

Integrated Rubber Development Projects and Their Impact on Tribal Livelihoods: The Case of the Northeast Region with Special Reference to Tripura

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Abstract: Few studies have investigated the adoption of rubber-integrating farming systems, rubber inter-cropping practices, and the impact of natural rubber cultivation on livelihood in the traditional and non-traditional rubber growing regions in India. This article attempts to provide a critical understanding of the role of the state and other stakeholders in livelihood promotion through sustainable rubber cultivation in the state of Tripura in Northeast India. The theoretical frame of the article largely draws from the “social capital approach,” where social capital is utilized as resource by the rubber producer societies in promoting tribal livelihoods in forested areas in Tripura. The article underscores best practices on rural job creation through corporations driven by rubber development projects in the selected four districts of Tripura through fieldwork. It analyses the impact of integrated rubber development projects on tribal beneficiaries in the study area through the Sustainable Livelihood Index (SLI). In doing so, the article juxtaposes the socioeconomic and ecological impact of rubber development projects with their sustainability, replicability, and convergence aspects in addition to suggesting policy recommendations.

Introduction

The Scheduled Tribe (ST) communities consist of 104 million people, constituting 8.6 per cent of the India’s total population. ST communities inhabit about 15 per cent of the country’s territory in various ecological and geo-climatic conditions, ranging from plains and forests to hills and inaccessible areas. There are 705 individual ethnic tribes or groups which are classified as STs in the 2011 census. Among them, 75 tribes are classified as Particularly Vulnerable Tribal Groups (PVTG) on account of their exacerbated vulnerabilities. The vulnerabilities associated with STs are recognised through various legal provisions of affirmative action in the Indian Constitution, such as the prohibition of discrimination, protection of equality of opportunity of public employment, political representation, and promotion of educational and economic interests.² Several high-level committees and commissions were constituted by the Government of India following independence to formulate policies and programmes and create national institutions to develop the tribal areas in the country. The need to adopt an “integrated approach” to tribal development was emphasized among the several recommendations from these expert committees in promoting development among the tribal communities. For instance, the Renuka Ray’s Committee (1959) highlighted that while each aspect of development was important in its own place, integrated programmes based on agriculture, forestry, handicrafts, and village industries neces-

sitated a greater degree of attention to be determined by a systematic survey of the needs and possibilities in each area (Pfeffer and Behra 1997, 44). Likewise, the Dhebar Commission (1962) also stressed the “integrated approach” by touching upon its broad strategy and indicating socio-economic development as a general goal. The Expert Committee (1972), headed by S.C. Dube, advised for the formation of a new strategy for tribal development through the first time-bound integrated area development concept and other programmes as per genius of the stakeholders. An Integrated Tribal Development Programme (ITDP) was also launched during the Fifth Five Year Plan period between 1974-79. The states were directed to frame tribal sub-plans for areas of tribal concentration. A review of the development of Scheduled Tribes (STs) was undertaken on the eve of the Fifth Five Year Plan, whereby the tribal sub-plans strategy came into being (ibid. 45). The provisions of the Panchayats (Extension to Scheduled Areas) Act, 1996 provides the extension of the provisions of Part IX of the Indian Constitution relating to the Panchayats to the Scheduled Areas for establishing a decentralized self-governance structure. In 2006, the Forest Rights Act (FRA) was enacted which shows that the integrative development of tribal communities cannot take place in the absence of a legally protected right to land as well as other productive reprocess. The approaches and interventions to “leave no one behind” are crucial to India’s implementation of the Sustainable Development Goals 2030. Recognising this, the Indian State has consciously shifted from a “whole of government” to a “whole of society” approach by engaging all key stakeholders including the tribal communities (India VNR 2020, 144).

Natural Rubber and Tribal Livelihoods

Sociologists define plantations as an instrument of force wielded to create and maintain a class structure of workers and owners connected hierarchically by a staff line or overseers and managers (Bhowmik 1980, 1524). Plantations can be distinguished from peasant agriculture in that it is a large-scale enterprise which normally requires more labour per unit of land (Mynt 1973, 29). In its preamble, the National Rubber Policy (NRP) of 2019 underlines the vital industrial, environmental, and strategic significance of natural rubber commercially produced in plantations in India.³ It recognizes the economic importance of the rubber industry value chain in terms of its vast potential and versatility in value addition, the extensive market for end products, and its prospective contribution to national economic progress. The NRP reflects on livelihood concerns of small and marginal holders and wage labourers engaged in rubber cultivation. Rubber cultivation shows a definite pattern of geographical concentration in the traditional regions of Kerala, Tamil Nadu, and Karnataka, and more recently in the non-traditional regions of Northeastern states, Maharashtra, Odisha, West Bengal and Andhra Pradesh. Table 1 indicates that five states together account for 86 % of the area in hectare under rubber plantation and 95 per cent of production of rubber. Among the states, Kerala has the highest share in area and production of rubber (approximately 72% and 88%, respectively) (Joseph and Viswanathan 2016, 6). Rubber cultivation provides gainful self-employment and sustainable livelihoods. It generates direct employment, around 1,000 days of labour/ha. During the beginning phase, it provides permanent jobs for seven people per 10 ha. It also provides indirect employment through childcare services, the production and distribution of plantation inputs, growing intercrops in rubber plantation, rubber dealing, processing, rubber wood cutting, its sale, processing, and related furniture making (MoDoNER NER Vision 2020,76).

