

**IMPACT OF INTEGRATED RUBBER DEVELOPMENT PROJECTS ON
TRIBAL LIVELIHOOD IN TRIPURA: A SOCIOLOGICAL STUDY
(A Major Research Project Sponsored by ICSSR, MHRD, New Delhi)**

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A PROJECT REPORT

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ABBREVIATIONS

AIRIA	All India Rubber Industries Association
ATMA	Automotive Tyre Manufacturers' Association
ADS	Air Dried Sheet
ADC	Autonomous District Council
ASRY	Adivasi Shikha Rrinn Yojana
APL	Above Poverty Line
AAY	Antyodaya Anna Yojana
AWC	Angan Wadi Centres
BPS	Block Plantation Scheme
BPUs)	Block Planting Units
BPL	Below Poverty Line
BRGF	Backward Region Grant Fund
BSF	Boarder Security Force
CPCs	Community Processing Centers
CAO	Chief Accounts Officer
CSA	Community Supported Agriculture
CDI	Cluster Development Initiatives
CHC	Community Health Centre
CRPF	Central Reserve Police Force
CBOs	Community-Based Organization
DM	Divisional Manager
DLSDC	District Level Skill Development Centre
DFID	Department for International Development
ED	Executive Director
FGD	Focus Group Discussion
GSCM	Green Supply Chain Management
GPUs	Group Processing Scheme
GPCs	Group Processing Centres
HHRP	Households having rubber plantation
HNHRP	Households not having rubber plantation
HQ	Head-Quarter
HDI	Human Development Index
HDRC	Human Development Resource Centre
ISNR	Indian Standard Natural Rubber
IFAD	International Fund for Agricultural Development
IAY	Indira Awas Yojana
IMR	Infant Mortality Rate
IBA	Indolebutyric acid
IL&FS	Infrastructure Leasing & Financial Services Limited
IEC	Information, Education and Communication
IHHL	Individual household latrines
JFMCs	Joint Forest Management Committees
LAP	Livelihood Action Plan
LPG	Liquefied Petroleum Gas
LFT	Low Frequency Tapping

MPCE	Monthly Per Capita Expenditure
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MD	Managing Director
MRP	Mixed Reference Period
MT	Million Tonne
MPCI	Monthly per capita Income
MPCE	Monthly per capita Expenditure
NR	Natural Rubber
NTFPs	Non-Timber Forest Produce
NEFA	North-East Frontier Agency
NGOs	Non-Governmental Organizations
NIT	National Institute of Technology
NSTFDC	National Scheduled Tribes Finance and Development Corporation
NABARD	National Bank for Agriculture and Rural Development
NSDC	National Skill Development Corporation
NER	North Eastern Region
NRETC	Nucleus Rubber Estate and Training Centre
NFSA	National Food Security Act
NCO	National Classification of Occupations
PFL	Preserved Field Latex
PDS	Public Distribution System
PFL	Preserved field latex
PHC	Public Health Centre
PRIs	Panchayat Raj Institutions
PCs	Production Centers
PNG	Natural Petroleum Gas, Pipelined Natural Gas
RSDC	Rubber Skill Development Council
RSS	Ribbed Smoked Sheet
RPSs	Rubber Producer's Societies
RPC	Rubber plantation centers
RGSs	Rubber Growers Societies
RPS	Rubber Producing Societies
RG	Rubber Grower
RT	Rubber Tappers
RSMs	Rural Sanitary Marts
RSBY	Rashtriya Swasthya Bima Yojana
RSDC	Rubber Skill Development Council
RBI	Rubber Board of India
RPHH	Rubber Producing Households
SDM	Sub-divisional Magistrates
SHGs	Self Help Groups
SLA	Sustainable Livelihoods Approach
SLF	Sustainable Livelihoods Framework
SL	Sustainable livelihoods
SDH	Sub-divisional Hospital
SLI	Sustainable Living Index

SLA	Sustainable Livelihood Analysis
SCA	Special Central Assistance
SSCM	Sustainable Supply Chain Management
SSA	Sarva Shiksha Abhiyan
ST	Schedule Tribes
SC	Schedule Caste
SOTFD	Scheduled Tribes & other Traditional Forest Dwellers
SSHE	School Sanitation and Hygiene Education
TFDPC	Tripura Forest Development and Plantation Corporation Ltd
TRPC	Tripura Rehabilitation Plantation Corporation Ltd
TTAADC	Tripura Tribal Areas Autonomous District Council
TRPC	Tripura Rehabilitation Plantation Corporation
TIDC	Tripura Industrial Development Corporation
TBPP	Tripura Block Plantation Project
TFDC	Tripura Forest Development & Plantation Corporation
TSP	Tribal Sub-Plan
TSC	Total Sanitation Campaign
TIT	Tripura Institute of Technology
TTWREIS	Tripura Tribal Welfare Residential Educational Institutions Society
TPP	Twenty Point Programme
TSR	Technically Specified Rubber
TSR	Tripura State Rifles
TGB	Tripura Gramin Bank
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
UNESCO	United Nations Educational, Scientific and Cultural Organization.
VLSDC	Village Level Skill Development Centre
WTGs	Women Thrift Groups
WBAP	World Bank Aided Rubber Project
W.H.O	World Health Organization
WTGs	Women Thrift Groups

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EXECUTIVE SUMMARY

The study was undertaken by Indian Institute of Public Administration (IIPA), New Delhi sponsored by Indian Council of Social Science Research (ICSSR), New Delhi. The study is a pioneering attempt to assess the socio-economic and ecological impact of natural rubber plantation from the angle of the beneficiaries, the stakeholders involved in the process of implementation and the policymakers.

The objectives of the study were to: (i) study the socio-economic conditions of the *Jhumias* (shifting cultivators/tribals) in the four districts of Tripura: South Tripura, Gomati, Sephaijala and West Tripura; (ii) identify the traditional pattern of livelihood of the tribal communities; (iii) explore the dynamics of tribal livelihood linked with natural rubber block plantation project; (iv) identify the nature of the ownership of plantation in the selected districts; (v) study the division of labour in rubber plantation and the contribution of tribal women in the entire process of plantation and latex processing; (vi) explore the socio-cultural changes among the tribal community with changing pattern of livelihood; (vii) study the ecological impact and effect of rubber processing on the community; (viii) explore the role of social capital in livelihood promotion of community in the forested areas; (ix) document the best practices in livelihood promotion through rubber plantation; and (x) study the replicability, sustainability and convergence aspects of Tripura rubber development projects elsewhere in the country.

This study is based on a field survey of 300 rubber growing and tapping tribal households (75 from each district) belonging to eight Rubber Producing Societies (RPS) spread across six Gram Panchayats/villages and in selected districts of Tripura. The primary data were supplemented with secondary information gathered from relevant official sources and concerned agencies.

A close look into the performance of the state in the human development indicators reflects that Tripura scores well above the national average in terms of literacy, birth rate, death rate, natural growth rate and infant mortality rate (*Chapter 3*).

Review of literature on natural rubber plantation in Tripura reflects that implementation of rubber plantation programmes has led to the improvement in the economic status of tribal communities and opened up a new work culture in the state of Tripura. It highlights remarkable achievements in the sphere of education made through the integrated rubber plantation programme. The study also reveals that job opportunities generated through implementation of rubber plantation programme has resulted into minimizing the unrest prevailing in the society (*Chapter 2*).

A major factor behind the success of rubber plantation in Tripura was the formation of Rubber Producer Societies (RPS) and establishing their strong linkages with rubber growers, Rubber Board and other agencies. The RPS in the region have greatly enhanced the rubber area production, productivity through its multipronged intervention. Tripura Rubber park, promoted jointly by Tripura Industrial Development Corporation and Rubber Board, India plays a vital role in promoting the rubber industry in the State. The Government of Tripura provides excellent initiatives to the rubber companies under Tripura Industrial Promotion Scheme 2017.

The stakeholder's analysis on sustainable rubber cultivation in the state of Tripura informs that dynamic leadership, dedicated works, coordinated efforts and social commitments of the several stakeholders in Tripura has led to a spectacular growth of rubber sector in the state (*Chapter 4*).

From the analysis of the organizational structure, functions and role of the rubber producer societies at the local level it is apparent that RPS plays an important role in livelihood promotion among the tribal rubber growing households in the study area especially in rubber plantation and, in transferring new technologies to the members. It is also instrumental in establishing a robust market linkages with the rubber companies such as *Mani Malayar Rubber Pvt/. Ltd.* (under Rubber Board) and *Tripura Latex Pvt. Limited.* Apart from this, the Rubber Producer Societies 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 price (*Chapter 6*).

The survey findings presented in the report reflects on the socio-economic status of the rubber growing and tapping tribal households and the impact of integrated rubber development projects on the lives and livelihoods of the tribal communities (*Chapter 5*).

- As a hilly State in the NER of India, Tripura is the homeland of 19 (nineteen) tribes (STs), comprising 31.8% of its total population. 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-third (59%) of rubber growers fall under the age group of 18-45. Thus, it is clear that majority of the RG/RT belongs to the working age group.
- Out of 300 surveyed households, 249(83%) are male and 51 (17%) are female. Since rubber tapping requires considerable amount of physical labour women find it little difficult to cope with the multiple load including estate management. Women members do the domestic work, take care of the family members and collect and store firewood (fuel) for use during the monsoons.
- The educational background of the respondents shows that 61.3 per cent male members have attended education at the primary (28.7%), secondary (25.3%) and higher secondary (5.3%) level. But only 2 percent have gone upto the higher secondary level. Whereas 10.3 per cent female members have received education mostly at primary (5.7%), secondary (3.7%) and hardly 1 percent have attained higher secondary level. The literacy rate however, is 71.6 per cent in the study area. In view of their low income profile, and tribal background, the literacy rate is much higher – a fact needs to be highlighted and appreciated too.
- Considerably, the educational standards of tribal women are very low. Very few of them are able to complete the class 12th standard. In fact, they do not go beyond secondary level. Tribal women tappers have to carry out family works as well as tapping continuously. In rare cases children or husband help them in the allied works of tapping. Most importantly, there is no gender discrimination regarding wage rate in the field of tapping.
- The average family size of the tribals in the study area in Tripura is 4.6, which is almost equal to the national average (4.8).
- An overwhelming majority of (84%) of the tribal households under study reside in tin-roofed house, belonging generally to lower middle income groups. A very small fraction of tribal households, merely four per cent who are well-off, and belonging to high income groups live in brick-walled and concrete-roof house. Yet another 12 per cent tribal households live in mud-walled house.

- More than three-fourth (78.7%) respondents from the tribal communities preferred to go to the Public Health Centre (PHC)/Community Health Centre (CHC) and Sub-divisional Hospital (SDH) for health check-up. The State has comparatively performed better in the field of health and medical facilities, thanks to resources, both physical and material created under the national rural health mission (NRHM) a centrally sponsored scheme. Additionally, the State Health Department, taken great strides in providing comprehensive health care insurance coverage, especially to poor people.
- The RSBY scheme of Government of India intended to benefit Below Poverty Line (BPL) population and all other 11 identified categories of beneficiaries permissible as per the guidelines is in operation in eight districts in Tripura. For effective operation of the scheme, partnership has been envisaged between the Insurance Company, public and the private sector hospitals and the State agencies.
- The main sources of drinking water in the study area is hand pump, as affirmed by 63 per cent of tribal households, while it is tube well for 30.7 per cent surveyed tribal households and the rest (2.34%) rely on river and canal water. Only 3.33 per cent tribal households reported using potable water supplied by the government of Tripura. The respondents reported that there is high level of contamination of iron and manganese in the groundwater of Tripura.
- The main goal of the Swachh Bharat Mission (Gramin) is to eradicate the practice of open defecation in the rural and tribal areas. It is heartening to note that nearly three-fourths (71%) tribal households in the four districts of Tripura covered in the study, are having latrine facility within their own premises, whereas 25 per cent of the tribal households using public toilets. A very marginal (4%) tribal households still go for open defecation.
- Firewood based energy remains the largest supply source for three-fourths (78%), and only 10 per cent rural/tribal households have LPG/PNG gas connection. Kerosene based energy use among the rural/tribal households in the study area is limited to only 9 per cent of the respondents. A very low (3%) households in the study area make use of electrical energy. Tribal women spend a significant amount of their time daily on fetching water and collecting firewood from faraway places.
- Over half (52%) cent of the tribal households have grid electricity connection in the study area, whereas, 45.7 per cent households use Kerosene, 1 per cent households use solar energy and 0.7 percent use oil for lighting. Thus, it was observed that almost 99.3 per cent ST households have sources of lighting facility (including electricity and Kerosene) within the premise. However, the households without lighting facility was 0.7%.
- It is apparent that 143 HHs (48%) have BPL Card, whereas 129 HHs (43%) have APL Card and the remaining 9% have *Antodaya Card*. That three-fifths of the (57%) households belong to below poverty line.
- The monthly wage earning of the majority (70.7%) of rubber producers is less than 10000 rupees. Below this band 22.3% rubber producer earn between Rs. 10000 to 20000, while a very small proportion of them (5%) earns between Rs. 20000 to 30000. On the upper end of the scale are those (1.3%) who earn between Rs. 30000 to 40000. Merely 0.7 per cent surveyed respondents who have member in their family earning above 40000 in a month.
- The average monthly per capita expenditure of tribal households stands at Rs 5511. Their highest expenditure is on food items (Rs.1633) and children's education (Rs. 1056). On the other hand, they spend minimum on entertainment, Rs. 22 only and little more on establishment of new rubber plantation (Rs.34).

Occupational Profile and Livelihood

Agriculture is the mainstay of Tripura's economy and paddy being the principal crop. However, rubber plantation in the waste/high lands has been promoted in a big way and now it is a major source of income for both the rubber growers/plantation owners and the rubber tappers who work as daily wage labourers in rubber tapping and processing activities.

The occupational profile of the surveyed households shows that out of 300 sample households, 230 tribal households (76.7%) belong to small and marginal growers, whereas 70 tribal households (23.3%) are from rubber tapping tribal households. In Tripura, majority of the rubber producers belong to backward and under privileged groups. In most of the cases, the growers engage family labour for rubber tapping. In addition to this, the tribal households are also engaged in agricultural and allied activities, including firewood collection, vegetable production, cottage industry, livestock's fishery and handicraft etc.

Five per cent tribal households are in services. This includes, all those who have joined as soldiers (*Jawans*) in the Indian Army, the Border Security Force (BSF), the Central Reserve Police Force (CRPF), the Tripura State Rifles (TSR). Some of them also are employed as manager, industrial security guard, drivers and helpers in hotel. A little over one-fourth about 27 households (9.0%) are working as agricultural wage labourers, whereas majority of 92 tribal households (30.6%) are engaged in non-agricultural work. Yet another 8 tribal households (2.7%) of the study sample were engaged in petty business. It is also observed that 32 tribal households were still practicing *Jhum* cultivation, largely in South and Gomati district. The topographical situations of the land of South Tripura have constrained them to continue with this subsistence farming method.

Land and Other Assets Ownership

Land ownership in Tripura is of allotted, *rayati* (inherited), purchased, gifted and leased in nature. It is apparent that about two-thirds (61%) tribal households have inherited (*Raiyati*) land and 34 per cent people have allotted land in the study area. On the other hand, only 2 per cent people have purchased land and the remaining 3 per cent people have gifted land. More than four-fifth of the covered tribal HHs (82%) have mature land and only 17.8 per cent have immature land for rubber plantation. Little less than two-fifths (38.7%) tribal HHs have mature land holding below 2 kani and only 6.5% HHs have immature landholding below 2 kani. Only few HHs (0.9%) have mature landholding of more than 20 kani. Thus, it is evident that majority of rubber growers in the study area belong to small and marginal growers.

Ownership of assets among the surveyed HHs shows that 276 HHs including RG&RT (92%) possess consumer durables and assets, whereas 24 tribal HHs (8%) that don't possess any household assets belong to very poor tribal family. Goats and fishery constitute majority of 20.8 per cent of the total livestock population in Tripura, followed by pigs (19.9%), cow (17.7%), poultry (12.9%), oxen (5.3%), sheep (1.4%) and buffalo (1.2%) by the rest 52.7 percent households. The average ownership of livestock per household is 3.6.

Indebtedness

Indebtedness not only indicates economic condition of the tribal households in the study area, but also reflects unequal distribution of socio-economic opportunities and benefits, arrests social progress and misdirects social efforts. The survey results indicate that more than half of tribal households out of 300 sampled household (63%) have taken loan from the nearest *Tripura Gramin/Bandhan Bank*. Another 24.2 per cent tribal households have borrowed from other sources

including MGNREGA Fund through bank. Few Self Help Groups (SHGs) operated in the study area are linked to Tripura Gramin Bank have extended loan to 9 per cent tribal households who happen to be its members. The rest 9.1 per cent tribal households had borrowed from the local money lenders. Thus, the incidence of indebtedness is widespread among the tribal in the study area. Out of 300 respondents, only around 22 per cent household had received benefits from government schemes such as IAY, MGNREGA etc.

Socio-Cultural Aspects

Socio-cultural aspects of the tribals reflects that most of the respondents(95%) do not follow dowry system; also domestic violence or wife beating and preference for son or gender discrimination for that matter is not common among the tribal communities. However, it needs mentioning that dowry either in cash or kind like gifts, gold, furniture etc. is gaining acceptance rather speedily 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 per cent tribal households reported dropping of their children from school. Though Tripura has achieved the first position in literacy attainment in the country, quality of education at all levels has not improved. There are many schools that also lack required amenities like drinking water, infrastructures including toilets. Lack of toilets in the government schools forced many girl students to drop out.

Profile of Rubber Growers and Tappers

Out of 76.7 per cent rubber growers (RG&RT) in the study area, 64 per cent tapper happen to be male and 12.7 per cent are female. Among the rubber tappers (23.3%), 19 per cent tappers are male and 4.3 per cent female. Thus, the study reveals very high male representation (83%) in both the categories of rubber growers and rubber tappers. Tribal women engaged in tapping work are exposed to various arduous exercises, like, tapping in early morning, collecting latex from trees, carrying latex to house etc. Because of lack of alternative employment opportunity available to them in rural areas women are perforce engaged in this kind of occupation that falls largely in male domain.

The largest number of rubber growers are found among the Tripuri tribes (116 out of total 300 households), whereas the Jamatia community has more number of rubber tappers (30 households). Natural rubber production and tapping has been a major source of livelihood for as high as 84 per cent tribal households in the four districts of Tripura. Majority of rubber growers engage their family members (76.7%) for tapping rubber, whereas, only 23.3 per cent rubber producing households hire local rubber tappers. Among the hired rubber tappers, 21 (30%) tappers are male and 49 (70 %) are hired female tapper. More than four-fifth of the tribal households (82%) have mature land and only 17.8 per cent households have immature land. That apart, 38.7 per cent tribal HHs have mature land holding below 2 kani and only 6.5 per cent HHs have immature landholding below 2 kani. Only few household (0.9%) have mature landholding of more than 20 kani. Thus, it is evident that majority of rubber growers in the study area belong to small and marginal growers.

Majority of the RPS members (87%) reported that the RPS in their locality have all the processing facilities. Little more than half (53%) surveyed tribal households reported that they deposited the preserved field latex to the RPS/Board companies, 40.3 per cent preferred to sale it to the private dealer whereas only 5 per cent took recourse to cooperatives. Those who sold it to collection depot of private processor or to the direct purchase depot of the tire company accounted for less than one per cent households. The average annual selling of rubber per persons stands at 982.05 kg, fetching around Rs. 1 lakh. Since, the rubber price in the market has gone down significantly, the tribal

rubber growers expressed unwillingness to sell rubber at the lower prices. Infact, nearly three-fourth (74.57%) rubber producing households reported unhappiness with the rubber market price.

Work Schedule

Out of 70 rubber tappers(including family labour/tapper and hired tappers), most of the tappers under study (69%) work in the plantation on every alternate day, while 28 per cent tappers work in the plantation every day and only 3 per cent tapper preferred work third day (after every two days). Majority (56.7%) of rubber tappers do the jobs of tapping, while 31.3 per cent tappers do both tapping and processing. All jobs of tapping, processing, and smoking(all for RSS) are done by 8.3 per cent tappers, while 3.7 per cent have responsibilities only up to filling up of PFL barrels.

An experienced tapper normally taps between 250 and 350 trees. Trees are usually tapped alternate or third day, which varies from plantation to plantation. In the surveyed area, between 200 to 250 trees are tapped daily by nearly two-fifths (39.7%) of rubber tappers, followed by tapping of 100 to 150 trees on daily basis by 18% and almost equal proportion (17.7%) having tapping task of 150 to 200 trees. Another 10 per cent tappers tapping less than 100 trees daily while 14.7 per cent rubber tappers tap maximum number of more than 250 tree for daily.

Although the Labour Department, Government of Tripura has revised the minimum wages for the tappers/processing workers (for both male and female) at Rs. 238 for 8 hours of work, and for rubber plantation field worker (for S/he) at Rs. 230 for equal hours of work, the hired tappers are actually paid between Rs. 170- 200 only by the rubber growers/plantation owners. Most of the rubber tappers (52.3%) have their place of work within 1 km from their place of residence.

Capacity Building

Half (50%) of tappers (including self-growers and tappers) were provided with training for rubber tapping whereas 34 per cent respondents were provided with all type of training (including rubber tapping, sheet preparation, tapping and sheet collection). Another 10 per cent respondents had received training for tapping and sheet collection and the remaining 6 per cent for sheet rubber preparation.

Wages and Allowances

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

Nearly two-thirds (62.9%) of the study sample have stood with their employers while 37.1% tapper claimed to have more than one employer during their occupational carrier. 31 per cent hired rubber tappers changed their employers due to low wage payments. About 23 per cent tappers marked long distance to cover to reach the plantation as the reason for such changes. When they found plantations close to their places of residences, they got absorbed there subsequently. To another 15 per cent tappers it was rude behavior of their employer. Another 19% respondent blamed unpleasant working atmosphere for the change happened to them. The rest 12% declined to name

any reason that forced them to change their employers. Almost over three-fourth (76%) tappers expressed good job satisfaction. For 21 per cent respondent it is mere average while for 3% it has been poor.

Impact of Rubber Plantation, Progress and Change

Rubber plantation in the study area have brought significant changes among 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 plantation has led to asset creation and brought also significant changes in all the spheres.

Almost all the respondent (98%) agreed that rubber plantation affected the local weather conditions. Again, 93.7 per cent 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 come out so far. Most of the negative responses pointed out by the rubber growing tribal households were pertaining to environment/ecology. Rubber plantation affecting soil fertility for instance leads to decline in paddy productivity, decline in forest cover, decrease in water level, foul smell and health issues. The study has explored the role of social capital among the tribal communities in livelihood promotion in the forested areas in Tripura. The study has followed the Range Equalization Method of UNDP (Ghosh et.al. 2006) and examined the livelihood assets of the rubber growers and plantation workers, namely human, natural, physical, financial, and social capital.

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 to the type of society they belong to. Human Capital of the surveyed households are moderately sustainable with score value of rubber producing households (RPHH) (0.63). It is observed that there is increased working population (100%) among rubber growers (family labour) has increased and also among hired tappers associated with rubber plantation such as tapping, processing, 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%) and political association (90.7%) and health facilities (86.3%) among the RPHH in the study area.

Natural capital/assets include land ownership, possession of mature and immature land for plantation and housing status of the tribal communities in the study area. The plantation households lack access to basic amenities and mostly dependent on natural assets. The natural capital of the RPHH are unsustainable with score value (0.32) due to possession of small and marginal landholdings. Most of the lands possessed by RPHH are inherited (*raiya*) and homestead in nature. Allotted lands account for 34 per cent only. Few RPHH have gained in land holding size as they were allotted 1.5 hectare (ha.) of land: 1 ha. for rubber plantation and 0.5 ha for homestead. However it varies from place to place on availability of land.

Physical capital/assets comprise health care facilities, electricity, water supply and sanitation, possession of jewels and consumer durables owned by the tribal communities. Physical assets on

the whole, are considered a reflection of the quality of livelihood the tribal communities possess. It shows huge difference in score value, as RPHH found highly sustainable (0.80).

Livelihood is highly dependent on the financial assets of an individual. It broadly covers wages, income sources, possession of livestock's, access to credit facility and saving habits. The more the financial assets, the higher will be the probability to acquire other livelihood assets. It also indicates whether individual's wages are enough to make a decent living and gives a sense of their access to credit facilities from financial institutions like banks, and cooperative societies as well as their saving habit and financial inclusion features. The financial assets/capital score value of RPHH (0.41) shows moderately sustainable. Taking the income of the rubber growers into consideration, 70.7% of RPHH earned more than one lakh per annum, from collecting field latex, rubber sheet processing and other sources.

The social assets/capital 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 etc. The score value of RPHH in social capital (0.64) is moderately sustainable. The RPHH in the surveyed localities have a strong inbuilt social capital as they are closely tied on the basis of kinship network. This social bonding enable them to take decision in adopting rubber plantation and achieving socio economic success.

The rubber producing households have better-of physical capital (infrastructure) and human capital (literacy, working population) and social capital (trust, norms and network with SHGs, Banks). Social capital is found higher among the RPHH whereas they lack in natural capital (landholdings) as most of the tribal household belong to small and marginal growers in the study area. High income from rubber plantation has strengthened the coping strategies of the RPHH.

Constraints/Bottlenecks

The study highlights the major constraints the rubber growers face in planting and processing natural rubber in the study area. Nearly three-fourths (71%) of surveyed tribal and rubber growing households reported that even high quality of sheet rubber didn't get a premium price in the market. Another 11.7 % rubber growing households reported lack of adequate rubber-sheet processing facilities in the locality and to another 8 per cent tribal households it was lack of quality processing inputs. Finally, to 3 per cent rubber growing households, it was labour constraint in producing rubber sheet in higher grades. Consequent to the growing popularity of employment opportunities under MGNREGA there is serious constraints of the supply of family labour to the immature rubber plantations in the State. Since MGNREGA linked minimum wage rates are at a premium, tribal villagers prefer not to work as rubber tappers.

Faulty tapping is a serious problem affecting both yielding and economic life of the rubber plantation particularly in the plantation owned by the tribal families. About 4 cubic meter of firewood is required to produce 1 MT of dried and smoked rubber. As a result, the country side is fast losing the indigenous tree cover, cost of processing also is on the rise. Use of biogas utilizing effluents from latex processing facilities does not commensurate with the cost of their installation. Stray cattle are a menace for juvenile rubber plantations in Tripura and plantations suffer a serious damage due to grazing during the first two years of planting.

Policy Recommendations

The study has made several recommendations based on the interaction with the beneficiaries (rubber growing and tapping tribal households) and the other stakeholders involved in the process of implementation of rubber development projects in the state. The recommendations are centred around skill impartation, awareness building and diversification etc.

Problems and Prospects

- Cyclone often damages the rubber trees both in mature and immature plantations. Since bud grafted clonal rubber trees are shallow-rooted, these are uprooted and damaged even in low intensity cyclone. *Therefore, strong rooted clones should be developed. Further, shelterbelt plantation should be promoted to protect the trees from wind and soil erosion.* Above all, insurance of the plantation for both mature and immature plantation should be continued as it was already introduced by Rubber Board earlier.
- Spread of natural rubber plantations in the State needs to be regulated to avoid conversion of dense and reserved forest areas by adopting use of mixed cropping methods instead of rubber mono-cultures to balance between socio-economic development and ecosystem resilience.

