Visit cum interaction programmes for students in rubber technology from VHSC/

Diploma/B.Tech/M.Sc/B.Sc. disciplines are conducted to RTI and RRII for familiarising with the activities/ laboratories and also to have interaction with experts.

5.2.7. Collaborative programmes

Advanced programmes in specific topics in collaboration with professional bodies are arranged on need basis.

- i) Advanced training in rubber products manufacture
- ii) Orientation programme cum placement drive
- iii) Trainers' training programme
- iv) Entrepreneurship development programme

5.2.8. International training

Advanced training in rubber products manufacture and testing (need based).

5.2.9. External funded projects

The Division undertook collaborative project with Additional Skill Acquisition Programme (ASAP) to enhance employability of students.

- ▶ Lab Chemist: Incoming raw material testing – Summer Skill School for B.Sc. completed students (Crash programme)
- ▶ Lab Chemist: Incoming raw material testing – Regular course for B.Sc. first year completed students (Round the year programme)
- ▶ Junior Rubber Technician: Regular course for plus one completed students (Round the year Programme)

Placement support was also given for needy candidates. Achievements of the RID Division are in Table 55.

**Table : 55 Training imparted under RID Division during 2016-17**

Course code	Course Title	Participants	Duration (days)	No. of batches	No. of participants	No. of mandays
1. Rubber processing and quality improvement programmes						
RP 02	Sheet rubber processing and grading	Growers/ Processors/ Dealers/consumers/ Entrepreneurs	2	5	68	136
RP 03	Specialized training in -Testing of latex, DRC, ISNR, Effluent, latex foam, ISNR production and QC	Persons from rubber processing and product manufacturing units	1 -5	14	23	66
RP 04	Specialized training in testing of DRC of NR latex	Technical persons from Rubber Sector	2	1	2	4
RP06	Rubber wood processing & quality control	Persons from rubber processing and product manufacturing units	5	1	2	10
Sub total				21	95	216
2. Rubber industrial development programmes						
RM01	Short term training in latex goods manufacture	Entrepreneurs/ manufacturers/ traders	5	4	57	285
RM02	Short term training in dry rubber goods manufacture	Entrepreneurs/ traders/ manufacturers/ consumers	5	4	45	225
RM03	Advanced training in rubber products manufacture	Defence Personnel	5	1	10	50
RM04	Specialized training in testing and quality control of rubber and rubber products	Technical persons from Mumbai	5	2	12	60
RM05	Specialized training in latex and dry rubber products/ compounding	Research fellow from Mangalore University/ Tech. person from EKM.	1 to 4	6	32	36
Sub total				17	156	656
3. Training programmes for students						
ED01	Short term training in rubber products manufacture and testing	Students from SB College, Govt. Polytechnics (Mumbai, Nattakom and Koratty), Engineering colleges (MIT, Madurai Kamaraj, UCET & STAS of MG University)	5 -10	10	235	1,641



ED02	Rubber technology	B.Tech. students from CUSAT, Cochin	20	1	20	400
ED06	Specialized training in rubber technology	Amrita School of Engineering, Coimbatore	5	1	1	5
Sub total				12	256	2,046
4. Market and export development programmes						
MD01	Specialized training in marketing management.	Marketing personnel from RI International	1	1	9	9
5. Out station training programmes						
DT03	Entrepreneurship (orientation training in rubber based industry) DIC, Pathanamthitta	Entrepreneurs	½	1	78	39
DT03	Entrepreneurship development programme at CFSC, Changanassery	Entrepreneurs	1	1	30	30
	Workshop on Rubber products manufacture	Participants of Public Sector Undertaking/ rubber industry	1	1	21	21
Sub total				3	129	90
6. Sastradarsan						
VT01	Sastradarsan programmes	BSc Students/ Lab Chemist, ASAP		8	267	267
7. External funded project – ASAP, Government of Kerala						
ED10	Lab chemist course SSS: 1 batch. Completed training and internship	Lab Chemist students, Govt. College, Nattakam	60	1	30	1,800
ED10	Lab chemist course Regular : 1 batch (Internship is ongoing)	Lab Chemist students, Govt. College, Nattakam	30	1	32	960
ED09	Junior Rubber Technician course : 4 batches (Internship is ongoing)	Students from Velloor, Ponkunnam, Kodakara and Perumbavoor	35	4	112	3,920
Sub total				6	174	6,680
Grand total				111	1,086	9,964

5.3. Rubber Extension Development Division

The focused topics for this decentralized programmes were LFT, intercropping, manuring, disease management and apiculture. Thrust was given to activities for generating additional income and practices for cost reduction. Programmes were also conducted in non-traditional areas for creating awareness for the adoption of scientific / cost effective practices towards sustainability of the plantation industry in the context of instability in NR prices and other challenges. Massive Skill Development Programmes under the Prime Minister's Kaushal Vikas Yojana (PMKVY) were the major activity undertaken.