<i>Relative Share (%)</i>							<i>All India</i>	<i>Five States</i>
<i>Descrip- tives</i>	<i>Kerala</i>	<i>Tamil Nadu</i>	<i>Karna- taka</i>	<i>West Bengal</i>	<i>Assam</i>	<i>Other</i>	<i>('000 ha/'000 metric tonnes)</i>	<i>(%)</i>
Area (% share / '000 ha)								
Rubber	71.95	2.74	5.93	0.09	5.72	13.57	757.52	86.43
Production (% share / '000 ha)								
Rubber	87.56	2.77	3.42	-	1.28	4.97	913.70	95.03

Table 1: Distinct Features of Rubber Plantations in India, 2013-14

Source: Estimates based on data compiled from Rubber Board cited in Joseph and Viswanathan. 2016. Globalisation, Development and Plantation Labour, New Delhi: Routledge, p.8.

Notes: In the case of rubber, 'others' include north-eastern states, Odisha, Andhra Pradesh, Maharashtra, Goa and the Andaman and Nicobar Islands.

Evolution of the Natural Rubber Sector in Tripura

As a hilly State in the North-eastern region (NER) of India, Tripura is the homeland of 19 STs, comprising 31.8% of the NER's total population. The history of natural rubber cultivation in Tripura dates back to 1963 when the State Forest Department introduced rubber trees as a soil conservation initiative with the technical support of the Rubber Board. In 1976, the Tripura Forest Development & Plantation Corporation (TFDPC) was established; their first rubber-based rehabilitation project was implemented in Warrangbari in the West Tripura district. Different rubber developing agencies were established, such as the Tripura Rehabilitation Plantation Corporation (TRPC Ltd.) in 1983, and the Tripura Block Plantation Project (TBPP) undertaken by the Rubber Board and the Department of Tribal Welfare in 1992-93. The Tripura Tribal Area Autonomous District Council (TTAADC) and Sub-divisional Magistrates (SDM) initiated rubber development-based rehabilitation programmes in 1998. The Tribal Welfare Department of the Government of Tripura has added its efforts in spreading rubber production from one village to another.

The development of rubber cultivation in the NER including Tripura can be classified into two distinct phases (Krishna Kumar 2014, 14).⁴ The first phase was dominated by government sector plantations during the period up to 1984-85 and the second phase in which private small holdings received wider focus, especially under the Scheme of Accelerated Development of Rubber Plantation in the NER implemented by the Rubber Board. The rubber development schemes were implemented by the Rubber Board through an integrated approach, while ensuring extension of various services like, *Balwadi* (Nursery Schools), health camps, drinking water facilities, sanitation, and road connectivity at village level. These schemes also led to the creation of community level institutions like Rubber Producer Societies (RPS), facilitating women's empowerment through Self Help Groups (SHGs), Women's Thrift Groups (WTGs), providing continuous paid employment, ensuring additional sources of income, and utilizing fallow and barren lands. These initiatives helped conserve tonnes of soil and nutrients from run-off, made provisions for common processing, and marketed the product. Additionally, they facilitated beneficiaries' exposure to the outside world, leading to capacity building along with economic autonomy for them. More than 8,300 families, comprising 52,000 individuals, benefitted with these programmes (ibid. 172). Social capital utilization by RPSs in the NER, particularly in Tripura, is remarkable with regard to the responses to various indicators of social capital, such as: the average membership of grow-

ers in RPSs, participation in meetings and training programmes, awareness level among members with regard to rubber cultivation, time spent for RPS related activities, attitude of members, collective leadership, and responsibility (Govt. of Tripura, Souvenir 2014, 21).

