
ECONOMIC IMPLICATIONS AND PRODUCTION PROCEDURE OF RUBBER PLANTATION IN DIMORIA REGION, KAMRUP (M), ASSAM- A CASE STUDY

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Abstract: Rubber is one of the most versatile industrial raw-materials which find use in a variety of diversified activities, ranging from clinical to defense. It literally turns the wheels of industry and there is hardly any walk of life where rubber is not used. Rubber is an elastomeric which has a natural source as well as a synthetic analogue, known as synthetic rubber. Natural rubber accounts for 78% of the consumption in India where as the global consumption of rubber are 64% synthetic and 36% natural rubber. The social and economic benefits of rubber plantation produce are new jobs, renewable raw-materials, and absorbing carbon emissions. Rubber plantation creates a host of jobs, from directly rubber harvesting activities to those created indirectly to support the needs of the plantation workers. The agro-climatic conditions of NER are quite similar to that of South-West coastal region- the traditional rubber plantation area in terms of rainfall, humidity, temperature and suitable soil structure. It is

for this reason the NER registered itself in the list of non-traditional region of rubber growers. In Dimoria region there are about thirty numbers of Rubber Plantation gardens. Villagers in this hilly area on the city outskirts have found way to stretch their income-growing rubber. The paper presents a case study of the rubber plantation of this locality.

Keywords: *Tapping, Coagulation, Rural Employment, Economic Rehabilitation*

Rubber in North East Region of India:

The agro-climatic conditions of NER are quite similar to that of South-West coastal region- the traditional rubber plantation area in terms of rainfall, humidity, temperature and suitable soil structure. It is for this reason the

NER registered itself in the list of non-traditional region of rubber growers. The trial plantations in undivided Assam and Tripura in 1960 yielded very positive outcome and since then rubber plantations are growing in NER; the

state of Tripura taking the lead role. Recently the chairman of Rubber Board Ajith Kumar met Chief Minister of Assam and informed him that 58000 hectares of land in 28 districts are under rubber cultivation. About 103,500 hectares of land is under rubber cultivation in north-eastern states including Tripura, Assam, Meghalaya and Nagaland, producing 46,000 tonnes of rubber

History of Rubber Plantation in Dimoria:

Dimoria is a Block located in Kamrup Metropolitan district in Assam situated in an urban region. It is one among the 4 blocks of Kamrup Metropolitan district. Villagers in this hilly area on the city outskirts have found a new way to stretch the uncared greenery rubber which till recently were covered with wild creeper and a variety of trees. Villagers, mostly Amri Karbi community, are looking forward to a stable monthly income. Rubber has become a constant source of income. It can be harvested nine months a year. Sources said rubber cultivation had gained popularity in Assam because of the suitable agro-climatic condition as well as its economic viability. The area under rubber cultivation in the State has grown from 1,65,000 hectares in 2006-07 to 2,71,000 hectares in 2010-11 a 64 percent growth.

Rubber is one of the most versatile industrial raw-materials which are found used in a variety of activities, ranging from clinical to defense. It literally turns the wheels of industry

annually. Tripura is the second largest rubber producer in the country after Kerala with 72,000 hectares of land under plantation, producing 40,000 tonnes of rubber annually. The state's annual turnover from rubber cultivation is about Rs. 480 crore. India's second industrial park has come up in Bodhungnagar in Tripura to boost the polymer industry.

and there is hardly any walk of life where rubber is not used. Rubber is an elastomeric which has a natural source as well as a synthetic analogue, known as synthetic rubber. Natural rubber accounts for 78% of the consumption in India where as the global consumption of rubber are 64% synthetic and 36% natural rubber. Natural rubber is obtained from a wide range of plants 99% of the worlds sources of Natural rubber is 'Hevea brasiliensis' a tree native to Amazon rain forests. Commercial extraction of natural rubber started during 19th century, whereas rubber plantations were started in India during 20th century.

During the decade of 1960, soil conservation department of Assam established demonstration plot of cash crop like rubber and coffee etc. in various districts of Assam (both plains and hills). With the success of demonstration, soil conservation department has set up the Assam Plantation Crops Development Corporation in the year 1974. The basic aim to

utilize the hill slopes of hill areas of Assam suitable for more profitable use by cultivation of cash earning crops like rubber etc. along with Ginger, Turmeric, pineapple, Broom etc. for a period of 3 years till canopy of rubber plants cover the plantations. The intercropping generates extra income during the gestation period (Gestation period of rubber till maturity for production is 6-7 years).