Awareness

- Rubber cultivation, processing and tapping are to be very scientific and technical. Irregular and faulty tapping leads to less productivity, reduction of economic life of rubber plantation, particularly in the plantation owned by the tribal families. Quite a few of them engage paid untrained labour for tapping, as the family members trained for tapping would like to avoid the daily chore. Rubber Board should make aware the growers about bud-grafting, clone spacing of plantation and other silvicultural factors, fertilizer application and also sensitize not to use untrained tappers. The rubber producer/growers should also be imparted basic knowledge of the estate management.

Diversification

- Rubber also happens to be a major source of honey collection, but this has not started so far in Tripura. Thus, there is scope for making apiary honey collection from rubber commercially viable. It is therefore, necessary to take up plantation of these species also in forest land.
- Wage payment for the rubber tappers engaged in the plantation and rubber processing workers at the RPS level should be fixed along with incentives for better productivity and quality to bring out competitiveness.
- Rubber plantations present high risks in terms of plantation failure and price fluctuations as they are monoculture in nature. Thus, it is recommended that *the small rubber growers should be encouraged to adopt mixed cropping systems with other cash/economic plants such as fruit, medicinal plants, and timber, which will enrich local biodiversity and also provide short- and long-term sustainable benefits to farmers.*

Contingency and Welfare Funds

- Wage structure of the tappers should be made remunerative, not as fixed salary but as incentives for better production and quality of tapping.

- Tappers Welfare Fund based at the RPS level should be created to give medical expenses and other contingencies to the needy workers/tappers.

Skill Development and Training

- Focusing on skill development and training needs of rubber sector, the Rubber Skill Development Centre(RSDC) was set up as a Sector Skill Council(SSC) - a collaborative programme of National Skill Development Council (NSDC), All India Rubber Industries Association (AIRIA) and Automobile Tyre Manufacturers' Association (ATMA). The extension-delivery system of Rubber Board, joining hands with RSDC could develop and conduct programmes for various professions/occupations in NR production sector and provide certified training programmes to augment number of trained persons and create centre of excellence for training in plantation and processing subsectors in non-traditional areas.
- The structured training programmes for skill development and skill improvement in harvesting (tapping) is another user-friendly strategy of Rubber Board's extension machinery well received by the stakeholders. In continuation, the Tripura Skill Development Mission and Rubber Board must upscale their Skill based training programmes in all the rubber growing areas.
- The objective of the RPS is to empower the rural and tribal communities through transfer of technology and participatory approach. It provides market linkage to the field latex collected from the rubber growers at the local level. Further, the RPS can play a key role in the following areas:
 - ❖ Impart skill based training to rubber tappers and processors at RPS level so as to achieve better quality and competitiveness
 - ❖ Update the technical and managerial competitiveness of the rubber growers and rubber plantation workers/tappers
 - ❖ Wide RPS coverage needs to be extended to all unrepresented areas in the State
 - ❖ Create a contingency fund at the RPS level to meet the unforeseen future expenses of the members of the RPS (including the rubber growers and tappers).
 - ❖ Create employment opportunities by linking it with wood processing units in the State.
- The RPSs of a geographically compact area can be clustered with equity participation to form village level skill development centres (VLSDC). The VLSDC can impart need based trainings such as tapping and processing, budding and nursery management, planting and maintenance, rain guarding, grading and bundling of sheets etc. Apart from this, training on soft skill development such as computer, electronic, handicraft making, fabrication, weaving, tailoring etc. can also be imparted for empowering youth and women to earn their livelihood. Further, entrepreneurial skills like plumbing and carpentry could be developed among the tribal youths at the village skill development centres
- District Level Skill Development Centers (DLSDC) can be formed for advanced training by linking village level clusters with public sector banks, State departments and Central Government. This apex level skill development centre can issue certificates to the trainees, provided they maintain the required standards in the delivery of services. Thus, clustering the RPSs in the form of village and district level skill development centres enabling growth in opportunity and generating nonfarm income can do wonders in the state.

- Sufficient funds for instant, even advance payment against purchase of rubber has to be arranged by RPS on priority. Credit sale of estate inputs, which brings producers close to the buyers, also seeks affluence on the part of RPS.
- RPS has to have sufficient trained tappers so as to retrench inefficient, unproductive and detrimental ones.
- Scaling up and increasing capacities of the existing Group Processing Centres with the scope for providing employment to a group of young tappers from the local area
- Setting up of rubber based industry and wood processing factories in few more locations in Tripura, which could potentially employ the young tappers in the state.

Chapter I

Introduction

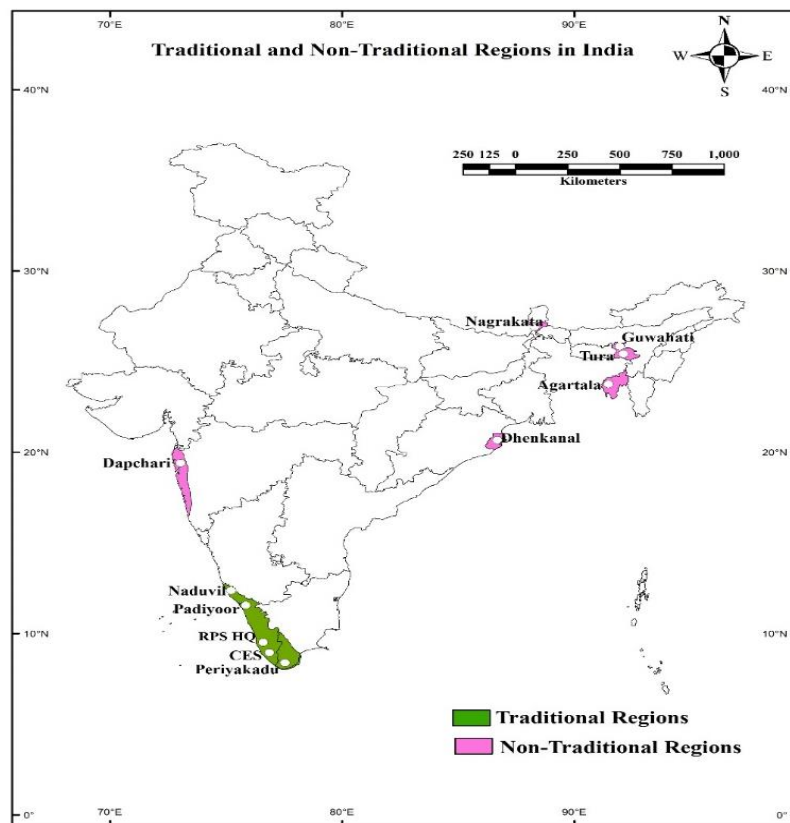
Rubber industry occupies a prominent place in the global economy and is one of the key engines of growth for the Indian economy.¹ The area under rubber plantations in India is ranked sixth globally and more than 10 lakh planters are involved in natural rubber (NR) plantation sector in the country.² India is the 5th largest producer and 4th largest consumer of natural rubber in the world. India's rubber industry consists of more than 6,000 manufacturing units and is highly labour intensive with around half million people currently employed in the manufacturing segment alone, natural rubber and synthetic rubber sub-segment (or the production side) also employs another million people in the country.³ However, there is a significant mismatch between skills available and skills demand in the industry. Rubber Skill Development Council (RSDC) is set up by the All India Rubber Industries Association (AIRIA) & Automotive Tyre Manufacturers' Association (ATMA) under the aegis of National Skill Development Corporation (NSDC). This is focused on skill development and training needs of the rubber sector.

Rubber is one of the most critical, strategic industrial raw materials in the modern world.⁴ Rubber products are used far and wide in all industries, health sector, households, sports and entertainment. Owing to its versatile industrial applications and multifarious uses, rubber industry has become a critical component of development with extensive interconnections across the economic, social and cultural fabric of the world.⁵ As demand and prices of rubber are positively linked to economic growth, the link between rubber industry and economic growth brings in fortunes during booms and hardships during busts. Cycles of economic growth result in cycles of commodity price movements, applicable for natural, synthetic and reclaimed rubbers also. The impact of low prices is more severely felt in natural rubber production sector which is mostly dominated by small and marginal growers. The low prices will have a critical bearing on planting and replanting decisions and future availability of natural rubber (NR). Providing safety nets for smallholders to protect them against price and other risks including socio-economic and political environment, remains a critical task.⁶ Natural rubber sector is going through an extremely difficult phase of very low prices, which will have serious implications for the future of the entire rubber industry value chain. However, sustained production of natural rubber is critical for protecting the income of the rubber farmers and ensuring availability of natural rubber for rubber product manufacturers.⁷

India is among the few producing countries that introduced incentives and measures for rubber growers to mitigate impact of prolonged low prices. The subsidy scheme in India envisages payment of Rs 150 per kg for rubber for farmers having up to two hectares, with the difference between the current price and the government fixed price as subsidy.⁸ Natural Rubber is traditionally grown in India in the hinterlands of the South West Coast comprising the State of Kerala and adjoining Kanyakumari District of Tamil Nadu. That apart, non-traditional areas so far identified as almost fully or marginally suitable for rubber cultivation are Arunachal Pradesh, Assam, Manipur, lower reaches of hills of Meghalaya, Mizoram, Nagaland and Tripura excluding the mainland states of India. Although the North Eastern Region lies far outside the traditional rubber growing zone, the agro-

climatic conditions obtained here are unique in as much as near tropical features are experienced in most parts owing to low elevations, exposure to monsoons and other moderating influences.⁹ The positive results obtained from trial plantations undertaken in early 1960s in the then undivided Assam and Tripura, commercial scale plantations were raised by the concerned States Forest and Soil Conservation Departments. Public Sector Corporations set up later joined rubber planting endeavours on extensive scales. Thus, while in Assam and Tripura, Public Sector Corporations are leading in the rubber plantation sector in the States of Meghalaya, Manipur, Mizoram and Arunachal Pradesh, the corresponding role is played by their respective State Forest and Soil Conservation Departments. Individual growers are also contributing to fast growth of rubber cultivation in this region.

Map 1: Rubber Development Plantation in the Traditional and Non-Traditional Regions in India



Source: India Rubber Industry at a Glance, 2016, Sheela Thomas¹

Rubber plantation shows a definite pattern of geographical concentration in the traditional regions of Kerala, Tamil Nadu and Karnataka, and lately in the non-traditional regions of north-eastern states of Maharashtra, Odisha, West Bengal and Andhra Pradesh. Table 1.1 indicates that five states together accounts for 86% of the area and production 95 percent of production of rubber. Among the States, Kerala has the highest share in area and production of rubber (72 % and almost 88% respectively).¹⁰

The structural changes got manifested in the emergence and growth of smallholder sector with entry of strong native planting interests, leading to substantial rise in area under small holdings, especially

¹ Rubber Scenario: What lies ahead? India Rubber Meet, 2016, Available at : http://indiarubbermeet.in/uploads_2016/topmenu/talk3_20160312092133.pdf

in rubber and coffee sector facilitated by a variety of socio-economic, political and institutional factors.¹¹ The phase of expansion of these plantation gained further momentum when the government of India and the respective state governments introduced various policies and institutional support measures to protect the big and small planters.

Table 1.1 Distinct Features of Rubber Plantations in India, 2013-14

Descriptives	Relative share (%)						All India('000 ha/ '000 metric tonnes)	Five States (%)
	Kerala	Tamil Nadu	Karnataka	West Bengal	Assam	Other		
Area(% share/ '000 ha)								
Rubber	71.95	2.74	5.93	0.09	5.72	13.57	757.52	86.43
Production (% share/ '000 MT)								
Rubber	87.56	2.77	3.42	-	1.28	4.97	913.70	95.03

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

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.

There has been a drastic change in the ownership pattern in the rubber plantation sector over the past five decades. This structural change has been characterized by dynamic growth of the small-holder sector against the decline of the larger plantations.¹² First, the small-holder sector has emerged as the major stakeholder in rubber sector with dominate shares in harvester area (90%) and production (93%). Second, the rubber sector is distinct in terms of its inward market orientation. This is evident from the dynamic expansion of the domestic rubber industry largely dominated by automotive manufacturing industry with domestic consumption level exceeding the production capacities. Third, rubber has significant share of area (5%) and production (8%) at the global level, its share is very insignificant in global exports (Below 1%).

Table 1.2 Changes in the Structural Characteristics of Major Plantations in India

Characteristics	Rubber Plantations			
	1961	1981	2001	2012
Harvested area ('000 ha)	45.00	194.20	401.00	442.00
Share of small holdings (%)	62.80	75.82	88.04	90.30
Production('000 tonnes)	26.99	153.10	631.00	900.00
Share of small holdings (%)	25.40	70.35	87.84	93.33
Exports as percentage of domestic production	0.00	0.00	0.09	1.24
Share in global harvested area (%)	1.16	3.60	5.29	4.46
Share in global production (%)	1.27	4.08	8.65	7.78
Share in global exports (%)	0.00	0.00	0.10	0.96
Average daily employment('000s)	130.00	199.78	348.70	493.00

Note: In the case of rubber, small holdings are considered as below 5 ha.

Source: Estimates based on various Publications of Rubber Board cited in Joseph and Viswanathan (2016), p.9.

The occupational structure in the plantations could be divided into three major categories, such as: plantation labour, field workers and supervisory/ managerial staff. The laborers engaged in rubber tapping and collection of filed latex are known as rubber tappers, whereas the owners of the plantation/estate are known as rubber growers. Studies shows that the gender roles are not that prominent in rubber plantation sector, as rubber tapping involves some amount of physical exertion to tap the rubber tree which women find little difficult.¹³ Since almost 90 per cent of the rubber is produced by smallholders, the extent of women employment is also determined by the availability and willingness of women in the family and women hired labourers. However, in estate-based rubber plantations, women account for almost half of the total tappers as well as about 70 per cent of the general workers engaged in weeding and other activities, such as fertilizer application and soil conservation.¹⁴

Table 1.3 presents the changes in the status of employment in rubber plantation over the past two decades in the estate sector. It is evident that average daily employment in the rubber plantation has marked a sharped decline. This trend also goes along with the decline in the area under plantation of rubber owned/operated by the large holdings. Table 1.3 also indicates that the total daily employment almost halved during the period under cultivation from 1991 to 2011. Gender analysis of plantation labour shows that laborers working in the rubber sector are largely dominated by male workers (59%), while the share of women employed in this sector has been the lowest (40%). Though rubber tapping tends to be a male dominated activity, the plantations normally function with an informal arrangement that women workers assist the male rubber tappers by collecting the field latex. A large segment of women are also engaged in manual jobs including rubber tapping.

Table 1.3 Status of Employment in Rubber Plantations, 1991-93 to 2009-11

Period	Rubber Plantations	Men		Women	
		Number	Percentage	Number	Percentage
1991-93	27,343	16166	59.12	11,177	40.88
1996-98	24,195	15055	62.22	9,140	37.78
2001-03	29,427	17067	58.00	12,360	42.00
2009-11	17,667	10456	59.18	7,211	40.82

Note: Figures are three yearly averages for the period specified. The employment figures pertain only to the plantations (estates) submitting returns as per the PLA 1951.

Source: Estimates based on data from Labour Statistics, Labour Bureau, Government of India, cited in *Joseph and Viswanathan (2016), p.12*.

The structural as well as regional concentration of plantations underlines that two important aspects having greater bearing for inclusive development.¹⁵ First, these plantations provide direct employment to millions of workforce dominantly from the marginalized communities (SC/ST) and women.¹⁶ Second, the dominance of the small and marginal producers in the case of rubber, signifies that these crops are the only sources of livelihoods for millions of small and marginal producers, who

are geographically concentrated. Rubber plantation provides livelihood support to the 1.21 million rubber producers in the country. The available estimates on dependence on the plantation sector in general indicates that about a little over 4.39 million producers and 20.2 million plantation-based population derive their livelihood from ancillary activities associated with production, processing, value addition and marketing of plantation commodities.¹⁷

1.1 Background of the Study

In Tripura rubber plants were introduced for soil and moisture conservation by Forest Department in 1963. Rubber is a tropical crop and grows well in Tripura. The species has proved excellent for permanent settlement of tribal *jhumias*.¹⁸ Tripura is the second largest producer of natural rubber after Kerala. At present, around 75000 hectares is under rubber cultivation in Tripura though the target is to spread it up to one lakh hectares with an additional target of another 1.5 lakh hectares under Right to Forest Act for the tribal sections.¹⁹ In fact, the rubber sector holds considerable potentiality for the development of the State especially in hilly/rural areas. The productivity of rubber in the State is around 1200 kg/ha/year, which is quite high.²⁰ The growth process of the rubber plantation sector in the State attained a unique dimension owing to the usage of plantation as an effective means of rehabilitation of landless shifting cultivators, which was initially spearheaded by the state agencies like Tripura Forest Development and Plantation Corporation Ltd (TFDPC) and the Tripura Rehabilitation Plantation Corporation Ltd. (TRPC) and Tripura Tribal Areas Autonomous District Council (TTAADC).²¹

However, market dynamics in later periods, particularly since the mid-1990s, generated a lot of interest from the private sector. Rubber farms are mostly small holdings, often run through family labour, while the number of farms using hired labour is also on the rise. The relative success of rubber in Tripura can be attributed to its economic viability; effective extension and institutional support in production and marketing by the Rubber Board; along with the decline and uncertainty in tea and horticulture crops. Tripura has earned the distinction of being the ‘*Second Rubber Capital of India*’.²²

About 15 per cent of plantations in the state are owned by state-run-corporation, Tripura Forest Development Plantation Corporation Ltd. (TFDPC Ltd.). Together they produce 50000 mt of rubber of which about 6 per cent gets marketed as preserved field latex (PFL).²³ Such PFL is first processed into centrifuged latex (Cenex) then into rubber thread. There are two rubber thread manufacturing units in the state and that remains the seat for entire domestic consumption for product manufacturing. Another 19 per cent is marked as scrap rubber which gets consumed by four ISNR (Indian Standard Natural Rubber) factories. Rest 75 per cent of the total rubber produced in the state is sheet rubber out of which only 10 per cent is of Tyre grades or Ribbed Smoked Sheet (RSS) leaving rest as Air Dried Sheet (ADS). All of the ISNR, RSS and ADS are marketed for respective product development outside the state, mostly in North India.²⁴

The Tripura state government in the year 1984 set up the Tripura Rehabilitation Plantation Corporation (TRPC) to rehabilitate the tribal *Jhumias* from shifting cultivation to rubber plantations. However, the first attempt for settlement of the *jhumias* had started as early as 1930 by the then King of Tripura, Maharaja Bir Bikram Singh Manikya.²⁵ Subsequently, schemes like ‘Shifting Cultivation

Control Scheme’ was also initiated during the first five year plan and under the scheme each *jhumia* family were allotted/given cultivable land or in other words the scheme wanted tribal communities ‘to practice settled agriculture’ and also by providing cash grant to the *jhumia* family to start settled agriculture²⁶ *Jhumia* families were also allotted lands through an integrated approach²⁷ and programmes like *Jhumia* resettlement colony Scheme, Individual settlement schemes.²⁸ Likewise, several schemes to shift the *jhumias* to a settled form of livelihood have been implemented in the state since then. In this order by giving land title, the village common land was ‘commodified’. The government has always taken special interest to rehabilitate the *jhumias*, in fact the main activity of TRPC since 1984 has been to create rubber plantation and it has created 2608 hectares of land which were distributed to 580 *jhumia* families.²⁹

During the journey of fifty years, the people of Tripura have taken up rubber plantations in a big way for eking out their livelihood. About 60,000 people are directly employed in rubber cultivation and the sales turnover of about Rs. 600-700 crore per annum. Rubber Board, Tripura Forest Development & Plantation Corporation, Tripura Rehabilitation Plantation Corporation and Tribal Welfare Department have brought laurels to the state by their dedicated work while raising rubber.

The role of Industry and Commerce Department is also laudable in establishing many rubber based industries in the state.³⁰ Rubber Board has assisted the growers in bringing up rubber plantation under different schemes like Rubber Plantation Development Scheme, Group Planting Scheme, Block Planting Scheme, Processing Improvement Scheme, Group formation and RPS development scheme etc. As per the latest statistics an area above 72,000 ha is successfully planted benefiting at least 90,000 growers. The revenue brought to above 30,000 families who are having yielding rubber is above Rs.444.00 crores.³¹ The plantation has given tremendous employment opportunity in the state. The economic and social status of the growers in the far flung villages is raised to

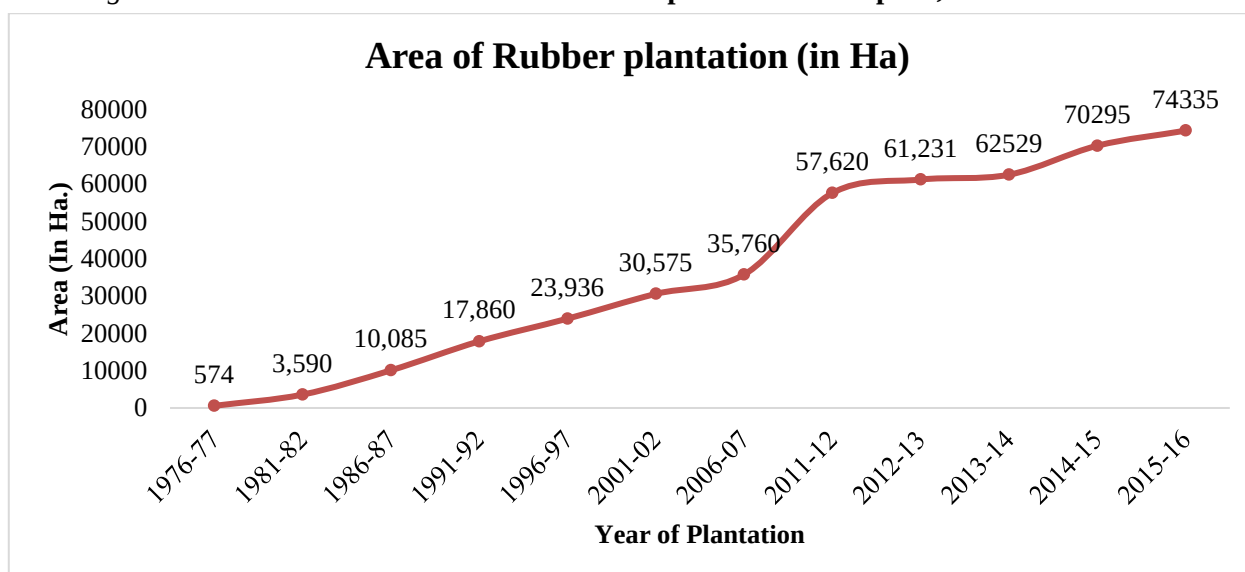
make a decent living, reaching better health care and opening up path for better education.

Table: 1.4: Year wise extension in area of rubber plantation in Tripura, 1976-77 to 2015-16

Year of Planting	Area (in Ha)
1976-77	574
1981-82	3,590
1986-87	10,085
1991-92	17,860
1996-97	23,936
2001-02	30,575
2006-07	35,760
2011-12	57,620
2012-13	61,231
2013-14	62529
2014-15	70295
2015-16	74335

Source: Economic Survey of Tripura 2015-16

Fig. 1.1: Year wise extension in area of rubber plantation in Tripura, 1976-77 to 2015-16



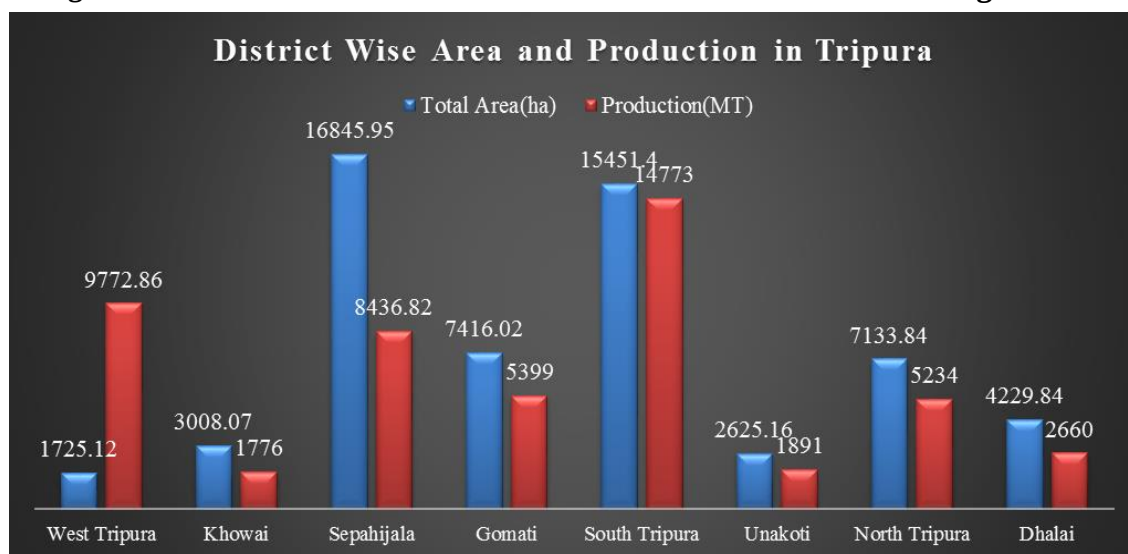
Source: Economic Survey of Tripura 2015-16

Table 1.5: District-wise area & Production of Rubber in the state during 2015-16

District	Immature Area(ha)	Mature Area(ha)	Total Area(ha)	Production(MT)
West Tripura	9769.12	7856	1725.12	9772.86
Khowai	1580.04	1428.03	3008.07	1776
Sepahijala	10063.94	6782.01	16845.95	8436.82
Gomati	3075.94	4340.08	7416.02	5399
South Tripura	3575.68	11875.72	15451.4	14773
Unakoti	1104.76	1520.4	2625.16	1891
North Tripura	2924.68	4208.71	7133.84	5234
Dhalai	2091.07	2138.77	4229.84	2660
Total	34185.23	40149.72	74334.95	49942.68

Source: Economic Survey of Tripura 2015-16

Fig.1.2: District-wise Area & Production of Rubber in the state during 2015-16



Source: Economic Survey of Tripura 2015-16

1.1.1 Rubber Processing Industry in Tripura

Natural Rubber is marketed in various forms. In India 72 percent of rubber is processed in to Ribbed Smoked Sheets (RSS) either in the households or in group processing centers. The other forms of marketable forms of rubber are latex concentrates (9 percent) and Technically Specified Rubber (14 percent), for which processing plants are required. The major processing units for rubber and rubber wood in Tripura are such as: (i) TFDPC Ltd Latex Centrifuging: Factory at Takmacharra, (ii) Bright Rubber Processors (P) Ltd: TSR Factory at Bodhjunnagar, (iii) TFDPC Ltd: Wood Processing Factory at Nagicharra, (iv) Agartala Rubber Industry: TSR Factory at Bodhjunnagar and (v) TFDPC Ltd: TSR Factory at Takmacharra.³² As Rubber is a vital raw material for more than 50,000 products, there is ample scope for rubber based industries in the state, which can generate much needed employment opportunities. At present, hardly 12 percent of total production is being consumed by the industries in the State. The rubber production in the State is estimated to be doubled by 2020 and it is necessary to initiative steps for further expansion of rubber based industries in the state. The major Rubber industry units in Tripura are such as (i) DS Group of Industries: Rubber Thread Factory at Bodhjunnagar and (ii) Maa Rubber Industry: Rubber Compound.