It is in this context that the article provides a comprehensive assessment of the impact of rubber development projects in livelihood enhancement and diversification among the rubber growing tribal households and communities in the newly formed districts of South Tripura, Gomati, Sephajjala and West Tripura district in Tripura. This study has examined the impact of rubber cultivation-based economic rehabilitation programmes on rubber-growing households by applying a Sustainable Livelihoods Approach (SLA) to analyse the five capital assets (human, natural, physical, financial, and social) gathered through household surveys. In doing so, this study captures the socioeconomic and ecological impact of rubber development projects and their sustainability, replicability, and convergence aspects in addition to suggesting policy recommendations.

Impact of Integrated Rubber Development Projects on Tribal Livelihoods: Empirical Findings

This article represents a pioneering attempt to analyse the socioeconomic and ecological impact of natural rubber cultivation from the perspective of the beneficiaries and stakeholders involved in the process of implementation and the policymakers. This article is an outcome of field surveys completed with 300 rubber-growing and tapping tribal households, including 75 families from each district, belonging to the eight Rubber Producing Societies (RPS) amongst the six *Gram Panchayats*/villages and in the four identified districts of Tripura (Table 2). This study has employed the purposeful sampling method to carry out the survey among the rubber growers, rubber tappers (wage labourers), and tribal households in the selected four districts. Observation and interviews with the key informants have been applied as the tools to carry out the research. Data collected from interviews, focus group discussions, and case studies have been tabulated by selected variables. The livelihood framework of the population of inquiry has been analyzed for its sustainability according to the rating of the improvement in five types of capital assets, namely: natural, physical, human, financial, and social, forming the Asset Pentagon.

This section deals with the profiles of rubber growers and tappers spread across four districts in Tripura. The socioeconomic and ecological impact of rubber cultivation on the project beneficiaries has been critically analyzed throughout this article. The results of measurement of range equalization method (UNDP method of HDI) in the indicators of the five capitals has also been analysed in detail.

District	Gram Panchayat/ Village	RPS	Members of the RPS (N = 300)
South Tripura	Jolaibari	Debdaru RPS	38
	Baikhora	Aurobinda RPS	37
Gomati District	Bagma	Dariya Bagma RPS (BPS)	38
	Bagma	Kanchani Colony RPS (BPS)	37
West Tripura	Radha-Mohanpur	Rambabu Para RPS	38
	Chintahuran Para	Khathansa RPS	37
Sepahijala	Rangmala GP	Rangmala RPS (BPS)	38
	Rangmala GP	Santaram Para RPS	37

Table 2: Selection of Sample from the Four Districts of Tripura

Source: Primary data collected by the author.

Legends: RPS – Rubber Producing Societies, BPS – Block Plantation Scheme, GP – Gram Panchayat

Results and Discussion

The major tribal groups surveyed in the four districts of Tripura are Tripuri (49%), Jamatia (23%), Mog (13.3%), Debbarma (11%), and Reang (3.7%). Nearly two-thirds (59%) of rubber growers fall within the age group of 18-45. Thus, it is clear that majority of the rubber growing (RG) and rubber tapping (RT) households belongs to the working age group. The gender differentiation of the RG tribal communities shows that out of 300 surveyed households, 249 (83%) are male and 51 (17%) are female. Since RT requires a considerable amount of physical strength to tap the rubber tree, collect the field latex from faraway places, and acquire domain knowledge of estate management, women might find it difficult to perform this taxing manual labour. The educational background of the respondents by gender shows that out of 61.3% of male members/rubber cultivators being educated, 28.7% have studied up to primary level, 25.3% have education up to secondary level, another 5.3% male members have studied up to higher secondary level and only 2 percent have gone up to the higher secondary level. Whereas only 10.3% of female members have received education mostly at primary (5.7%), secondary (3.6%) and hardly 1 percent have attained higher secondary level. The educational standards for tribal women are very low. Very few of them under study (1%) were able to complete the class 12th standard. In fact, 3.7% female rubber cultivators have revealed that they have not studied beyond secondary level (3.7%). Tribal female tappers are expected to perform family work as well as RT. In rare cases children or husbands assist with the allied works of tapping. Most importantly, there is no gender-based discrimination regarding the wage rate in the field of RT. The average family size of the tribal families in the study area in Tripura is 4.6 members, which is almost equal to the national average of 4.8 members. Inquiry into the poverty status of the tribal households under study shows that 143 households (48%) have BPL Card, 129 households (43%) have APL Card, and the remaining 9% have *Antodaya Card*. Therefore, nearly three-fifths (57%) of the households live below the poverty line.