HR training programmes were arranged in collaboration with Central Board for Workers Education, Kochi at Tribal RPSs towards empowerment and capacity building of backward communities.

The newly introduced programmes under the Division are:

- PMKVY- RPL Training
- Certificate course in apiculture
- Training on computer application/data entry for RPS/SHG members
- Empowerment of SC/ST, and
- Agro-management in non-traditional areas.

The details of programmes conducted by the Division under these heads are given in the following sections.

5.3.1. External funded project under PMKVY: RPL training for plantation sector

Massive skill development programmes under the PMKVY were undertaken by RED Division in collaboration with RP Department of Rubber Board. The training programmes conducted are:

i. Recognition of Prior Learning (RPL) Programmes

Phase I of the RPL project for Kerala to impart re-skilling/up-skilling covering 10000 participants was successfully implemented. The Project was successfully executed during November 2016- January 2017. Of the total 10000 participants trained through 334 centres under 26 Regional Offices in 12 districts in Kerala, 9221 were certified. On completion of Phase I, a structured post-evaluation survey was conducted and 34 per cent increase in the skills of tappers trained under the programme was found. The monthly yield in the holdings tapped by these trained tappers showed an increase of 16 per cent.

ii. Short term training for new skilling

The special project submitted by RTI for new skilling of unemployed youth in Kerala, Tripura and Assam is under consideration for approval by MSDE, GOI, is to be implemented by through the Division.

5.3.2. Certificate course in Apiculture

A one year certificate course in apiculture was conducted in collaboration with one of the RPSs on trial basis towards promoting entrepreneurship and also to generate ancillary income from rubber plantations.

5.3.3. Training for RPS sector

This is a need based programme for Directors of RPSs, enabling capacity building of societies. The main objective is to improve the skills in entrepreneurship, small business management, accounting, collective decision making, problem solving and other leadership qualities. The programmes conducted are:

- i. Training in Business Management Skills to RPS members/Director Board members of RPS/Rubber Board promoted processing/trading companies.



- ii. Training for collection agents of RPSs: To develop them as agents of social change in RPS.
- iii. Training in computer application/data entry.
- iv. Training in marketing/business management to RB promoted companies: To improve competency to take challenges and innovative practices.

topics were imparted and the one to be highlighted was training in LFT, which was in much demand.

5.3.5. Visit cum training programmes (Sastradarsan)

Rubber growers, members of cooperative societies, RPSs and others in rubber production and processing get an opportunity to visit RTI, RR II and rubber processing factories/laboratories and interact with scientists and technologists. These are conducted on Thursdays.

5.3.4. Outstation training programmes

These programmes are sponsored by RTI in selected locations and conducted as per demand from RPSs, product manufacturing firms, etc. Need based trainings on specific

Achievements of RED Training Division are furnished in Table 56.

Table : 56 Trainings imparted under RED Training Division

Course code	Course Title	Participants	Duration (days)	No. of batches	No. of participants	No. of mandays
a. Training for RPS sector						
RE 01	Training for Director Board Members of RPS	Members of different RPSs	2	1	13	26
RE 03	Training for Collection agents of RPS	Collection agents of RPSs	2	1	6	12
RE06	Computer application / data entry for RPS/SHG	Members of RPSs	2	1	18	36
MD03	Marketing / Business management	MDs of Processing/ Trading Co's. promoted by Rubber Board	3	1	14	42
Sub total				4	51	116
b. Certificate course in Apiculture						
	Certificate programme in Apiculture (one year) - collaborative programme with Palakkad RPS	Growers/ interested persons from Rubber Sector	Round the year prog.	2	65	1,560
Sub total				2	65	1,560
c. Outstation training programmes						
DT01	Training at RPS centers	RPS/SHG members	1	19	1,704	1,704
DT05	Empowerment of ST beneficiaries - capacity building prog. in collaboration with Central Board for Workers Education, Kochi	ST beneficiaries from Plantation Sector	1 to 2	4	243	425
Sub total				23	1,947	2,129



d. Sastradarsan (Visit cum training programmes)						
VT 01	Sastradarsan	Growers / RPS members/ Students	1	8	125	144
VT 02	Sastradarsan	TT School Trainees	1	1	15	15
Sub total				9	140	159
Workshop on promotion of LFT/CUT and massive launching of skill development programmes for rubber plantation sector		Extension Officers and RPS Presidents	1	1	93	93
Total (a+b+c+d)				39	2,296	4,057
e) External funded Project – PMKVY RPL Project, Govt. of India						
RPL LHT	RPL Programme - Job Role – Latex Harvest Technician	Tappers	3	309	9,280	27,840
RPL PT	RPL Programme - Job Role – Processing Technician - Rubber Sheeting	Persons engaged in RSS processing	3	25	720	2,160
Sub total				334	10,000	30,000
Grand total (a+b+c+d+e)				373	12,296	34,057