India's second Rubber Park has been set up in Tripura at Bodhjunnagar, which is jointly promoted by Tripura Industrial Development Corporation (TIDC) and Rubber Board. The Rs.230 million Rubber Park will provide State of the art plug and play infrastructure facilities with centralized quality control and product development laboratory, Latex and carbon black master batch etc. The park is expected to house 20 medium and small scale industries (ibid. 119).

Rubber plays a very vital role in socio-economic development and the state government along with the Rubber Board has played a major role in popularizing rubber in Tripura since the early 1980. Initially the state used to get tappers from Kerala, but with the demand for rubber increasing, a need has been felt to expose unskilled labourers to new techniques and employ them in this sector. The

Tripura Skill Development Mission, along with the Rubber Board of India, have recently completed six training programmes for rubber tappers in Tripura with an aim to enhance the skills of untrained tappers to meet the huge shortfall in the state (See Table 1.6).

Table 1.6. Skill Directorate Initiates Enhancing Skills of Local Youths in Rubber Sectors

Department	Name of Trades	Fund Released	sanction no. of Trainee	Duration (in hours)	Trained Candidate	Status of training
Rubber Board	Rubber Tappers	1,636,200	180	90	180	Completed
Sub Total		1,636,200	180		180	

Source: Directorate of Skill Development, Government of India

1.1.2 Integrated Rubber Development Projects in Tripura: Survey of Literature

The history of natural rubber plantation in Tripura dates back to 1963 when the State Forest Department introduced rubber trees for soil conservation initiative with the technical support of the Rubber Board. In 1976, Tripura Forest Development & Plantation Corporation (TFDPC) was set up, the first rubber based rehabilitation project was implemented at Warrangbari in West Tripura district. Different rubber developing agencies were established like Tripura Rehabilitation Plantation Corporation (TRPC Ltd.) in 1983, Tripura Block Plantation Project (TBPP) undertaken by Rubber Board and Department of Tribal Welfare in 1992-93. The office of the Tripura Tribal Area Autonomous District Council (TTAADC) and Sub-divisional Magistrates (SDM) in 1998, for initiating rubber development based rehabilitation programmes in Tripura. The Tribal Welfare Department, Government of Tripura has added its efforts in spreading rubber from one village to another. Despite all efforts made by these organizations, the level of adoption of rubber cash crops by the tribal communities until 1990s was poor, mainly because of grower's skepticism and lack of a matching approach.³³

The plantation development in the North Eastern Region (NER) including Tripura can be classified into two distinct phases.³⁴ 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 North East Region implemented by Rubber Board. The second phase has been further subdivided into phases: (i) it focused on individual small holders adopting the same strategy as outlined under the Rubber Plantation Development Scheme in its various phases implemented in the country as a whole by the Rubber Board, and (ii) a more inclusive one targeting the socially underprivileged group adopting an integrated approach for their economic rehabilitation. The later model with an area based development and a group approach proved to be game changer of rubber plantation development in Tripura. Despite several challenges, the Rubber Board assumed the role of an implementing agency and demonstrated the huge potential this crop holds for the State in the overall socio-economic development of rural communities and ecological restoration of denuded areas.³⁵ The Rubber Board

introduced two of its projects in the promotion of natural rubber plantation development in the state of Tripura: Group plantation and the Block plantation.

Group plantation scheme envisaged empowerment of interested resource poor population in general. A group of tribal and or non-tribal beneficiaries in one village having clear ownership of about 1.0 hectare was selected for whom planting materials were arranged by raising group nurseries. The technical know-how was transferred through awareness creation and proper participation was ensured by group activities to get the plantations raised by beneficiaries themselves. Facilities of crop harvesting etc. were also provided. These plantations were handled by their individual beneficiaries through their Rubber Producer's Societies (RPSs) (Rajeevan and Majumdar, 2005).

The economic rehabilitation project (Block Plantation Project) for the *Jhumias* (shifting cultivators) and the scheduled castes implemented by the rubber board was the first successful initiative which ensured convergence of various sources of funds for development meant for them. The Block Plantation Scheme (BPS), a flagship programme of Rubber Board and the Government of Tripura, was aimed at upliftment mainly of the poor tribal population in a cluster of 50 hectares or more area, having clear ownership of around 1.0 hectare to individual tribal *jhumias*(shifting cultivators). By engaging the beneficiaries and their family members as wage earners, this was developed into a rubber plantation along with its required infrastructures for harvesting and post harvest processing under the close supervision of extension officials of the Rubber Board. Later on these plantations were handed over to the individual beneficiary through their RPS along with technical know-how and structured facilities at maturity.³⁶

These schemes were implemented through an integrated approach, while ensuring extension of various services like, *Balwadi* (Nursery Schools), health camps, facilities of drinking water, sanitation, road connectivity etc. at village level. These two schemes also led to the creation of community level institutions like RPS, facilitating women's empowerment through Self Help Groups (SHGs), Women Thrift Groups (WTGs), providing continuous paid employment, ensuring additional sources of income, utilizing fallow and barren up lands. All these helped conservation of tones of soil and nutrients from run-off, making provisions for common processing and marketing of the produce as well as facilitating beneficiaries exposure to the outer world, leading to capacity building along with an economic autonomy for them. More than 8300 families along with their 52000 members got settled with these programmes.³⁷ The Group plantation and Block planation schemes were designed and implemented realizing that rubber plantation would be acceptable to those target groups, if the administrative lacuna were removed, educational facilities were expanded in the tribal areas and exposure avenues were properly explained to the target groups in the state. The two schemes were implemented in 1992. Unlike the conventional development projects, these schemes started from 1992 were unique in terms of adopting a family oriented approach and taking into consideration of the human development aspects along with the cash crop.

BPS was designed and developed mainly as a local economic development programme and it was implemented in manner that it would help the tribal *Jhumias* (Shifting cultivators, who were also practicing slash and burn form of agriculture) to shift from Jhum cultivation(Shifting cultivation) to

more settled or permanent form of livelihood.³⁸ The project addressed the felt needs of the targeted group, especially the tribals, who were much diversified and the Rubber board treated this project as a true development project and not as a commodity development programme alone. The project implementation also adopted a 'value chain approach' where in the support was ensured from 'Seed to Sheet' i.e. addressing the needs of planting, production, post-harvest and processing with proper market linkages. Adequate time, money and human resources were deployed for human capital development which led to the empowerment of the communities through formation of Rubber Producer Societies a time tested grass roots level organizations of rubber small holdings in the country. Subsequently these societies were federated into a Private Limited company. The net result has been elevation of some 3490 families spread over 58 colonies and majority of whom were much below the poverty line.³⁹ The macro impact of this has been that it ushered a silent socio-economic revolution in the far flung hamlets of Tripura. In fact, these centres acted as nuclei for rubber development and more plantations got established in denuded lands in the fringes of these centres. The Board also encouraged Group approach for plantation development for all categories of growers, thus not leaving out any from reaping the fruit of this unique successful initiative.

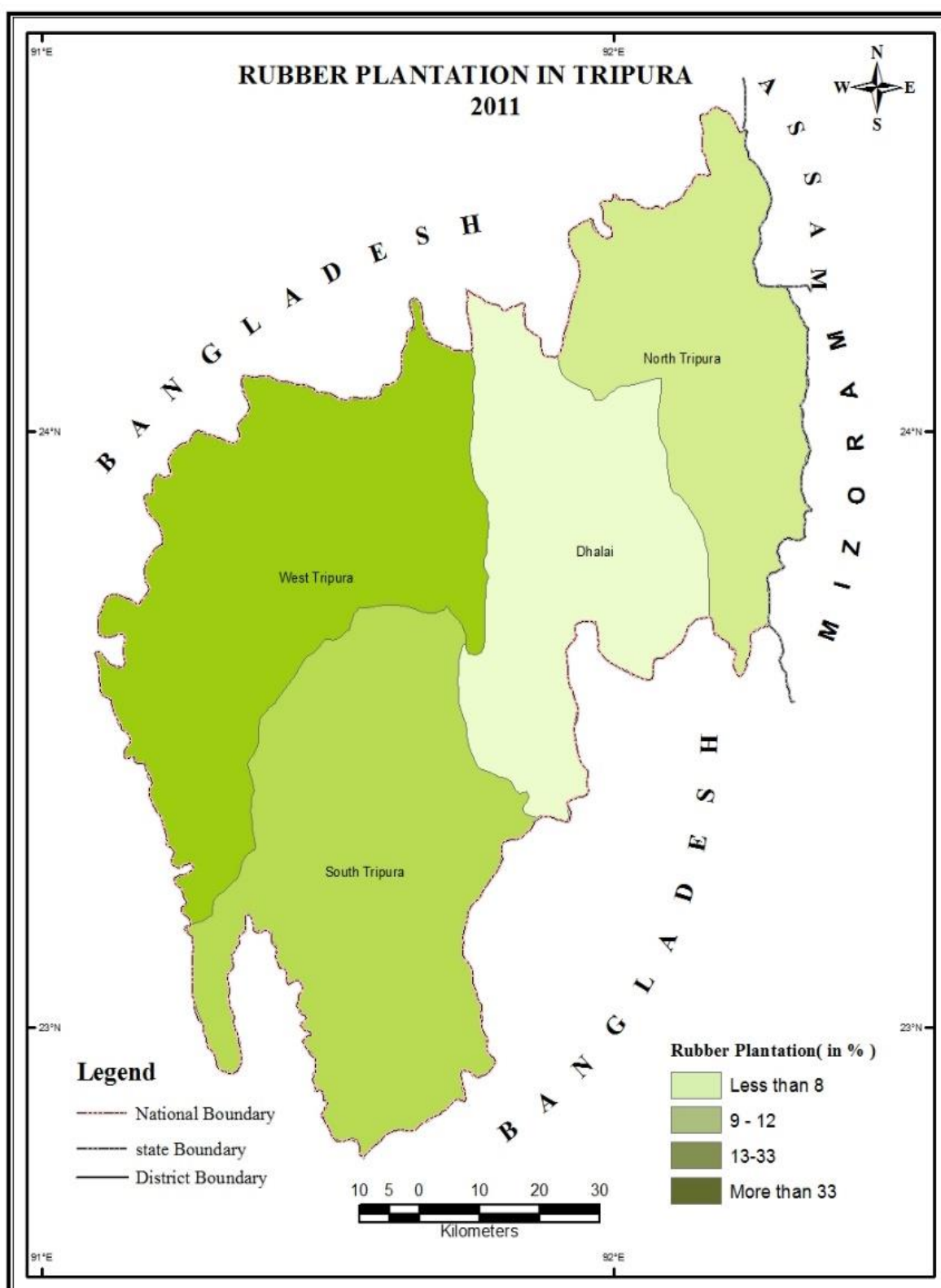
Among the various factors that contributed to the success of this project, the most important were the single window services provided by the Rubber Board which was responsible for the 'concept to commissioning'. The flexibility of the implementation team had ensured truly participatory approach through honest and sincere community engagement. The handpicked team had thoroughly dedicated members with sound technical knowledge working in a mission mode under the political and bureaucratic patronage.⁴⁰ The rural development model evolved through rubber plantation development needs to be effectively utilized on a much wider scale in a variety of sectors and situations. Rubber Development in near future should be aligned with livelihoods enhancement programmes and it should be a part of the systems approach to ensure sustainability of the interventions. Natural rubber plantations can be integrated with other crops under an agro forestry concept with livestock and poultry etc. This is extremely relevant in the case of Tripura where significant tract of land is released for economic rehabilitation of indigenous people.⁴¹

Spread of district wise area in rubber plantation in Tripura shows that Bishalgarh sub-division under Sepahijalla district is having highest maximum area under rubber plantation. In West Tripura Mohanpur sub-division has maximum. Likewise, Santirbazar sub-division in the South Tripura district has the maximum area, followed by Belonia. Kailashar sub-division has maximum area in Unnakoti district. There is fewer plantations in Gandachhara sub-division.⁴² Recently, TRPC and other agencies have also started plantation there. TFDPC has maximum presence in rubber plantation in five subdivisions, namely, Belonia, Santirbazar, Sabroom, Dharmnagar and Kailasahar. TRPC is the dominant agency for rubber plantation in five sub-divisions, namely, Khowai, Amarpur, Kamalpur, Ambasa and Longtraï valley. On the other hand, the private sector has the maximum area in the sub-divisions of Sadar, Bishalgarh, Sonamura and Udaipur. In terms of total area, however, private sector is ahead of the TFDPC after 2003. There are private plantations in all sub-divisions except Gandachhara.

In Tripura, rubber plantation has been considered successful in economic rehabilitation of the erstwhile *jhumias* and landless families mostly indigenous tribes.⁴³ Empirical studies on the socio-economic and ecological impact of rubber cultivation in the state of Tripura made by World Bank reveals that this crop has changed the lifestyle of the villagers and tribal people.⁴⁴ Another study on the impact of rubber on the living conditions of the people of Tripura also showed significant improvement in infrastructure, human resource development and overall economic growth of the region.⁴⁵ A comparative study of rubber production by small holders in the Northeast India and Thailand indicated that the scope for further promotion and scaling up of rubber based livelihood.⁴⁶ However, apart from the successful cases of rubber plantation development in livelihood generation in the state, few studies suggest that the programme seems not much hopeful in the long run as *jhumias* lack in technological knowledge for maintaining rubber plantation. That apart, *Benami*(unauthorized) transfers of rubber plantation to the non-tribals are often reported by scholars.⁴⁷

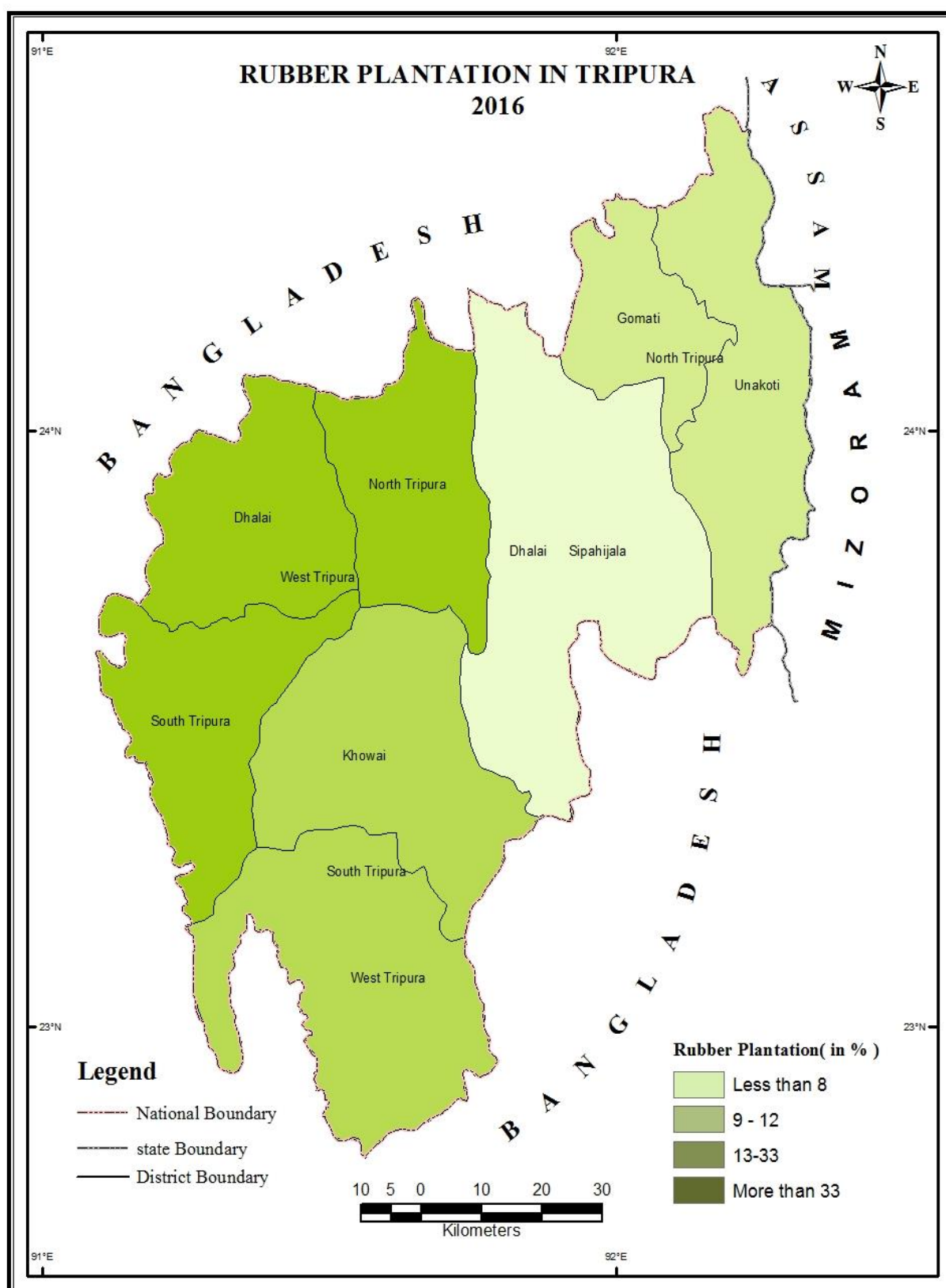
It is in this context, the study has assessed the impact of rubber development projects in livelihood promotion/enhancement and diversification among the rubber growing tribal households and communities in the newly formed districts of South Tripura, Gomati, Sephaijala and West Tripura district in Tripura in Northeast India. The study has examined the impact of rubber plantation based economic rehabilitation programme on the rubber growing households by applying Sustainable Livelihoods Approach (SLA) to analyse the five capital assets viz. human, natural, physical, financial and social gathered through household survey. In doing so, the study has captured the socio-economic and ecological impact of rubber development projects and its sustainability, replicability and convergence aspects and suggested policy recommendations.

Map 1.2: Rubber Plantation in Tripura State (Old Districts), 2011



Source: *Golden Jubilee of Rubber Plantation in Tripura Souvenir (1963-2013), pp-31*

Map 1.3 Rubber Plantation in Tripura State (Newly Districts), 2016



Source: *Golden Jubilee of Rubber Plantation in Tripura Souvenir (1963-2013), pp-31*

1.2 Objectives of the Study

Studies on tribal communities in India in general and Northeast India in particular has been classified into three categories: (i) the ethnographic, (ii) studies relating to the problems of the tribal people, and (iii) studies relating to the development of tribal populations in India. Most of these studies are done from the perspective of cultural and based on the observation made by the researchers concerned. Few independent studies in India and South Asian countries investigated the adoption of rubber-integrating farming systems⁴⁸, rubber inter-cropping practices⁴⁹, and the livelihood impact of rubber cultivation.⁵⁰ However, there exists no comparative study on rubber cultivation and its impact on people's livelihood in the traditional and non-traditional rubber growing regions in India. Further, sociological studies pertaining to the impact of various government projects and programmes on the tribal livelihood in the rural parts of India is somewhat rare in nature. Thus, apart from filling this gap, the study also provides a critical understanding of the development interventions made by the government and other stakeholders in livelihood promotion through sustainable rubber cultivation in the state of Tripura in Northeast India. Most importantly, this study explores the role of social capital among the tribal communities which helps in promoting livelihood in the forested areas in Tripura. The present study is both field-based and comparative in nature. It has documented the successful practices in rural livelihood generation and the impact of rubber development projects on tribal livelihood in four districts of Tripura: South Tripura, Gomati, Sephaijala and West Tripura.

The objectives of the study includes the following aspects:

- Study the socio-economic conditions of the *Jhumias* (shifting cultivators/tribals) in the four districts of South Tripura, Gomati, Sephaijala and West Tripura in the state of Tripura.
- Identify the traditional pattern of livelihood among the tribal communities in the study area.
- Explore the dynamics of tribal livelihood linked with natural rubber block plantation project in the study area.
- Identify the nature of the ownership of plantation in the selected districts.
- Study the division of labour in rubber plantation and the contribution of tribal women in the entire process of plantation and latex processing.
- Explore the socio-cultural changes among the tribal community with changing pattern of livelihood.
- Study the ecological impact and effect of rubber processing on the community.
- Explore the role of social capital among the tribal communities in livelihood promotion in the forested areas in Tripura.
- Document the best practices in livelihood promotion through rubber plantation in Tripura.
- Study the replicability, sustainability and convergence aspects of Tripura rubber development projects elsewhere in the country.

1.3 Research Questions

1. What are the factors that lead to a change in the livelihood among the tribals in Tripura?
2. What are the major outcomes and impacts of the rubber development programmes among the tribals in the state?
3. What are the best practices in livelihood promotion in Tripura?
4. What is the gender division of labour in Rubber production and do women have equal access to wages and other entitlements?
5. Does rubber plantation provide a more sustainable form of livelihood in comparison to other crops in the rural areas of Tripura?
6. What are the ecological impact and effect of rubber processing in the study area?
7. What are the major challenges and issues in the sustainability of the institutional model of rubber development in the state?
8. What is the role of the state, particularly the Rubber Board, TFDC, TRPC and tribal welfare department and other development agencies in rubber plantation in Tripura?
9. Whether the success of rubber development projects in Tripura could be replicated elsewhere in the country?

1.4 Methodology

The study has employed both quantitative and qualitative method to capture the impact of rubber development projects on tribal livelihoods in Tripura. Data have been collected both from primary and secondary sources. The study provides a detailed review of available literature on the economy of the state in general and rubber plantation under different schemes in particular. Secondary data available with Rubber Board, Tripura Forest Development & Plantation Corporation (TFDC), Tripura Rehabilitation Plantation Corporation (TRPC) and Tribal Welfare Department have been collected and analyzed in detail. Primary data have been generated through field visits in the selected four districts: South Tripura, Gomati, Sepahijala and West Tripura. The study has focussed on the Integrated Rubber Development Projects and its impact on tribal livelihood in the study area. The income aspects, class differentiation, gender dimension, division of labour, and ecological impact and effect of the rubber plantation project on the local community have been examined in detail through interview schedule and village information schedule followed by Focus Group Discussions (FGDs). The livelihood frame-work of the population under study has been analyzed for its sustainability according to the rating of the improvement in five types of capital assets viz. natural, physical, human, financial and social, forming the Asset Pentagon.⁵¹ The study has also documented the best practices/case studies in livelihood promotions through natural rubber plantation and development in the four sampled districts of Tripura.

1.4.1 Universe of the Study

In the Population Census - 2011(Provisional), the state is divided into 8 districts, namely, West Tripura, Sepahijala, Khowai, South Tripura, Gomati, North Tripura, Unakoti and Dhalai District. The study was been carried out in four districts: South Tripura, Gomati, Sepahijalla, and West Tripura in the Tripura state.

1.4.2 Unit of the Study

The study has been conducted among the rubber growers, rubber tappers (wage labourers) and the shifting cultivators and settled cultivators including the ST households.

1.4.3 Sample Size

The study has employed purposive sampling method to carry out the survey among the rubber growers, rubber tappers (wage labourers) and tribal households in the selected four districts. The criteria for identifying the study area has been mainly geographical diversity, social composition of the villages, villages under rubber cultivation, areas with vulnerability and better practices. The sample size for the study comprises 300 tribal rubber growing households (75 households in each district).

1.4.4 Group discussions and interviews

Focus Group Discussions (FGDs) have been carried out at various levels in the study area. First of all, to collect qualitative data based on checklist covering the following issues such as the perceptions of the rubber growers, rubber tappers and tribal women about switching over from shifting cultivation to settled cultivation, household well-being, status of tribal women in the family, changes in the social and cultural practices, control over the income and decision making at household level. The study has further conducted stakeholder interviews and recorded opinion of the officials of Rubber Board and other government agencies such as TPRC, Tripura Rubber Board Mission, Tripura Forest Development and Plantation Corporation (TFDPC) on the sustainability of the rubber plantation projects in the region.

1.4.5 Data collection

Observation method and interview with the key informants has been applied as the tools to carry out the research.

1.4.6 Data analysis

A combination of methods has been applied to analyze the collected data. Data collected from all sources: interviews, FGDs and Case Studies have been entered into Excel spreadsheets and SPSS and tabulated by selected variables. Average annual income of the tribal households has been calculated taking into account the various income sources such as jhum cultivation, agriculture, wage employment under MGNREGA, income from Non-Timber Forest Produce (NTFPs), horticulture, rubber cultivation. Monthly Per Capita Expenditure (MPCE) analysis has been calculated by dividing total expenditure from different items of a particular household by size of the household. A graphical representation of tabulated data has been done to enhance the merit of research work. Numerous bar, line, and pie diagrams has been constructed. Mapping and graphical presentation of data has been done with the help of Excel, SPSS and Arc GIS technics etc. and Range equalization method (UNDP method of HDI) (Ghosh et al, 2006) is adopted for measuring the indicators of the five capitals such as human, natural, physical, financial and social.

1.5 Survey period of the study

The survey has been conducted through two different phases. The pilot study has been conducted during the period from 22 to 29 October, 2016, with the help of Tripura Industrial Development Corporation Ltd. (TIDC) and extension officers of Manimalayar Rubber Pvt. Ltd. (a Rubber Board promoted trading company). During this study visit, the stakeholder interaction was held with the Department of Tribal Welfare, Tripura Forest Development & Plantation Corporation (TFDPC), Tripura Rehabilitation Plantation Corporation (TRPC). The study team also visited few RPS of Rubber Board, TRPC in Sepahijala District and the TFDPC Industrial Estate, Anandnagar to test the study methodology (including the effectiveness of the pre-design questionnaire and village information schedule at the local level). The pilot study visit to the State helped in selecting the study areas and the Rubber Producer Societies (RPS) prompted by Rubber Board. Finally, data collection in the four districts of the state (including South Tripura, Gomati, Sepahijalla, and West Tripura) were carried out by the study team in the month of March 23 to April 6, 2017 with the help of extension officers of Manimalayar Rubber (under Rubber Board India).

1.6 Scheme of Chapterisation

The study consists of 7 chapters.

Chapter 1 Introduction

Chapter 2 Conceptual Framework

Chapter 3 Socio Economic Profile of Tripura

Chapter 4 Stakeholders Participation Towards Sustainable Rubber Cultivation in Tripura

Chapter 5 Impact of Integrated Rubber Development Projects on Tribal Livelihoods: Empirical Findings

Chapter 6 Best Practices and Case Studies in Livelihood Promotions through Rubber Plantation in Tripura

Chapter 7 Observations, Conclusions and Policy Recommendations

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51. The Sustainable Livelihood Framework (SLF) identifies five types of assets or capitals upon which livelihoods are built, namely human capital, social capital, natural capital, physical capital and financial capital (DFID, 2000). The asset pentagon developed by DFID lies at the core of the livelihoods framework, ‘within’ the vulnerability context. The pentagon was developed to enable information about people’s assets to be presented visually, thereby bringing to life important inter-relationships between the various assets.

Chapter II

Conceptual Framework

This chapter is organized in two sections. Section one contains the conceptual framework and explains the livelihood concept and the Sustainable Livelihoods Framework (SLF) in guiding this study as well as underlines the symbiotic relationship between tribal communities and the forest. The second section comprises the literature review, focused on the critical analysis of the various studies in the field of tribal livelihood in general and rubber based livelihood generation in particular with a special reference to Tripura in Northeast India.

