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Natural Rubber Sector in Tripura: Role of Institutional Innovations§

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Abstract

Tripura's growing prominence in India's rubber map is essentially an outcome of the institutional interventions during the past five decades. These interventions have been found effective in transforming the state's agricultural sector from jhum based cultivation to commercial cultivation of NR. The major production–centric institutional interventions, viz. establishment of Tripura Forest Development and Plantation Corporation (TFDPC), Tripura Rehabilitation Plantation Corporation (TRPC), Block Planting Units — Rubber Producers Societies (BPU-RPS) schemes of Rubber Board and marketing interventions such as establishment of NR processing and rubber products units enabling value-addition have highlighted the relevance of institutional innovations in the promotion of NR in Tripura. A comparative analysis of marketing of sheet rubber has revealed the lowest transaction costs and highest marketing efficiency of TFDPC through its direct marketing strategy without intermediaries. However, the BPU/RPS have been effective in minimizing the transaction costs from the smallholder's angle. The study has suggested the development of a rubber based industrial sector in the state for the sustained growth of NR cultivation.

Key words: Institutional innovations, natural rubber, private sector, public sector, marketing efficiency, Tripura

JEL Classification: Q13, Q12, Q18

Introduction

Tripura occupies a pivotal position in India's rubber map in terms of relative shares in area, production as well as potential area identified for natural rubber cultivation. Tripura is also credited with higher utilization of potential area identified for rubber cultivation among the non-traditional rubber-growing regions in the country (Joseph *et al.*, 2009; 2010; 2012). It is the second largest rubber cultivating and producing state in India. The present status of natural rubber in the state is essentially an outcome of the institutional interventions conceived and implemented by the Rubber Board and the State Government of Tripura during the past five decades. Natural rubber (NR) cultivation was initially introduced in Tripura as a soil conservation project and in course of time, it was developed as the most commercially viable crop of the state. According to a study conducted by Joseph *et al.* (2010), there was 112 per cent increase in the annual average household income of NR cultivators. In this background, the present study was carried out to analyze the contributions of various institutional interventions in the natural rubber sector during the past five decades with following specific objectives:

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- To assess the role of institutional innovations in promotion of natural rubber in Tripura, and
- To examine the difference in marketing costs, marketing margins, price spread and marketing efficiency between the growers under institutionalized set-up and unorganized sector.

Data and Methodology

The study is both exploratory and analytical, involving qualitative as well as quantitative methods to assess the institutional interventions. To examine the status of natural rubber marketing in the state, primary data were gathered from the stakeholders in both organized and unorganized segments. The sources of data includes of Tripura Forest Development and Plantation Corporation (TFDPC), Tripura Rehabilitation Plantation Corporation (TRPC), Block Planting Units (BPU), Rubber Producers' Societies (RPS), individual farmers in the unorganized sector, dealers, Manimalayar Rubbers (a Rubber Board promoted trading company) and village traders/ sub-agents of the dealers involved in the marketing of NR.

The primary information was collected with the help of a pre-structured schedule by personal interview method during the period 2010-2012. The analysis of marketing of NR was broadly classified into two groups based on the organizational arrangements. The public sector undertakings of TFDPC and TRPC as well as smallholders under the BPU-RPS network belonged to the organized sector. The individual farmers not linked to any of the organizational networks mentioned above, represented the unorganized sector. At the disaggregate level, the data on NR marketing were collected from the four categories of growers, viz. growers under TRPC (52 beneficiaries); growers organized under BPS (82 beneficiaries), RPS network (107 members), and 116 individual growers covered neither by RPS nor BPS. Altogether, 357 small rubber growers were covered for the study. The survey also covered 47 intermediaries consisting of dealers, Manimalayar Rubbers and village traders/ sub-agents of the dealers. The price spread was worked out using the 'Mode Method'. It may be mentioned that the scope of the present study was limited to the primary marketing of natural rubber within the state. The marketing efficiency was worked out using the Acharya's Modified Method (Acharya and Agarwal, 2004).

Results and Discussion

Institutional Innovations for Promotion of Natural Rubber Sector in Tripura

The rubber plantation in Tripura is more than half a century old. Unlike in other non-traditional regions, a unique feature embedded to the process of development of rubber sector in the state has been a mutually reinforcing collaborative approach between the Government of Tripura and the Rubber Board. The notable outcomes of the collaborative initiatives are comprehensive policy approaches to the emerging issues over time.