5.4. Human Resources Development Division

The programmes of the Division are mainly aimed at improving technical and managerial competency of employees of the Board. During the year, training was imparted only to selected categories due to paucity of funds.

Focus was given for up-skilling extension personnel of RP Department to undertake challenging and innovative activities towards sustainability of plantation sector. Achievements of the HRD Division are provided in Table 57.

Table : 57 Trainings imparted under HRD Division: 2016-17

Course code	Course Title	Duration (days)	No. of batches	No. of participants	No. of mandays
TE 02	Refresher training for Junior Assistants / Assistants / Stenographers	9 to 15	2	16	204
TE 11	Training in E-Extension techniques to selected Extension Officers	3	1	22	66
TE 12	Refresher training for Field Officers in NE	3	1	34	102
TE 12	Training for Extension Officers and Office Staff on Management Skills–Model Office	3	1	19	57
TE 17	Refresher training for JRTTO/RTDs	1	1	37	37
TE 27	Sampling of NR and RSS grading	3	1	1	3
ToT	RPL/PMKVY- ToT/SDMS training for Extension Officers	2	4	202	404
SDMS	RPL/PMKVY – SDMS training for Junior Assistants	1	4	29	29



Workshops					
On Cashless transactions/ Productivity enhancement		Half day	1	92	46
On Productivity enhancement		Half day	1	40	20
On File Management		Half day	1	36	18
Management Lecture Series on Good Governance to Officers and Staff of the Board		Half day	1	200	100
Sub total			20	821	1,179
HRD training programmes in external agencies					
Self-management through personal profiling – MANAGE		4	1	1	4
India Rubber Expo IRE 2017, Chennai		3	1	2	6
Training in Mentoring – M/s. Green Management Consultancy (P) Ltd., Trivandrum		2	1	1	2
Sub total			3	4	12
Grand total			23	825	1,191
International Training					
INT 01	Officers from Ethiopia	9	1	5	45
INT 01	Technical person from Ivory Coast	5	1	1	5
INT 02	Chemical Engineer from Colombia	12	1	1	12
Total International Trainings			3	7	62

6. Physical and financial performance of RTI: 2016 - 17

During the financial year 2016-17, the Department was allocated of ₹ 185 lakh, under the Human Resource Development Scheme. For administration purpose, it was further apportioned into various components viz. training programmes, regional training

programmes, training facilities development, demonstration laboratories, hostel and infrastructure development. ₹ 146 lakh was generated through various programmes of which 110 lakh was from PMKVY-RPL Skill Project.

Table : 58 Summary of physical achievements of RTI: 2016-2017

Target	Achievement	Beneficiaries	Mandays
3500 beneficiaries	Calendared programmes including ASAP courses	5,346	17,065
	PMKVY - RPL : RTI - RPD collaborative Project:	10,000	30,000
	Grand total	15,346	47,065



RPL Project of Rubber Board was inaugurated by Sri. Rajiv Pratap Rudy, Union Minister of State, Ministry of Skill Development and Entrepreneurship, on 13th December 2016

RPL Training -Theory & Practical session, Assessment and Certification



**Table : 59 Financial performance of RTI at a glance: 2016-17** (₹ in lakh)

Sl.No.	Schemes	Budget sanction	Actual expenditure
1	Training programmes	₹185.00	6.56
2	Training facilities development		7.16
3	Demonstration lab		0.69
4	Apiculture		0.35
5	ASAP		6.50
5	PMKVY-RPL		1.72
Operating expenditure (Pay & Allowances)			166.41
Wages and garden maintenance			37.05
TOTAL (₹ in lakh)			226.44

The comparison of the budget sanction and actual expenditure under Plan scheme shows that the Training Department utilized 100 per cent of the sanctioned budget during the year.

**PART - VIII****FINANCE & ACCOUNTS**

The Finance & Accounts (F & A) Department is concerned with designing and operating the Accounting system, preparing budget, financial statements and reports, exercising budgetary control, effective resource planning and funds management, establishing and maintaining systems and procedures, and arranging for statutory audit, advising on financial propriety and regularity of transactions, overseeing cost control, evaluation of projects/ schemes, handling tax matters etc.