Introduction

The relationship of tribal people and forest resources is symbiotic by nature, it seems to be as old as human civilization. The tribal people maintain a close relationship with the forest resources available around their habitat. The life-way processes of the tribal people as reflected in their economy, religion, polity and social institutions cannot be understood without going into various aspects of forest surrounding them.¹ The intimacy of tribal people with forest resources are expressed through their adoption of natural species of plants/animals, birds as totem and performance of rituals both in their day to day life and on special ritual occasions. The use of various forest produces in the form of leaves, fruits, flowers and other forest by-products are mainly guided by natural laws, various festive occasions and their traditions. There is a gradual change however, in the tribal livelihood from (i) hunting, faming to hunting and agriculture, (ii) hill cultivation to settled agriculture, (iii) simple agricultural economy to multi-crop agricultural economy, labour and white collar job and commercial economy, and (iv) from artisan type to artisan-plus-marketing and so on.² The subsistence economy of the tribal's depends on the entire habitat-land, forest and water- and not any one of them. The habitat is accepted as a common heritage of the community; individual has the limited right of using the same. Individual ownership is an alien concept, which is insidiously introduced through superimposition of laws without their understanding. It is bitterly opposed wherever people have become conscious about its implications. Land alienation is a possible consequence only if ownership is individual.³ The kinds of development and change that tribes in India have undergone during the last six decades may be classified under three responses such as positive, negative and suggestive.⁴ Furer-Haimendorf (1990) had earlier worked among the *Apatani* tribe of the North-East Frontier Agency (NEFA) in 1944, while revisiting this region in 1976, he noticed the positive changes among these tribal communities. He observed that the tribes of India were slowly integrating into the mainstream polity, economy, society and culture, thanks to the effects of development policy of the welfare state.

2.1 Conceptual Framework:

2.1.1 Defining Livelihoods

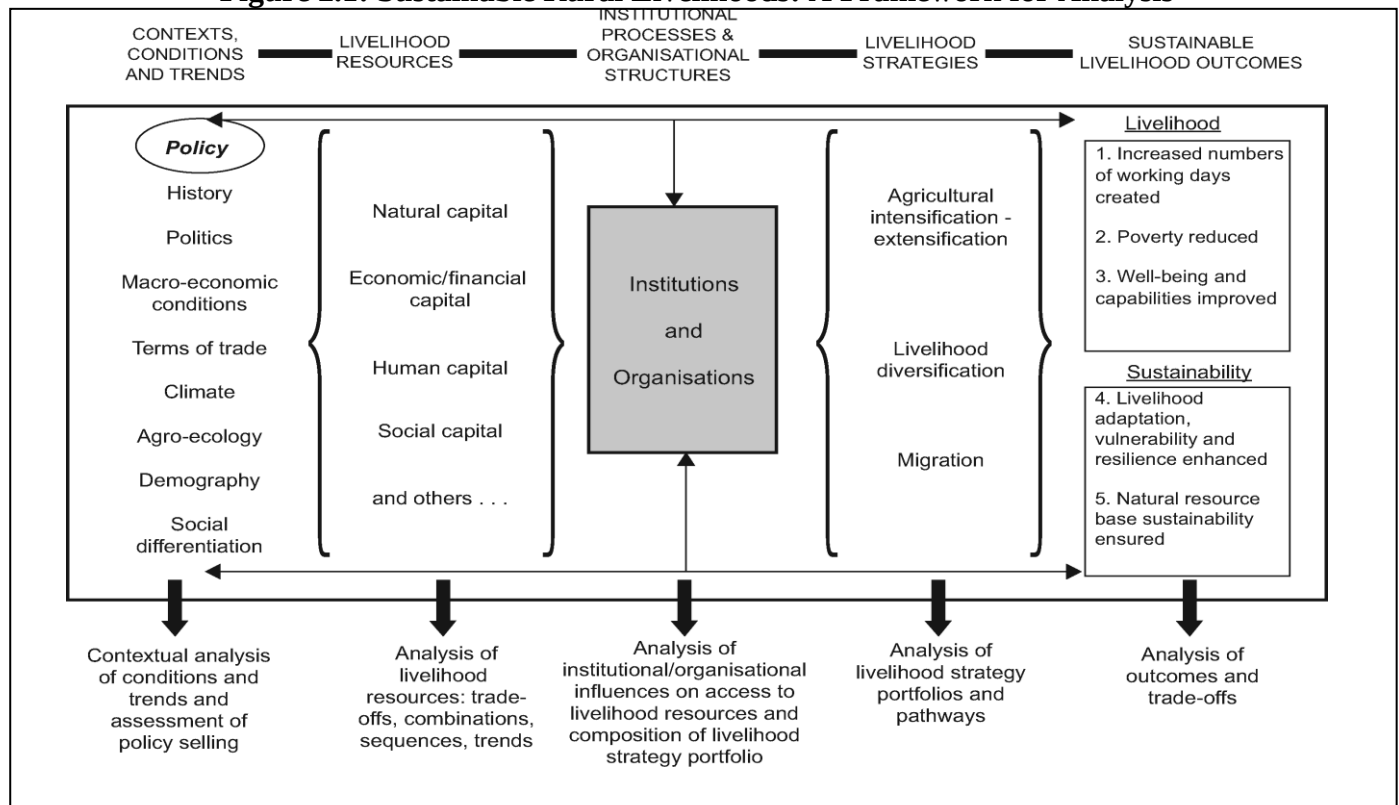
Livelihoods may be defined as the means by which households obtain and maintain access to the resources necessary to ensure their immediate and long-term survival. The factors essential to livelihood can be placed into six categories: physical, natural, human, financial, social, and political.⁵ Livelihoods are complex and changing. The concept of a livelihood is widely used in contemporary writings on poverty and rural development. Its dictionary definition is a 'means to a living', which straightaway makes it more than merely synonymous with income because it directs attention to the way in which a living is obtained, not just the net results in terms of income received or consumption obtained. A popular definition is provided by Chambers and Conway(1991:7) wherein a livelihood 'comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living'.⁶ This definition with slight modification has been utilized by Scoones (1998), who identified five main categories of capital as contributing to assets in the livelihood definition, and these are natural capital, physical capital, human capital, financial capital, and social capital.⁸ The diversification dimension was developed by Frank Ellis⁷: 'A livelihood comprises the assets (natural,

physical, human, financial and social capital), the activities, and access to these mediated by institutions and social relations) that together determine the living gained by the individual or household’.

2.1.1.2 Defining Sustainable Livelihoods Framework

A concept of sustainable livelihoods was put forward in the report of an Advisory panel of the World Commission on Environment and Development. In calling for a new analysis, it proposed ‘sustainable livelihood security’ as an integrating concept (WECD, 1987a: 2-5). The Sustainable Livelihoods Framework (SLF) is widely used in development projects and livelihoods development project across the globe. Sustainable livelihoods (SL) as an approach became popular with organizations like DIFD in the year 1998, similarly other organizations like CARE, Oxfam and UNDP also started using it with their own perspective and methodologies (Hussein, 2002 cited in Carney, 1998). The sustainable livelihoods framework (Scoones 1998, Carney 1998 cited in Scoones 2009) ‘emphasized the economic attributes of livelihoods as mediated by social-institutional processes’. The sustainable livelihoods framework in particular linked inputs (designated with the term ‘capitals’ or assets) and outputs (livelihoods strategies), connected in turn to outcomes, which combined familiar territory with wider framings (of well-being and sustainability).

Figure 2.1: Sustainable Rural Livelihoods: A Framework for Analysis



Source: Ian Scoones 1998), IDS Working Paper 72, p.4.

According to Krishna (2012), the ‘concept of sustainable livelihoods (SL) that gained prominence in the 1990’s focused on community participation and drew upon Amartya Sen’s delineation of development as enhancing people’s capabilities and entitlements’. Furthermore, Krishna points out that SL interventions mostly ‘address the access to resource but not resource control and conflicts’.⁹ This can further be explained with Agarwal’s extensive work on land rights and its implication for women’s bargaining power contribute immensely while discussing the complexity of unequal power relation between men and women in the society in particular of patriarchal society. She highlights that without independent resources, women remains vulnerable, more so in the case of marital

breakdown or widowhood (Agarwal, 2008). Linking livelihoods with sustainability and how it interacts with gender remains an important area of study (Matouleibi, 2012).

Roslina Kamaruddin et.al.¹⁰ (2014) in a paper titled '*The Sustainable Livelihoods Index: A Tool to assess the ability and preparedness of the rural poor in receiving entrepreneurial project*', developed the Sustainable Living Index (SLI) to assess the ability and preparedness of the rural poor in receiving entrepreneurial project channeled by government. Income data alone cannot fully reflect the suitability of the hardcore poor in receiving government assistance in the form of entrepreneurial projects. In this case such projects do not take into account the ability and preparedness of the poor in receiving the projects. Thus, the developed SLI might be treated as additional information in assisting the local authority in selecting an appropriate rural poor to receive government assistance project, adjacent to the regular use of household income level. The index was developed which was based on the Sustainable Livelihood Analysis (SLA) framework, concentrating on five group of livelihood assets namely, human, physical, social, natural and financial assets. The study was conducted in the Baling district in the state of Kedah, Malaysia. The analysis of the study shows that the higher the income, the higher the SLI will be. Further, it shows that household income plays a significant role in the increasing the livelihood assets. The results also showed that the hard core poor group were obtained relatively low index except for physical asset. Natural, human, financial and social asset were appeared to be the least asset possessed by the hardcore poor. However, the financial support from government and other related agencies by encouraging them to involve in micro-credit and cooperative systems could enhance their financial status to ensure smooth implementation of the entrepreneurial project.

2.2 Studies Relating to Tribal Livelihoods

'Sustainable livelihood' is usually understood in the material terms – in terms of access to and sustainable management of livelihood resources. However, in a broad sense, sustainable livelihood – especially in the context of marginalized groups including the tribal people – is perhaps more appropriately seen in terms of enhancement of capabilities.¹¹ Ensuring a subsistence income is not sufficient for this purpose. Rather, sustainability is a function of access to institutions and institutional resources in general and to social and economic services in particular.¹² Therefore, 'mainstreaming' of tribal people needs a broader approach, which effectively deals with their manifold vulnerabilities in a rather harsh physical environment.

Amita Shah and Sajitha O.G.¹³ (2014) in their study on '*Poverty and Livelihood among Tribal's of Gujarat*' analyzed the current status, opportunities and challenges of the livelihood of tribal communities in the state. This study analyzed how sustained high level of poverty among tribal communities, despite faster economic growth, can pose the most difficult challenges for the development of the state. The study suggests two major approaches for promoting livelihood in tribal areas: (a) an area-based approach for sustainable production in agriculture and allied sectors by developing markets and new organizational mechanisms; and (b) a rights-based approach for ensuring clear entitlement, benefit sharing, compensation, and redressal mechanisms. The authors recommended that the government look for a comprehensive assessment of the opportunities and challenges for this problem, rather keeping a sectoral view.

Nilakantha Panigrahi's¹⁴ (2014) study on '*Tribal Livelihood in Changing Perspective*', analyses the process of technology transfer to tribal communities, which is regarded as one of the key elements in their development. While doing so, it deals with the impact of Treadle Pump on the livelihood of tribal farmers in a holistic manner. By applying the diachronic method, the study tried to find out the growth impact of Treadle Pump on lives and livelihoods of the tribals in Koraput district of Odisha. The findings of the study reveals that the Treadle Pump technology has immense impact on the socio-cultural and political economy of the tribal people of the State.

R.M. Mallik's¹⁵ (2013) study on '*Tribal Livelihood, Food Security and Poverty in India*' addresses the question of the extent of dependence of the tribal households on the forest for a living, the extent of poverty amongst the tribals and the scope for change or improvement in the state policy relating to the use of the forest by the tribals, including the scheme of joint forest management. The empirical findings of the study reveals that in the tribal villages in Keonjhar district in Odisha where the dependency of the people on the forest is rather high, the earnings of households are low, incidence of poverty is very high and employment opportunity is rather limited. It suggest that massive deforestation, growing devastating mining activities in the forest-based areas, continuing inaccessibility of the forest dwellers, tribal land alienation and encroachment of forest land, environmental degradation etc. are the major causes of poverty, vulnerability and improvements. Along with this, poor governance and unsustainable management of the depleted resource base has begun to pose serious threats to food security and the livelihood of forest-dependent communities. Further, the stringent forest laws, and the subsequent administrative orders at different point of time for ensuring conservation of its rich biodiversity, environmental/ecological security seem to have restricted/prevented access of the forest dwellers to forests for collection, value addition/processing and marketing of NTFPs in a large way. Therefore, limited collection, value addition, preventions/restrictions on marketing of the products, limited skill/capacity building training programmes, poor market structure, and unremunerated price to the primary gathers and distress sales etc. seem to have accentuated their food insecurity and vulnerability.

Kishore C. Samal's¹⁶ (2013) study on '*Livelihood of the Tribal and Non-Tribal of Forest*', brings out the process of deforestation in a most forested district called Keonjhar in Odisha and its impact on the livelihood of the forest dwellers. The study critically discussed the issues pertaining to forest policy, livelihood of tribal people, social capital of the forest dwellers and households living in the forest. The study suggests for the establishment of forest produced based small-scale industries/cottage industries/processing units; granting more power to Gram Panchayats particularly relating to management of forest and forest produce; formation of self-help group of primary collectors of NTFP with assistance from financial institutions, storage facility for NTFP, and granting *patta* to landless forest dwellers on forest land for cultivation.

Brigitte Leduc and Dhruvad Choudhury¹⁷ (2012) in their paper "*Agricultural Transformations in Shifting Cultivation Areas of North-east India*" states that "the common perception on shifting cultivation is that the practice is subsistence, economically unviable, and environmentally destructive. Government across the world have, therefore, encouraged settled agricultural practices to replace shifting cultivation, and in the process strived to promote economic development of communities practicing such agriculture." In the enthusiasm for fuelling such transformations to replace shifting cultivation, policy-makers have often overlooked the need for support during the transition period, particularly for the less privileged. This short-sightedness has marginalized many households, increasing their vulnerability rather than reducing it. Based on researches and field experience, including IFAD-funded projects, Leduc and Choudhury call for a policy reappraisal for assessing the economic benefits of shifting cultivation and re-examination of the perception towards this practice, which could build upon untapped opportunities in organic and health foods.

S.K. Datta and K. Singh¹⁸ (2011) have analyzed the issues pertaining to livelihood and diversification strategy followed by people in two very backward regions in West Bengal in India with different geographic and socio-economic features. Greater divergences or uniformities in socio-economic status, outlook, opportunities and push and pull factors explain significant difference in various parameters of diversification across the study areas. Their study explores that household level diversification in the study area appears to be rather moderate. It is basically governed by the extent

of alternative non-farm opportunities in the neighborhood, socio-economic features of the villagers, and their access to credit, assets and benefits accruing from government sponsored projects. It is important to note that alternative job prospects is influenced by acquired diversified skill as well as training facilities in the adjoining region, availability of access roads to market, level of literacy and awareness of the villagers about the prospective benefits they are entitled to through their local Panchayats. Differences in the level of diversification across households is accounted for by dissimilarities in socio-economic attainments, differential access to assets and available diversification opportunities as a form of insurance to guard against uncertain income shocks. Individual earnings again, are influenced by the extent of diversification, occupational weightage of non-farm/ farm sector, education, age patterns etc.

Shakti Padhi and Nilakantha Panigrahi¹⁹ (2011) in the paper titled '*Tribal Movements and Livelihoods in Odisha*', provides a critical review of major tribal policies and programmes of the state within the broad framework of planned development efforts. It tries to assess the impact of and changing perspectives regarding development programmes that affect the livelihood resources of the tribal people. The paper also reviews various methods of articulation of collective concerns of tribal people regarding to the promotion and protection of their natural resources based livelihood. The paper highlighted that protest movements by the tribal people of Odisha in different pockets have attracted the attention of policy makers, bureaucrats, academia and activists across the world. These movements have contributed to strengthening the sporadic articulations by tribal people to organized protests and have led to the recognition that there is further need to review the approaches and strategies of development interventions of the state as well as streamline the development programmes.

Mathew Aerthayil²⁰ (2008), in his major work on '*Impact of Globalization on Tribals in the Context of Kerala*' analyzed that the means of livelihood is vital and basic for any people, especially the marginalized who often need to struggle to live and survive. He focused on land, employment and availability of essential commodities as the major sources of livelihood for the tribals.

S. K Thorat²¹ (2006) in his writing on '*Situation of Dalit and Adivasi – Policies and Change*', views that in India exclusion involves social processes that exclude, discriminate, isolate and deprive some groups on the basis of their caste and, ethnicity. Such social groups constitute a significant section of population, including untouchables, tribals, nomadic, semi-nomadic, de-notified (or ex-criminal) tribes. These groups constitute about 250 million population in 2002 (about 167 untouchable, 86 millions of Adivasis, and other small minorities. Although these social groups experienced exclusion and isolation there are differences in sources and process of deprivations.

S. Galab et.al.²² (2003) in their study on '*Livelihood diversification in rural Andhra Pradesh*' explored the main livelihood strategies in the different regions of the state and examined the relationship between household livelihood diversification strategies and the household asset base. Their study found that households with irrigated land, non-farm productive assets, access to credit, access to transfers and high male education status in developed areas could help them in diversifying their income sources, choosing non-farm over off-farm activities. In contrast, households involved in off-farm activities were vulnerable to a greater number of shocks, while those engaged in non-farm activities were less susceptible to shocks. The study also found an association between poor households in backward areas and non-farm diversification, for example, MGNREGA which aims to provide minimum wage income-generating opportunities to all citizens for 100 days per year. Non-farm activities for the rural poor range from the well-paid to the poorly paid, including public works programmes involving construction and rural infrastructure development.

Mosse et. al.²³ (2002) in their study on '*Brokered livelihoods debt, labour, migration and development in tribal Western India*' points out that seasonal labour migration is irreversibly a critical aspect of rural livelihood strategies among *Bhil* farming families of the inter-state border districts of Madhya Pradesh, Rajasthan and Gujarat. Their study shows that because of its tie to long-term debt, migrant labour is often extremely unproductive and unprofitable for those involved. The experience and outcome of migration varies widely depending upon the resources a household can command, both the economic and social resources. The study suggests that the critical rural development issue is not how to reduce migration, but how to reduce its social and economic costs and increase its returns especially for the poorest.

Arjan de Haan²⁴ (1999) in his paper on '*livelihoods and poverty: The Role of migration –a critical review of the migration literature*' states that labour migration, between and within urban and rural areas needs to be seen as a central element in the livelihoods of many poor households in developing countries. Much of the literature focusses on movements of people as a result of crises-environmental, economic or demographic. Thus, there is a need to integrate the analysis of migration within those of agricultural and rural development.

Deogaonkar's²⁵ (1994) work on '*Tribal Administration and Development: With Ethnographic Profiles of Selected Tribes*' discusses the origin and growth of the efforts for the development of tribal population in India. Apart from examining various approaches to tribal development, it enumerates the administrative structures and organizational strategies adopted during the last many years of planning, the outlay on tribal development during the plans and the priorities adopted have also been indicated. The Tribal Sub-Plan strategy and its implementation has been examined elaborately. The personnel policy adopted in tribal development finds a special and critical treatment.

Amita Baviskar²⁶ (1995) in her study on '*In the belly of the river: Tribal conflicts over development in the Narmada Valley*', argues that positivism has failed to comprehend the tribal conflicts over the developments in the valley. She stated that in such researches positivism is in conflict with the epistemological situation of the tribal people. The methodology of 'critical enquiry' postulated by Baviskar argues that there are two important variables: (i) the perspective of the tribals on the life as they live; and (ii) the perspective of the researcher who 'interprets' the meaning of life given by the objects of study. Here it is very clear that the researcher becomes a strong variable. It is his ideological bias, his values and his definition of life which interpret the life of the tribal. Perhaps the authentic perspective of the tribals remain unexplained or not properly represented by the researcher.

S.B.K. Dev Varman²⁷ (1971) in his book titled '*A Study Over the Jhum and Jhumia Rehabilitation in the Union Territory of Tripura*' provided a systematic enquiry into the problems of the tribals and identified the lacunas which were responsible for the failure of the administration and forming the misunderstanding among tribals. He also suggested the possible ways and means to combat the problems faced by the administration. The book tried provide a sketch of the nature and practice of cultivation and rehabilitation programmes in Tripura. The author has made several suggestions, such as: (i) the principal problems of rehabilitation of the tribals in the colonies did not lie in the vary implementation of the scheme but in creating such socio-economic conditions which may help them to settle permanently; (ii) the colonization scheme should be organized as near to the original rehabilitation of the tribal as far as possible; (iii) the colony should invariably be built in ideal surrounding where the tribals can live undisturbed with all their peculiarities; (iv) the tribals who live in the vicinity of tea plantation areas seemed to have developed the art of plucking in a tea leaves. So, if the tea plantation are grown by the Government efforts, preferably under public sector near the tribal colonies or tea plantations, the problem of employment could be tackled to a considerable extent; and (v) the part which the personnel play in a colony is no less important. Thus, sufficiently qualified and experienced staff may be placed in the colonies with higher salaries.

J.B. Ganguly²⁸ (1980) reported titled “*Socio-economic problems of transition from shifting to sedentary cultivation in North-East India*” that Government has taken various Jhum control measures like Jhumias rehabilitation colonies in Tripura where the Jhumias were given individual plots for settled wet rice cultivation and were provided with various extension services. In Assam's Jhum control scheme has been a part of the soil conservation programme undertaken by the forest department and in the Angami and Chakasang areas of Nagaland hill slopes have been terraced where the people practice continuous cultivation. Terrace cultivation obtains in Meghalaya also; it is also being tried in Manipur, particularly in the Tonghul area in Ukhrul Sub-division. In Arunachal Pradesh the main plan on which the Jhum control scheme rests was the introduction of terrace cultivation. Despite the various Jhum control and improvement measures adopted in different parts of the region, it cannot be said that the problem of shifting cultivation have been substantially solved in any of the state or Union Territories. On the contrary, the problem is still very much there.

Mayuri Sengupta²⁹ (2014) in their book titled “*State-initiated Development and the Reang ethnic minority in Tripura North east India*” while examining the relationship between the state and ethnic minorities, argued that most state-led development programmes are formulated on a preconceived notion of ‘backwardness’ in the ethnic minorities; state-led development projects create internal fissures and ruptures within ethnic minorities on issues of what constitutes development and often, such development programmes create an image of oneself as inherently ‘backward’, whereby the conditioning of the mind plays an important role in extending the desire of the members of an ethnic minority to achieve this state propagated ‘imagined modernity’.

Jayanta Choudhury and Ratan Ghosh³⁰ (2016) in their book titled ‘*Tribal Development in Tripura: An Assessment of the Tribal Sub-Plan*’ have critically examined the impact of the schemes Sanctioned under the Special Central Assistance (SCA) to Tribal Sub-Plan (TSP) in the state of Tripura. The researchers evaluated the Tribal Sub-Plan in four districts of Tripura. The authors have provide a detailed analysis of the benefits received by the target groups in the state under Tribal Sub-Plan(TSP) and also from schemes other than the Special Central Assistance(SCA) such as MGNREGS, IAY, and TSC etc. The study suggests that state government should give wide publicity, in local language, to the beneficiaries’ oriented scheme under the Special Central Assistance and Centrally Sponsored Schemes relating to tribal population. The selection of beneficiaries under the SCA should not be an arbitrary or an adhoc decision. The choice of activity should be based on the local resources, the aptitude as well as the skill of the beneficiaries. In each block, block level monitoring committee on ST should explore various opportunities that are available such as credit, technology, skill upgradation and marketing and recommend the beneficiaries for the SCA so that they can move out of poverty line. The Gram Panchayats/village Committee would help the Block level committee in all respects (p.29). Non-Governmental Organizations(NGOs) may be encourage to get involved in different stages of the project like preparation of the village level micro-plan specially preparation of Livelihood Action Plan(LAP), awareness generation, credit linkage, capacity building, marketing support monitoring and concurrent evaluation. Further at the national level, the researchers have suggested that the Nit-Ayog should come out with a specific identification of major and minor head of schemes and projects that can be earmarked for the TSP in order to ensure ‘direct benefits to individuals or families belonging to Scheduled Tribes(ibid.128). The monitoring system of the Niti-Ayog needs to be strengthened to ensure that the State Governments are properly earmarking of the flow of funds to the TSP. Further, the quarterly review of the TSP Plans should be done along with the State Plan review.

2.3 Studies on Rubber Plantation Development

S. Mohanakumar and KirandeepKaur ³¹(2016) in their paper “Global Integration and sustainability of NR Production in India” analysed the interrelationship between natural rubber price in the domestic and world markets after the market integration. The price of natural rubber is predicated to slide down further to reach its ever recorded trough point by the close of the present decade. The study is based on time series annual data on NR price and related macro-economic variables in the domestic and international markets from 1979-80 to 2013-14. Daily price data is used to analyse integration of domestic and international markets for NR. Ever since the downward spiral of NR price has started by early 2012 in India, productivity of the crop has been declining posing serious threat to the long run viability and sustainability of NR farmers in India. Analysis shows that there is a unidirectional causality from world price of NR to domestic market price while the domestic market price does not influence world price. It is found that the imports of NR to India does not directly effect on the price in the domestic market but the association is robust between imports of NR to India and its world price. Econometric analysis reveals that there is significant co-movement between crude oil price, price of synthetic rubber and NR price movement but multicollinearity between crude oil and NR prices turned the model spurious. Impulse Response Function applied on daily price data showed that the change in the international price of NR impacted on the domestic price within a track period of 5 days. Policy implication of the study is that India’s option in the global market scenario is severely restricted as state intervention in the market could yield minimal response. Rather, the emphasis should be on productivity augmentation measures to reduce the cost on the one side while considering the option of regulating NR supply in the world market in association with major NR producing countries in the world. The demand side options are rigidly restricted and limited in the context of global market integration.

Maniemai Thongyou³² (2014) in an article titled ‘*Rubber Cash Crop and Changes in Livelihoods Strategies in a Village in Northeast Thailand*’, elucidates the changes in livelihood strategies of smallholder rubber households in a village in the northeast region of Thailand. In order to capture the changes, the research studied livelihoods changes over last 62 years from 1950 to the present, or since the village establishment. The study adopted the historical analysis which would generate new knowledge of rural people’s strategies to take advantage of opportunities and cope with the problems arising out of rapid changes as a result of the integration of the region into the capitalist system. The study classified the livelihood strategies into three periods, based on the dominant mode of production and livelihoods. The first period was the livelihoods before cash crops in which people were involved in subsistence mode of production. The second period was marked by the introduction of cash crops and market economy into the village in the early 1960s. During this period the subsistence economy had been transformed into market oriented. Forest lands were changed into cash crop farms, so much that the natural capital lost its balance and became less dependable. The third period, starting in 2001, was the rubber period. The paper stated that rubber came to the northeastern region of Thailand as a result of the promotion of the state. This research found that the rubber expansion and extension policy corresponds well with the situation of the middle and better-off northeastern peasantry who were willing to take another risk after various failures with many cash crops in the past. The success of rubber farmers in the South, the relatively high price of rubber compared to other crops that used to be popular in the region, and the perennial nature of the plant that goes well with the aging population in rural areas all motivated northeastern people to start growing rubber. However, the adoption of rubber has not been without problems. The new rubber growers in the northeast have to adjust themselves to the standardized farming practices of rubber growing. In addition, there was an imbalance of and unequal access to capital assets and access, rural households adopted integrated livelihood strategies including: (i) economic diversification or pluri-activities to reduce risks and increase income, (ii) maintaining rice cultivation to guarantee food security, (iii) keeping the ownership of agricultural land as an important capital asset, (iv) investment in higher education of the younger generation of the household.