The monthly wage earnings of the majority (70.7%) of rubber producers is less than 10,000 INR; the remaining 29.3% of rubber producers earn between 10,001 to 40,000 INR monthly. The average monthly per capita expenditure of tribal households stands at 5,511 INR. Their highest expenditure is on food items (1633 INR) and children's education (1056 INR). They spend

Types of Ration Card/ Community	Tripuri	Debbarma Mog	Jamatia	Reang	Total	
BPL	64 (44%)	17 (50%)	24 (62%)	31 (46%)	7 (47%)	143 (48%)
APL	69 (48%)	14 (41%)	13 (33%)	27 (40%)	6 (40%)	129 (43%)
Antodaya	12 (8%)	3 (9%)	2 (5%)	9 (13%)	2 (13%)	28 (9%)
Total	145 (100%)	34 (100%)	39 (100%)	67 (100%)	15 (100%)	300 (100%)

Table 3: Classification of Ration Cardholders by Community

Source: Primary data collected by the author.

the least on entertainment, (22 INR) only and 34 INR on establishment of new rubber cultivations.

Occupational Profile and Livelihood

Agriculture is the mainstay of Tripura's economy and paddy fields being the principal crop. However, rubber cultivation in the high lands has been intensely promoted and is now a major source of income for both the rubber growers/plantation owners and the rubber tappers who work as daily wage labourers in RT and processing activities. The occupational profile of the surveyed households shows that out of the 300 sampled households, 230 tribal households (76.7%) belonged to small and marginal growers, whereas 70 tribal households (23.3%) came from RT tribal households. In Tripura, a majority of the rubber producers belong to underprivileged groups. In most of the cases, the growers engaged family labour for RT. In addition to this, the tribal households are also engaged in agricultural and allied activities, including firewood collection, vegetable production, the cottage industry, the livestock's fishery, and handicrafts (Table 4).

Occupational Profile	Frequency	percentage
I. Rubber Plantation	300	100%
Rubber Growers	230	76.7%
Rubber Tappers	70	23.3%
II. Other Occupational Activities		
Service	14	4.7%
Agriculture Labourer	27	9.0%
Daily Wages/Non-Agricultural Labourer	92	30.6%
Jhum Cultivation	32	10.7%
Firewood collection	32	10.7%
Vegetables (Horticulture)	14	4.7%
Petty Business	8	2.7%
Livestock raising	61	20.3%
Fishery	13	4.3%
Handicrafts and handloom	7	2.3%

Table 4: Occupational Classification

Source: Primary data collected by the author.

Possession of Landholdings

Land ownership in Tripura is allotted, *rayati* (inherited), purchased, gifted and leased in nature. About two-thirds (61%) of tribal households have *raiya* land and 34% of people have allotted land in the study area. On the other hand, only two percent of people have purchased land; the remaining three percent of people have gifted land. More than four-fifths of the covered tribal households (82%) have mature land and 17.8% have immature land for rubber cultivation. Less than two-fifths (38.7%) tribal households have mature land, holding below 2 *kani* and only 6.5% households have immature landholding below 2 *kani*. Only few households (0.9%) have mature land, holding of more than 20 *kani*. Thus, it is evident that majority of rubber growers in the study area belong to small and marginal growers. The unit of land measurement in Tripura is in terms of *Kani* (1 *Kani* is equal to 17,280 square feet and 0.16 hectre). Community-level possession of land in the study area is shown in Table 5.

Landholding	Tribes/No. of Persons					Total
	Tripuri	Debbarma	Mog	Jamatia	Reang	
<2 Kani	45 (31%)	17 (50%)	22 (56%)	17 (25%)	3 (20%)	104 (35%)
2-5 Kani	41 (28%)	6 (18%)	8 (21%)	10 (15%)	2 (13%)	67 (22%)
5-10 Kani	21 (14%)	5 (15%)	2 (5%)	22 (33%)	1 (7%)	51 (17%)
>10 Kani	4 (3%)	0 (0%)	0 (0%)	3 (4%)	1 (7%)	8 (3%)
Landless	34 (23%)	6 (18%)	7 (18%)	15 (22%)	8 (53%)	70 (23%)
Total	145 (100%)	34 (100%)	39 (100%)	67 (100%)	15 (100%)	300 (100%)

Table 5: *Possession of Landholdings*

Source: Primary data collected by the author.

Indebtedness

Indebtedness not only indicates the economic condition of the tribal households in the study area but also reflects the unequal distribution of socioeconomic opportunities and benefits, the hindrance of social progress, and the misdirection of social efforts. The survey results indicated that more than half of the tribal households out of 300 sampled households (63%) have taken a loan from the nearest *Tripura Gramin/Bandhan Bank*. Another 24.2% of tribal households have borrowed from other sources including MGNREGA Fund through their bank. The few SHGs operated in the study area are linked to the Tripura Gramin Bank, which has extended loans to nine percent of tribal households who happen to be members. The remaining 9.1% of tribal households borrowed from local money lenders. Thus, the incidence of indebtedness is widespread among the tribal communities in the study area.

