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Rubber Cultivation in North Eastern Region

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The consumption of natural rubber in India has been increasing consistently during the last few years. The production in the year 1985/86 was 200,000 tonnes while the consumption was 235,000 tonnes. It is estimated that consumption of natural rubber would be to the tune of 500,000 tonnes by 2000 A. D. Expecting improvement in average productivity to 1250 kg/ha by then, a tappable area of 400,000 ha would be required to produce this quantity. Including immature areas, the total rubber area needed to bring about this output would be 500,000 ha. To meet this demand, the Rubber Board has taken up various steps to accelerate the production, both by maximising the output from the existing plantations and by introducing rubber to new areas. There is not much scope for expanding rubber cultivation in the traditional rubber growing tracts in Kerala and Tamil Nadu due to limitation of cultivable land and certain other socio-economic factors. Therefore attempts were made to explore the possibility of cultivating rubber outside the traditional belt. Experimental plantings were taken up in Karnataka, North Eastern Region, Konkan area of Maharashtra, Goa, Orissa, Andaman and Nicobar Islands, Jalpaiguri and Darjeeling districts of West Bengal etc.

The agro-climatic condition of North Eastern Region is suitable for raising rubber plantations even though the prolonged winter and summer retard the growth of the rubber plant to a little extent. The total area that can be straightaway planted with rubber in the North Eastern Region could be of the order of 100,000 hectares. Assam alone has prospects for a minimum 50,000 hectares. Tripura's share could be about 25,000 hectares and other States and Union Territories may contribute atleast 25,000 hectares. The figure could be even higher.

Geographical locations and agro-climatic conditions.

The North Eastern Region comprises of the five states of Tripura, Assam, Meghalaya, Manipur, Nagaland and two Union Territories of Arunachal Pradesh and Mizoram. Geographically the region lies between 22° and 28° in the north latitude and is far out side the normal rubber growing tracts of the World, which are confined to the tropical regions within 10° to 15° on either side of the equator. The temperature touches the lowest range in January, which coincides with the wintering in rubber trees. Hailstorms observed in this region occasionally cause injuries to foliage and bark of the trees. However, these factors are not likely to be adverse. The climatic conditions are nevertheless unique, in as much as near tropical features are obtained in most of the parts owing to low elevation, exposure to monsoons, protection of the hill ranges and other moderating influences.

Public Sector

Tripura: The climatic conditions in Tripura are better for rubber plantation than in other States and Union Territories of the North Eastern Region. The first rubber plantation was started in Tripura by the Forest Department in various localities such as Pathichari and Manu as early as 1963. Till 1976, the Forest Department raised 418.45 hectares with avilable improved seedling varieties. These plantations were eventually transferred to Tripura Forest Development and Plantation Corporation Limited (TFD& PC), established in 1976. The State Government took up large scale rubber plantation through TFD & PC. With the development of rubber plantations under TFDPC along with private rubber plantations, Tripura has by now emerged as the 4th largest rubber growing State in India, growing more than 60% of the rubber area so far developed in the North East. The Corporation has up till now planted rubber in an area of over 5000 hectares. There are at present 30 centres spread all over the State through its three divisions with 9 Centres in Bagafa, 11 Centres in Sadar and 10 Centres in Kumarghat. Implementation of the work is more or less according to schedule and the performance of the plantations is satisfactory. Owing to technical as well as managerial lapses, the plantings have suffered heavy casualities and the condition in

a sizeable area is downright poor. The Centre-wise and division-wise achievements in development of rubber plantations are indicated in Table-1.