F & A Department undertook the following activities during the year :

1. Preparation of Annual Budget, Performance Budget, etc
2. Review and Revision of budget under Zero Based Budgeting and exercising budgetary control.
3. Maintenance of the accounts of the Board, preparation of Annual Accounts and Balance Sheet, presentation of accounts for audit to Principal Director, Commercial Audit, Chennai and the audited accounts to the Board/ Ministry/ Both the Houses of Parliament.
4. Placing demands for grant from Government from time to time, receiving funds from Government and ensuring its optimum utilization.
5. Advising on financial propriety and regularity of transactions and regulating payments of the Board.
6. Assisting the Cost Accounts Branch of the Ministry of Finance in ascertaining the cost of production of natural rubber (NR).
7. Preparation of financial statements for project reports and schemes.
8. Suggesting measures for augmenting the Internal and Extra Budgetary Resources (IEBR) of the Board
9. Dealing with Central Income Tax, Agricultural Income Tax, Service Tax and Sales Tax / VAT matters relating to the activities of the Board.
10. Co-ordinating the activities of the companies jointly promoted by the Rubber Board and RPS.
11. Computerized data processing in the field of financial accounting, pay roll, etc.
12. Drawal and disbursement of pay and other entitlements of the employees of the Board based on the orders issued by Government of India from time to time.
13. Work connected with on boarding of PFMS platform for DBT by registering with the PFMS, training and preparation for making payments.
14. Work regarding Rubber Skill Development under PMKVY.
15. Management of Pension Fund and General Provident Fund and regulating disbursements therefrom.

Annual Accounts 2015-16

Annual Accounts of the Board for the year 2015-16 were presented to the Principal Director of Commercial Audit and Ex-officio Member, Audit Board, Chennai within the stipulated time. The Annual Accounts for the year 2015-16 along with the Audit Report from the Principal Director of Commercial Audit, Chennai were placed in both houses of Parliament before due dates.

**Revised Estimates 2016-17 and Budget Estimates 2017-18**

The Revised Budget for 2016-17 and Budget Estimates for 2017-18 were prepared and submitted to Government.

Budget sanctioned for the year 2016-17 was 148.75 crore comprising ₹ 91.41 crore under Plan and ₹ 57.34 crore under Non Plan, as against which the actual expenditure for the year was ₹ 182.61 crore (Plan ₹ 121.34 crore and Non Plan ₹ 61.27 crore). Internal and Extra Budgetary Resources (IEBR) fund was ₹ 21.38 crore comprising of ₹ 5.59 crore under Plan and ₹ 15.79 crore under Non-Plan.

Budget sanctioned for the year 2017-18 is ₹ 142.60 crore.

Management of Funds*General Fund*

A fund amounting to ₹ 148.75 crore was received from Government of India as

budgetary support during the year 2016-17. The fund raised from internal resources was ₹ 21.38 crore.

General Provident Fund/Pension Fund

The balance under the General Provident Fund as on 31st March 2017 was ₹ 78.70 crore and that under Pension Fund ₹ 114.24 crore. The accumulations in the funds are invested in long-term securities to obtain optimum returns. The Board is maintaining GPF accounts for 1,265 subscribers. There were 1,278 pensioners on the rolls as on 31.03.2017.

Cost Accounts

Cost Accounts division of the Finance & Accounts Department continued to collect, analyse and update cost data. Information sought for from Government, statutory bodies and other agencies were furnished as and when required.



PART - IX

LICENSING AND EXCISE DUTY

Transactions in natural rubber are regulated by licences issued by the Board under the Rubber Act 1947 and the Rubber Rules 1955. The Act provides for levy of a cess on all rubber produced in India. This cess is collected from the manufacturers who use such rubber. The amount so collected, reduced by the cost of collection, is credited to the Consolidated Fund of India and then be paid by the Central Government to the Board for being utilized for the purposes of the Act, if Parliament by appropriation made by law in this behalf so provides.

The Licensing and Excise Duty Department is entrusted with the task of issuing licences to deal in rubber, purchase or otherwise acquire rubber for processing / manufacture of rubber based products, collection of cess on rubber and enforcement of various provisions of the Rubber Act, 1947 and the Rubber Rules, 1955. The Department has three Divisions viz., Excise Duty, Licensing and Revenue Intelligence functioning from Kottayam and nine Sub-offices, one each located in New Delhi, Mumbai, Kolkata, Chennai, Kanpur, Jalandhar, Ahmedabad, Agartala and Guwahati.