The paper by Sharit K. Bhowmik³³ (1980) titled '*The Plantation as a Social System*' provides a sociological definition of the plantation. The author states that the plantation has a distinct form of production organization which gives rise to certain specific social relations. The author argues that most of the definition of a plantation tend to overlook these relations which emerge from plantation as a social system. The study is based on the findings of fieldwork conducted among the plantation workers employed in the Dooars area in Jalpaiguri district, West Bengal. The plantation workers mainly belong to the Oraon, Munda, Kharia and Santhal tribes (STs) from Chotanagpur area of Bihar, who were brought to the Dooars at the end of the nineteenth century as indentured labour in the tea plantations. The study finds that the planters were able to maintain the plantation system due to four main factors such as: coercion, migrant labour, isolation and political support.

Bag, S., Anand, N and Pandey, K.K.³⁴ (2014) in their paper titled '*A Framework for the Analysis of Sustainable Supply Chain Management: An Insight from Indian Rubber Industry*', identified the two key influencing sustainable supply chain management(SSCM) practices and explained the relationships in the context to Indian rubber goods and manufacturing sector. The authors suggested a SSCM model for Indian rubber goods manufacturing sector. The review of literature by the authors show that without SSCM practices, it is impossible to develop competitiveness in global market. The model developed by the authors explains the complex relationships among key variables and also show the direct and indirect relationships in a better fashion so that managers can understand the links and devise green supply chain management (GSCM) strategies successfully. The paper states that SSCM practices in Indian rubber industry are mainly influenced by market pressure, carbon emission reduction, market share and profit; also there would be reduction in carbon emission and hence less market pressure on the sector. Secondly, the supplier relationship management and Green technology adoption are the linkage variables with respect to SSCM practices in Indian rubber industry. Thirdly, supplier relationship management, top management commitment, regulatory pressures and market pressures are the key drivers of SSCM practices in Indian rubber industry.

Arunabha Mazumdar³⁵ (2009) in a paper titled '*Rubber Block Plantation for Jhumias in Tripura: A Case Study on Demographic, Social and Economic variations at Laxmandhepa Block Plantation Unit*', noted that Block plantation scheme was introduced in Tripura during 1992 with the objective to permanently settle the Jhumias, who practice shifting cultivation. The restoration of the eco-system was being degraded due to century-long practice of shifting cultivation and upliftment of the backward communities involved were the main objectives of the scheme. The case study highlights that there is significant development of the community in all aspects, particularly in education and women's empowerment. The study also points out that the necessity of further guidance of the community, which has recently transformed from barter to money economy and from starving existence to surplus economy, on their future investment opportunities.

Suchintya Bhattacharya³⁶ (1992) in the monograph '*From Jhuming to Tapping: Rubber Plantation augurs Well for the Tribals of Tripura*' dealt with some important aspects of the social and economic life of the Jhumias such as the traditional economic pattern of the jhumias including their food production, handicrafts, weaving and, their social organization. The author viewed that jhuming as a system of agriculture is in the transitional phase from hunting and food gathering to settled cultivation. Such system cannot survive in the long run because of the fact that the increase of population in the absence of abundant supply of land is bound to shorten the cycle of jhuming, bringing about continuous deterioration in soil fertility and ecological changes (p.62). In this context, the author has highlighted the observation made by J.B. Ganguly in 1968 that in Tripura, a particular plot of land is jhummed only once and then left fallow for about ten years for regeneration of forests. Hence, cultivation factor under jhumming is eleven. J.B. Ganguly further observed that in Tripura every year approximately 20,235 hectares of land is jhummed which means that this form of cultivation

can support about 2,200 souls only. This shows the utter inadequacy of the system today. Bhattacharya has narrated in detail about the transformation of Jhumia economy to money economy and the growth of market along with the development of transport, exploitation of forests and also economic poverty prevailing on the hills of Tripura. The author opined that rubber plantation has emerged as a promising alternative to Jhuming and suggested that the possibility of removing the distress of the Jhumias and ensuring a higher level of living to them is intimately connected with the successful change over from Jhuming to tapping.

B. Rajeevan and Arunabha Majumdar³⁷ (2005) conducted a study on the *Impact of Rubber(Block/Group Plantations on the Living Conditions of the people of Tripura*'. The study reports that implementation of rubber plantation programme has certainly improved the economic status and opened up a new work culture in the estate of Tripura. The quality of life of the society improved considerably. It helped significantly in the capacity building of the societies involved. The study highlights that progress achieved in the educational status of the rural population through this programme is remarkable. Job opportunities generated through implementation of rubber plantation programme minimized the growing unrest in the region, which is an added advantage. The study reveals that thrust has to be given for further improvement of the educational facilities/exposure avenues, especially for the tribal communities. However, the study recommends that concerted efforts for promotion of rubber cultivation coupled with education/exposure promotional programmes would be ideal for the development of the state of Tripura.

Vishwanathan, P.K. and Ganesh P. Shivakoti³⁸ (2008) in their paper titled '*Adoption of rubber-integrated farm livelihood systems: contrasting empirical evidence from the Indian context*', examined the contrasting empirical evidence of smallholder adoption of rubber-integrated farm livelihood systems in the traditional versus non-traditional rubber growing regions in India. The empirical analysis is based on a survey of rubber growers in the traditional rubber grower regions of Kerala (south India) and non-traditional rubber regions of Assam, Meghalaya, and Tripura (northeast India). It also identifies the region-specific socio-economic and institutional factors determining the adoption or non-adoption of rubber-integrated farm-livelihood systems across the study regions. The study clearly reveals contrasting evidences of adoption of rubber-integrated-farm-livelihood systems in the rubber-growing regions in Kerala and in the NE states in India. The results of multivariate analysis employed in the study reveals that the socio-economic factors such as declining holding size, non-availability of family labour, and the rubber monoculture-oriented policy and institutional intervention by the Indian Rubber Board had acted as important constraints in the adoption of rubber-integrated farming systems in Kerala. The study shows that the existing institutional arrangements and policies, which evolved historically to facilitate rubber area expansion in the traditional regions (including Kerala), have been highly instrumental in perpetuating rubber farming as a mono-culture system. On the other hand, the newly emerging rubber growing tracts in the NE region show immense dynamism in terms of adoption of rubber-integrated farming systems, which needs to be promoted as an important strategy in the context of the growing food security concerns in the region.

Sinha and Chakraborty et.al.³⁹ (2010) in their book on '*Reflections on Economy and Society of Tripura*' looked into the various socio-economic aspects of Tripura. The book in the subsequent chapter on '*Indio-Bangladesh Border Trade: Tripura's Perspectives*' has highlighted upon the development of tea and rubber plantation in the state. It highlights that more and more rubber plantations are reaching yielding stage and the productivity levels are also encouraging. In the view of the area under plantations together with the growth potential and rubber production trends, the State has been identified as the second rubber capital of the country (p.84). The authors opined that there is a vast potential for setting up of rubber-based industries in the State. Although the rubber produced in the state is of high quality which faces trading problems in the absence of any rubber based industry in the State. The raw materials produced is being sent out to the neighbouring States

for further value addition. Internal trade in India takes a long route through the narrow corridor in Assam which is both time consuming as well as expensive. The authors suggest that if the rubber based products are exported to Bangladesh or to other countries through Bangladesh port, it will easily reduce the related expenses as well as ensure foreign exchange considerably.

Shamjetshabam Matouleibi⁴⁰ (2012) in a research paper titled '*How Wonderful is the Wonderful Crop? Block Rubber Plantation and Indigenous Tribal Women in Tripura*' made an attempt to study the Block Planting Scheme (BPS) of Rubber Board and Government of Tripura, and its impact on the indigenous tribal women beneficiaries. The study examined how women have benefited from Block Planting scheme and what are the cultural and social changes brought about in the context of tribal communities after adopting the new form of livelihoods. The study also examined the role of the Rubber Board in generating a sustainable livelihood for the tribal communities in Tripura. The empirical findings of the study suggests that while the income of beneficiaries of Block Planting Scheme have raised significantly and brought development in the village, in terms of better infrastructure and access to basic facilities, the flip side of development is loss of common (community) land, loss of biodiversity, an emerging class of landless, rubber becoming a men's crop and women's withdrawal from work outside the household.

S. Mohanakumar (2014)⁴¹ in the paper titled "Rubber Goods Industry (Non-Tyre Sector) in India under Globalisation" analyzed the impact of NR price hike on micro and small enterprises in the non-tyre sector of the rubber products manufacturing sector during the economic reform period from 1991. The study looks also into the process of transformation in the non-tyre sector of the rubber goods industry during the economic reform phase. The rubber goods manufacturing industry includes an advanced technology based and large capital owned automotive tyre sector and predominantly labour intensive, technologically primitive and small capital based non-tyre sector. The products in the non-tyre sector, particularly the latex based segment, is manufactured with natural rubber accounting for more than 60% of the cost of production. The viability of non-tier products from the micro and small enterprises are contingent on the price of NR. During the economic reform phase in India, the price of NR became volatile with a sudden spurt during the first half of 1990s and a prolonged trough period from 1997 to 2002, followed by a steady hike in price from 2003. The upward movement continued, to a great extent, till 2012. The hike in NR price has destabilized the micro and small peasant industries, particularly in the non-tyre sector. It is concluded that micro and small enterprises of the rubber goods industry have been largely eliminated from the market rendering a large chunk of the workforce jobless. The institutional mechanism to intervene in the crisis of the small producers is fragile and inadequate. Transformation in the rubber goods industry has resulted in the concentration of market for rubber goods in fewer and large enterprises. In a situation of market concentration in a few hands, the market for NR may turn into a buyers' market dominated by a few large enterprises like automotive tyre corporations, which would in turn augur doom for a million of sub-marginal and marginal NR farmers in India.

Chaudhuri, P.S., Bhattacharjee, S., Dey, A, Chattopadhyay and D. Bhattacharya⁴² (2013) in a paper titled '*Impact of age of rubber (Hevea brasiliensis) plantation on earthworm communities of West Tripura*' provided a comparative analysis of earthworm communities in the rubber plantation of different age groups in West Tripura and examined the impact of exotic and monoculture plantation in conservation of earthworm diversity. The study shows that density, biomass and dominance of earthworms increased, while species diversity, species richness and species evenness of earthworm communities decreased with increase in the age of rubber plantation.

Joseph, Joby, Tharian, George K. and Dey, S.K.⁴³ (2010) conducted a study to assess the socio-economic impact of the Block Plantation scheme on the targeted groups in the state of Tripura and suggested for compatible policy initiative from a regional perspective. The study is based on the

primary information gathered from 480 households drawn from Block Planting Units with mature (Mature BPUs) and immature (Immature BPUs) area under Natural Rubber (NR) as well as households attached to Group Processing Scheme (GPUs) with mature area under Natural Rubber during the year 2008. It provides a comparative perspective about the sources of income and consumption expenditure of the beneficiary households under mature and immature Block Planting Units (BPUs) as well as growers covered under Group Processing Scheme (GPUs). It provided an estimated figure on the assets and liabilities of the households under the three categories. The study reveals that the BPS has been successful in fulfilling the two objectives, i.e., the expansion of area under NR cultivation and improvements in the income profile of the economically and socially marginalized groups, judged by the progress under the three complicated phases and the fourth phase in progress.

However, the study underlined two critical components which required for the effective utilization of the income impact of the BPS such as imparting skills through technical/professional education and providing access to infrastructure facilities related to higher education, healthcare, communication and transport. The study also indicated the inadequacies and higher costs of education and healthcare for the beneficiary's households. In the long-run, only such comprehensive approaches addressing multifaceted issues of the economically marginalized groups can facilitate comprehensive diversification of the sources of income. In the short-run, close monitoring and supervision by the Rubber Board are essential for two reasons: (i) the beneficiary households are yet to fully assimilate the prescribed agro-management practices; and (ii) the RPSs attached to mature BPUs require the inputs and guidance of the Board. The study suggests that along with improvement in infrastructural facilities, there is a need to organize/provide short-term industrial training courses so as to impart skills and empower the unemployed/underemployed youth in the state.

The status report by D. Rajasenan⁴⁴ (2010) titled '*Livelihood and Employment of Workers in Rubber and Spices Plantations in Kerala*' attempts to capture the various dimensions of livelihood among the workers in these two sectors. The report discusses the livelihood assets of plantation workers according to the components identified by USAID and UNDP for a sustainable livelihood and for poverty alleviation. Livelihood assets were classified into physical, natural, financial, human, social, political and welfare for the study purpose. The livelihood variables show that plantation workers' livelihood options are below the standard criteria. While comparing the livelihood of workers in the two commodity sectors i.e. rubber and spices it is clear that the problem of decent livelihood is more perennial and severe in the spices plantation. The findings of the status report also mentions about the scarcity of labour in the plantation sector in the state because of the implementation of employment guarantee programmes like the MNREGA. Gender neutral wage in MGNREGA programme has resulted in large scale participation of women in MGNREGA. It has resulted in shortage of women in plantation sector which is largely dependent on unskilled women workers. Further, the outmigration of Tamil labourers to their native places because of the recent construction boom in Tamil Nadu has also resulted shortage in plantations. The report also states that the wage in plantation sector is lower than existing market clearing wage in the labour market in Kerala and this is one of the causes for which plantation workers switch over from plantation jobs to other unskilled jobs where wage rate is comparatively higher. It also states that there is also the prevalence of gender based wage discrimination in small scale plantations in the state (45-47).

Gaurav Sharma, J. Joseph, T. Gerge K. and Dey S.K.⁴⁵ (2011) in an article titled '*Impact of Mahatma Gandhi National Employment Guarantee Act on Rubber Block Plantation Scheme in Tripura*', examined the region-specific factors instrumental in the unique developmental experience of NR sector in Tripura. It focused on the recent developments posing serious constraints on the supply of family labour to the immature rubber plantations consequent to the growing popularity of employment opportunities under MGNREGA and suggests that the inclusion of the developmental

works required for the immature rubber plantations under the MGNREGA projects by the State Government of Tripura.

A. Majumdar, L. Anita Devi, Shyamlal Sen and M. Narayan Potti(2015)⁴⁶ in their paper titled '*Participatory Rubber Extension in Tripura-Case Study of Manimalayar Rubbers(P) Ltd*', views that the Manimalayar Rubbers, a joint venture of Rubbers Producers Societies and the Rubber Board, at Agartala has become a major player in rubber and estate input business in Tripura. The market intervention by the company could change buyers' market to the seller's market' and facilitated the farmers to realize the highest farm gate price. Manimalayar Rubbers serves as a facilitator to the producers, as Rubber Boards priority has been for immature area. The Company operates its own designer module of disseminating knowledge base on tapping, processing, smoke house construction, pest management, chemical stimulation etc. based on Boards scientific stipulations. Field visits are conducted for training on quality sheet making and filling of ammoniated field latex. The company is the single largest destination of graded sheet rubber in the entire state. The company also has key role in maintaining integrity and transparency in the RPS sector by providing fair deal and fair price.

The intimate contact that prevails round the year also protects the societies from disintegration and ensures better performance. The company supports its stakeholders by means of credit sale, advance payment. Materialistic and financial supports are also given to the clusters of the producers at the time of commencement of tapping-processing at resource poor units. Dividends for transacting with the company are also given as marketing assistance to the RPS. Under its corporate social responsibility, Company use to contribute to the Chief Ministers Relief Fund. The strategy of the Company is to provide need-based service to the stakeholders in purchases, sales and after sales services etc. The study suggest that with the initiative of the Company, a new processing/manufacturing company called Tripura Latex could be floated involving the resettled primitive and nomadic tribal 'jhumias' as shareholders representing rubber producers. The study findings informs that concerted efforts of the Company, Rubber Board and stakeholders proves the success of a PPP for achieving inclusive development of remote villages in Tripura.

In a study on the '*Status and prospects of RPS in Tripura*', A. Majumdar⁴⁷ (2012) examined the prevailing status of the RPS and that of the rubber producers community in absence of effective services of an RPS, and also to analyze the contributions and constraints of functioning of RPS in the state. The study made several suggestions for improving the status of RPS in Tripura. It stated that RPS coverage needs to be extended to all unrepresented area. Unless it attains coverage over 50% stakeholders, it cannot take over other players. Sufficient funds for instant, even advance payment against purchase of rubber has to be arranged by RPS on priority. Credit sale of estate inputs, which brings producers close to the buyers also seeks affluence on the part of RPS. RPS has to be simultaneously service and business minded. It has to be competitive all round. RPS has to have sufficient trained tappers so as to retrench inefficient, unproductive and detrimental ones. Wage structure of tappers has to be remunerative, not as fixed salary but as incentives for better production and quality of tapping. Appropriate education of the stakeholders, arranged by a self-governed entity like RPS can amend their attitudes, ambitions, approaches etc. towards problems in hand and convey counter attack for desired outcome. Although RPS does it, in addition to this only wider coverage, contribution and competitiveness are sought in this direction.

S. Mohanakumar⁴⁸ (2013) conducted a study on '*Expansion of Natural Rubber Cultivation in Tripura: Impact on Landholding, Employment and Income*'. This study is based on a field survey of cultivators and agricultural workers including those engaged in the cultivation of Natural Rubber in two districts (West Tripura and South Tripura- before the reorganization of districts in 2012). In view of the shift in cropping pattern to the cultivation of Natural Rubber (NR) in the state of Tripura, the study examined the consequence of the spread of NR on the land market, employment and food

security of vulnerable sections in the society. Having analyzed the crop specific policies of the state and central government (commodity boards) in facilitating the shift in cropping pattern. The study found that the area under NR has been increasing faster than other crops in Tripura. The central and state governments have been promoting NR in the state through regional discrimination of crop-subsidy system for NR. In non-traditional NR growing region, the crop subsidy per hectare of land, scope and coverage of subsidy schemes are much higher than the traditional NR growing region. The state has included partial or full withdrawal of financial assistance, near total stoppage of extension services, non-implementation of declared schemes and non-release of funds for traditional crops, particularly rice. Thus the expansion of NR on a large scale may transform the state into a mono-crop agrarian system. However, given the social and economic structure of the agrarian economy of the state, fall in area under rice cultivation is a matter of serious concern with respect to the economically and socially vulnerable sections.

It is against the backdrop, the study suggests that a subsidy system for paddy and vegetable production should be put in place which may compensate for the relative income loss from growing food crops. Extension service system should be more effective than NR for food crops as well, especially for rice. A land use policy needs to be framed which would clearly mark the places where only food crops should be cultivated. The activities of Rubber Board may be integrated with the activities of Rice Board and the vigorous extension for NR may also be clubbed with rice cultivation. Training needs to be imparted to the displaced workers from paddy field in the latex based and other rubber goods manufacturing industries. Further, training needs to be imparted to women workers to enable them to get employment in NR plantation including tapping jobs. Rubber Board should ensure that there is a well-designed and sufficiently funded labour welfare schemes for workers in NR plantation, which would attract more labour to the sector.⁴⁹

P.K. Viswanathan and Indraneel Bhowmik⁵⁰ (2014) in their paper on '*Compatibility of Institutional Architecture for Rubber Plantation Development in North East India from a comparative perspective of Kerala*' made a critical examination of the compatibility and adaptability of the Kerala model of institutional interventions for rubber development in the specific context of the NER. While examining the trajectory of development of rubber plantation in Kerala under the institutional interventions spearheaded by the Rubber Board, it emerges that the Board had promoted a system of rubber production that was highly oriented towards monoculture without considering the crop promotion from an agriculture system perspective. The paper argues that given the agro-ecological diversity and the specific socio-economic, ethnic and institutional settings as well as the pattern of livelihoods followed, the institutional interventions for rubber development in the NER should have an integrated and holistic approach, so as to minimize the damages caused to the fragile agro-ecosystems of the region. Replication of the rubber based monoculture as widely promoted in the traditional regions, especially, Kerala to the NER, can be a cause of conflict with the pre-existing as well as co-existing agricultural production (including food crops) practices/farm integrated livelihood systems.

Abhik Majumder, S. Datta, B.K. Choudhury and Koushik Majumder⁵¹ (2014) in their paper titled '*Do Extensive Rubber Plantation Influences Local Environment? A Case Study from Tripura, Northeast India*', studied the effect of Natural Rubber (NR) production on local environment and assessed the ecological implications of NR production in the state of Tripura. The study observed that as most of the NR plantation in the state is rain dependent, fluctuation in monsoon poses a serious threat to growth of rubber plantation. The effect of such shift and fluctuation in climate change ranges from surface and ground water level variation, air quality and soil preservation. The paper states that the multi-directional environmental threat to the state comprising annual rainfall deficit of 23.3 %, depleted ground water level and significant rise in average atmospheric temperature may severely hit the production of NR in the region. Moreover, the estimated requirement of water to produce ribbed smokes sheet (RSS) will may escalate to more than 152140 kiloliters in the next ten years. The

predicted amount of waste water generated (directly or indirectly) in RSS collection and industry processing effluents may cause large environmental issue due to their open disposal in many cases. This may further pose a threat to the rubber production and growth of the sector.

Indraneel Bhowmik and P K Viswanathan⁵² (2015) in their study on “*Emerging Labour Relations in the Small Rubber Plantations of Tripura*”, illustrated that Tripura has emerged as the second largest rubber growing state of India after Kerala in terms of area as well as production. Government of Tripura has taken several initiative to rehabilitate the landless tribal (shifting) cultivators through rubber plantation. However, the authors underlined that the dynamics of rubber cultivation in Tripura is quite different from that in Kerala. Differential productivity, agro-climatic conditions, cultural practices, ownership pattern and labour relations differ substantially owing to the different economic, political, cultural transformation of the society in the two states. Small rubber farms traditionally used family labour, but since the late 1990s the use of hired labour is on the rise. The labour relations in such small rubber holdings are contractual and extremely personal in nature. It is observed that a new wage settlement mechanism based on revenue sharing in the tribal majority areas of the state is emerging particularly after the boom in the rubber market. However, the workers are mostly deprived of the various welfare means of the Rubber Board as the plantations are often raised in occupied lands. Their study argues for legalisation of such illegal plantations provided the workers of those plantations are issued a certificate of authenticity by the owner to make them eligible for Rubber Board Support. Moreover, development of a mechanism of welfare for workers of the small holdings in tune to that available for estate workers covered through PLA may be thought off. The study suggested that the Rubber Board or the government of Tripura may consider an incentive policy to reward good and efficient tappers/ workers.

Raju Debbarma⁵³ (2015) in a paper on ‘*Impact of Rubber Plantation based Economic Rehabilitation Programme on the Shifting Cultivators in Dhalai District of Tripura*’ examined the impact of rubber plantation based economic-rehabilitation programme on households having rubber plantation(HHRP) erstwhile shifting cultivators(*jhumias*) and compared with households not having rubber plantation(HNHRP). The study applied the Sustainable Livelihoods Approach (SLA) to analyse the five capital assets viz., human, natural, physical, financial and social capital gathered through household survey. It also adopted the range equalization method to elucidate the five capitals. The study findings revealed that physical and financial capitals have great influence on enhancing the livelihood of HHRP than HNHRP, whereas social capital the least for both households. HHRP slightly lack in natural and human capitals than HNHRP, as access to land for shifting(*jhum*) of HHRP have drastically declined due to land allotted for rubber cultivation and declined in traditional skills but resulted in increasing modern skills associated with rubber plantation. The study also informs that high income of HHRP from rubber plantation has strengthened coping strategies than HNHRP.

Arunabha Mazumdar, B. Rajeevan and L. Anita Devi⁵⁴ (2017) in their paper on ‘*Study on Backdrops of Tappers in NR Sector in Tripura*’ noted that rubber tappers who hail from underprivileged sections of the society, are also poor in the economy, education and exposure. Skill is the predisposing factor which ultimately ends up with low profiles for productivity, quality, wages, job dissatisfaction and upcoming discontents. The paper suggests that tappers in Tripura seek immediate interventions for proper education to bring out scientific norms of harvesting and processing of latex together with awareness programmes for the plantation owners.

Arunabha Mazumdar, B. Rajeevan and Anita Devi (2016)⁵⁵ in their paper on ‘*Skill level, demography and social status of rubber tappers and their impact on sustainability of NR plantation sector in Tripura*’, reveals that tappers, who hail from unprivileged sectors of the society, are financially poor and far behind in education and exposure level, especially in terms of professional skill. Skill deficiency or the skill gap is the determining factor for low yield, poor plant health, deprived wages,

less satisfaction and the unhealthy owner-tapper relationship which tempt the unemployed youths venturing into this potential job opportunity. Skill development initiatives and exposures avenues for tappers together with awareness programs on labour relations for the plantations owners need prioritized implementation for sustainable development of NR plantation industry.

Arunabha Majumdar, Shyamal Sen and J Chandrasenan Nair⁵⁶ (2011) in their study titled '*Influence of Rubber Producer (RPS) Society in the Growth and Performance of Natural Rubber (NR) Sector in Tripura*' pointed out that formation of RPS and the strong linkage of RPS with rubber growers, Rubber Board and Rubber Board promoted companies is one among the major factors behind the success of rubber plantation development in Tripura. Their study reports that majority of the rubber growers belongs to backward and unprivileged groups. Maximum rubber area and number of rubber growers were from Agartala region. The study revealed that 60% rubber growers directly inspired from RPS and 40% indirectly, motivated by seeing neighbours success. The Rubber Board company-Manimalayar Rubbers Pvt. Ltd., played an important role in the controlling rubber market and supplying estate inputs in time. RPS in these locations have greatly enhanced the rubber area and production, and productivity through its interventions in harvesting, processing and marketing by association with Rubber Board and Rubber Board companies. This study made several suggestions for improving the status of RPS sector in Tripura which includes: RPS coverage needs to be extended to all unrepresented area. Sufficient funds for instant and advance payment against purchase has to be arranged by RPS on priority. Credit sale of estate inputs, which brings producers close to the buyers, also seeks affluence on the part of RPS. RPS has to be simultaneously service and business minds as well. It has to be competitive all round. RPS has to have sufficient trained tappers, arranged so as to retrench inefficient, unproductive and detrimental ones. Wage structure of tappers has to be remunerative, not as fixed salary but as incentives for better production and quality of tapping. Finally, the study suggested that appropriate education of the stakeholders, arranged by a self-governed entity like RPS can amend their attitudes, ambitions, approach etc. towards problems in hand and convey counter attack for desired outcome. RPS does it, however only wider coverage, contribution and competitiveness are sought in addition.

B. Rajeevan, P.C. Goswamy and Arunabha Majumdar(2011)⁵⁷ in another study titled '*Role of RPS in the Socio-Economic Development of Northeast India-A critical Analysis*' pointed out that rubber producing societies in addition to rubber plantation development, were instrumental in solving the problems such as health-care and hygiene issues, unaffordability of cost of production of food crops, poor credit system and low per capita income resulting in poverty, poor housing condition, indebtedness, land alienation etc., faced by the rural poor and tribal villages. Farmer group (RPS) formation accelerated the infrastructure build up, institutional development, education level improvement etc. and consequently opened up exposure avenues leading to their attitudinal change which has also helped to control the insurgency prevailed in the tribal pockets to a certain context. The study found that rubber based livelihood system generated more employment opportunities for the rural poor. The study also reveals that there was significant increase in utilization of financial resources for health care, children's education and food/clothing, showing the positive change towards improvement in quality of the life of socio-economically backward rural population. The improvement in transportation and communication facilities due to the group synergy impact also contributed considerably to the overall development of the area.