About one-third of the state population is tribal, who mostly inhabit the isolated inaccessible hilly areas. The benefits of development programme have not adequately percolated to these areas. Most of the people in these areas live below the poverty level. The tribal population practices shifting cultivation. Shifting cultivation which is locally known as "Jhuming" is a primitive form of agriculture, in the process of which the forest growth in the hills irrespective of the degree of slope is cut and burnt, to prepare the land to raise agricultural crops. In Tripura, the Jhum crop is raised only for one year and then a new forest area is selected in the next year. The process is repeated year after year. They shift from one place to other for jhuming. Shifting cultivation is a very destructive practice which causes considerable soil erosion, loss of fertility, siltation of river beds and reservoirs, sand casting on agricultural fields making them unfit for cultivation, natural havoc like flood and drought etc. With a view to rehabilitating the jhumias mainly through rubber cultivation, the State Government set up in 1983 another Corporation styled as Tripura Rehabilitation Plantation Corporation Limited. The Corporation operates a scheme to provide 1.50 hectares to each family for rubber plantation and I hectare for homestead cultivation. They plan to settle more than 1500 tribal families during the VIi plan period. So far they have raised 238.5 hectares of rubber plantation. (Table. II)

Choice of Crop

Rubber has been selected as a main plantation crop to support the settlers because of the following advantageous factors.

a) The hilly and undulating areas are not suitable for conventional agriculture. Most of the project areas are lying unutilised. These were either jhumed or cleared for growing agricultural crops, but ultimately rendered unproductive. These areas are not suitable now either for jhuming or for permanent agriculture. But rubber plants will grow here well.

b) Rubber cultivation is labour intensive and can provide regular employment throughout its rotation period of 32 years, until it has stopped giving economic yields. It is estimated that every 1.6 hectares of plantation will provide regular employment to one person in Tripura.

c) Rubber Plantation is capital intensive. Major part of the expenditure for establishment of the plantation during the immaturity period of 7 years is spent as labour wages. This helps in increasing the purchasing power of the people, by circulation of money and improves the rural economy.

d) Rubber is a crop of good economic return. Of all the plantation and horticultural crops grown in the State rubber probably gives the highest net income regularly every year after it comes to production.

e) The tribal people are already accustomed to raising large scale rubber plantation in this State. Rubber can be grown easily by the jhumias under proper technical supervision and guidance.

Regional Office and Regional Research Centre

For the purpose of giving local publicity and technical assistance, the Board opened a Sub Office in Tripura in1967. The Officers have been ever since giving technical assistance to the State Governments, the Tripura Forest Development and the Plantation Corporation Ltd and also to private entrepreneurs, in all aspects of rubber cultivation and production. The office was upgraded into a Regional Office in 1980 for stepping up the activities and providing financial assistance for the expansion of cultivation. Apart from this, two Offices of Junior Field Officers were opened in 1983 at Udaipur and Kumarghat. A field office was opened at Aizwal, Mizoram in 1975 which had, however, to be closed down within a couple of years in view of the limited scope of work. A second Regional Office in the N. E. Region was established in 1980 at Gauhati in Assam. The technical officers of the Gauhati Office also give extension support and financial aids to the Assam Plantation Crops Development Corporation Ltd., Soil Conservation Departments of neighbouring States/Union Territories and a few private entrepreneurs who have taken rubber plantings recently.

In order to take care of the immediate research needs, the Rubber Research Institute of India established a Regional Research Centre at Taranagar in Tripura in the year 1979, to evolve suitable clones and for developing agro-management practices under the specific agro-ecological conditions of North Eastern Region. The various experiments are listed below:-

1. 15 clones of *Hevea* are being compared for their relative performance under the agro-ecological conditions.
2. To evolve optimum dose of fertilizers for rubber.
3. To compare suitability of different planting practices such as polybag and conventional budded stumps of various ages.
4. To compare the growth rate and yield potential of 12 clones under Tripura conditions against their performance in traditional rubber growing tracts.
5. To compare the suitability of various types of cover crops.
6. To study the economics of growing various inter-crops in rubber plantations.

7. To arrive at the optimum density of rubber plants per unit area.
8. To improve the genetic stock of rubber by mutation breeding.
9. To find out the growth, yield etc of the polyclonal seedlings.
10. To find out the effect of stock plant on the growth of scion.
11. To find out the influence of environmental factors. physiological, parameters in *Hevea brasiliensis*.
12. For multidisciplinary evaluation of clones.