1. EXCISE DUTY DIVISION

The ED Division discharges the functions of issue and renewal of licence to manufacturers, registration of authorizations issued by manufacturers to their purchase agents, assessment and collection of cess on

rubber and remittance of the cess so collected to the Consolidated Fund of India. Further, the Division processes the cases of unpaid cess to initiate revenue recovery proceedings, takes action against violators of the provisions of the Rubber Act and the Rubber Rules, conditions of licence, etc.

Assessment and Collection of Cess:

During the year, the Division collected ₹ 10,364 lakh towards cess on rubber against the target of ₹ 10,200 lakh. In addition, ₹ 66.87 lakh was collected towards interest on belated payment of cess. With the collective efforts of ED Division and the Sub Offices, Division detected various irregularities/flouting of Rules committed by some manufacturers involving 17,363 tonnes rubber and initiated compounding action.

Issue of Licence:

For the year 2016-17, the Division issued/ renewed licence to 4,295 manufacturers to purchase / otherwise acquire rubber.

Table:60 Details of Licences issued during 2016-17

Sl.No.	Type of Licence	Numbers
1.	New licences issued	237
2.	Licences renewed	4,058
Total Licences issued		4,295

**Table:61 State-wise distribution of licences issued during 2016–17**

Sl. No	Name of State/Union Territory	Number of units
1	Andhra Pradesh	132
2	Assam	7
3	Bihar	1
4	Chandigarh	1
5	Chhattisgarh	9
6	Delhi	104
7	Goa, Daman, Diu	22
8	Gujarat	427
9	Haryana	311
10	Himachal Pradesh	23
11	Jammu & Kashmir	2
12	Jharkhand	24
13	Karnataka	189
14	Kerala	734
15	Madhya Pradesh	61
16	Maharashtra	500
17	Odisha	9
18	Puducherry	14
19	Punjab	395
20	Rajasthan	132
21	Tamilnadu	469
22	Telangana	9
23	Tripura	4
24	Uttar Pradesh	393
25	Uttarakhand	24
26	West Bengal	299
TOTAL		4,295

Registration of authorisation:

Registered 129 letters of authorisation issued by manufacturers to their purchase agents. Special letters of authorisation were issued to 16 institutions to purchase rubber for experiment / research purposes.

2. LICENSING DIVISION

This Division deals with issue and renewal of licences to rubber dealers and processors and other related work such as agency registration, branch registration, shifting of business premises, etc. Ordinarily, licences to processors and dealers are issued initially for three years and thereafter, renewed for every five years.

Issue of Licence to Processors

Total number of licensed processors as on 31 March 2017 was 105. During the year, one fresh licence was issued for producing creamed latex and 13 licences were renewed.

Table:62 Type-wise break-up of processors

Sl. No.	Type of processing	Numbers
1.	Latex centrifuging factories	40
2.	Block rubber factories	41
3.	Creamed latex	7
4.	Combined processing units	17
Total number of processors		105

Latex collection

Permission was granted to 106 dealers for collection of field latex for ammoniation / making superior grade sheets.

Issue of Licence to Dealers

During the year under report, 542 new dealer licences were issued. Moreover, 1,512 licences were renewed. Total number of licensed dealers was 8,252 at the end of the year, as against 8,710 at the end of the previous year. The State-wise distribution of licensed dealers as on 31 March 2017 is furnished in Table – 63.

**Table:63 State wise distribution of licensed dealers as on 31.03.2017**

Sl. No.	Name of State	No. of dealers
1	Andhra Pradesh	6
2	Arunachal Pradesh	2
3	Assam	55
4	Andaman & Nicobar	4
5	Chandigarh	1
6	Chhattisgarh	1
7	Delhi	101
8	Goa	2
9	Gujarat	35
10	Harayana	52
11	Jharkhand	3
12	Karnataka	140
13	Kerala	6,686
14	Madhya Pradesh	4
15	Maharashtra	73
16	Meghalaya	3
17	Nagaland	9
18	Odisha	1
19	Puducherry	2
20	Punjab	144
21	Rajasthan	26
22	Tamilnadu	242
23	Telangana	2
24	Tripura	529
25	Uttar Pradesh	56
26	West Bengal	73
Total		8,252

Penal measures and cancellations of dealers / processors licences

During the year, neither dealer licence nor processor licence was suspended. On specific requests, 126 dealer licences and 123 registrations were cancelled as the dealers concerned did not show any interest for renewal.