Socio-Cultural Aspects

Socio-cultural aspects of the tribal community reflect that most of the respondents (95%) do not follow the dowry system; also, domestic violence and preference for male-born children is not common among the tribal communities. However, it should be mentioned that dowries, either in cash or in-kind, are gaining acceptance among the Debbarma community, the most developed among the tribal groups. School dropout among tribal children in the study area is a major concern as about 29% of tribal households reported removing of their children from school.

Profile of Rubber Growers and Tappers

76.7% respondents of the entire study sample involved in rubber cultivation are rubber growers (RGs), out of which 64% surveyed rubber growers are male and 12.7% are female. The remaining 23.3% respondents of the total study sample are rubber tappers (RTs), out of which 19% surveyed rubber tappers are male and 4.3% are female. Thus, the study reveals very high male representation (83%) in both the categories of RGs and RTs. Tribal women engaged in tapping work are exposed to various arduous exercises, like tapping in early morning, collecting latex from trees, and carrying latex to house. Because of lack of alternative employment opportunities available to them in rural areas, women are engaged in this kind of occupation that falls largely in what is considered the male domain.

Natural rubber production and tapping has been a major source of livelihood for as much as 84% of tribal households in the four districts of Tripura. A majority of rubber growers engage their family members (76.7%) for tapping rubber, whereas, only 23.3% of rubber producing households hire local rubber tappers. Among the hired rubber tappers, 21 (30%) tappers are male and 49 (70%) are female tappers.

More than half (53%) of the surveyed tribal households reported that they deposited the preserved field latex to the RPS/Board companies, 40.3% preferred to sell it to private dealers, whereas only five percent took recourse to cooperatives. Those who sold it to the collection depot of private processors or to the direct purchase depot of the tire company accounted for less than one percent of households. The average annual selling of rubber per persons stands at 982.05 kg, earning around 100,000 INR. Since the rubber price in the market has gone down significantly, the tribal rubber growers expressed unwillingness to sell rubber at lower prices. In fact, nearly three-fourths (74.57%) of rubber producing households reported unhappiness with the rubber market price.

Work Schedule

Out of 70 RTs. (including family labour/tapper and hired tappers), most of the tappers under study (69%) work in rubber cultivation every alternate day, 28% of tappers work every day and only three percent of tappers preferred working every three days (after every two days). The majority (56.7%) of RTs do the jobs of tapping, while 31.3% of tappers do both tapping and processing. All jobs of tapping, processing, and smoking (all for RSS) are done by 8.3% of tappers, while only 3.7% have the responsibility of filling up of PFL barrels. An experienced tapper normally taps between 250 and 350 trees. Trees are usually tapped every other or every third day, which varies from plantation to plantation. Although the Labour Department of the Government of Tripura has revised the minimum wages for the tappers/processing workers at 238 INR for 8 hours of work and for rubber plantation field workers at 230 INR/8 hours, the hired tappers are actually paid between 170- 200 INR only by the rubber growers/plantation owners.

Capacity Building

Half (50%) of the tappers (including self-growers and tappers) were provided with training for RT whereas 34% of respondents were provided with all types of training (including RT, sheet preparation, tapping, and sheet collection). Another 10% of respondents had received training for tapping and sheet collection; the remaining six percent for sheet rubber preparation.