The Centre will also cater to the demand of this region in technical advice, improved planting materials training of personnel etc. The State Government allotted 66.40 hectares of land for the establishment of this Centre. Since most of the areas already allotted have been brought under rubber, action has been taken to procure additional 50 hectares of land for laying further trials. Bud mother plants of 22 improved high yielding clones exist in the budwood nursery at present. The centre also maintains a nursery for making available nucleus materials of modern high yielding rubber cultivars to the growers in the region. A soil and leaf testing laboratory was established in 1982 in Agartala for the benefit of rubber growers in this region. This laboratory helps the growers to adopt discriminatory fertilizer uses based on soil and leaf analysis, which is the most efficient and economic method of manuring rubber plants.

Assam

The introduction of rubber in the State by some individual growers and tea gardens dates back to the beginning of the 19th century. These plantations were subsequently abandoned as the species tried did not include *Hevea brasiliensis* and were found to be uneconomic.

Cultivation of rubber was also taken up by the Forest Department in association with other forest species as evidenced by the existence of a few rubber trees in Bilaipur areas of Cachar. This appeared to be at the local initiative rather than by virtue of any plantation policy. Systematic cultivation of rubber however dates back to the mid-fifties. This was adopted by the Forest Department as a solution to the ill effects of shifting cultivation extensively practised in the hill districts of Assam. On the basis of their performance, cultivation of rubber was continued and extended to different centres of both Karbi Anglong and N. C.Hills districts, with seeds brought from South Indian States. Departmental efforts were progressively increasing as the number of trial-cum-demonstration plots were continued. The tempo has been substantially cut down following the formation of the Assam Plantation Crops Development Corporation Limited which has been assigned the expansion programme in the hills on a large scale.

The Soil Conservation Department whose activities were initially confined to the Hills Districts alone, were finally extended to the plain districts since the year 1960. Accordingly, trial planting of rubber was started in the districts of Goalpara, Kamrup, Darrang, Lakhimpur, Dibrugarh and Cachar on a limited scale, An area of 336.27 hectares has been planted upto 1985 with clonal and unselected seedlings.

Production of rubber

Plantations raised in the earlier years in Tripura, Assam and Meghalaya are now under tapping. Better maintained and carefully tapped areas are yielding 800 kg of dry rubber per hectare a year in the plantations of Tripura Forest Development and Plantation Corporation. The production of rubber from the tapping blocks has increased from an average of 22.95 kg per block per month during 1982-83 to 32 kg per block per month during 1983-84. The year-wise production of dry sheet and scrap rubber in this Corporation from 1976 to 1985 is persented in Table IV. There are four small growers in Tripura whose areas have come into tapping. One small holder obtained 600 kg of dry rubber in the first year of tapping, 800 kg in the second year and 900 kg in the third year of tapping from one hectare of plantation. The planting material used was old clonal seedlings. This indicates that plantations raised with modern high yielding budded stumps may easily give an annual yield of 1000-1500 kg per hectare.

The Soil Conservation Department in Assam is producing a few tonnes of rubber from their trial plantations every year, though the trees are fully tapped.

Planting materials

All the States and Union Territories in the North Eastern Region are now poised for large scale expansion of rubber cultivation. To meet the demand of high yielding planting materials of the region, the North Eastern Council had financed establishment of two 10—hectare nurseries in 1979, one in Tripura and the other in Assam, and a 10-hectare nursery each in Tripura, Assam, Meghalaya, Manipur, Mizoram and Nagaland during 1981. These NEC-aided nurseries in Assam and Tripura, together with the nureries established by the public sector Plantation Corporations, have been able to produce enough high yielding budgrafts in the two states. The Tripura Forest Development and Plantation Corporation has also raised two NEC-aided nurseries during 1982—83. The public sector nurseries in Tripura are now in a position to produce 15 lakhs budded plants annually.

New Scheme Approved

In order to ensure comprehensive and organised rubber development, the Rubber Board has proposed a 16 year accelerated programme exclusively for the North Eastern Region in three phases. The first and second phases are of 3 year duration each. The first phase commenced in 1984. By 1989-90 the second

phase will also be over. The third phase is for a period of 10 years from 1990 to 2000 A. D. During the first two phases the target is to complete fresh plantings in 24,000 hectares. The 3rd phase will put up 70,000 hectares of new plantation in 10 years.