Excise Duty collection / forfeiture of bank guarantee

Licensing Division collected ₹ 4.28 lakh from the dealers as compounding charges on unauthorized dealings in rubber.

Registration of branches / letters of authorisation

During the year, 872 branches were registered/ renewed while 16 of them were cancelled as requested by the licensees concerned. 192 letters of authorization for purchase of rubber on agency basis were also registered.

Approval of change of licensed premises/ constitution/additional godowns

Shifting of premises in respect of 146 dealers was approved. Approval was given for change of constitution in respect of 13 cases. 84 additional godowns were registered.

3. REVENUE INTELLIGENCE DIVISION

The main task of the Revenue Intelligence (RI) Division is prevention of cess evasion. The Division comprises its establishment cell, one central squad, five regional squads and two check posts.

Activities of Inspection Squad

Revenue Intelligence Squad functioning from Taliparamba, Palakkad, Muvattupuzha, Kottayam, Punalur and Marthandam could arrest illicit trade in rubber to a considerable extent and thereby augment cess collection. Inspections conducted by the officers helped in collecting monthly returns from a large number of delinquent dealers. Inspections were also conducted for the purpose of issuing licence to deal in rubber, registration of branches and approval of new/additional premises, issue of special authorization for collection of field latex, etc.



During the year, RI squad inspected 1,997 licensed dealers, 7 processors and 2 manufacturers and detected irregularities to the tune of 7,867 tonnes of rubber. The squad also conducted 155 road-checking and check post visits. Wherever irregular despatches were noticed, such cases were referred to the concerned Sub Office/ RI Squad for inspection.

Checkposts and Interstate movement of rubber

In order to strengthen surveillance of inter-state movement of rubber, checking of the documents accompanying rubber consignments was done round the clock at the check posts at Walayar and Manjeswaram, both in Kerala.

The surveillance exercised at the said check posts helped in detecting instances of illicit transport of rubber. Several consignments of rubber were detained at the check posts on valid grounds and the material was allowed to cross the border on production of valid documents/receipt of satisfactory explanation/remittance of cess/compounding charges, etc. wherever applicable.

Cross checking of monthly returns / Form N declarations.

Monthly returns and the copies of Form N declarations received from various dealers/ manufacturers/ processors/ estates were cross checked/ scrutinized at random. Wherever discrepancies/ irregularities were noticed, explanation/ clarification were called for from the licensees concerned and appropriate action was taken.

Issue of 'N' forms

During 2016-17, the RI Division issued 977 books containing 12,736 Form 'N' books meant for inter-state transport of rubber as required under Rubber Rules, 1955 to various Offices, manufacturers, processors, dealers and estates and received 53,385 numbers of Form 'N' declarations (copy to Rubber Board) at the Division.

4. SUB OFFICE ACTIVITIES

The nine Sub-offices stationed at New Delhi, Mumbai, Kolkata, Chennai, Jalandhar, Kanpur, Ahmedabad, Guwahati and Agartala pursued remittance of cess, submission of various returns, licence renewal applications, etc. and conducted inspections in the respective jurisdiction. The officers also kept vigil on the movement of rubber transported inter-state. As a part of austerity measures, the Board merged the sub offices at Bengaluru and Secunderabad with the Regional Office, Mangalore and sub office, Chennai respectively with effect from 31 March 2017.

The guest houses at Chennai and Mumbai were closed and the premises of Mumbai, Chennai and Jalandhar sub offices were shifted to low-rent buildings.

Officers posted in these sub-offices altogether had conducted 1851 inspections/ visits, which helped in detecting irregularities in many cases involving unauthorized dealings in rubber and contributed to realization of cess/compounding charges. In addition, 116 inspections were conducted in connection with issue of NOC for clearance of imported rubber and 359 visits were made as part of liaison works during 2016 – 17.

5. COMPOUNDING OF OFFENCE:

Contravening any provision of the Rubber Act or any rule made under the Act is punishable with imprisonment or with fine or with both. However, section 26A of the Act provides for compounding of offences committed in respect of any quantity of rubber. During the year, with the collective efforts put in by the sub-offices, check posts, squad units and the three Divisions, the Department could collect ₹110.10 lakh from different offenders as compounding charges.