During 1980, the corporation (APCDC) established rubber nursery at Topatoli under Dimoria Block Kamrup (M) Assam to promote rubber plantation in plain districts of Assam. Rubber plantations were started at Magursila

Rubber Production:

In Dimoria region seeds of Hevea normally ripen in June/July and during these months they are collected and seedling raised. Seeds are picked up every day during the seed fall season. Seeds should be germinated before planting on specially made germination beds. Germinated seeds are packed in boxes between layers of damp fibre, sawdust or damp charcoal powder. Level beds with a layer of river sand about 5 cm in thickness and of convenient size and shape with 90 cm width is generally made for germination. The surface of the bed should be raised to 10-15 cm to avoid water logging. Partial shade may be provided against strong sun. Germination bed should be kept in a moist, but not wet state by evenly sprinkling water

and Chandrapur in Kamrup district of Assam. Later on it expands to other district of Assam. Gradually, people of Dimoria started Rubber plantation in their own land with the help of Rubber Board of India, which gives necessary helps to the grower like technical knowhow, subsidies, arranging supply of planting materials etc. Small growers of Dimoria have set up Rubber producing Societies (RPS) for expansion of rubber plantation in Dimoria. Rubber board also established Rubber Research cum training centre at Sarutari and RRTC at Hohora under Dimoria Block Kamrup (M) Assam.

during early morning and evening. Germination starts within 6 to 7 days after sowing. Germinated seeds should be planted when the young root has just emerged and before the young shoots start developing. Germinated seeds must be carefully handled.

After Collection and Germination of seeds, as far as possible level land should be selected for raising the nursery. The first step in the preparation of the nursery is digging the soil to a depth of 75 cm and removing all stamps and stones. Bed should be prepared with 60 to 120 cm width and of convenient length, with pathways in between to facilitate watering, weeding etc. Nurseries are laid for raising seedlings, budded plants, and bud wood. The

planting distance varies according to the type of planting materials to be raised. Common spacing adopted for raising seedling stumps is 23x23 cm, 30x30 cm and 34x20 cm. One hectare flat land, after allowing space for inspection path's drain, accommodates approximately 75000-85000 seedlings. After seedling, nursery planting can be done with poly bag plants or budded stumps. One year after planting of budded source plant in the bud wood nursery, bud wood can be harvested for the first time, at 30 cm from the union. After harvesting, brown bud wood is cut into pieces of one metre length. And bud grafting consists of replacing a strip of bark of the stock with a strip of bark, containing a dormant bud taken from the scion plant and bandaging it. Transparent polythene tapes are commonly used for bandaging. The bandage should be firm enough to prevent rain

List of Dimoria Rubber Garden and Nursery:

Name of Garden/Nursery	Owner	Area
Topatoli, Central Rubber Nursery	APCDL LTD	3 Hectore
Khetri College Road	M. Baruah	5 Bigha
Khetri Nuwagaon	J. Teron	4 ¹ / ₂ Bigha
Talani	Mridul Sarmah	1 ¹ / ₂ Bigha
Tegheria	Nabin Basumatary	2 Hectore
Tegheria	Diganta Rahang	5 Bigha
Tegheria	Gubordhan Kalita	4 ¹ / ₂ Bigha
Magursila	Hareswar Rahang	2 ¹ / ₂ Bigha
Mitanni	Narayan Sharma	7 ¹ / ₂ Bigha
Magursila Rubber Estate	Soil Conservation Department	30 Hectore
Hohora	Rubber Board	88 Hectore
Magursila	Ranjit Teran	5 Bigha
Magursila	Dilip Fangcho	12 Bigha
Magursila	Prabin Rahang	8 Bigha
Komarkuchi	Deepak Basumatary	3 Hectore
Komarkuchi	Badal Rahang	5 Bigha

water from reaching the bud. The tissue of the bud patch and the seedling become firmly united three or four weeks after grafting. After grafting budding is carried out by grafting buds taken from bud wood of about one year's growth on the stock plants of 10 months or more growth. In Dimoria, budding is best done during the wet months. The planting materials for rubber plantation are seedling stumps, budded stumps and poly bag plants.

Rubber plantations in Dimoria are mostly situated on sloping and undulating lands. silly land, soil conservation measures are necessary. In Dimoria region, June/July is best season for planting and so all preparations should be completed before that period. In Dimoria, planting is done of poly bag planting. Planting can be done in hills area is 16x12 metre and in plan area 16x16 metre.