The first and second phases have been approved by the Government of India at an outlay of over Rs. 6 crores. To facilitate speedy implementation of the programme the following infrastructural facilities have been planned.

a) Strengthening the existing Regional Research Centre at Tripura and establishing new centres at Meghalaya, Asam, and Mizoram.

b) Establishing a Nucleus Rubber Estate-Cum-Training Centre at Tripura in 1,000 hectares which will be developed as a demonstration farm and training ground for the personnel of North Eastern Region.

c) Establishing a full-fledged and self contained Zonal Office of the Rubber Board at Gauhati with adequate power for sanctions of plantation subsidy and provision of technical and extension assistance to the whole North Eastern Region.

d) Opening a new Regional Office at Silchar. in addition to the ones existing in Tripura and Gauhati, besides starting several field extension Centres.

The respective Governments have allotted land for establishing research stations at Sonapur in Assam, Ganolgre and Darachigre in Meghalaya and Kolasib in Mizoram. Multidisciplinary evaluation of clones was started in these stations as in the existing centre at Tripura. The programmes initiated in 1986 include experiments on rubber based cropping systems, carpet area of intercrops and block planting of modern clones.

Suggestions for improvement of the Existing plantations

1) The benefits and economics of rubber cultivation and the assistance provided by the Rubber Board and credit facilities available from commercial banks should get widely propagated among the land owners. Widespread awareness campaigns have to be mounted throughout the length and breadth of the NE Region.

2) Considering the fact that most of the plantations are opened in virgin lands and the climatic conditions favour very dense weed growth mainly *Impreata Cylindrica* at least six rounds of weeding are required during the second year and five rounds in the third year of planting.

3) The efforts put in for the establishment of cover crops is meagre in most of the plantations. *Pueraria Phaseoloides* should be shown during the year of planting itself.

4) Discriminatory fertilizer usage based on soil and leaf analysis may be adopted in the existing plantations especially from the fifth year of planting onwards.

5) Tapping in most of the plantations in the North Eastern Region is done by unskilled labourers, who either under-exploit the trees or wound them seriously. It is necessary to make arrangements for training sufficient number of tappers on scientific methods of tapping.

6) Most of the plantations in this region have lot of vacancies. Care should be taken for filling up the vacancies as soon as noticed.

7) In some of the plantations there is dearth of competent staff to supervise tapping, collection and processing of latex etc. This can be solved by expert advice from the Rubber Board.

8) Apart from planting materials, many other materials like fertilizer mixtures, plant protection chemicals, sprayers and dusters, polythene tapes for budding, polythene bags for poly-bag plants, budding knives, tapping knives, spouts, collection cups, chemicals, sieves, bulking tanks, coagulating pans and rubber rollers (sheeting machines) are required in rubber plantations. Many of these materials are brought from Calcutta, and some like budding and tapping knives and rubber rollers are even now being brought all the way from Kerala. Apart from the high cost and long delay in the supply, equipments like rubber rollers often get damaged during transport from Kerala to this region. It is therefore, necessary to have a Regional Service Centre located either in Assam (Gauhati or Silchar) or in Tripura (Dharmanagar or Kumarghat) to manufacture and / or supply as many of these inputs as possible to the rubber growers in this region. Construction of smoke houses has also been found to be problematic.

9) Major diseases of rubber like abnormal leaf fall or pink disease are not observed in Tripura. However shoot rot incidence was found in Meghalaya in the Umling and other plantations. In the Kohra Plantations belonging to the Soil Conservation Department of Assam, bark diseases were noticed. Since the climatic conditions in Meghalaya and Assam appear to favour the incidence on diseases of rubber, Planters may take appropriate prophylactic measures in consultation with Rubber Board.