**SUMMARY**

Overall performance of the Department during 2016-17 is as follows in a nutshell:

(a) Number of manufacturers licences issued for 2016-17	4,295
(b) Number of dealer's licences as on 31st March 2017	8,252
(c) Number of processor's licences as on 31st March 2017	105
(d) Number of inspections/other visits conducted	4,614
(e) Quantity of rubber involved in irregular/ unlawful transactions detected (in tonnes)	25,230

Assessment of Cess and Collection of Cess/ compounding charges

(f) Number of assessments made during the year	8,754
(g) Amount assessed during the year	₹ 10,373 lakh
(h) Amount of cess collected during the year	₹ 10,364 lakh
(i) Amount of interest collected during the year	₹ 66.87 lakh
(j) Amount of compounding charges received during the year	₹ 110.1 lakh
(k) Amount of licence fee collected	₹ 33.0 lakh



PART - X

MARKET PROMOTION

The Market Promotion Division consists of four units viz., Market Intelligence Cell, Export Promotion Cell and Domestic Promotion Cell functioning at Kottayam, and a Marketing unit functioning at NRETC, Agartala to support the marketing activities in NE region. The major functions of each division are as follows:

a) Market Intelligence Cell

Market Intelligence Unit collects, compiles and disseminates market price of different grades of natural rubber (NR) and rubber wood. During 2016-17, this Unit collected daily price of sheet rubber (RSS-4 & RSS-5 grades), block rubber (ISNR-20 grade) and centrifuged latex (60% drc) at Kottayam and Kochi. Besides, price of higher grades of sheet rubber, block rubber and pale latex crepe were collected and published on a weekly basis and price of field coagulum

rubber thrice a week. International prices from Bangkok and Kuala Lumpur markets were also collected and published daily. Price information was made available to the public through different media like newspaper, website, IVRS and SMS. 93 new subscribers were enrolled for SMS mode of price dissemination during 2016-17.

Besides, rubber wood prices were uploaded in Board's website. Daily prices were uploaded in the websites of the Board www.rubberboard.org.in and www.indiannaturalrubber.com. The Division started publishing rubber prices in Agartala also during the year. Monthly average price of RSS-4, RSS-3, ISNR 20, SMR 20, and 60% centrifuged latex in the domestic and international markets during 2016-17 are furnished in Table – 64.

Table : 64 Price of Natural Rubber (2016 – 17) (₹ per Quintal)

Month	Sheet Rubber		ISNR 20/ SMR 20		Latex 60% drc	
	Kottayam RSS 4	Bangkok RSS 3	Kottayam ISNR 20	Kuala Lumpur SMR 20	Kottayam	Kuala Lumpur
April 2016	13,062	11,416	12,225	9,930	10,298	8,208
May	13,076	11,231	11,714	9,137	10,187	8,161
June	13,375	10,556	11,500	8,558	9,891	7,435
July	14,177	11,788	11,936	8,656	9,392	7,465
August	13,850	11,305	11,477	8,719	8,152	7,430
September	12,142	10,814	9,728	9,124	7,292	7,553
October	11,692	11,253	9,848	9,916	7,178	7,935
November	12,214	12,677	10,964	11,271	7,545	8,527
December	13,370	15,105	12,243	12,971	8,290	9,516
January 2017	14,666	17,654	13,683	14,843	8,981	11,022
February	15,942	18,451	14,565	14,804	10,158	12,223
March	15,024	15,889	13,183	13,025	9,561	11,044
Average	13,549	13,178	11,922	10,913	8,910	8,877



b) Export Promotion Unit

Rubber Board is the designated Export Promotion Council (EPC) for export of natural rubber. The Board as the EPC issued 3 new Registration-cum-Membership Certificates (RCMC) and renewed 23 RCMCs, to export natural rubber from India. Board introduced a fee of ₹ 5,000 (taxes extra) for issuance of RCMC as done by other EPCs. Volume of NR exported in 2016-17 increased to 20,920 tons compared to 865 tons in the previous year. Of this, 66 per cent was in the form of Centrifuged latex, 31 per cent as ISNR grades and the rest 3 per cent as RSS grades.

Indian NR was mainly exported to Malaysia (29%), China (23%), Brazil (10%), USA (8%), Belgium, Iran, Egypt, Netherlands, Germany so on. The country-wise Export of NR from India during the year is provided in Table-65.

Table:65 Country wise Export of Natural Rubber (2016-17)

Product	Country	Export Volume (MTs)
Natural Rubber HS Code 4001 - ISNR, RSS and 60% drc Latex	Malaysia	6,085
	China	4,863
	Brazil	2,114
	USA	1,774
	Belgium	1,193
	Others	4,891
	Total	20,920

As part of export promotion, Board undertook the following activities during 2016-2017.

- 1) Participation in Trade Fairs – In order to promote exports of NR and to propagate the concept of branding natural rubber, Board participated in 2 international fairs held at China, and Turkey during 2016-17.
- 2) Branding of NR – The brand “Indian Natural Rubber” is initiated to differentiate Indian NR in the international market.

