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Identification and Causes of Resorting of Rubber Cultivation

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ABSTRACT: Rubber growing system is gradually emerging as a promising sector in Tripura and being substitutive to the traditional crop production system. High return compared to other traditional crops and less risk of crop failure makes it more popular among the youth and small and marginal farmers. Limited works has been done on rubber in Unakoti district perspective. In this condition, to study the rubber growing system of Unakoti, present study was undertaken as a M.Sc. student in Kumarghat R.D. Block and Pecharthal R.D. Block as the most concentrated rubber growing blocks in Unakoti district; and selected 60 numbers of rubber growers from the target area as respondents. It was observed that the most common reason for resorting rubber is unsuitability of land and its topography for other crops (mean score 1.82) followed by other reasons. It was also observed that respondent's strength of resorting causes have positive correlation with the earliness to the rubber cultivation; whereas media communication in respondent's family had a significant negative correlation. After resorting of rubber it was clear that incase of all respondents (100%), overall happiness in the family, food security and health security has been improved.

Keywords: Rubber Cultivation, Resorting, Tripura, Causes, Unsuitability of land.

INTRODUCTION

One of the most significant items that come from the rainforest is rubber. Although South American indigenous people who live in rain forests have used rubber for generations, rubber's first useful commercial use did not occur until 1839. Charles Goodyear spilled rubber and sulphur on a hot cook top by mistake that year, causing it to scorch like leather yet stay plastic and stretchy. The white sap from the *Hevea* tree's bark was refined through a process called vulcanization into an important industry. Natural rubber is the most significant revenue crop in Tripura. Since its introduction in 1963 by the State Forest Department, Tripura has overtaken Kerala as the second-largest producer of natural rubber in the nation, producing around 9% of all rubber produced in India. After Kerala, Tripura boasts the second-largest rubber-growing region in the nation. The Tripura tribal population initially started a rubber plantation as a means of generating income. The state government of Tripura has two PSUs, Tripura Forest Development Plantation Corporation Ltd. (TFDPC) and Tripura Rehabilitation Plantation Corporation Ltd. (TRPC), that are dedicated to the expansion of the state's rubber plantations and rubber industry. Rubber-based businesses have been designated as Tripura's "Thrust Sector" for investment by the Industries & Commerce Department and the State Government as the priority sector for generating income (Dept. of Industries and Commerce, Govt. of Tripura, 2022). Under the institutional oversight of the Rubber Board, researchers looked into the expansion of rubber farming in the NE states of India. The authors discovered that several R&D and institutional support activities are included in the developmental projects. The authors discovered that the setup called for the tribal groups to begin working in the rubber plantations as wage labourers in the beginning and earn their living until the plantations started producing (say, 5-7 years). The farms were turned over to the growers for ongoing maintenance and supervision, and as the plantations began to produce in the eighth year after planting, the growers hired the indigenous tribes for daily labour (Mohanan *et al.*, 2002). The implementation of rubber-integrated farm-livelihood systems differs across Kerala and Northeast India. Socioeconomic factors such as shrinking land holding size, lack of family labour, and the rubber monoculture-oriented policy promotional schemes offered by the Rubber Board's institutional intervention have all played a role in the limited adoption of

integrated rubber farming systems in Kerala's traditional regions (Viswanathan and Shivakoti 2008). the study intended to assess the influence of rubber planting on the socioeconomic situations of shifting cultivators in Tripura's Dhalai region. Using the five assets/capitals associated with sustainable livelihood, namely Natural capital, Human capital, Physical capital, Economic or financial capital, and Social capital, and measuring it with appropriate indicators representing the five assets/capitals, his findings show that the socioeconomic conditions of the beneficiaries in Dhalai district have significantly improved (Debbarma, 2013). The appropriateness and adaptation of the Kerala model of institutional interventions for rubber development in the unique context of the North Eastern Region were critically explored (NER). The authors investigated the trajectory of development of rubber plantations in Kerala under the institutional interventions spearheaded by the Rubber Board and discovered that the Board promoted a rubber production system that was highly oriented toward monoculture without considering crop promotion from an agricultural system perspective (Viswanathan and Bhowmik 2021). The result of trend analysis for rubber plantations in Tripura in respect of production of natural rubber on years and production of natural rubber on the matured planting area under the existing market conditions, credit support and other facilities show that progress of rubber plantation in the state was highly inspiring (Haripada *et al*., 2019).