Kolongpar	Tarun Gohain	75 Bigha
Kolongpar	Pilot Ahmed	1 Hectore
Kolongpar	Bakul Jain	16 Bigha
Tegheria	Niraj Gupta	1 Hectore
Magursila	Rahul Basumatary	2 ¹ / ₂ Hectore

Pictures of Rubber Processing:



Figure 1: Tapping



Figure 2 : Mixing water and formic acid in latex



Figure 3: Coagulation



Figure 4: Smooth rolling



Figure 5: grooved rolling



Figure 6: Dry sheets



Figure 7: Smoking



Figure 8: Packing

Processing and Product Development of Rubber:

The crop from rubber tree is latex, a milky liquid, which is harvested by the process of tapping. The latex that flow out from the rubber tree on tapping is channeled into container generally plastic cups, attached to them. Latex collected into cup us transferred to clean buckets, two or three hours after tapping. Latex is coagulated in suitable containers into thin slabs of coagulum and sheeted through a set of smooth rollers followed by a grooved set, and dried to obtain sheet rubber. For processing into sheet rubber, the latex collected is brought to the processing factory before pre-coagulation sets in. A few drops of the anticoagulant are added to collection cups at the time of tapping, if necessary. Latex brought to the factory is stained

through 40 and 60 mesh stainless steel sieves. The dry rubber content is estimated with a metrical which is a special type of hydrometer calibrated to read arc directly.

Latex is diluted in bulking tanks to a standard consistency of 1/2 kg of rubber for every 4 litres of diluted latex. The diluted latex is transferred to each pans or tanks of coagulation. Formic acid or lactic acid is used for coagulation of latex. A general indication of acid requirement for coagulation is 1.5 ml of formic acid diluted in 300 ml water is used. After coagulation, the coagulum is removed from the pans or tank and thoroughly washed in running water. The coagulum passed through smooth rollers to a thickness of 3mm and finally

passed through the grooved roller. The wet sheets were dried in sheet, then transferred to smoke house for 3-5 days, finally, smoked. Rubber sheets are produced. After smoking, the next is grading. Grading is completely dried sheets and removed to the packing shed where carefully impacted and graded according to the standards as per **IS-15361-2003**. After Grading, the sheets are packed in bales of 50 kg bundle through the visual observation for sale in International market.

For the product development of rubber, the Rubber Board has developed various infrastructures for research, administration, training and extension, and process and production. In Dimoria, Rubber Board is giving technical advices to the growers for improved cultivation and extraction of rubber products. The following are the task is taken for product development of Rubber-

- Providing technical and engineering support to growers, processors, exporters and

entrepreneurs in setting up/expansion/modernization of Rubber plantation.

- Providing demonstration, training and testing facilities to Rubber plantation for value addition, testing, quality control and environmental protection.
- Implementation of various schemes to strengthen the processing and marketing of rubber produced in Dimoria.
- Implementation of various schemes for development of rubber plantation in Dimoria region through quality improvement, value addition, cost competitiveness and promotion campaigns.
- Providing technical assistance to processing for latex and sheet collection.
- Conducting export quality inspections of sheet rubber and issue of quality certificates.
- Technical assistance for reducing process wastage and cost of production

Import Policy of Rubber Products:

Natural Rubber (NR) can be imported to India free of License from 1 April 2001 on payment of prevailing import duty. The basic import duty effective from 9 January 2004 is 20% for all forms of NR except NR Latex for which it is 70%. As per provisions of GATT 1994, each WTO member country is bound to limit its import duty within a ceiling, called

bound rate, which was fixed by each member country fir different product lines and notified in its national schedule submitted to the WTO in 1994. The bound rate committed by India is 25% for all forms of NR except for NR latex for which India did not commit any ceiling on import duty. Import of NR in India during the period from 10 December 2001 to 5 August

2004 was permitted only through the customer's port of Kolkata and Visakhapatnam. The restriction on port of entry was removed on 6 August 2004. The following are the various policies through which NR can be imported to the country

• **Open channel:**

This is the general channel through which NR can be imported. Importer has to pay the prevailing import duty (called MFN tariff). The MFN tariff effective from 9 January 2004 is 20% for all forms of NR except NR Latex for which it is 70%. 4% countervailing duty has been imposed on all forms of NR, effective from 1 March 2006.

• **Bangkok Agreement:**

The Bangkok Agreement signed between India, China, South Korea, Sri Lanka and Bangladesh in 1976 provides for concession on import duty (called preferential import duty) for trade between these countries. The preferential import duty effective from 9 January 2004 in India under provisions of Bangkok Agreement is 16% for all forms of NR except NR Latex for which it is 40%.

• **Duty Entitlement Pass Book (DEPB) Scheme:**

Under this scheme, Government provided credit (called DEPB) to exporters at rates fixed for different products exported. The exporter can use the DEPB credit entered in his passbook for payment of customs duty for

further imports made under DEPB scheme. DEPB scheme introduced by the Government of India under the EXIM policy for 1997-2002 was confined to products not coming under the 'Negative List' of imports.

• **Duty Exemption Entitlement Certificate (DEEC) or Advance License Scheme:**

Duty Exemption Entitlement Certificate (DEEC), popularly called Advance License, facilitates duty free imports of raw materials in advance against commitment on export of manufactured products. DEEC is issued subject to fulfillment of time-bound export obligation. Normal validity of DEEC is 18 months after issue and it could be extended twice for durations of six months each. Government of India had put a ban on issue of DEEC for importing NR into the country from 20 February 1999 with view to check the excess supply in the domestic market.