The Tripura Forest Department had introduced rubber plantation as a soil conservation measure in 1963. The commercial viability of the crop was exploded only with the commencement of tapping from 1970 onwards. Thereafter, the major interventions were initiated for the promotion of NR sector in Tripura, which can broadly be classified under four phases, viz. Phase I (1970-85), Phase II (1986-1995), Phase III (1996-2006) and Phase IV (2006 onwards). During Phase I and Phase II, major impetus was on the production-led interventions, whereas Phase III and Phase IV were primarily focused on interventions for removing hurdles in NR marketing.

Phase I — During this phase, the focus was on development of plantations and it was dominated by the state government agencies. The major institutional interventions during this phase were establishment of Tripura Forest Development and Plantation Corporation (TFDPC) and setting-up of regional office by the Rubber Board. The TFDPC is functionally a corporate entity established in 1976 with the main objective of soil conservation, but subsequently diversified into various spheres of rubber production, including processing and promotion of rubber-based industries. At present, TFDPC is having 11673 ha. of natural rubber plantation with 3 rubber based industries, viz. Takmacherra Latex Processing Factory, Tripura Rubber Wood Factory and Technically Specified Rubber Factory. During this phase, large-scale plantations were raised but less attention was given to known forms of quality processing and organized marketing of NR. The type of NR processed was either semi-smoked or air-dried sheets. The crude form of processed sheet rubber was sold to the dealers operating at major consuming centres.

Phase II — This phase witnessed major changes in the production sector with steady growth in the share of small and marginal farmers backed by both the promotional schemes of the Rubber Board and the rehabilitation schemes of the state government through Tripura Rehabilitation Plantation Corporation Limited (TRPC). The first rehabilitation project in the state was started in Warangbari village of west Tripura to wean away the tribals from shifting cultivation by providing wage employment through rubber plantation. The families worked on daily wages under the TFDPC for establishment of rubber plantations in the government land which would be allotted to them on maturity. The Warangbari experience was precursor to the establishment Tripura Rehabilitation Plantation Corporation Limited in 1983, solely for economic rehabilitation of marginalised tribal families on rubber plantations. Presently, TRPC through its rubber based rehabilitation programme is lifeline for around five thousand beneficiary farmers.

The introduction of Block Plantation Scheme - Rubber Producers Society schemes (BPS-RPS) by Rubber Board has been another major breakthrough for active participation of the local peasentry. The BPU-RPS is a platform for providing different services to the growers on scientific plantation, followed by efficient processing and marketing. The Rubber Board supplies the necessary inputs, equipment and services to the growers through the institutionalized set-up of BPU-RPS network. These supports are crucial to sustain the income base of the targeted groups.

Despite differences in the extent of services delivery by different BPU-RPS, they are complementary at a functional level. The Rubber Board provides planting subsidy during the immature phase so that the growers adopt good quality plantation material. At present, there are 49 mature and 9 immature block planting units with 3423 beneficiary families and 59 RPS with group processing facilities. The institutions also provide a platform for effective implementation of extension programmes, technology transfer and help in linking the local peasantry to main stream development process. This phase had also been remarkable for the launching of promotional programmes highlighting the need for upgradation of quality of processed NR. The type of processed NR remained to be inferior grades of sheet rubber and the primary market was dominated by the private dealers.

Phase III — This phase heralded a new era in the sphere of NR marketing in Tripura with the backdrop of severe uncertainty in NR prices. The three important marketing innovations during this phase were: (i) opening a centrifuge factory at Takmachiya under TFDPC initiative in south Tripura, which was the first step in transforming state from producing hub to industrial hub; (ii) formal entry of Manimalayar Rubbers Ltd. (a Rubber Board promoted trading company) in 1997 for appropriate interventions in the marketing of NR. During the initial years, the growers sold their produce to the local dealers at throw away prices. To adress this situation, the Rubber Board has set up a wing of Manimilayar Rubbers Ltd. for removing the bottleneck in NR marketing as well as providing quality inputs; and (iii) the mushroom growth of both licensed and as un-licensed dealers providing better opportunities for the realization of higher farmgate prices

Phase IV — This current phase has witnessed vertical integration of the rubber sector, especially with the establishment of a large heat-resistant rubber thread manufacturing plant in the private sector by the DS Group in 2006 with the installed capacity of 5000 tonnes per annum. This industrial unit has transformed the status of NR processing sector in the state. The industry sources a major share of its raw material requirements (latex) from TFDPC and TRPC and trading companies (Tripura Latex/ Manimalayar Rubbers). In effect, with opening of the thread unit, the rubber processing industry of Tripura has been broadly evolved into two groups, viz. the public sector undertakings such as TFDPC and TRPC as well as the smallholders under BPU- RPS network selling a significant share of their produce as preserved field latex (PFL), and the growers in the unorganized sector who primarily process / market their produce as either semi-smoked or air-dried sheets.