A. Majumdar and L. Anita Devi (2015)⁵⁸ in their paper titled '*The Paradigm Shift in Rubber Extension & Development in Tripura*', apprise that Rubber Board established a branch of Manimalayar Rubber (P) Ltd. at Agartala. This company was set up at the instance of rubber producers and the Government of Tripura. The driving force behind the support extended to the company by the government as well as the Rubber Producer Societies was that there was ruthless exploitation of the grower's community by the business-men while purchasing rubber and selling

inputs. Manimalayar Rubbers could prove that it (rubber) could be a crop having higher income generating potential and livelihood development activity in the state of Tripura. The company has been doing a commendable job in providing market support to the rubber producers in Tripura. Besides providing daily bench mark of price of different grades of rubber, it gathers general awareness of rubber market and adds market intelligence among the rubber growers community. Manimalayar Rubbers is the single largest source of graded rubber like RSS IV in the entire state. To commemorate its Silver Jubilee Year, it had introduced higher grades of sheet rubber and half a dozen of new estate inputs in the market besides bouquets of service-oriented-business-options for its stakeholders. Manimalaya Rubbers has been engaged in bridging the gaps between the two-ends of supply-demand banks since inception.

Arunabha Majumdar, Gaurav Sharma, B. Rajeevan, M. Narayanan Potti, Shyamal Sen and L. Anita Devi⁵⁹ (2014) in their study titled '*Knowledge Management for Capacitating the Rural Poor: Impact of Community Processing cum technology transfer Centres in the NR Sector of Tripura*' stated that Natural Rubber (NR) plantation activity in Tripura has transformed the rural and tribal livelihood in the state. For effective resource management, group approach was attempted by forming clusters called Rubber Producer's Societies (RPS) which subsequently developed into the Community Processing Centres (CPCs) with infrastructure for processing of latex and facilities for technology transfer. The study highlights the effectiveness of the CPCs for optimum resource-use and knowledge management for inclusive development. RPSs having CPCs disseminate information on schemes and services of the Rubber Board inspire and facilitate entrepreneurs for rubber cultivation, arrange necessary trainings on nursery management, pre-planting and post planting cultural operations, harvesting and processing, conduct capacity building programmes and handhold the absentee producers and prompt in conducting statutory meetings. CPCs maintain Corporate Social Responsibility (CSR) through welfare funds, short-term loans, advances for medical attendance etc. Irrespective of the educational backgrounds, the managers in most of the CPCs are trained on book keeping, accounting to handle accounts. Women attached to the CPCs also are capacitated in terms of skill development, cluster formation, micro-financing and ancillary income generation. Their study establishes that judicious knowledge management on technology and skill in RPSs with CPCs could bring attitudinal change among the resource poor inhabitants of remote villages in Tripura.

The summary of the literature relating to sustainable livelihood and rubber-based tribal livelihoods with specific reference to Tripura in Northeast India has been tabulated in Table 1. The review reveals the various insights, methodological implications and the gaps in the area of rural and tribal livelihoods in the last decade.

Table 2.1: Literature Review

Author(s)	Objective of Study	Key Findings	Methodology Applied	Variables Identified
Elisabeth Kvitashvili, (2005); US AID (2005)	To examine the relationship between conflict and people's livelihoods; lessons in developing livelihoods programs and listings of relevant USAID mechanisms, implementing partners, and contact information.	Effective livelihood programming in pre-conflict, conflict, and post-conflict situations requires creative thinking, flexibility, an understanding of the dynamics of the particular conflict, and a recognition of its local impact.	Review	Livelihood assets(including physical, natural, financial, social & political), conflict shocks, appropriate responses
Chambers and Conway (1992)	To explore and elaborate the concept of sustainable livelihoods	Livelihood capability in a context of change and unpredictability requires being adaptable, versatile, quick to change, well-informed, and able to exploit diverse, complicating and changing resources opportunities. Giving priority to the capabilities, assets and access of the poorer, including minorities and women. Reducing vulnerability by restraining external stress, minimizing shocks, and providing safety nets, so that poor people do not become poorer. Understanding better how more people can want and be able to continue to gain their livelihoods in rural areas, how to prevent distress migration to urban areas, and how to support reversals of rural-urban migration.	Conceptual	Capability(livelihood capability), equity and sustainability(enviromental and social ; inter-generational sustainability); Sustainable rural livelihoods and migration
Ian Scoones (1998)	Outlines a framework for analyzing sustainable livelihoods with the help of five key indicators	The framework shows how in different contexts, sustainable livelihoods are achieved through access to a range of livelihood resources (natural, economic, human and social capitals) which are combined in the pursuit of different livelihood strategies (agricultural intensification or livelihood diversification and migration). Central to the framework is the analysis of the range of formal and informal organizational and institutional factors that influence sustainable livelihood outcomes.	Review	Creation of working days, poverty reduction, well-being and capabilities, livelihood adaptation, vulnerability and resilience and natural resource-base sustainability
Frank, Ellis (2000)	Examines livelihood diversification as a survival strategy of rural households in developing countries.	The book sets out the rural livelihoods approach within the larger context of past and current themes in rural development. It adopts diversity as its principal theme and explores the implications of diverse rural livelihoods for ideas about poverty, agriculture, environment, gender, and macroeconomic policy. It also considers appropriate methods for gaining quick and effective knowledge	Conceptual	Poverty and income distribution, Agriculture, Environment and Gender

		about the livelihoods of the rural poor for project and policy purposes.		
Roslina Kamaruddin and Shamzaeffa Samsudin (2014)	To measure comprehensively all the livelihood elements of the rural poor households through developing a Sustainable Livelihood Index (SLI).	SLI is a more analytically rigorous tool to assess the ability and preparedness of the rural poor than the regular use of household income level alone. Understanding the current situation of livelihood assets owned by the poor is very crucial for local authorities or related agencies for appropriate assistance	Empirical	Livelihood assets (human, physical, social, natural and financial assets).
Maniemai Thongyou (2014)	To explain the changes in livelihoods strategies of rubber smallholder households in a village in the northeast region of Thailand.	Within the changing socio-economic context and constraining status of capital assets and access, rural households adopted integrated livelihood strategies, including 1) economic diversification or plural-activities to reduce risks and increase income 2) maintaining rice cultivation to guarantee food security 3) keeping the ownership of agricultural land as an important capital asset 4) investment in higher education of the younger generation of the household.	Empirical and qualitative research method	Livelihoods before Cash Crops; Major Characteristics of Capital Assets and Access and The Balance of Capital Assets as a Foundation of Economic and Social Life
Sharit K. Bhowmik (1980)	To provide a sociological definition of the plantation system.	The uniqueness of a plantation system lies in its social and production relation. Change in the production relation is determined by the context of isolation of the plantation from the wider social systems and the influence of the working class organizations among the workers and the role of the State.	Empirical	Plantation, Social System, , Social and production relations
Bag, S., Anand, N and Pandey, K.K. (2014)	To identify the key factors influencing sustainable supply chain management (SSCM) practices and understand the relationships in context to Indian rubber goods and manufacturing sector. To develop a SSCM model for Indian rubber goods manufacturing sector.	SSCM model explains the complex relationships among key variables and also shows the direct and indirect relationships in a better way so that Managers can easily understand the links and devise green supply chain management strategies successfully. SSCM practices in Indian Industry are mainly influenced by market pressures, carbon emission reduction, market share and profit. Rubber Industries feel motivated in SSCM practices due to increase in market share and profit. Supplier relationship management and Green technology adoption are the linkage variables with respect to SSCM practices in Indian rubber Industry. Supplier relationship management, top management commitment, regulatory pressures and market pressures are the key drivers of SSCM practices in Indian rubber industry.	Quantitative Modeling	Sustainable Supply Chain Management

Arunabha Mazumdar (1990)	To provide a comparative analysis of different parameters, related to the demography, sociology and economy of the Jhumia community in one of the Block Plantation units; to understand decennial and 15 years' changes and also to comprehend the impacts of Rubber Block Plantation Scheme.	The case study on demographic, social and economic variations occurred over a period of 10 and 15 years at Laxmandhepa block plantation unit shows the significant development of the community in all aspects, particularly in education and women's empowerment. The study also points out the necessity of further guidance of the community, which has recently transformed from barter to cash economy and from near starving to surplus economy, on their future investment opportunities.	Empirical, Case Study	Sources of Income, Average Expenditure, Production of rubber and returns, Standard of living of the stakeholders
Suchintya Bhattacharya (1992)	To explore the traditional economic pattern of the Jhumias, their social organization, transformation of the Jhumia economy, new ideal for the Jhumias rehabilitation and the socio-economic life-pattern of the Jhumias and their potential level of changes.	The possibility of removing the distress of the Jhumias and ensuring a higher level of living to them is intimately connected with the successful changeover from Jhumming to tapping in Tripura	Theoretical	Ethnic affiliation, Jhumia Community, traditional socio-economic life pattern, Transformation of Jhumia Economy, Rubber Tapping
B. Rajeevan and Arunabha Majumdar (2005)	To analyze the impact of the rubber plantation programmes on the living conditions of the people of Tripura, block plantation and group plantation units under production for last 3-5 years.	The study reveals that thrust has to be given for further improvement of the educational facilities/exposure avenues, especially for the tribal communities. Concerted efforts for promotion of rubber cultivation coupled with education/exposure promotional programmes would be ideal for the development of the state of Tripura	Empirical	General(Village) Analysis, Infrastructure, Human Resource, Monetary Condition; Individual(Family) Analysis: Health, Wealth, Vigor(Educational, Economic and socio-cultural status)
Vishwanathan, P.K. and Ganesh P. Shivakoti (2008)	To examine the influence of important socio-economic, institutional/policy level factors in determining the adoption/non-adoption of rubber-integrated farming systems in traditional and non-traditional rubber growing regions in India.	The study reveals contrasting empirical evidences of adoption of rubber-integrated farm-livelihood systems in the rubber growing regions of Kerala and in the NE states of India. The socio-economic factors such as declining holding size, non-availability of family labour, and the rubber mono-culture oriented policy and institutional intervention by RB has acted as important constraints in the adoption of rubber-integrated farming systems in Kerala. On the other hand, the newly emerging rubber growing tracts in NE region shows immense dynamism in terms of adoption of rubber-integrated farming systems, which needs to be promoted as an important strategy in the context of the growing food security concerns in the region.	Empirical	Traditional and Non-traditional Rubber growing regions; Institutional and Socio-economic factors and prevalence of rubber Mono-culture; Determinants of adoption of rubber in traditional and non-traditional regions

Shamjetshabam Matouleibi (2012)	To examine the impact of the BPS programme on indigenous tribal women, and to assess whether rubber plantation has the potential for providing sustainable livelihoods in the future for all the beneficiaries.	The study suggest that the income of beneficiaries of BPS have raised significantly and brought development in the village under study, in terms of better infrastructure and access to basic facilities, whereas the flip side of development is loss of common community land, loss of biodiversity, an emerging class of landless, rubber becoming a men's crop and women's withdrawal from work outside the household	Empirical; Case Study	Block Plantation Scheme(BPS), Sustainable Livelihood, Gender, and BPS, Class Formation, Perception of Rubber Growers & Rubber Board, Ecological Impact of Rubber Plantation
Chaudhuri, P.S., Bhattacharjee, S., Dey, A, Chattopadhyay and D. Bhattacharya (2013)	To provide a comparative analysis of earthworm communities carried out in the rubber plantation of different age groups in West Tripura to understand the impact of such exotic and monoculture plantation in conservation of earthworm diversity.	The study shows that density, biomass and dominance of earthworms increased, while species diversity, species richness and species evenness of earthworm communities decreased with increase in the age of rubber plantation.	Empirical	Earthworm population, Soil analysis, Leaf chemical analysis, Inter-habitat variation in community characteristics
Joseph et.al. (2010)	To assess the socio-economic impact of the Block Plantation Scheme(BPS) from the angle of the beneficiaries, implementing agencies and the policy makers	The study underlined two critical components which required for the effective utilization of the income impact of the BPS such as imparting skills through technical/professional education and providing access to infrastructure facilities related to higher education, healthcare, communication and transport. The study also indicated the inadequacies and higher costs of education and healthcare for the beneficiaries' households.	Empirical	Household Income, Household Expenditure, Savings and assets, Indebtedness
D. Rajasenan (2010)	To explore the various dimensions of livelihood among the workers in rubber and spices plantation in Kerala.	The study explored that the workers in rubber plantations are better off whereas the condition of workers in spices plantation remain vulnerable in every sphere of livelihood.	Empirical	Components of USAID and UNDP. Livelihood Assets(Physical, Natural, Human, Financial, Social and Political), Rubber and Spice Plantations
Gaurav Sharma, J. Joseph, T. Gerge K. and Dey S.K. (2011)	To summarize the region-specific factors instrumental in the unique developmental experience of NR sector in Tripura. To focus on the recent developments posing serious constraints on the supply of family labour to the immature rubber plantations consequent popularity of employment	The study findings shoes that there has been a distortion in the uninterrupted supply of family labour to growing popularity of the employment scheme(MGNREGS), which may eventually lead to a prolongation of immature phase and adversely affect the uniform and healthy growth of rubber sector. The authors suggested for inclusion of the developmental works required for the immature rubber plantations under the MGNREGA projects by the State Government of Tripura.	Review	Family Labour, Immature Rubber Plantation, Block Plantation Scheme, MGNREGA

	opportunities under MGNREGS. To suggest policy options to overcome the observed problems from a a long-term perspective			
A. Majumdar (2012)	To examine the prevailing status of the RPSs and that of the rubber producers' community in absence of effective services of an RPS. Also to analyze the contributions and constraints of functioning of RPSs in the state of Tripura	The study suggested that RPS coverage needs to be extended to all unrepresented area.. It has to be competitive all round. Appropriate education of the stakeholders, arranged by a self-governed entity like RPS can amend the attitudes, ambitions, approaches etc. of the rubber growers towards problems in hand and convey counter attack for desired outcome.	Empirical	Details of Plantations, Demography, Types of employments, amenities of tapping and processing, levels of market intelligence, modes of disposal, preferences of sales patterns of marketing, cost-profit ratio, manners of dis-investment
S. Mohanakumar (2013)	To study the cropping pattern in Tripura over time; analyze the crop specific policies of the state and central governments in facilitating the shift in cropping pattern. To study the consequences of the spread of NR on labd market, employment and food security of vulnerable sections of the society.	The study found that the area under NR has been increasing faster than other crops in Tripura. The central and state governments have been promoting NR in the state through regional discrimination of crop-subsidy system for NR. The state has included partial or full withdrawal of financial assistance, near total stoppage of extension services, non-implementation of declared schemes and non-release of funds for traditional crops, particularly rice. Thus the expansion of NR on a large scale may transform the state into a mono-crop agrarian system.	Empirical	Economic Profile and the land holding structure, Occupational Structure, Simpson Index of Diversification, Changes in Cropping Pattern, Crop Substitution and Employment Effect, Employment Effect of the Crop Shifts, Income Effect of NR Cultivation, Impact of NR cultivation on Land Market, Food Security and Village Life
P.K. Viswanathan and Indraneel Bhowmik (2014)	To explore the various dimensions of the labour relations in the plantation sector of Tripura including the nature of labour contracts existing among the rubber small holdings; the nature of employment relations in the rubber small holdings; and the policy imperatives for addressing the emerging labour market issues in the state	The labour market for rubber small holdings in Tripura reflects the typical characteristics of the Principal- Agent Mechanism. Contracts are informal and oral in nature and mostly personal in character.	Empirical	Profiles of the rubber workers(Age, Educational status, living conditions, extent of training, sources and duration of training, reasons for working as rubber tappers, nature of contracts, annual wage earnings from plantation, additional benefits/incentives enjoyed by the workers)

Abhik Majumder, S. Datta, B.K. Choudhury and Koushik Majumder (2014)	To study the effect of Natural Rubber (NR) production on local environment and assessed the ecological implications of NR production in the state of Tripura.	The study observed that as most of the NR plantation in the state is rain dependent, fluctuation in monsoon poses a serious threat to growth of rubber plantation. The effect of such shift and fluctuation in climate change ranges from surface and ground water level variation, air quality and soil preservation.	Quantitative Modeling	Natural Rubber Production, Yearly variation of rainfall and deficiencies in rainfall, Generation of waste water and soil contamination, Depletion of ground water table, impacts on local rainfall and temperature, Effect of rubber on soil, shrinking of natural forest areas and loss of diversity
Indraneel Bhowmik and P K Viswanathan (2015)	To examine the nature of labour contracts and employment relations existing among the rubber small holdings and provide policy suggestion for addressing the emerging labour market issues in the state of Tripura.	The labour market for rubber small holdings in Tripura reflects the typical characteristics of the Principal-Agent Mechanism. Contracts are often informal and oral in nature and mostly personal in character. The study suggested that the Rubber Board or the government of Tripura may consider an incentive policy to reward good and efficient tappers/ workers.	Empirical	Profile of the rubber Workers (Gender, Social Composition, Age, Educational Level, living conditions of the plantation workers, work experience, Source and duration of training, reasons and sources of support for working as Tapper, Past occupation, Nature of contracts, mechanism for wage fixation, facilities at the worksite etc).
Raju Debbarma (2015)	To examine the impact of rubber plantation based economic-rehabilitation programme on households having rubber plantation (HHRP) erstwhile shifting cultivators (<i>Jhumias</i>) and compared with households not having rubber plantation (HNHRP).	The physical and financial capitals have great influence on enhancing the livelihood of HHRP than HNHRP, whereas social capital the least for both households. HHRP slightly lack in natural and human capitals than HNHRP, as access to land for shifting(<i>jhum</i>) of HHRP have drastically declined due to land allotted for rubber cultivation and declined in traditional skills but resulted in increasing modern skills associated with rubber plantation. The study also informs that high income of HHRP from rubber plantation has strengthened coping strategies than HNHRP.	Empirical	Livelihood Assessment, Households having rubber plantation (HHRP), Households not having rubber plantation (HNHRP). Five Capitals(Human, Natural, Physical, Financial, Social)

Summary

From the above studies it can be concluded that the rubber cash crops has the potential to transform the rural and tribal livelihoods and it could generate employment opportunities for the poor and asset-less tribals in the traditional and non-traditional rubber growing regions in India. Review of case studies of rubber plantation in the state of Tripura reveals that the introduction of rubber industry in the state has influenced the economy, land-use pattern, the tradition and culture of the involved society and facilitated technological improvement in resource use, leading to overall development of the rubber growing regions in the state. One of the major factors behind the success of rubber plantation in Tripura includes the formation and the strong linkage of Rubber Producer Societies (RPS) with rubber growers, Rubber Board and the other agencies. RPS in the region have greatly enhanced the rubber area and production, and productivity through its intervention in harvesting, processing and marketing by association with the Rubber Board and promoted companies. Implementation of natural rubber plantation programmes has led to the improvement in the economic status and opened up a new work culture in the state of Tripura. Achievement in the sphere of education through the integrated rubber plantation programme is remarkable. Further, studies reveals that job opportunities generated through implementation of rubber plantation programme has led to minimizing the unrest prevailing in the society. However, further emphasis needs to be given for improvement in educational facilities/exposures avenues, health services and skill development of the rubber tappers who hail from underprivileged sections of the society in the state of Tripura. Another emerging trend in the small plantation sector in Tripura reflects the typical characteristics of the Principal-Agent Mechanism. The labour market is purely informal with oral contracts and majority of the workers are into the sector lack of alternative occupation. The workers enjoy a very modest wage earning and lead their lives at a subsistence level. Empirical study findings on the impact of MGNREGA on rubber block plantation scheme in Tripura reveals that there is serious constraints of the supply of family labour to the immature rubber plantations in the State consequent to the growing popularity of employment opportunities under MGNREGA. It is suggested that state government should allow for inclusion of the developmental works required for the immature rubber plantations under the MGNREGA. In view of this, an important question remains how sustainable is rubber plantation and does rubber plantation have the potential to provide continued sustainable livelihood and income even for the future generation of tribal communities in Tripura. The review of studies suggest that rubber plantation development in Tripura should be aligned with livelihoods enhancement programmes and it should be a part of the systems approach to ensure sustainability of interventions.

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Chapter III

Socio-Economic Profile of Tripura

This chapter is divided in three sections. Section one provides a brief overview of economy and society in Tripura. Second section explores the socio-economic profile of Tripura in general and the profiles of the districts covered under the study. The third section critically analyses the quality of governance and implementation of the *Jhumia* (shifting cultivators) rehabilitation programmes and schemes/programmes in poverty alleviation and tribal welfare in the state of Tripura. Thus, this chapter essentially depicts the current scenario in Tripura across different socio-economic parameters, and also outlines the various elements crucial for growth and development in the state.

Introduction

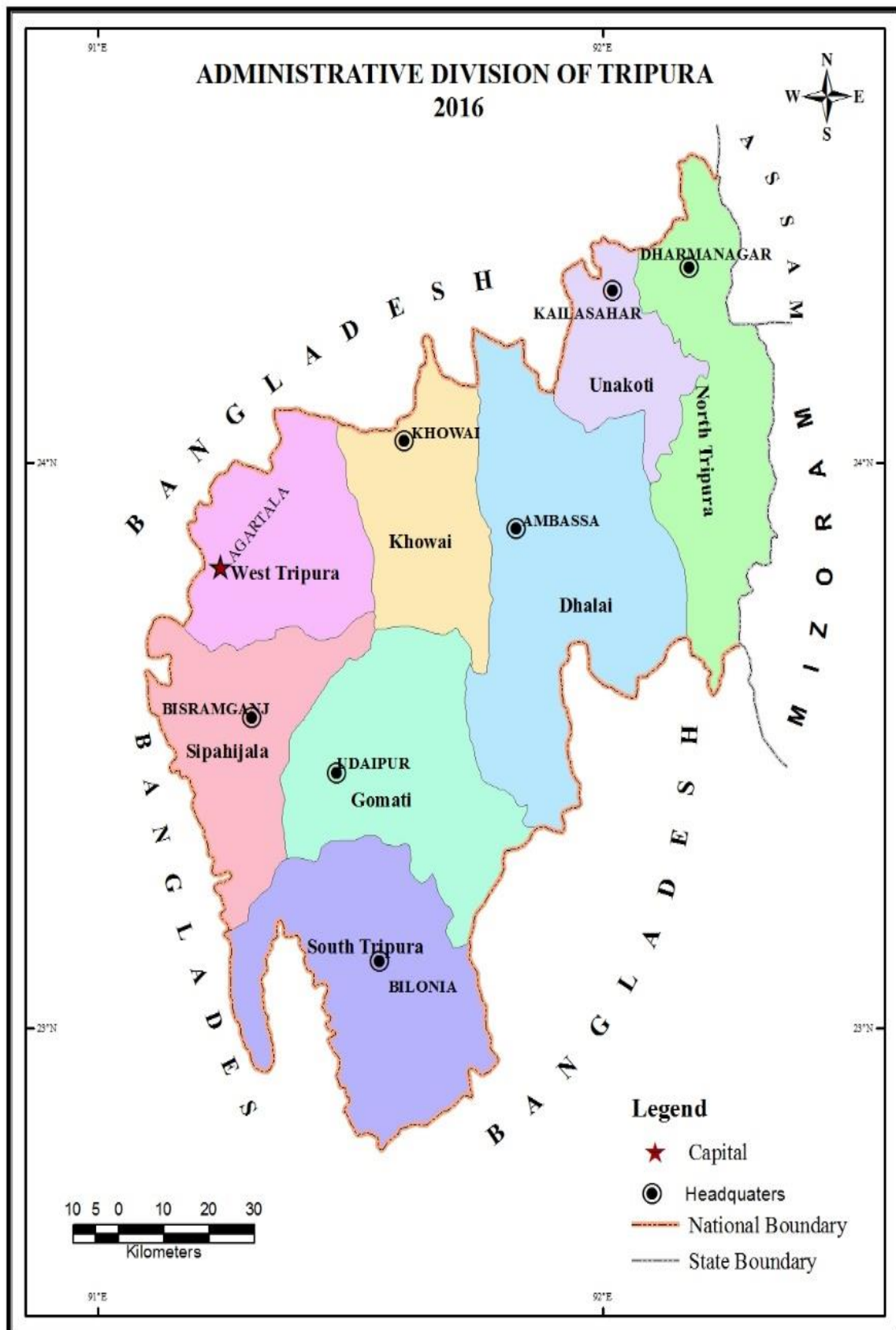
Tripura is a land-locked state. It is surrounded by Bangladesh on its north, south and west. The state is connected with the rest of India by only one road, which runs through the hills to the border of Cachar district in Assam. The terrain is hilly and forested: over 60 per cent of the terrain is hilly, and around two-thirds of the land area of the state is classified as forest.¹ At the time of Tripura's merger with the Indian Union, the major mode of farming in the State was shifting cultivation or *jhum*, which produced little surplus. Only a small proportion of the State's plain lands were under settled agriculture (cultivated mainly by Bengali settlers), and the main crop was rice. Most of the plains were not under cultivation and were covered with cane-brakes and marshes. The economy of Tripura at the time of Independence was agriculture-and forest-based, with no manufacturing base.² It is still characterized by high rate of poverty, low per-capita income, low capital formation, in-adequate infrastructure facilities, geographical isolation and communication bottleneck, inadequate exploitation and use of forest and mineral resources, low progress in industrial field and high unemployment problem.³

Tripura was among the first states in India to have enacted a new panchayat legislation, namely, the *Tripura Panchayat Act*, 1993 in conformity with the Constitution (Seventy-third Amendment) Act, 1992. This act provided for a three-tier Panchayati Raj structure comprising the gram panchayat at the village level, the panchayat samiti at the block level and zilla parishad at the district level. However, the new act does not cover those areas of the state which come under the purview of the Sixth Schedule of the Constitution and constitute 75 percent of the state's area.⁴ The next section explores the socio-economic profile of Tripura in general and the profiles of the study area at the district level.

3.1 Tripura- A State Profile

Tripura is the third smallest state in our country behind Sikkim and Goa. It covers 10,491 km² total area of India and it is bordered by Bangladesh with three sides north, south and west, and other side border with two Indian states Assam and Mizoram to east. It lies from 22°56'N to 24°32'N, and 91°09'E to 92°20'E. The physiography is characterised by hill ranges, valleys and plains. From the point of administration and governance, Tripura is divided into 32 revenue circles covering 8 districts. The three tier Panchayati Raj System is prevalent in the state. There are 8 Zilla Parishads and 35 Panchayat Samitis presently functioning in the state. There are 591 elected Gram Panchayats in the state, which are functioning outside the Autonomous District Council (ADC) areas of the State (Choudhury & Ghosh, 2016). Tripura has 8 districts, 23 sub-divisions, 58 blocks and also one Tripura Tribal Areas Autonomous District Council (TTADC) created under the 6th Schedule of the Constitution (See Table 3.1).

Map 3.1 Location Map of Tripura



Source: Economic Review of Tripura, 2015-16

Table 3.1 Statistical Data on the Administration and Governance of the State of Tripura

Districts	8
Autonomous District Councils	1
Sub Divisions	23
Blocks	58
Revenue Circles	32
Zilla Parishads	8
Panchayat Samitis	35
Municipal Council	13
Gram Panchayats outside ADC	537
Municipal Corporation	1
Gram Panchayats within ADC	527
Nagar Panchayats	6

Source: *Economic Review, 2012-13*

The state has a decentralized active administrative set-up for achieving the pro-poor inclusive growth and the detail status in 2014-15 by districts is presented in the following Table 2.