• **Duty-Free Import Authorization Scheme:**

By the annual supplement (2006-2007) to the Foreign Trade Policy, Government of India has discontinued issuing the Duty Free Replenishment Certificate (DRFC) from 30 April 2006 and introduced a new scheme called Duty Free Import Authorization Scheme (DFIAS). Imports made under this new scheme are exempted from basic customs duty, additional customs duty, and anti-dumping duty and safeguard duty as long as certain conditions are met. This scheme allows exporters to import

the required inputs before exports. DFIA also allows exporters to transfer the scrip once the export obligation is completed.

• **Scheme for 100% EOUs and units in SEZ/EPZ:**

The 100% export oriented units (EOUs) and the manufacturing units which operate in export processing zones (EPZs) and special export zones (SEZs) can import NR free of duty.

Export of Rubber Products:

Export of rubber has been growing at a healthy double digit rates for about two decades have seen the growth rate in the last three financial years. This is a cause of concern as rubber is a sunrise sector and the potential for exports is immense notwithstanding the economic slowdown in some of the export markets. The export of rubber products

increased 5% in financial year 2015 to USD 2.82 billion from Dollar 2.74 billion in financial year. Among the world rubber economic, India's performance reached unprecedented levels in production and consumption. India occupies 4th place in production and 3rd place in consumption in the international level.

Export of rubber products from Dimoria has also increased. Approximate 500-600 tons of rubber products have exported to other state and countries.

India's trade depends considerably on the import and export of rubber related products. Manufactured goods remain the main item in imports of rubber products, while tyre and tube products accumulated a major share in export from India.

The following are the value of rubber products exported and imported-

Value of rubber products exported and imported (Rs in millions)

Year	Export	Import
2011-2012	21650.02	6458.98
2012-2013	25283.12	7703.57
2013-2014	31990.65	9259.09
2014-2015	36062.32	11291.98
2015-2016	36090.30	10200.58
2016-2017	37150.60	11157.90

Improvement of Rubber in Dimoria:

Rubber is a labour intensive crop which utilizes on an average 7 man days per hectare during its economic life span, one hectare of rubber plantation from the stage of Planting to

the level of maturity (when ready for tapping) in 7 (seven years) utilizes 1000 an days. This will ensure generate massive rural employment including employment opportunities for women

skilled, semi skilled and un-skilled. In Dimoria region many workers are engaged in the rubber garden. One hectare of rubber plantation in Dimoria region can yield up to 1.5 tonnes of dry rubber annually under average management and around more than 1.5 tonnes under scientific care. So 1.5 tonnes of rubber at present can fetch around Rs.150000 when average net income per hectare could be anything between 1, 00,000 to 1, and 10,000 per year. If family labour is engaged then the profit could be higher. In the places like Dimoria where there is large scale rural unemployment and related social problem, rubber plantation could be a solution for economic rehabilitation of the rural people.

The improvement of rubber in Dimoria has been quite developed. In Dimoria, more than 3000 people are self engaged directly or indirectly in the rubber agricultural field. The ancillary activities has provided through rubber; which is helpful in our day to day life. The

• **Prospects for Rubber Base industries in this region:**

Small scale industries can be established for manufacturing rubber bands, threads, balloons, hawai chappals, foot mates etc. for employing women and tribal beneficiaries.

Rubber being a relatively new crop in the Dimoria region, and this region being located far away from the traditional rubber growing track, special attention has to be given to identify problems relating to all aspects of

following are the various improvement of rubber in Dimoria is as-

• **Timber:**

Rubber wood with proper chemical treatment can be compared to some good quality timbers including teak etc. After economic life span of 30-35 years, while replanting one hectare can yield around 200 to 250 cub of timber. This can also form sources of fuel wood too in rural areas.

• **Apiculture:**

Rubber plant produce extra floral nectar and the yield of honey are to the tune of around 200 to 225 kg per hectare. One hectare of plantation can support about 15 bee hives.

• **Seed oil and cake:**

Rubber seed, apart from its use for raising seedlings is used for seed oil, which is mostly used in soap industry and also finds use in paint industry. Seed oil cake is used as a mix in the cattle feed.

rubber planting. The identified issues have to be addressed and scientific recommendations evolved through research activities have to be adopted to increase the financial viability of rubber plantations in the North-East region. In order to evolve location specific rubber clones suitable for the North-East region and to maximize rubber production and productivity in that area, appropriate agro management

practices have to be evolved for which scientific research is highly essential. Rubber Board has already set up Regional Research Station in important locations and many of the problems could be understood through intensive research

only. Continuation of research activity on a long term will result in addressing all problems of these areas. Hence, the research programmes like crop improvement, crop management etc. should be intensified in the North-East region.

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