MATERIAL AND METHODS

Among the other districts of Tripura, Unakoti is one of the lowest producers of rubber. Being the smallest district of the state, most of the rubber plantations are concentrated in Kumarghat and Pecharthal block. Among these two blocks specific areas where the rubber concentration is high were selected. The growers are mostly small and marginal. So, these two blocks were taken purposively. Finally individual rubber growers from different patches of these blocks were selected. A total number of 60 farmers were selected randomly from the two blocks. The study mainly considered primary data for analysis. Primary data were collected through individual interview schedule. However, small amount of data collected from secondary sources. The statistical methods used in the study include mean, percentage, correlation, frequency, standard deviation. Following Ghosh (2015) with some modification according to this study, twelve numbers of statements were placed before the respondent regarding the benefits of rubber cultivation in comparison to other food or cash crops. The respondents were asked to give his agreement based on the scale viz. strongly agree, agree, undecided, disagree, strongly disagree with '+2 to -2 scores. The seasons were collected based on real life situations by observations and from review of literatures. The lists of the reasons are:

1. Ratio of periodic money back and paid out cost is comparatively high in rubber
2. Relative net profit is low in other crop in comparison to rubber
3. Competitive market is not available in other crop in comparison to rubber
4. Quality planting material is not available in comparison to rubber
5. Infrastructural facility like transport, storage etc is not sufficient in comparisonto rubber
6. Governmental support is more for rubber than other crops
7. Subsidy /good benefits from rubber board and SHG
8. Started rubber cultivation by observing the success of other farmers
9. Encouragement from rubber board / another agency
10. To come up from climatic and uncertainty associated with cultivation of othercrops
11. It gives preplanned expenditure opportunity to the family
12. Unsuitability of land for other crops.

RESULTS AND DISCUSSION

This section represents the scenario of rubber resort by the farmers of Unakoti district. It includes analysis on the year wise of farmer resorted to rubber cultivation, the causes responsible for attracting farmers towards rubber cultivation.

Year wise resort for rubber cultivation. Table-1 reveals that the respondents of target area had been resorted to rubber cultivation from 1995 to 2016. The maximum resorting to rubber growing system observed from 2010 to 2016. 45% resorting is observed during 2010 and upto 2016.

Table 1: Year wise number of farmers resorted to rubber.

Year	No. of farmers		Cumulative number	
	Frequency	Percentage	Frequency	Percentage
up to 1995	1	1.66	1	1.66
1996-2000	12	20.00	13	21.66
2001-2005	11	18.33	24	39.99
2006-2010	9	15.00	33	54.99
beyond 2010	27	45.00	60	100

Causes of resorting rubber. It is crucial to investigate the reasons behind the farmers' decision to switch from traditional crop production to rubber production. These causes are shown in Table 2. The reasons for resorting to rubber were discovered through earlier investigations and discussions with the farmers. To evaluate the strength of the causes, a five point scale (-2 to +2, denoting strongly disagree to strongly agree), was utilised. According to the scale, it is clear that the factors that received high scores are seen to be crucial factors in the resorting of rubber, while factors that received low scores might not be thought to be factors in the resorting of rubber.

The most common reason for resorting rubber is unsuitability of land and its topography for other crops (mean score 1.82). The tribal people could turn their wasteland into rubber cultivation. Most of the land falls under hilly topography which does not suits for other crops to cultivate.

In late 90s it has been seen that the rubber board and

forest department of the state had come with scheme related to rubber plantation. This encourages people to shift from traditional crop production to rubber production. Government also provided some financial assistance to establish rubber based enterprises. The next justification for resorting was that, compared to rubber, other crops had lower net profits. Governmental support for the rubber industry, encouragement from the rubber board and other organisations, a lack of high-quality planting materials, a lack of adequate transportation and storage options, and subsidies from the Rubber Board or SHG were some of the factors, though some people didn't think they were very significant. The data shows that the primary motivation for turning to rubber production in the Unakoti district was that it supported the family's pre-planned expenditures. Every household has a yearly budget that has been carefully laid out. In order to achieve this budget, farmers rely on farm products. Any unexpected failure could make life difficult for the family. Farmers in the study region favour rubber because it can tolerate this failure. Additionally, it provides additional financial support to farm households. The term "paid out cost" refers to cultivation costs that must be paid in cash, such as expenditures associated with labour and supplies like plant protection agents. Although the need for labour in the rubber industry is quite high, the ratio of labour needed for tapping and other operations in the industry is extremely high.