Table 3.2: Administrative Set up in Tripura

Districts	Sub-Divisions	Blocks	Panchayats	Revenue Circles	Revenue Villages	TTAADC	AMC/ NP
West Tripura	3	9	87	5	98	77	4
Shepahijala	3	7	111	6	119	52	3
Khowai	2	6	54	4	79	58	2
Gomati	3	8	70	7	132	95	2
South Tripura	3	8	99	6	138	70	3
Dhalai	4	8	41	7	154	96	2
Unokati	2	4	59	3	78	28	2
North Tripura	3	8	70	7	89	51	2
Tripura	23	58	591	45	887	527	20

Source: *Economic Review of Tripura, 2015-16*

3.2 Socio-Economic Profile

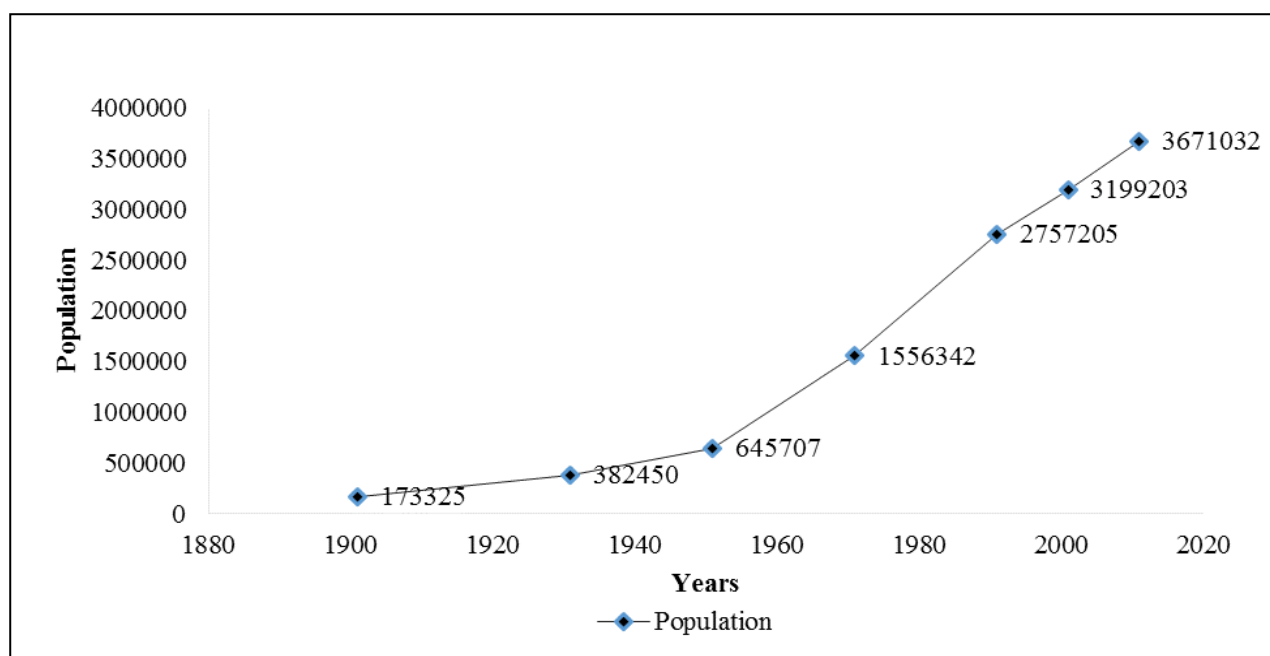
3.2.1 Demographic Profile of Tripura

The total population of Tripura was 36,73,917 (Census, 2011). The annual exponential population growth rate is 1.46 per cent, which is the lowest among the Northeastern states. The data of 2011 Census shows that Tripura ranks 18th in terms of population density at all India level. Among the north-eastern states, Tripura remained the second highest populous State after Assam. The population density of Tripura in 2011 was 350 persons per sq. km., which means that 45 more people live in a sq. km. area in the State than they lived a decade ago. The population density for all India in 2011 was 324. There is a positive improvement in sex ratio in the State and it rose from 945 (per 1000 males) in 1991 to 948 (per 1000 males) in 2001 and further to 960 in 2011. The State has also faced problem of 60,000 Chakma refugees who took shelters from neighbouring country Bangladesh during 1986 to 1996. About 35,000 Reang refugees also took shelter in Kanchanpur Sub-Division of North Tripura District from neighbouring State of Mizoram since 1997.⁵

The rural population of Tripura forms 73.83 per cent of the total population and as per 2011 Census, it stands at 2,712,464. The decadal growth (1991-2001) of rural population was 12.72 per cent, which was lower than the State's decadal growth rate of 16.03 per cent during the period. The proportion of

rural population has declined from 84.70 per cent to 82.29 per cent in 2001. According to 2011 Census, 17.06 per cent of the State's population was in urban areas against 27.78 per cent at all India level. The proportion of urban population is increased from 15.30 per cent in 1991 to 17.71 per cent in 2001. Out of the total urban population, about 65 per cent of urban population of the State is concentrated in Agartala Municipality area.⁶

Fig. 3.1: Population Growth Rate in Tripura, Year of 1880-2020



Source: Census of India, 2011

A comparative key demographic feature in 2001 and 2011 for Tripura and All India is presented in the following table. The population rate has declined to 14.8 percent during the intra-census period of 2001-2011 from earlier 16.0 percent in 1991-2001. The population growth rate has also declined at all India level to 17.67 percent from 21.50 percent in 1991-2001. The population of Tripura is classified by social diversity.

Table 3.3: Demographic Characteristics of Tripura

Sl. No.	Item	Unit	2001 Census		2011 Census	
			Tripura	India	Tripura	India
1	2	3	4	5	6	7
1	Population	in lakhs	31.99	10287	36.73	12105
2	Decadal growth rate	percent	16.0	21.5	14.80	17.70
3	Density	per Sq. Km.	305	325	350	382
4	Sex-rate	per'000 males	948	933	960	943
5	Literacy rate	percent	73.2	64.8	87.2	73.0
6	ST population	percent	31.1	8.2	31.8	8.6
7	SC population	percent	17.4	16.2	17.8	16.6

Source: Census-2001 & 2011, RGI.

The following Table shows district wise area, population, literacy, sex ratio and density based on Census-2011 data.

Table 3.4: District wise Area, Population, Literacy, Sex Ratio and Density in Tripura

Districts	Area in sq. km.	Population	Literacy	Sex ratio(females per 1000 males)	Density (per sq.km.
West Tripura	942.55	918200	91.07	970	974
Shepahijala	1044.78	483687	84.68	952	463
Khowai	1005.67	327564	87.78	957	326
Gomati	1522.8	441538	84.53	959	290
South Tripura	1534.2	430751	84.68	956	281
Dhalai	2400	378230	85.72	944	158
Unokati	591.93	276506	86.91	972	467
North Tripura	1444.5	417441	87.90	963	289
Tripura	10486.43	3673917	87.22	960	350

Source: *Economic Review of Tripura, 2015-16.*

Social Infrastructure – Education

Tripura has a literacy rate of 87.2%; the male and female literacy rates are 91.5% and 82.7%, respectively. In 2014-15, Tripura had a total of 4,818 schools with an enrolment of 800,565 students of which 20,016 were in preprimary, 3,74,462 were in primary, 202,753 were in upper primary, 146,974 were in secondary and 56,360 were in higher secondary.

Table: 3.5 Tripura's education statistics (2014-15)

Tripura's education statistics (2014-15)		
Number of schools	Primary	2,409
	Senior basic	1,251
	Secondary	586
	Higher secondary	392
Dropout rate (%)	Class I-IV	3.62
	Class I-VIII	3.46
	Class IX-X	22.06
Number of teachers	Primary (I-IV)	23,914
	Middle (V-VIII)	12,903
	Secondary (IX-X)	5,032
	Higher secondary (XI-XII)	5,406

Sources: *Tripura State Portal, Government of Tripura, 2016 & www.ibef.org*

In 2014-15, of the total number of students in the state, the number of girls in the state totaled to 389,862 and Tripura had 84 girls' only schools. Over the same period, Tripura had 13,663 female teachers from the total 47,255 teachers. The School Education Department of Tripura focuses on achieving zero dropout and 100% retention in elementary level of schooling in Tripura through Sarva Shiksha Abhiyan (SSA) Scheme.

Table: 3.6 Literacy Rate of Tripura, 2016-17

Literacy rate (%)	
Literacy rate	87.8
Male literacy	91.5
Female literacy	82.7

Sources: Census 2011, Government of Tripura & www.ibef.org

During 2015-16, the Government of Tripura divided the school education department into Elementary and Secondary Education Directorates for the up gradation of education system in the state. Moreover, during 2016-17, the government will focus on maximizing its efforts to set up dining halls and kitchen sheds for providing mid-day meals across various schools in the state. As per budget 2016-17, the state government allocated 438.41 million for the education sector. Tripura has a central university called Tripura University, a National Institute of Technology (NIT) and a state institute of technology called Tripura Institute of Technology (TIT).

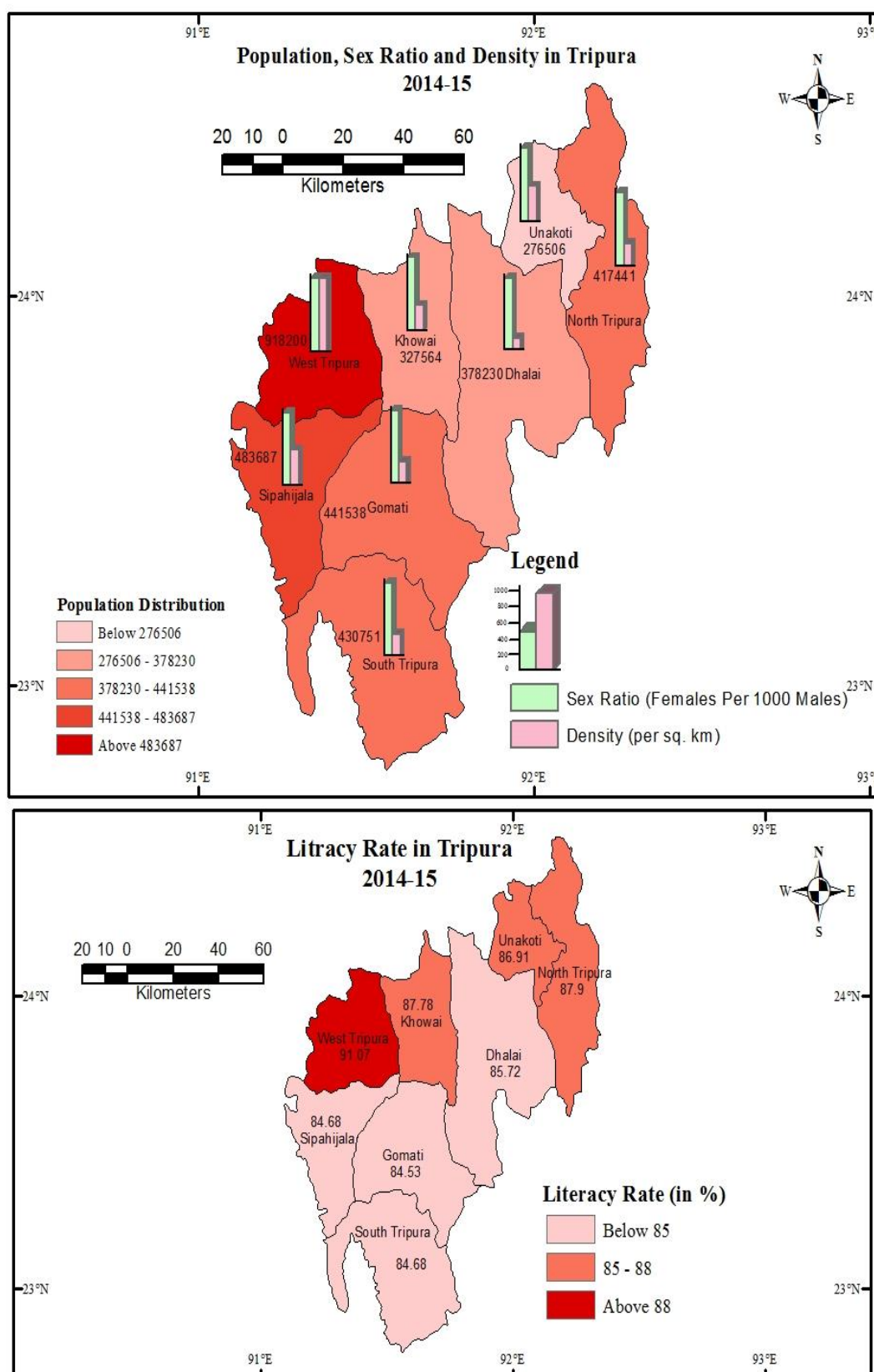
Table 3.7 Educational infrastructure of Tripura (2015-16)

Educational infrastructure (2015-16)	
Universities	2
Engineering colleges	3
Government colleges	22
Medical colleges	2
Other professional and technical colleges	10

Source: Tripura State Portal, Government of Tripura, State Budget 2016-17

The state government is encouraging several initiatives to set up various educational complexes. The "Right of Children to Free and Compulsory Education Act" has come into effect to provide free and compulsory education to children in the age group of 6-14 years in a neighborhood school. In August 2015, the state government proposed a bill to set up a university with the objective to boost higher education in the state⁷.

**Map 3.2: Distribution of population, Sex Ratio, literacy Rate and density in Tripura
2014-2015**



Source: Economic review of Tripura 2015-2016

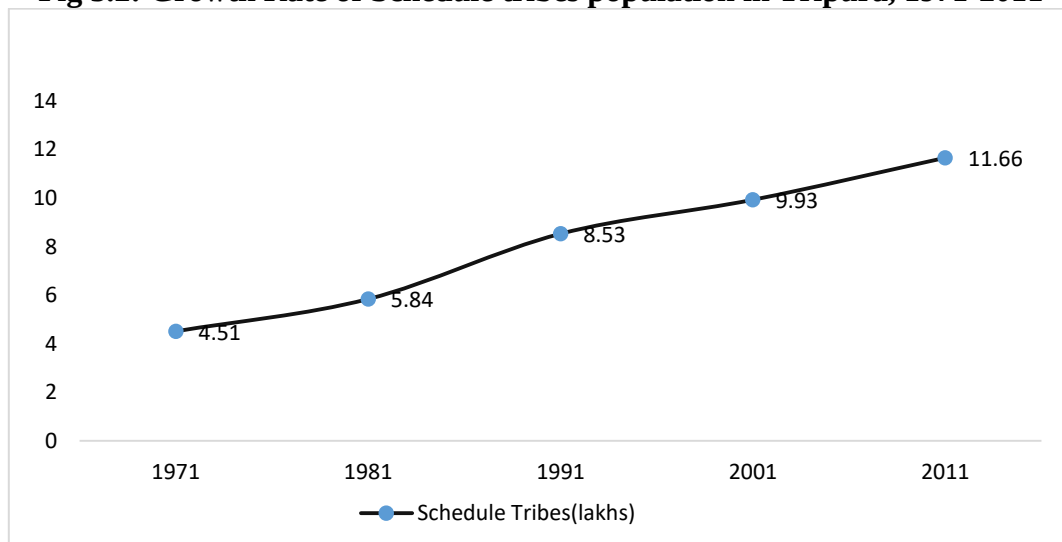
The decadal growth of Scheduled Tribes and Scheduled Caste are shown in the following table during 1971-2011.

Table 3.8: Decadal growth of STs & SCs Population in Tripura

Year	1971	1981	1991	2001	2011
Population(in lakhs)	15.56	20.53	27.57	31.99	36.73
Density of population (per sq. km)	148	196	263	305	350
Schedule Tribes(lakhs)	4.51	5.84	8.53	9.93	11.66
Schedule Castes(lakhs)	1.93	3.10	4.51	5.56	6.54

Source: Economic Review of Tripura 2012-13.

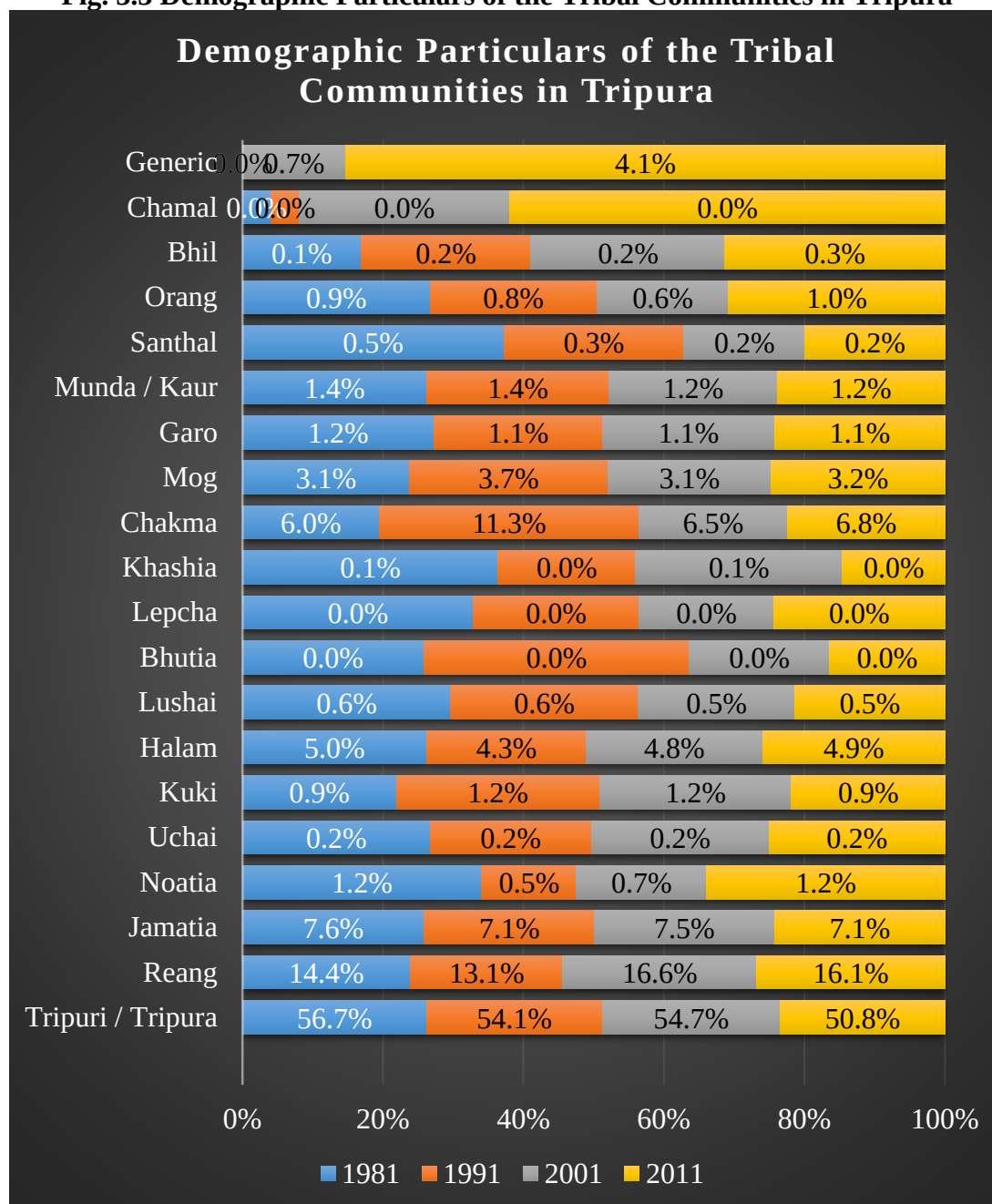
Fig 3.2: Growth Rate of Schedule tribes population in Tripura, 1971-2011



Source: Economic Review of Tripura 2012-13.

According to Census 2011, the total population of Tripura is about 36,73,917 and one third of the population (31.75%) belongs to the tribal communities. (Economic Review of Tripura, 2014-15:296). Scheduled tribes in the state differ usually in their socio-economic conditions, development needs, cultural background, ethos, language etc.

Fig. 3.3 Demographic Particulars of the Tribal Communities in Tripura



Source: - Census-2011, RGI, New Delhi.

There are 20 Schedule Tribes (ST) in the State with their own cultural identity, namely, Tripuri, Reang, Jamatia, Chakma, Lusai, Mog, Garo, Kuki, Chaimal, Uchai, Hala., Khasia, Bhutia, Munda, Orang, Lepcha, Santal, Bhil, Noatia and Generic. The detailed demographic particulars of the tribal communities are as follows:

Table 3.9: Demographic Particulars of the Tribal Communities in Tripura

Sl No.	Name of the Tribes	Population (Census Years)			
		1981	1991	2001	2011
i	Tripuri / Tripura	3,30,872	4,61,531	5,43,848	5,92,255
ii	Reang	84,003	1,11,606	1,65,103	1,88,220
iii	Jamatia	44,501	60,824	74,949	83,347
iv	Noatia	7,182	4,158	6,655	14,298
v	Uchai	1,306	1,637	2,103	2,447
vi	Kuki	5,501	10,628	11,674	10,965
vii	Halam	28,969	36,499	47,245	57,210
viii	Lushai	3,734	4,910	4,777	5,384
ix	Bhutia	22	47	29	28
x	Lepcha	106	111	105	157
xi	Khashia	457	358	630	366
xii	Chakma	34,797	96,096	64,293	79,813
xiii	Mog	18,231	31,612	30,385	37,893
xiv	Garo	7,297	9,360	11,180	12,952
xv	Munda / Kaur	7,993	11,547	12,416	14,544
xvi	Santhal	2,726	2,736	2,151	2,913
xvii	Orang	5,217	6,751	6,223	12,011
xviii	Bhil	838	1,754	2,336	3,105
xix	Chamal	18	26	226	549
xx	Generic	0	0	7,098	48,356
Total		5,83,770	8,53,345	9,93,426	11,66,813

Source: - Census-2011, RGI, New Delhi.

From table 7 it is evident that Tripura attained 87.2 percent literacy in 2011 census which is higher than the national average (73.0 per cent). The tribal literacy rate in the state is 79.1 percent, which is much higher than the national average. With every decennial census the gap in literacy is declining (Table 7).

Table 3.10: Literacy rate of total population and Scheduled Tribes Population and Gap in Literacy rate-1991-2011

(Figures in percentage)

Tripura/India	Census 1991			Census 2001			Census 2011		
	Literacy Rate		Gap in Literacy rate	Literacy Rate- 2001		Gap in Literacy Rate-2001	Literacy Rate- 2011		Gap in Literacy Rate
	Total	ST		Total	ST		Total	ST	
India	52.2	29.6	22.6	64.8	47.1	17.7	73.0	59.0	14.0
Tripura	60.4	40.4	20	73.2	56.5	16.7	87.2	79.1	8.2

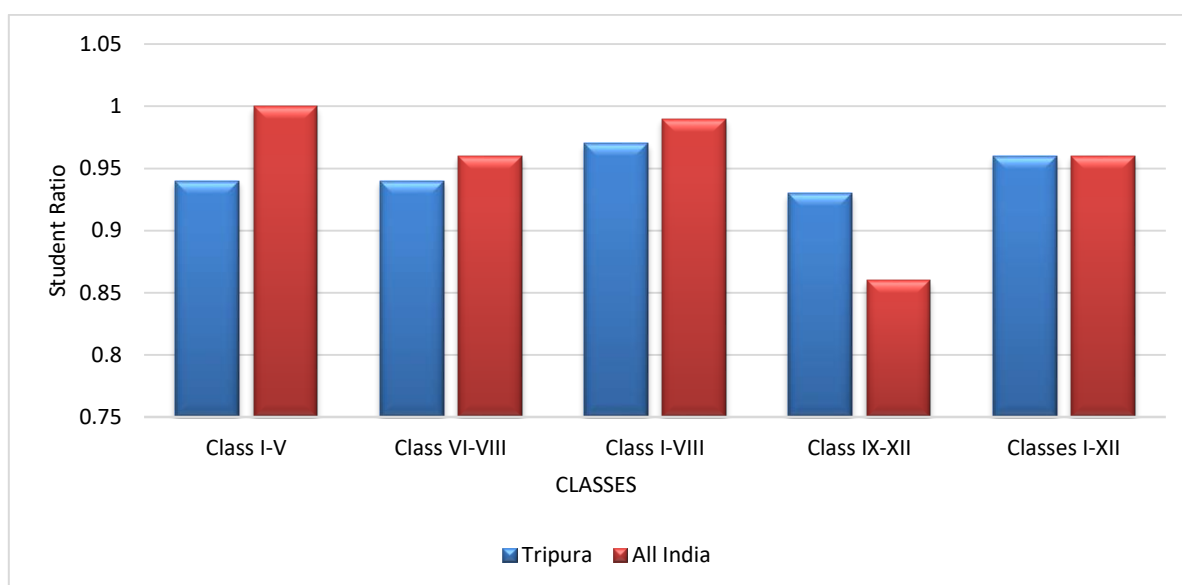
Source: Census of India, 2011, cited in Choudhury and Ghosh, 2016, p.53.

The gender parity for Tripura is very high (0.96) and same as the national average for the ST students and at the primary stage it is almost one (1), but it is minimum (0.93) in classes IX to XII at the secondary level (Table 8).

Table 3.11: Gender parity Index for ST Students

Tripura/India	Class I-V	Class VI-VIII	Class I-VIII	Class IX-XII	Classes I-XII
Tripura	0.94	0.94	0.97	0.93	0.96
All India	1.00	0.96	0.99	0.86	0.96

Source: Statistics of School Education, 2010-2011.

Fig 3.4: Gender parity Index for ST Students

Source: Statistics of School Education, 2010-2011.

3.3 Workforce

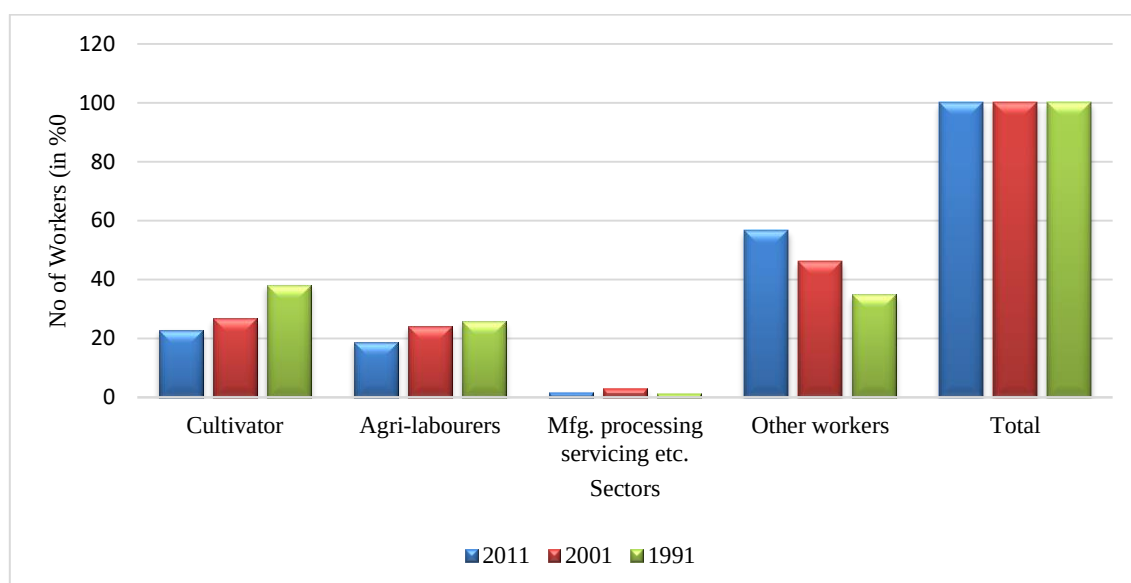
The percentage distribution of main workers according to economic classification as per 1991, 2001 and 2011 Censuses is presented in the table no. 9. The proportion of cultivators among all main workers in the State declined from 43.29 in 1981 to 38.09 in 1991 and to 26.88 in 2001 and further to 22.90 in 2011. In the same period the proportion of agri-labour in the State decreased from 26.72 percent in 1981 to 25.70 percent in 1991 and to 24.03 in 2001 and again to 18.74 in 2011. The proportion of other workers has increased from 34.79 percent in 1991 to 46.19 percent in 2001 and further to 56.56 in 2011. The proportion of manufacturing main worker stood at 1.79 percent in 2011.