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TABLE 1

The Centre-wise achievement in development of rubber plantations by T.F.D & P.C.*

Name of Centre	Rubber Plantations during						
	upto 1980	1981	1982	1983	1984	1985	Total
1	2	3	4	5	6	7	8
Sadar Division			(in hectares)				
Pathalia	93.40	50.50	15.5	–	–	–	159.40
Guliray	4.70	-	–	–	–	–	4.70
Warrangbari	183.00	1.86	–	–	–	–	184.86
Rupachera	267.48	–	–	–	–	–	267.48
Kalamchora	56.25	100.00	100.00	56.00	54.00	60.00	426.25
Karangichera	30.00	75.00	41.00	27.50	30.00	30.00	233.50
Padmanagar	-	–	71.00	25.00	–	–	96.50
Matinagar	-	–	–	20.00	56.00	70.00	145.00
Dhanpur	–	–	–	20.00	45.00	–	65.00
Kaikalia	–	-	30.50	20.00	–	–	50.50
Bankumari	30.00	6.00	19.00	20.00	–	–	75.00
Total	664.83	233.36	277.00	189.00	185.00	160.00	1,709.19
SOUTH DIVISION							
Pathichery	80.25	–	–	–	–	–	80.25
Kalshimukh	133.48	55.50	3.00	–	–	–	191.89
West Ludhua	189.80	47.00	38.00	–	–	20.00	294.80
Sachirambari	279.90	25.00	18.50	19.50	–	–	342.90
Takmachera	268.00	46.00	62.00	26.00	–	–	402.00
Abengchera	201.50	71.50	48.00	48.00	120.00	26.60	515.60
Paikhola	–	–	50.00	53.00	46.50	68.00	217.50
Gourifa	–	–	–	50.00	100.00	90.00	240.00
Ekinpur	–	–	–	–	–	15.00	15.03
TOTAL	*1152.95	245.00	219.50	196.50	266.50	219.60	2300.00
NORTH DIVISION							
Manu	2.80	–	–	–	–	–	2.80
Ratachera	241.50	22.00	1.50	–	–	–	265.00
Juri	371.00	40.00	9.40	-	-	–	420.40
N. C. Para	252.50	20.00	–	–	–	–	272.50
Panitilla	–	62.00	68.00	80.00	60.00	26.00	296.00
Nalkata	–	46.00	18.50	–	–	–	64.50
Sailenbari	–	67.00	61.00	–	–	–	128.00
Kanchanbari	–	–	38.00	60.00	64.00	100.00	262.00
Saiderpar	–	–	30.50	–	60.00	60.00	150.50
Rewa	–	–	–	–	–	35.00	35.00
TOTAL	867.80	257.00	226.90	140.00	184.00	221.00	1896.70

Source : Office of the Managing Director, TFD & PC

TABLE II

The District-wise achievement in raising rubber plantations by TRPC *

Name of Centre	Rubber Plantation during 1984	1985	Total plantation upto 1985
	(in hectares)		
SADAR DIST			
Promodnagar	75.00	30.00	105.00
SOUTH DIST.			
Karbook	–	45.00	45.00
NORTH DIST.			
Abhanga	–	34.50	34.50
Dulubari	–	54.00	54.00
TOTAL	75.00	165.00	238.50

* Source : Office of the Managing Director, TRPC.

TABLE III

Area under Rubber upto 1985 in Assam, Meghalaya, Mizoram, Manipur, Arunachal Pradesh and Nagaland. (in hectares)*

	Public Sector	Private Sector
Assam	1167.52	799.62
Meghalaya	1251.43	6.78
Mizoram	406.80	–
Arunachal Pradesh	30.75	–
Manipur	335.00	4.85
Nagaland	316.00	17.91

*From Zonal Office, Rubber Board, Guwahati and Regional Office, Agartala.

TABLE IV

Year-wise production of dry sheet rubber and scrap rubber (in kg.) under the TFD & PC*

Year	Sheet rubber	Scrap rubber	Total
1	2	3	4
1976-77	19,361.00	843.00	20,204.00
1977 78	26,775.00	1,408.00	28,183.00
1978-79	32,339.80	2,545.50	34,885.20
1979-80	36,087.82	3,044.87	39,132.69
1980-81	48,886.37	3,246.26	52,132.64
1981-82	73,515.52	10,964.18	84,479.71
1982-83	92,832.21	11,167.79	1,04,000.00
1983-84	1,16,383.50	16,163.82	1,32,547.32
1984-85	1,31,839.69	15,634.10	1,47,473.79

*Source : Office of the Managing Director, TFD & PC.