This section of the peasantry class chose to transition to rubber due to the uncertainty associated with traditional crop farming, assurance of financial security, a consistent flow of farm revenue, a relatively low risk of illness, and a comparatively little amount of investment. Another reason why some respondents turned to rubber was because they had seen other farmers succeed. One of the key drivers of incentive for new technologies is the success of neighboring farmers. One of these activities is the farmer exchange programme. More than any other type of change agent, farmers may learn from one another. Table further supports the conclusion that neighbors and family members had the greatest influence on rubber resort.

The next justification for resorting is related to climate conditions and the unpredictability of growing other crops. Due to its perpetual nature, hardiness, and resistance to unpredictable climate dangers, rubber cannot fail once it is established. As a result, it became crucial when resorting to rubber.

Influence of socio-economic and personal characters on earliness of resortingrubber. Table 3 presented the correlation between Socio-economic and personal characters of rubber growers and earliness of resorting rubber.

Table 2: Causes of resorting to rubber cultivation.

Causes	Strongly agree	Agree	Unde cided	Disagree	Stron gly disagree	Mea n score	Rank
Ratio of periodic moneyback and paid out cost is comparatively high in rubber	16 (26.7)	28 (46.7)	16 26.7)	0 (00.0)	0 (00.0)	1.00	IV
Relative net profit is lowin other crop in comparison to rubber	29 (48.3)	24 (40.0)	7 (11.7)	0 (00.0)	0 (00.0)	1.37	III
Competitive market is notavailable in other crop in comparison to rubber	0 (00.0)	12 (20.0)	10 16.7)	38 (63.3)	0 (00.0)	-0.43	XI
Quality planting material is not available in comparison to rubber	0 (00.0)	38 (63.3)	8 (13.3)	14 (23.3)	0 (00.0)	0.40	VII
Infrastructural facility like transport, storage etc is not sufficient in comparison torubber	0 (00.0)	32 (53.3)	17 28.3)	11 (18.3)	0 (00.0)	0.35	VIII
Governmental support is more for rubber than othercrops	0 (00.0)	60 (100.0)	0 (00.0)	0 (00.0)	0 (00.0)	1.00	IV
Subsidy /good benefits from rubber board andSHG	46 (76.7)	14 (23.3)	0 (00.0)	0 (00.0)	0(00.0)	1.77	II
Started rubber cultivationby observing the success of other farmers	0 (00.0)	25 (41.7)	0(00.0)	35 (58.3)	0(00.0)	-0.17	IX
Encouragement from rubber board / anotheragency	18 (30.0)	17 (28.3)	8 (13.3)	17 (28.3)	0(00.0)	0.60	V
To come up from climatic and uncertainty associated with cultivation of other crops	0 (00.0)	3 (5.0)	43 71.7)	13 (21.7)	1(1.7)	-0.20	X
It gives preplanned expenditure opportunity tothe family	4 (6.7)	18 (30.0)	38 63.3)	0(00.0)	0(00.0)	0.43	VI
Unsuitability of land forother crops	49 (81.7)	11 (18.3)	0 (00.0)	0 (00.0)	0 (00.0)	1.82	I

Table 3: Impact of socio-economic and personal characters on earliness of resorting rubber.

Socio-economic and personal characters of rubber growers	Simple correlation coefficient (r-value)
Respondent's chronological age	0.055
Respondent's family size	0.011
Respondent's highest family education	0.044
Respondent's family economic status	-0.137
Family mandays provided for rubber cultivation	-0.014
Respondent's outside contact	0.130
Respondent's media communication	-0.320*
Respondent's land holding	-0.022
Strength of resorting causes	0.276*

It is found from the table-3 that respondent's strength of resorting causes have positive correlation with the earliness to the rubber cultivation; whereas media communication in respondent's family had a significant negative correlation.