Accordingly, the brand ‘Indian Natural Rubber’ is awarded to export consignments on confirmation of quality parameters defined by the Board. Board ensured quality features of the branded materials by carrying out necessary laboratory tests and inspections. During the year 2016-17, 13,267 tonnes of NR was branded. More than 64 per cent of NR exported from India was branded.

- 3) Training Programs – In order to improve the marketing system of rubber in North Eastern states, we had organized training programs on Agricultural Marketing to rubber growers in the region with the funding from National Institute of Agricultural Marketing (NIAM), Jaipur. The awareness program was conducted in two schedules, one for Assam & Meghalaya and another for Tripura. Division Organized six EDP programs during November 2016 for the benefit of rubber growers in Assam & Meghalaya region and conducted four EDP programs during December 2016 in Tripura region. About 300 growers attended the programs.

c) Domestic Promotion Unit

Domestic Promotion Unit monitored the import of natural rubber into the country. Details of import through various ports, under different channels and grades were collected and compiled. The Unit also coordinated Board’s participation in domestic trade fairs held at Chennai and Arunachal Pradesh related to rubber industry. Promotional materials like INR brochures, posters and display materials were brought out. Trade information portal www.indiannaturalrubber.com was updated with latest information and current data.



PART - XI

STATISTICS AND PLANNING

1. Broad functions and activities

Key functions of the Statistics & Planning Department of the Board are:

- i. Administration of official statistics of all aspects of the Indian Rubber Industry
- ii. Publishing of statistics through monthly and annual publications.
- iii. Surveillance on the Indian and global rubber industry and identifying issues having potential implications for the demand and supply of Natural Rubber (NR).
- iv. Planning and organization of periodical surveys and preparation of analytical reports on need basis.
- v. Preparing long-term forecasts of demand and supply for NR in India.
- vi. Drafting analytical reports on domestic rubber industry and report through statistical publications of the Rubber Board.
- vii. Rendering statistical services to international inter-governmental rubber organizations.
- viii. Servicing meetings of the 'Internal Statistics Monitoring Committee (ISMC)' and 'Statistics Consultative Panel (SCP)' to examine the key estimates, to review the quality of estimates and its methodology and make revisions thereof including projections.
- ix. Facilitate consultations with stakeholders.
- x. Rendering support services to the Rubber Research Institute of India in designing

field and laboratory experiments.

- xi. Monitoring domestic purchase of natural rubber by auto-tyre companies on a weekly basis by collecting weekly purchase reports.

During 2016-17, the Department collected information from growers, processors, traders and end-use product manufacturers through monthly and annual returns. Monthly sample surveys were carried out in small holdings for assessing tapped and tappable area, type-wise production and stock of natural rubber by considering regional variations in productivity, level of adoption of recommended agro-management practices, tapping system and harvesting practices.

New sampling design introduced in 2015-16 for conducting sample survey was used in 2016-17. An Internal Statistics Monitoring Committee (ISMC) scrutinised key variables and projections. Monthly trends in production, consumption, import, export and stock of natural rubber, synthetic rubber and reclaimed rubber and prices was published through monthly publication "Rubber Statistical News".

Four meetings of Statistics Consultative Panel (SCP) were held to take care of the salient points while compiling rubber statistics of the country. Based on its recommendation, a survey in one lakh small holdings was carried out by utilizing the services of extension officers of the Board through RPS for assessing tapped area, percentage of untapped area, age profile, production,



availability of tappers, level of adoption of cost effective tapping systems etc. Prepared the manual “Statistics of Indian Natural Rubber Industry –definitions, sources and methods” and circulated among members of SCP. Applied validation techniques on production data by using three estimators, viz; the quantity directly purchased by manufacturers, the quantity of NR directly purchased by dealers from small growers and the quantity of NR disposed of by dealers to manufacturers. The Department rendered information services to the Central Government, State Governments, different

governmental and non-governmental bodies, industry associations, research institutions, international bodies individuals and the media. The Department prepared updated statistics, projections and policy changes pertaining to the Indian rubber sector for submitting to the Association of Natural Rubber Producing Countries (ANRPC) and International Rubber Study Group (IRSG).

The Department published the annual Publication “Indian Rubber Statistics”, Volume 37, 2016 covering data for three years viz., 2013-14, 2014-15 and 2015-16.



PART - XII

**LIST OF MEMBERS OF THE
RUBBER BOARD**

**The tenure of the last Board expired on 28 February 2014.
The Board was not re-constituted by Government of India
during the reporting year.**