Marketing of Natural Rubber in Tripura

The major grades of natural rubber sold in Tripura are the Sheet Rubber and Preserved Field Latex (PFL). Table 1 provides details at disaggregated level about different grades sold by the public sector undertakings TFDPC and TRPC. The combined share of sheet rubber and PFL was 67 per cent of TFDPC and 96 per cent of TRPC. The processing and marketing of natural rubber in the BPU-RPS is more focused on latex than of the

Table 1. Sale of natural rubber by TFDPC and TRPC during 2011- 2012

(in percentage of quantity)

Form of natural rubber	TFDPC	TRPC
Preserved field latex (PFL)	31.13	8.18
Sheet rubber	38.6	87.88
Cenex	16.52	Nil
Others	13.75	3.94

public sector undertakings. Though reliable data on the quantities of latex and sheet rubber processed are not available from the BPU-RPS sector, it was found that only 16.67 per cent of the surveyed BPU and 33.33 per cent of the surveyed RPS exclusively processed sheet rubber. The majority of remaining units were found pursuing a flexible strategy of processing of both latex and sheet, depending on the market demand. In sharp contrast to the small growers organized under BPU/RPS, 96.55 per cent of the individual growers in the unorganized sector were found selling their produce as sheet and 3.45 per cent as latex.

As there is only one factory for processing PFL, the TFDPC and TRPC were found selling their produce as PFL directly to the local thread manufacturing company, and this sale is based on backward price fixing method. Earlier, the price was linked to the prices of RSS 4 reported in the Kottayam market, it has been delinked since February 2012 and is now linked to cenex prices. The rate during the study period was arrived after deducting ₹ 27/ kg from the price of cenex.

The price fixing mechanism adopted by BPU/RPS for marketing of PFL was the same as of TFDPC/ TRPC, except that the produce was routed through Manimalayar Rubbers. During the study period, Manimalayar Rubbers realized a price of ₹ 27/kg less than cenex prices prevailing in the the Kottayam market. In addition, the company also deducted ₹ 3/kg of dry rubber as their commission. Thus, the RPS/BPU received ₹ 30/kg, less than the cenex price. The transportation cost and other expenses were borne by the RPS/BPU. The RPS/BPU deduct ₹ 5.15/kg of dry rubber as transportation cost and development fee from the beneficiaries/ members. Hence, the farm gate price realized by the beneficiaries/ members for one kg of dry rubber was ₹ 35.15 less than the cenex price.

Marketing of Sheet Rubber

For the marketing of sheet rubber, six different channels are followed by the organized and unorganized segments, as depicted in Figure 1. It was found that TFDPC and TRPC market sheet rubber mainly through one Channel-1, to private dealers/ manufacturers located in other states. The small growers organized under RPS/BPU segment and unorganized individual growers reported marketing of sheet rubber to the market intermediaries. Around 83 per cent of sheet rubber in the organized set-up of BPU/ RPS network was marketed through Channel-III, whereas 72 per cent of sheet rubber in the unorganized sector was marketed through Channel-VI. It was observed that the growers in the unorganized sector sell their produce as air-dried (ungraded) sheet rubber.

In the organized sector, TRPC and RPS/BPU procure latex from the beneficiaries / member-farmers at their respective collecting centres and market it as graded forms of RSS. Although the BPU/RPS have the required infrastructure to process best quality sheet rubber, they were selling the produce as RSS 5 only rather than as RSS 4 or other superior grades.