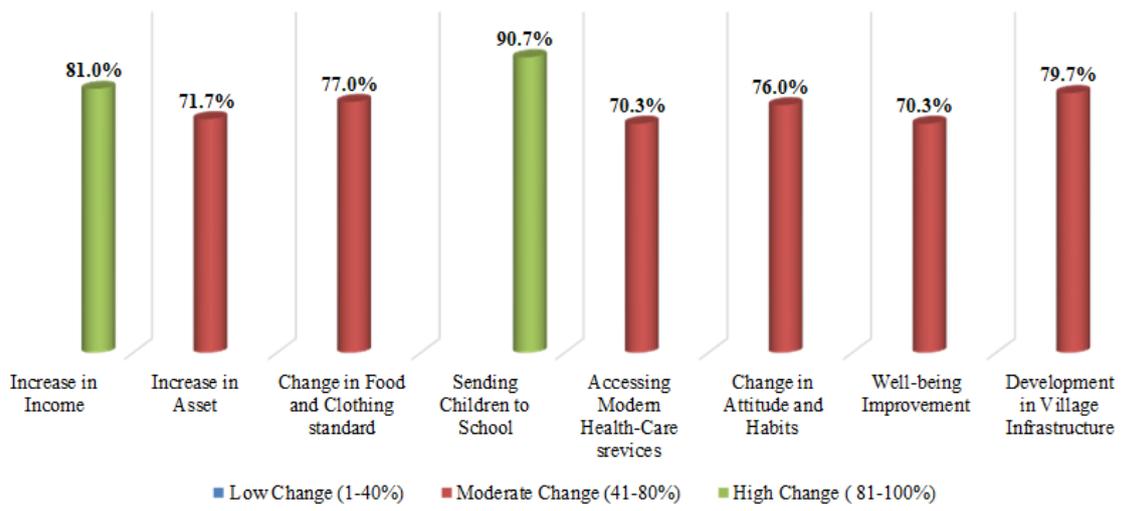
Wages and Allowances

The majority (62.9%) of RTs received their wage payments fortnightly followed by 18.6% tappers for whom it was on monthly basis. Only 10% tappers worked on a daily basis on cash payment; less (8.6%) worked on a weekly basis. Earlier, tappers used to take advance wages of ranging 1,000 to 5,000 INR from growers. But after a slump in the rubber price, this practice has taken a nosedive. Tappers still avail other benefits such as assistance for house construction, children's education, and incentives during festive occasions. Only 30% of RTs reported getting festival allowances during *Durga puja*, Christmas, and during tribal festivals like *Garia puja* and *Ker puja*; 62.9% of RTs reported having sickness leave.

Impact of Rubber Cultivation, Progress and Change

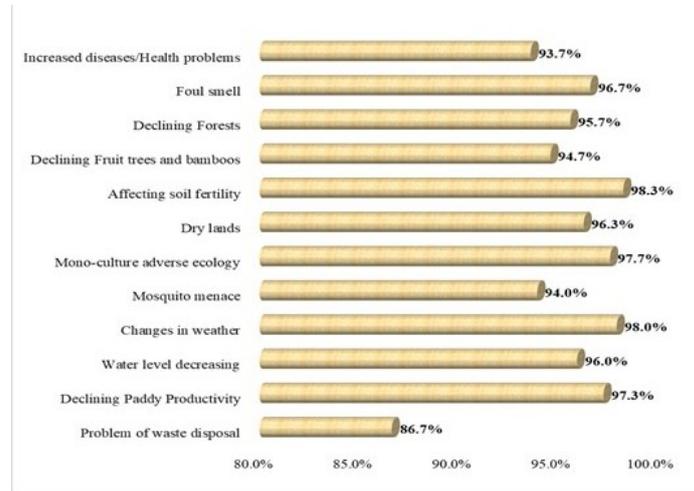
Rubber cultivation in the study area has brought significant changes to the rubber growing and tapping tribal households in terms of high income (81%) and improvement in children's education (90.7%). Moderate changes have been noticed among the surveyed households in the state of Tripura with respect to the following: food and clothing standard (77%), healthcare facilities (70.3%), attitudinal changes and habits (76%), development of village infrastructure (79.7%), asset creation (71.7%) and the overall well-being (70.3%) of the tribal households. In nutshell, the study shows that the rise in income level of the rubber growers through cultivation has led to asset creation and brought significant changes.

Figure 1: Impact of Rubber Cultivation on the Rubber Growing and Tapping Households



Almost all (98%) respondents opined that rubber cultivation is affecting the local weather conditions. More than four-fifths (93.7%) of respondents viewed that rubber is a cause for a host of diseases and associated health problems. It arises mainly from the foul smell emanating during rubber processing. No remedial solution has emerged thus far. Most of the negative responses pointed out by the rubber growing tribal households pertained to the environment. Rubber cultivation affecting soil fertility, for instance, leads to a decline in paddy field productivity, forest cover, water levels, and an increase in foul smells and health issues.