Changes in family after resorting rubber. Table 4 represented the changes in family conditions from food security to overall happiness as perceived by the rubber growers of Unakoti district. The changes were perceived in a three point scale from "deteriorated" to "improved" with (-1) to (+1). From table, different changes in the household level after resorting rubber growing system are known. It is clear that in case of all respondents (100%), overall happiness in the family, food security and health security has been improved. Besides it, 88.3% respondents improved their savings in the bank and 81.7% respondents improved their housing conditions. But their loan availability, school going to children, drinking water facility does not improved much. It is to be notice that women drudgery is completely deteriorated after adopting rubber growing system. Borrowing money has been observed to be deteriorated in case 98.3% respondents. The most of the rubber growers perceived a positive change in their overall condition after resorting rubber. This may be regarded as the impact of rubber growing system is highly promising in the study area. In most of the house hold situation except borrowing money and women drudgery none had expressed that the condition is deteriorated.

Table 4: Perceived changes in household situation.

Situation	Deteriorated	Remainedsame/no comments	Improved	Meanscore	Rank
Condition of food security at Home	00 (00.00)	00 (00.00)	100 (100.00)	1.00	I
Housing condition	00 (00.00)	11 (18.30)	49 (81.70)	0.82	III
Sanitation condition	00 (00.00)	26 (43.30)	34 (56.70)	0.57	V
Drinking water facility	00 (00.00)	49 (81.70)	11 (18.30)	0.18	IX
Using modern appliances	00 (00.00)	30 (50.00)	30 (50.00)	0.50	VII
Using luxury goods	00 (00.00)	29 (48.30)	31 (51.70)	0.52	VI
Using modern farmequipments	00 (00.00)	21 (35.00)	39 (65.00)	0.65	IV
Using farm machinery	00 (00.00)	30 (50.00)	30 (50.00)	0.50	VII
Availability of loans	00 (00.00)	49 (81.70)	11 (18.30)	0.18	IX
Borrowing money	59 (98.30)	1 (1.70)	00 (00.00)	-0.98	XI
Saving with banks	00 (00.00)	7 (11.70)	53 (88.30)	0.88	II
Women drudgery	60 (100.00)	00 (00.00)	00 (00.00)	-1.00	XII
Health security	00 (00.00)	00 (00.00)	60 (100.00)	1.00	I
School going of children	00 (00.00)	42 (70.00)	18 (30.00)	0.30	VIII
Tours and travels	00 (00.00)	60 (100.00)	00 (00.00)	0.00	X
Festivals & ceremony	00 (00.00)	60 (100.00)	00 (00.00)	0.00	X
Overall happiness in family	00 (00.00)	00 (00.00)	60 (100.00)	1.00	I

Perception regarding change in the locality after resorting rubber. The use of the rubber growing system may be viewed as a system change from the traditional crop cultivation model to a cultivation system focused on cash crops. Similar to how each individual family experiences change during any system transformation, the community level also goes through change in various ways. Development on several societal and communal fronts is facilitated by individual empowerment. The current study attempted to document perceived changes in the neighborhood's general quality of life, including local sanitization, health care accessibility, and other basic household necessities. One of the most significant capitals in the capital pentagon of the livelihood analysis model is social capital. It is the internal movement of the social network that connects the community's members. The level of contact between members and the presence of local grass-roots organisations were used as indirect variables to measure social capital. Another factor that was considered was leadership and collective voice. Housing, markets, roads, schools, and other changes were generally referred to as infrastructural facilities. The movement of the labour force was the most significant change taken into account at the locality level. Rural Unakoti does not also exhibit this characteristic because seasonal and persistent out-migration is one of its characteristics.

The table-5 reveals changes in the locality environment after adopting rubber cultivation. The change was perceived under the domain of General living condition, social capital formation, leadership & collective say, infrastructure and labour out migration. They were exposed against the scale consisting the response points highly deteriorated (HD); moderately deteriorated (MD); deteriorated (D); no change (NC); improved (I); moderately improved (MI); and highly improved (HI) with (-3); (-2); (-1); 0; (+1); (+2) and (+3) respectively. Table-5 represented frequencies of respondents under each response points along with the representative mean score to get a general and comparative picture on change in the locality.

Table 5: Perceived regarding improvement in locality after resorting to rubber.