Organized Sector
Channel- I : TFDPC → Buyer
Channel - II : Grower → TRPC → Buyer
Channel- III : Grower → RPS/BPU → Trading Company → Buyer
Channel- IV : Grower → RPS/BPU → Dealer → Buyer
Unorganized Sector
Channel- V : Grower → Dealer → Buyer
Channel- VI : Grower → Agent of dealer → Dealer → Buyer

Figure 1. Major marketing channels for sheet rubber in Tripura

Table 2. Marketing of RSS 5 by TFDPC during 2011- 2012

Region	Quantity (tonnes)	Average price received (₹/kg)	Average marketing cost incurred by consumer			Final cost to consumer (₹/kg)	Price spread (₹/kg)	Marketing efficiency (ratio)
			Transportation (₹/ kg)	Tax in Rs /kg (2% for TFDPC)	Total			
Guwahati	210.0	195	3	4	7	202	7	28.27
Kolkata	180.0	195	4	4	8	203	8	25.81
North India	210.0	192	5	4	9	201	9	22.61
South India	250.3	210	5	4	9	219	9	23.36
Total	850.3	199	4	4	8	207	8	24.69

Tripura Forest Development and Plantation Corporation (TFDPC) — A major share of sheet rubber by TFDPC was sold as RSS 5. The sheet rubber was sold mostly to the agencies based in eastern India, viz. Guwahati and Kolkata. Table 2 provides the details.

The average price realized, marketing costs and final cost to the buyer varied across the four regions. Since there was no intermediary between the corporation and the buyer, the corporation could realize around 95-96 per cent share of the buyers' price. The destination-wise marketing efficiency was observed highest in the case of Guwahati.

Tripura Rehabilitation Plantation Corporation Limited (TRPC) — It was found that the TRPC was also selling most of its produce as RSS 5, despite availability of ample infrastructural facilities for processing better grades rubber. This grade is sold to the private dealers, mostly to East India based agencies. However, during the past two years there has been a surge in the number of South India based agencies. Table 3 provides the details.

The annual average price realization by TRPC from the sale of RSS 5 was marginally higher compared to TFDPC. In TRPC, the produce is collected by the beneficiaries and brought to the collection centres for processing into sheet rubber and provided to the marketing division for sale. The payment was made to the beneficiaries after deducting various costs involved, viz. variable costs and establishment expenses related to processing. The rate provided to the beneficiaries ranged from ₹160/kg to ₹ 180/kg during 2011-12. Although the corporation had been realizing 96.14 per cent share of the buyers' price, the beneficiaries share in the buyers' price was 79.30 per cent. The differences in marketing efficiency among the regions were insignificant and TRPC had the lowest marketing efficiency among various groups selected.

Table 3. Marketing of RSS 5 by TRPC during 2011- 2012

Region	Quantity (tonnes)	Average price received by TRPC (₹/kg)	Average price received by beneficiaries (₹/kg)	Average marketing cost of consumer			Final cost to consumer (₹/kg)	Price spread (₹/kg)	Marketing efficiency (ratio)
				Transpor-tation (₹/kg)	Tax in ₹/kg (2% for TRPC)	Total			
Guwahati	330.0	209	170	3	4	7	216	46	3.67
Kolkata	330.0	195	162	4	4	8	203	40	4.01
North India	442.0	197	165	5	4	9	206	41	4.01
South India	263.4	204	166	5	4	9	213	47	3.56
Total	1365.4	201	166	4	4	8	209	43	3.83

Block Plantation Units – Rubber Producers Societies (BPU / RPS) — Although the RPS/BPU have been processing good quality rubber sheets, a segregated record for different grades was not maintained by the sample units. Moreover, a major share of the sheets was sold as RSS 5. Table 4 shows that 83 per cent of the sheet rubber was routed through Manimalayar Rubbers and the annual average price realization was ₹ 8/kg higher than through private dealer channel. Moreover, producers' share in buyers' price was 90.79 per cent in the sale through Manimalayar Rubbers compared to 88.73 per cent in the private dealer channel. The marketing cost of final consumer was higher in the private dealer channel. A higher marketing efficiency was observed in sale through Manimalayar Rubbers.

Individual Growers — The farmers' share in consumer price for sheet rubber was higher when the produce was sold directly to the dealer. Table 5 provides the details. The higher share of producers' price (86.68%) in dealers' channel is mainly due to less number of commission agents in the channel. However, the producers' share was lower compared to the counterparts in the BPU-RPS sector. Technically, the transaction costs including the dealers' margins incurred in the individual growers sector were higher and to that extent the producers' share was affected. Though the marketing efficiency through the dealer channel was higher, it was lower than the two channels opted by the BPU/RPS network.

Despite relevant data on the price spread are for different years, the comparative marketing efficiency was the highest for TFDPC. Similar results were obtained by Sharma *et al.* (2013). As there is no intermediary between the TFDPC and the buyer, the corporation could achieve a better price. realization. At the smallholders' level, the marketing efficiency was highest among the farmers organized under RPS/BPU network mainly due to group marketing and the resultant economies of scale leading to better bargaining power. The marketing efficiency was found lowest for the beneficiaries of TRPC due to higher share of variable costs and establishment expenses.