Figure 2: Negative Impacts of Rubber Cultivation

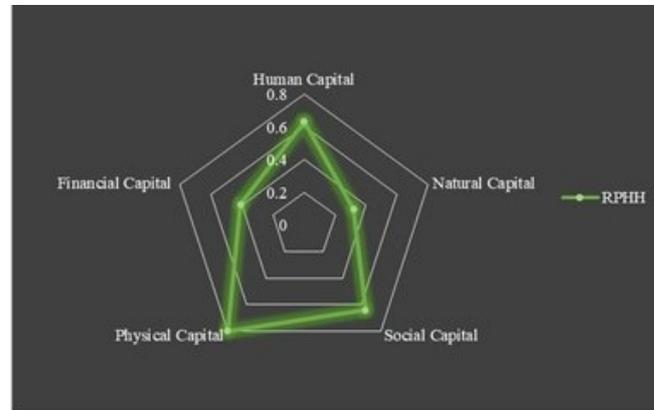


Sustainable Livelihoods Framework

Livelihoods may be defined as the means by which households obtain and maintain access to the resources necessary to ensure their immediate and long-term survival. The factors essential for livelihood can be classified into six categories: physical, natural, human, financial, social, and political (USAID 2005, 2). Department for International Development has developed a ‘Sustainable Livelihood Framework’ (SLF), which is one of the most widely used livelihoods framework in development practices. A sustainable livelihoods asset (SLA), an element within this framework, is concerned first and foremost with people and seeks to gain an accurate and realistic understanding of people’s strengths (called “assets” or “capitals”). It is crucial to analyze how people endeavor to convert these strengths into positive livelihood outcomes. The approach is founded on the belief that people require a range of assets to achieve positive livelihood outcomes. Therefore, the SLA identifies five types of assets or capitals upon which livelihoods are built, namely human capital, social capital, natural capital, physical capital, and financial capital. Furthermore, the Range Equalization Method of the UNDP examines the livelihood assets of the rubber growers and plantation workers, namely human, natural, physical, financial, and social capital (Ghosh et.al. 2006). The asset pentagon lies at the core of the livelihoods framework within the vulnerability context. The pentagon was developed to visually highlight information about people’s assets, thereby bringing to life important relationships between the various assets. To understand their strengths and weaknesses, the score values of the five capitals of RPHH is diagrammatically represented by the livelihood asset pentagon (fig. 3).

Human capital assets included: working population, literacy rate, dropout from school, and political consciousness/affiliation. These are the key factors responsible for attaining a high quality of livelihood and better human development irrespective of the type of society to which they belong. The human capital of the surveyed households is moderately sustainable with score value of 0.63 among rubber producing households (RPHH) . It is observed that the working population (100%) of rubber growers (family labour) has increased and also among hired tappers associated with rubber cultivation such as tapping, processing, and maintaining the plantation with help from RPS and Manimalayar (Rubber Board). Further, it is noted that there is an increase in literacy rate (79.7%), political association (90.7%), and health facilities (86.3%) among

Figure 3: *Livelihood Assets Pentagon of RPHH of Tripura*



the RPHH in the study area.

Natural capital assets included: land ownership, possession of mature and immature land for cultivation, and housing status of the tribal communities in the study area. The cultivation households lacked access to basic amenities and were mostly dependent on natural assets. The natural capital of the RPHH was unsustainable with a score of 0.32 due to possession of small and marginal land. Most of the lands possessed by RPHH were inherited (*raiyati*) and homestead in nature. Allotted lands accounted for 34% of total possessed lands. Few RPHH had increased their land size as they were allotted 1.5 hectare (ha.) of land; 1 ha. for rubber cultivation and 0.5 ha for homestead. However, this varied from place to place based on availability. Physical capital/assets comprised of health care facilities, electricity, water supply and sanitation, and the possession of jewels and consumer durables owned by the tribal communities. Physical assets were considered as a reflection of the quality of livelihood the tribal communities. This shows huge difference in score, as RPHH were found to be moderately sustainable (0.80).

Livelihood is highly dependent on the financial assets of an individual. It broadly covers wages, income sources, possession of livestock, access to credit, and saving habits. The more financial assets one has, the higher the probability is to acquire other livelihood assets. It also indicates whether an individual's wages are enough to make a decent living. Additionally, it gives a sense of their access to credit facilities from financial institutions as well as their savings habits and financial inclusion features. The financial capital asset score for RPHH was 0.41, showing moderate sustainability. Taking the income of the rubber growers into consideration, 70.7% of RPHH earned more than 100,000 INR per year from collecting field latex, rubber sheet processing, and other sources.

The social capital assets considered here include: the average membership of growers in RPSs, the membership of rubber growers and tappers in SHGs, beneficiaries from government schemes, participation in meetings and training programmes, awareness level, time spent for RPS related activities, attitude of members, collective leadership, and responsibility. The score for RPHH in social capital, 0.64, was moderately sustainable. The RPHH in the surveyed localities had a strongly inbuilt social capital as they are closely connected on the basis of kinship networks. This social bonding enables them to make decisions in adopting rubber cultivation and achieving socioeconomic success. The RPHH had better physical capital (infrastructure), human capital

(literacy, working population), and social capital (trust, norms and network with SHGs, Banks). Social capital was found to be higher among the RPHH whereas they lacked natural capital (land) as most of the tribal household belonged to small and marginal growers in the study area. Higher income from rubber cultivation has strengthened the coping strategies of the RPHH.