Conditions	HD	MD	D	NC	I	MI	HI	Meanscore
General livingcondition	0(00.0)	0(00.0)	0(00.0)	610.00	5490.00	0(00.0)	0(00.0)	0.90
Social capitalformation	0(00.0)	23.3	0(00.0)	5490.00	46.70	0(00.0)	0(00.0)	0.00
Leadership andcollective say	0(00.0)	0(00.0)	58.3	5286.7	35.00	0(00.0)	0(00.0)	-0.03
Infrastructure	0(00.0)	0(00.0)	0(00.0)	1423.30	4676.70	0(00.0)	0(00.0)	0.77
Out migration	0(00.0)	1626.7	1118.30	3355.00	0(00.0)	0(00.0)	0(00.0)	-0.72

HD=highly deteriorated; MD=moderately deteriorated; D=deteriorated; NC=no change; I=improved; MI=moderately improved; HI=highly improved NB: figures in the parentheses indicate percentage

From the Table 5, it is observed that the general living condition is perceived as highly improved (HI) by 90% of the respondents, where as 10% respondents perceived as no change or remained same (NC). In no cases any deterioration has been observed. Here social capital indicates various types of social activities related to relationship with neighbours, relatives, attending social programmes, rituals, festivals, helping attitude to neighbours etc. and building of grass root organisation like SHG or farmers' club. In the sector of social capital formation, maximum respondents (90%) perceived that it was No changed (NC). 6.7% respondents perceived that it was only improved (I). A very few respondents also perceived it was deteriorated (D) (3.3% cases each).Leadership and collective say means leadership behaviour, functioning at grass root organization or participation in various kinds of development works etc. 5% respondents perceived that leadership and collective say had been highly improved whereas 86.7% and 8.3% respondents had said that it was no change (NC) and deteriorated (D).Infrastructure means power access in locality, sanitation and drinking water facilities, health facilities, roads and easily accessibility. In case of infrastructure issue, 76.7% respondents had been observed with improved (I) perception category; whereas 23.3% respondents also perceived as no change (NC) in infrastructure.

CONCLUSIONS

The most common reason for resorting rubber is unsuitability of land and its topography for other crops (mean score 1.82). The tribal people could turn their wasteland into rubber cultivation. Most of the land falls under hilly topography which does not suits for other crops to cultivate. Government also provided some financial assistance to establish rubber based enterprises. The next justification for resorting was that, compared to rubber, other crops had lower net profits. The next justification for resorting is related to climate conditions and the unpredictability of growing other crops. Due to its perpetual nature, hardiness, and resistance to unpredictable climate dangers, rubber cannot fail once it is established. As a result, it became crucial when resorting to rubber.

FUTURE SCOPE

The present research may be used further for marketing channels of different form of rubber in Tripura, economic viability of rubber production and value chain in rubber.

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REFERENCES

Debbarma, R. (2013). *Socio-Economic Impact of Rubber Plantation on Shifting Cultivatorsin Dhalai District of Tripura*, M.Phil. Dissertation, North-Eastern Hill University, Shillong, Meghalaya, 54-135.

Ghosh, A. (2015). Studies on small tea growers in north Bengal- prospects and perspectives. Ph.D. Thesis.

Uttar Banga Krishi Viswavidyalaya. West Bengal.

Haripada, Datta, Haradhan Debnath and Parag, Shil (2019). Production and Productivity of Natural Rubber: A Study on Growth-trends of Rubber Plantation in Tripura. *International Journal of Management*, *10*(4), 115–131.

Mohanan, K. G., Krishnakumar, A. K., & Lalithakumari, E. (2002). An Overview of Rubber Plantation Development in North-East India. In *Global Competitiveness of Indian Rubber Plantation Industry. Full Text of papers presented in the Rubber Planters Conference*, 359-368.

Ph.D. Thesis. Uttar Banga Krishi Viswavidyalaya. West Bengal

Viswanathan, P., and Bhowmik, I. (2021). Compatibility of institutional architecture for rubber plantation development in North East India from a comparative perspective of Kerala, *NRPPD Discussion Paper No. 38*, Centre For Development Studies, Thiruvananthapuram, pp. 1-71.

Viswanathan, P. K., & Shivakoti, G. P. (2008). Adoption of rubber-integrated farm- livelihood systems: contrasting empirical evidence from the Indian context. *Journal of Forest Research*, *13*(1), 1-14.

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