Conclusions

The study is focused on the role of institutional innovations for persuading natural rubber sector in Tripura. The NR plantation in the state, initiated as soil conservation strategy, is presently the most commercially viable crop. The status of widely accepted industrial crop (NR) is an outcome of systematic institutional interventions for the past five decades. In Tripura, the foundation of the natural rubber was laid down in 1963 and the institutional innovations

Table 4. Marketing patternof sheet rubber by RPS/BPU during 2010-11

(₹/kg)

Particulars	Channel of sale	
	Dealer	Maimalayar Rubbers
Percentage of quantity sold (%)	17	83
Net price received by grower	169	177
Marketing cost incurred by grower	Nil	Nil
Marketing costs of RPS/BPU	6	5
Purchase price of Manimalayar Rubbers	-	182
Marketing cost of Manimalayar Rubbers	-	0
Net margin by Manimalayar Rubbers	-	4
Purchase price of dealer	175	-
Marketing cost of dealer	0.42	-
Net margin by dealer	1	-
Purchase price of final consumer	177	186
Marketing cost of final consumer	14	9
Final cost of consumer	191	195
Price spread	22	18
Marketing efficiency (Ratio)	7.87	9.86

Table 5. Marketingpattern of sheet rubber by individual growers during 2011-12

(₹/kg)

Particulars	Channel of sale	
	Sub-agent	Dealer
Net price received by grower	185	185
Marketing cost incurred by grower	0	1
Purchase price of village trader/ sub-agent of dealer	185	NA
Marketing cost of sub-agent	1	0
Net Margin of sub-agent	7	0
Purchase price of dealer	193	186
Marketing cost of dealer	1	1
Net margin of dealer	13	12
Purchase price of consumer	207	199
Marketing cost of final consumer	16	15
Final cost of consumer	223	214
Price spread	38	29
Marketing efficiency (Ratio)	5.02	6.51

after that can be broadly classified as production-centric and marketing innovations. The production-centric innovations involve large plantations by the State Forest Department and latter established by the Tripura Forest Development & Plantation Corporation Limited (TFDPC), and rehabilitation scheme of TRPC and Rubber Board for active participation of small and marginal farmers. The major breakthrough in the natural rubber sector of Tripura was achieved by institutions of different marketing reforms, incluing establishment of centrifuge factory by TFDPC, formal entry of Manimalayar Trading Company (promoted by Rubber Board) and increased participation of NR traders. With a quantum of such marketing innovations, the local peasantry has started getting true value of their produce.

Another step in removing the bottlenecks of marketing was the launching of first thread manufacturing plant by the DS Group in 2006 with an installed capacity of 5000 tonnes per annum. This industrial unit has transformed the status of NR processing/marketing sector in the state. In effect, with the opening of thread unit, the rubber processing industry of Tripura has been broadly evolved into two groups, viz. the public sector undertakings such as TFDPC and TRPC as well as the smallholders under BPU- RPS network selling a significant share of their produce as preserved field latex (PFL), and the growers in the unorganized sector which primarily process / market their produce as either semi-smoked or air-dried sheets.

A comparative analysis of marketing of sheet rubber has revealed the lowest transaction costs and highest marketing efficiency of TFDPC was through of its direct marketing strategy without intermediaries. The other three categories depend on at least two tiers of intermediaries with higher transaction costs. However, the BPU/RPS have been effective in minimizing the transaction costs from the smallholders' angle.

Given the geographical isolation and the resultant high transaction costs on marketing of NR, it is necessary to evolve a long-term strategy of developing a rubber based industrial sector in the state for the manufacturing of value-added products in a phased manner. This proposition assumes significance in the backdrop of producer price realization of sheet rubber varying from 79 per cent in the case of beneficiaries under TRPC to 96 per cent for TFDPC. The surge in latex processing and marketing is dependent on the thread manufacturing unit. Therefore, the development of a rubber based industrial sector in the state is a pre-requisite for streamlining NR processing and marketing strategies so as to ensure higher producer prices. Although policy initiatives have been taken for the

functioning of a Rubber Park, the choice of products necessitates higher export content due to limited size of the local market. A collective action for compatible policy initiatives should consider the involvement of Government of Tripura, The Rubber Board and representative organisations of both NR producers and rubber products manufacturers.

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