Constraints/Bottlenecks

Nearly three-fourths (71%) of surveyed tribal and rubber growing households reported that even high-quality sheet rubber did not get a premium price in the market. Another 11.7% of rubber growing households reported a lack of adequate rubber sheet processing facilities and other eight percent of tribal households noted a lack of quality processing inputs. Finally, three percent rubber growing households underscored labour constraints in producing higher quality rubber sheets. Consequent to the growing popularity of employment opportunities under MGNREGA, there are serious constraints of the supply of family labour to immature rubber cultivation in the State (Sharma 2011, 526). Since MGNREGA-linked minimum wage rates are at a premium, tribal villagers prefer not to work as RTs. Faulty tapping is a serious problem affecting both the yields and economic life of the rubber cultivation, particularly in the plantations owned by the tribal families. About 4 cubic meters of firewood is required to produce 1 MT of dried and smoked rubber. As a result, the countryside is quickly losing its indigenous tree cover; the cost of processing also is on the rise.

Conclusion

Implementation of rubber cultivation programmes in the surveyed districts of Tripura has outlined a number of benefits. These efforts have certainly reduced poverty, enhanced the socioeconomic condition of the erstwhile poor *jhumias* (shifting cultivators) and landless families (now RPHH), and also strengthened their coping strategies to overcome crisis and shock. The quality of life of the tribal households have improved significantly in terms of income, asset creation, food and clothing, children's education, family healthcare, changes in their attitudes and habits, improvement in village infrastructure, and overall well-being. The RPSs at the local level play an important role in livelihood promotion among the tribal rubber growing households in the study area especially in rubber cultivation and in transferring new technologies to their members. They also established a robust market linkage with the rubber companies such as *Mani Malayar Rubber Pvt/. Ltd.* (under Rubber Board) and *Tripura Latex Pvt. Limited.* Apart from this, the RPSs have evolved the cooperative spirit and democratic values among the small rubber growing and tapping tribal households in the region. Furthermore, the latex harvesting technician (tapper) training imparted by the Tripura Skill Development Mission, along with the Rubber Board of India, have enhanced the capacity of the small rubber growers to produce high quality of rubber sheets, which attracts higher prices. Employment opportunities generated through implementation of rubber cultivation programmes has minimized the unrest in the state, which represents an added advantage. The success stories of the BPS have been further replicated in the non-traditional regions of north-eastern states of Maharashtra, Odisha, West Bengal and Andhra Pradesh.

List of Abbreviations

APL Card - Above Poverty Line Card
BPL Card – Below Poverty Line Card
FRA - Forest Rights Act
HDI - Human Development Index
India VNR - India Voluntary National Review
ITDP - Integrated Tribal Development Programme
NER - North-eastern Region
NRP - National Rubber Policy
PESA - Panchayats Extension to Scheduled Areas Act
PVTG - Particularly Vulnerable Tribal Groups
RG - Rubber Growing
RT - Rubber Tapping
RPHH - Rubber Producing Households
RPS - Rubber Producing Societies
SDGs - Sustainable Development Goals
SDM - Sub-divisional Magistrates
SHG - Self Help Group
SLA - Sustainable Livelihoods Approach
SLF - Sustainable Livelihood Framework
SLI - Sustainable Livelihood Index
ST- Scheduled Tribe
TBPP - Tripura Block Plantation Project
TFDPC - Tripura Forest Development & Plantation Corporation
TTAADC - Tripura Tribal Area Autonomous District Council
TRPC Ltd. - Tripura Rehabilitation Plantation Corporation
UNDP - United Nations Development Programme
WTGs - Women's Thrift Groups

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Notes

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²India Voluntary National Review (India VNR) 2020: Decade of Action-Taking SDGs from Global to Local. NITI Aayog, Government of India. Leaving No One Behind: Voices from the Community (Chapter 6). The most compelling vision of the 2030 agenda, epitomizing the well-being of all, is poised on the principle of 'leaving no one behind'. For details see the section on Scheduled Tribes and Adivasis, p.141-44.

³Department of Commerce, Ministry of Commerce & Industry, Government of India. National Rubber Policy 2019, Chapter-I Preamble, Goals and Objectives, page no. 5-6, available at: https://commerce.gov.in/wp-content/uploads/2020/02/NTESCL636871126727394221_National-Rubber-Policy-2019.pdf

⁴A.K. Krishna Kumar 2014. Rubber Development Version 2.0 for North Eastern Region with a reference to Tripura, p. 14-15, in the Souvenir brought out by Rubber Board Tripura titled 'Rubber in Tripura-Golden Jubilee Celebration (1963-2013)', to celebrate the Golden Jubilee Celebration of Rubber Plantation on 29th October, 2014, in order to commemorate the development and role played by various stakeholders in the natural rubber sector in Tripura.

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