Table 3.12: Classification of Workers

Sl No	Items	2011	2001	1991
i	Cultivator	22.90	26.88	38.09
ii	Agri-labourers	18.74	24.03	25.70
iii	Mfg. processing servicing etc.	1.79	2.90	1.42
iv	Other workers	56.56	46.19	34.79
v	Total	100.00	100.00	100.00

Source: Economic Review of Tripura, 2015-16.

Fig 3.5 Classification of Workers



According to Census of India definitions, the entire population has been classified into three main characteristics such as Main Workers, those who work for the major part of the year (more than 183 days); the marginal workers, those who work for less than 183 days (or six months) and the non-workers, those who have not worked any time at all in the preceding year.⁸ The categories of workers in Tripura as per 2011 Census are given below. These tables provides a comparative perspective of the workforce among the SC and ST communities.

Table 3.13: Distribution of Categories of Workers in Tripura

Total Workers					
All Population		Scheduled Caste		Scheduled Tribe	
Male	Female	Male	Female	Male	Female
71.13	28.87	51.06	48.94	59.13	40.87
Main Workers					
Male	Female	Male	Female	Male	Female
82.44	17.56	85.53	14.47	74.8	25.2
Marginal Workers					
Male	Female	Male	Female	Male	Female
40.11	59.89	46.56	53.44	30.7	69.3

Source: Census of India, 2011, cited in Choudhury and Ghosh, 2016, p.71.

3.3.1 Female Workers

As per the estimates of the Sixth Economic Census, 2013, in Tripura there were about 78,068 female employments which was 19.32% of the total employment in 2013. In 5th Economic Census, the total female workers were 60,579, which constituted 15.71% of the total work force. In 1998, Economic

Census, the total female workers were 42,945, which constituted 16% of the total work force. The following table depicts the female workers in agriculture and non-agriculture sectors.

Table 3.14: Female Employment in Tripura

SL No.	Economic activity	Female Workers		
		1998	2005	2013
	A. Agriculture:			
i)	Own account establishment	826	3,935	7,658
ii)	Establishments with hired workers	123	723	239
iii)	Total	949	4,658	7,897
	B. Non-agriculture:			
i)	Own account establishment	10,765	18,543	22,501
ii)	Establishments with hired workers	31,231	37,378	47,670
iii)	Total	41,996	55,921	70,171
	Grand total (A+B)	42,945	60,579	78,068

Source: Sixth Economic Census of Tripura, 2013.

The following Table 12 shows the district level (Population Census-2011 frame) establishments and employment under Women Entrepreneurs therein as per 6th Economic Census.

Table 3.15: District wise women Entrepreneurs establishments and Employments in Tripura

SL No.	Districts	Establishments			Employments		
		Rural	Urban	Combined	Rural	Urban	Combined
1	West Tripura	3,858	3,470	7,328	5,009	5,399	10,408
2	South Tripura	2,798	792	3,590	3,439	1,008	4,447
3	Dhalai	781	194	975	988	328	1,316
4	North Tripura	1,879	734	2,613	2,552	1,157	3,709
	All Tripura	9,316	5,190	14,506	11,988	7,892	19,880

Source: Sixth Economic Census of Tripura, 2013.

3.4 Health

Health status of tribes in the state of Tripura is very poor as witnessed by the lack of personal hygiene, poor sanitation, poor maternal and child care services. Absence of health education, lack of national preventive programmes, and poor health services are the factors responsible for the poor health conditions of tribals. Health care measures in Tripura include some myth and superstitions. Problems like unhygienic food supply, water contamination and poor food intake reflects on the health status of tribals. The following table shows the major health indicator of the State, 2013 vis-à-vis all India. According to the report of the Tripura Tribal Areas Autonomous District Council (TTAADC), requirements of the health care facilities in the area is not proportional to the increasing demand of the people due to the fact of population explosion.⁹

The following Table provides a comparative perspective on the health status Tripura and India.

Table 3.16: Health Indicators

Sl. No.	Category	All India	Tripura
1	Birth rate, 2013	21.6	13.7
2	Death rate, 2013	7.0	4.0
3	Natural growth rate, 2013	14.5	9.0
4	Infant Mortality Rate (IMR), 2013	42	26
5	Couple Protection Rate (CPR), NFHS-3	56.03	65.08
6	TFR (Total Fertility Rate), NFHS-3	2.5	1.7
7	Maternal Mortality Rate, SPP-2000	4.37	4
8	Sex ratio, Census-2011	940:1000	960:1000

Source: Census-2001 & 2011, RGI.

The tribal population has a much lower infant mortality rate (IMR) as compared to the scheduled caste, but moderately higher than the other population. Infant and child mortality is predominant among female children than the male and in the rural areas, the mortality rate is more than 80 per cent which is more than that of in the urban areas.

Table 3.17: Estimates of Infant Mortality and Under 5 Mortality for STs in in Tripura

Tripura/ India	Rural/ Urban	Infant Mortality			Under 5 Mortality		
		Male	Female	Persons	Male	Female	Persons
Tripura	Rural	68	73	70	95	105	100
	Urban	46	41	43	61	53	57
	Total	67	73	70	94	104	99
India	Rural	84	88	85	121	131	126
	Urban	58	64	61	79	90	84
	Total	82	86	84	118	128	123

Source: District Level Estimates of Child Mortality in India, Census of India.

3.5 Land Use Statistics

In Tripura, forest area is over 60 percent of its land use statistics and predominant, leaving only 27 percent land for agricultural cultivation. Moreover the large part of the land is up-land or *tilla* land, which causes high soil erosion in the State. Bamboo is available in the State abundantly and is traditionally been used for a variety of purpose by the tribal people's social life.

The following Table depicts the Land Use Statistics of the State for the year 2014-15.

Table 3.18: Land Use Statistics, 2014-15

Sl. No.	Items	Area in Ha
i	Geographical area	10,49,169
ii	Forest area	6,29,426
iii	Land not available for agriculture use	1,46,155
iv	Land under miscellaneous tree crops and groves not included in net area sown	11,213
v	Permanent pasture and other grazing land	1,130
vi	Culturable waste land	3,020
vii	Current fallow	1,150
viii	Fallow Land other than current fallow	1,715
ix	Net cropped area	2,55,360

x	Gross cropped area	4,83,488
xi	Cropping intensity (%)	189

Source: *Economic Review of Tripura, 2014-15.*

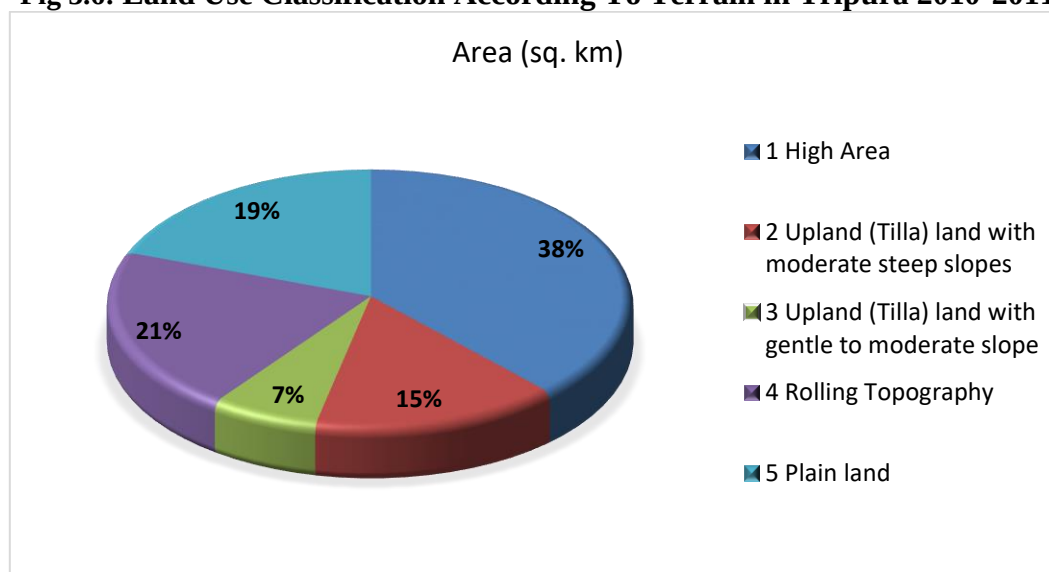
According to classification of terrain, the land of this State is divided into 5 major groups such as land in the high area, upland (*Tilla*) with moderate steep slopes, upland (*Tilla*) with gentle to moderate slope, rolling topography, plain land. The area and percentage of geographical area in each is as shown below:

Table 3.19: Land classification according to terrain in Tripura

Sl No.	Category	Area (sq. km)	% of geog. Area
1	High Area	4000	38%
2	Upland (<i>Tilla</i>) land with moderate steep slopes	1600	15%
3	Upland (<i>Tilla</i>) land with gentle to moderate slope	700	6.7%
4	Rolling Topography	2149	20.5%
5	Plain land	2042	19.8%
	Total Geographical Area	10491	100%

Source: *Agriculture Department, Govt. of Tripura.*

Fig 3.6: Land Use Classification According To Terrain in Tripura 2010-2011



Source: *Agriculture Department, Govt. of Tripura*

As per Agricultural Census, 2010-11, the operational holdings and area operated among the STs and SCs in Tripura is shown in Table 15.

Table 3.20: Agricultural Census, 2010-11:

Sl. No.	Operational holdings	Unit	2010-11
a	SC-operational holdings	in Hect	1,15,421
b	SC- area operated	in Hect	41,844
c	ST-operational holdings	in Hect	1,63,485
d	ST-area operated (in Hect)	in Hect	1,23,854
e	Total operational holdings	in Hect	5,78,479
f	Total area operated (in Hect)	in Hect	2,84,945

Source: Tripura at A Glance, 2015-16.

Land ownership in Tripura in general is of allotted, rayati (inherited), purchased, gifted, leased etc. The following table shows land allotted by Government of Tripura to the landless and homeless families in the year 2014-15.

Table 3.21: Land Allotment in Tripura, 2014-15

Sl No.	Land Allotment	Number
a	Land allotted to landless families	262
b	Land allotted to homeless families	1,696
c	Land allotted to both landless and homeless families	2,427
d	Area of land allotted to landless families	15.36
e	Area of land allotted to homeless families (acres)	118.74
f	Area of land allotted to both landless and homeless families (acres)	361.74

Source: Tripura at A Glance, 2015-16.

3.5.1 Forestry and Rubber

In Tripura, total area under forest is 6294.29 Sq. km. The following table shows the various types of unclassified, reserved and protected forest area in the state per sq.km (Table.16.). The total area under rubber plantation is 11305.2 ha and taping area of rubber is 3811 ha. The production of natural rubber in the year 2014-15 is 44740.17 Mt. There are about 1000 Joint Forest Management Committees (JFMCs and the membership of the FMCs is 100045. Membership of JFMCs in the afforestation area is 134706.87. Till 2014-14, 124,541 passbooks have been issued under SOTFD (Scheduled Tribes & other Traditional Forest Dwellers).

Table 3.22: Forestry and Rubber

Sl. No.	Particulars	Unit	2014-2015
1	Total Forest area	Sq. Km.	6294.29
2	Unclassified Government forest	Sq. Km.	2116.87
3	Reserve forest	Sq. Km.	3588.18
4	Proposed reserved forest	Sq. Km.	587.63
5	Protected forest	Sq. Km.	1.597
6	Development expenditure on forestry	Rs in Crore	2659.36
7	Revenue earned	Rs in Crore	984.77
8	Wildlife sanctuary	Nos.	4
9	National Park	Nos.	2
10	Plantation area of rubber	Ha	11305.2
11	Tapping area of rubber	Ha	3811
12	Production of rubber	MT	44740.17
13	Joint Forest Management Committees (JFMCs)	Nos	1000
14	Membership of JFMCs	Nos.	100045
15	Project area of JFMCs	Ha	260210.62
16	Afforestation area in JFMC	Ha	134706.87
17	Patta pass book issued under SOTFD(Scheduled Tribes & other Traditional Forest Dwellers)	Nos.	124541

Source: Tripura at A Glance, 2015-16.

3.6 Basic Amenities in the Tribal Areas in Tripura

Census of India through its enumeration provides information pertaining to the basic amenities such as housing conditions, sources of drinking water, sanitation facilities etc.

3.6.1 Safe Drinking Water & Sanitation Facility

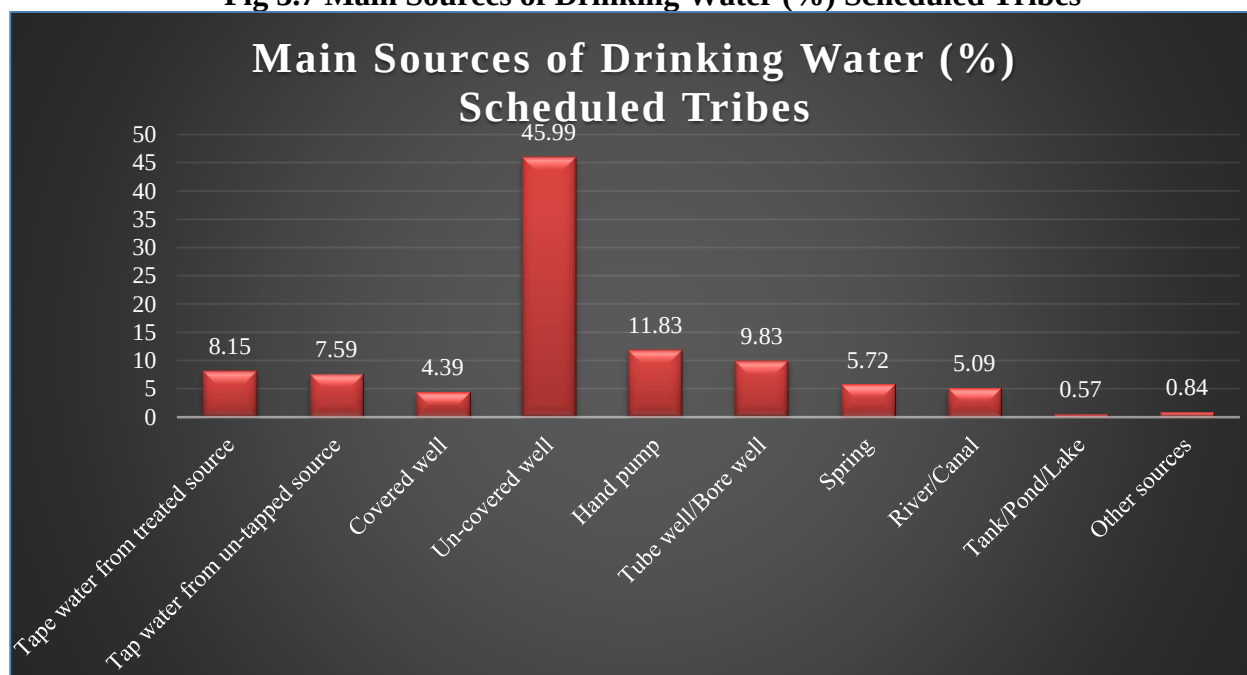
Table 20 shows that the major sources of drinking water among the tribal communities is from uncovered well (45.99%), whereas the percentage use of drinking water from other sources is less. The tap-water from treated sources, hand pump and tube-well/bore well and these sources were more hygienic as compared to uncovered well as the sources of drinking water.

Table 3.23: Main Sources of Drinking Water in Tripura

Social Groups	Main Sources of Drinking Water (%)									
	Tape water from treated source	Tap water from un-tapped source	Covered well	Un-covered well	Hand pump	Tube well/ Bore well	Spring	River/ Canal	Tank/ Pond/ Lake	Other sources
Scheduled Tribes	8.15	7.59	4.39	45.99	11.83	9.83	5.72	5.09	0.57	0.84

Source: Census of India, 2011.

Fig 3.7 Main Sources of Drinking Water (%) Scheduled Tribes



Source: Census of India, 2011.

From the table below it is clear that 63.70 percent ST households had toilet facility within their premises whereas the rest do not have latrine within their premises.

Table 3.24: Availability of Toilet Facility in Tripura

Scheduled Tribes	Availability of Latrine Facility in Percentage		
	Number of households having latrine facility within the premises	Number of latrine within premises	
		Public latrine	Open
	63.70	5.99	30.30

Source: Census of India, 2011.

3.6.2 Housing

The houses constructed under the Indira Awaas Yojana for the Scheduled Tribes in Tripura during 2006-07 to 2010-11 are given below.

Table 3.25: Number of IAY Houses Completed and Sanctioned in Tripura

2006-07	2007-08	2008-09	2009-10		2010-11	
IAY Houses Completed	IAY Houses Completed	IAY Houses Sanctioned	IAY Houses Sanctioned	IAY Houses Completed	IAY Houses Sanctioned	IAY Houses Completed
4485	5810	8205	7,123	4,128	11267	5986

Source: Department of Rural Development (2010), Bharat Nirman-Rural Housing, Government of India, MoRD, cited in Choudhury and Ghosh (2016:77).

It is evident from the Table 21 that so far as implementation of MGNREGS in the ST households in Tripura is concerned, the state stands far above the national average. 88 percent of ST households in the state received job cards, while the all India average is only 54 percent. Almost all the ST households in having job cards got wage employment under MGNREGS. In Tripura, 87.6 percent of

ST households got wage employment under MGNREGS, while at India level the average is 39.8 percent.¹⁰

Table 3. 26: MGNREGS and Scheduled Tribes in Tripura

Tripura/ India	No. of HHs having MGNREGS Job Card per 1000 HHs	Per 1000 distribution of ST HHs by status of getting MGNREGS work								Average number of days worked in MGNREGS by ST HHs
		Less than 20 Days	20 to 50 Days	50 to 100 Days	100 Days or more	All	Sought but did not get MGNREGS work	Did not seek MGNRE GS work	All incl. not reported	
Tripura	884	9	227	640	0	876	39	80	1000	66
India	541	143	129	123	3	398	197	363	1000	42

Source: NSS Report No. 543; NSS 66th Round Report (2009-10): Employment and unemployment situation among social Groups in India, cited in Choudhury and Ghosh (2016:78).

3.6.3 Poverty and Unemployment in Tripura

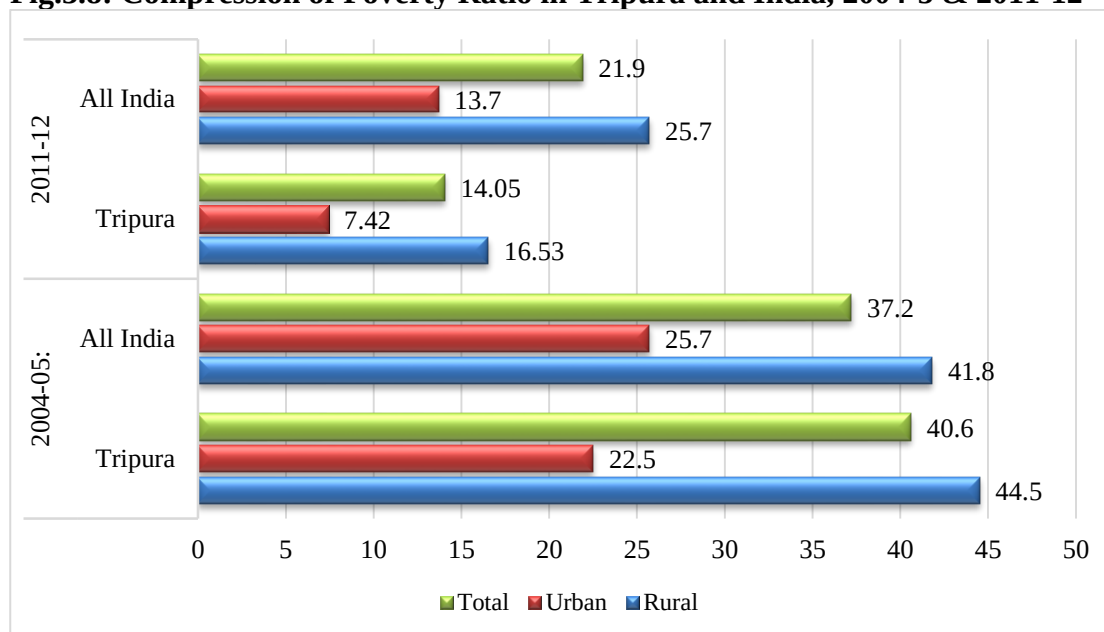
As per the estimates of the Tendulkar Committee, the final set of new poverty ratio for Tripura in 2004-05 comes about 44.5 percent for rural areas and 22.55 percent for urban areas. The all India similar poverty ratio of 41.8 percent for rural areas and 25.7 percent for urban areas, respectively. The total poverty ratio combining the rural and urban stood at 40.6 percent for Tripura against 37.2 percent for all India in 2004-05 as per the new expert group estimates. The next large scale survey of house hold consumer expenditure was conducted in 2009-10. Following the Tendulkar Committee methodology, Planning Commission made estimates of poverty for 2009-10 which were released through a Press Note on 19th March 2012. The following table shows the poverty ratio by Tendulkar Methodology using Mixed Reference Period (MRP) for 2004-05 and 2011-12 as released by the Planning Commission.

Table 3. 27 (a): Poverty Ratio

	Tripura/India	Rural	Urban	Total
2004-05:	Tripura	44.50	22.50	40.60
	All India	41.80	25.70	37.20
2011-12	Tripura	16.53	7.42	14.05
	All India	25.70	13.70	21.90

Sources: Census of India, 2011

Fig.3.8: Compression of Poverty Ratio in Tripura and India, 2004-5 & 2011-12



Sources: Census of India, 2011

3.6.4 Unemployment in Tripura

According to the latest annual survey on employment by Labour Bureau, Tripura had the highest unemployment rate of 19.7 per cent followed by Sikkim (18.1%), Lakshadweep (16.1%), A&N Islands (12.7%) and Kerala (12.5%). In contrast, Daman& Diu had the lowest unemployment rate of 0.3 per cent followed by Gujarat (0.9%), Karnataka (1.5%), Chhattisgarh (1.9%) and Maharashtra (2.1%).

3.6.5 Employment generated Under Skill Initiatives

The Directorate of Skill Development was set up under the Department of Industries and Commerce, Government of Tripura, to bring more focus and coordination to the skill development initiatives in the State. The following table shows the departmental performance under skill initiatives in Tripura in the financial year 2015-16.

Table 3.27 (b): Employment Generated under Skill Initiatives in Tripura

No. of persons trained	37,068
No. of persons Certified	13,842
No. of persons employed	1,355
No. of persons Self Employed	22,732

Source: Directorate of Skill Development, Department of Industries and Commerce, Government of Tripura.

Availability of assets by the households like radio/transistor, television, computer, mobile, scooter/moped etc. based on Census-2011 is presented in the following Table.

Table 3.28: Households by possession of assets

Districts	Total	Number		Percentage		
		Rural	Urban	Total	Rural	Urban
1	2	3	4	5	6	7
Total number of households	8,42,781	6,07,779	2,35,002	100.0	100.0	100.0
Radio/Transistor	1,07,995	80,746	27,249	12.8	13.3	11.6
Television	3,77,988	2,05,683	1,72,305	44.9	33.8	73.3
Computer/Laptop with internet	8,612	2,489	6,123	1.0	0.4	2.6
Computer/Laptop with internet	53,344	1,989	21,355	6.3	5.3	9.1
Landline only	4,05,115	2,33,957	1,71,158	48.1	38.5	72.8
Mobile only	3,60,143	2,14,022	1,46,121	42.7	35.2	62.2
Both	27,481	9,956	17,525	3.3	1.6	7.5
Bi-cycle	3,31,560	2,23,872	1,07,688	39.3	36.8	45.8
Scooter/Motorcycle/Moped	69,463	28,451	41,012	8.2	4.7	17.5
Car/Jeep/Van	18,443	7,839	10,604	2.2	1.3	4.5
None of the specified assets	2,34,638	2,09,711	24,927	27.8	34.5	10.6

Source: Census-2011, RGI.

3.7 District Profiles

The profiles of newly created eight districts of Tripura in the parameters of population, male and female literacy rate are shown in the following table 26.

Table 3.29: District-wise Population based on Census-2011

Sl. No.	Districts	Total Population	Male	Female	Overall literacy rate (%)	Male Literacy rate (%)	Female literacy rate (%)	Female per thousand males
1	West Tripura	9,18,200	4,66,152	4,52,048	91.07	94.04	88.01	970
2	Sepahijala	4,83,687	2,47,829	2,35,858	84.78	89.80	79.49	952
3	Khowai	3,27,564	1,67,401	1,60,163	87.78	92.17	83.17	957
4	South Tripura	4,30,751	2,20,162	2,10,589	84.68	89.96	79.16	957
5	Gomati	4,41,538	2,25,428	2,16,110	84.50	89.94	78.90	959
6	North Tripura	4,17,441	2,12,650	2,04,791	87.90	91.27	84.39	963
7	Unakoti	2,76,506	1,40,210	1,36,296	86.91	90.92	82.79	972
8	Dhalai	3,78,230	1,94,544	1,83,686	85.72	91.31	79.79	944

Source: Tripura at a Glance 2015-16.

Socio-economic profiles of the study districts out of eight districts of Tripura such as: West Tripura, Sepahilala, South Tripura and Gomati district in the parameters of population in general and SC and ST population, literacy rate(including male and female literacy) and child population to the total population is shown in Table 27.

Table 3.30: Socio-Demographic Profile of the Study Districts

Districts	Total Population	Male	Female	ST	SC	Literacy Rate (%)	Male literacy (%)	Female Literacy (%)	Child Population (0-6 Year)
West Tripura	9,18,200	4,66,152	4,52,048	1,76,596	1,92,475	91.07	94.04	88.01	93,078
Sepahijala District	4,83,687	2,47,829	2,35,858	1,19,401	82,558	84.78	89.80	79.49	59,782
South District	4,30,751	2,20,162	2,10,589	1,52,691	65,737	84.68	89.96	79.16	55,243
Gomati District	4,41,538	2,25,428	2,16,110	1,88,554	74,430	84.53	89.94	78.90	56,037

Source: Census, 2011.

The educational infrastructure in the study districts of Tripura including the number of primary, middle schools, high schools and general degree colleges are shown in Table 3.28.

Table 3.31: Educational Infrastructure in the Study Districts

Districts	Number of Primary Schools	Number of Middle Schools	Number of High Schools	Number of H.S.(+2) Schools	Number of General Degree Colleges
West Tripura	335	153	98	103	6
Sepahijala District	327	151	94	53	2
South District	349	158	101	55	3
Gomati District	309	177	74	41	2

Source: Census 2011.

Fig.3.9 Educational Infrastructure in the Study Districts

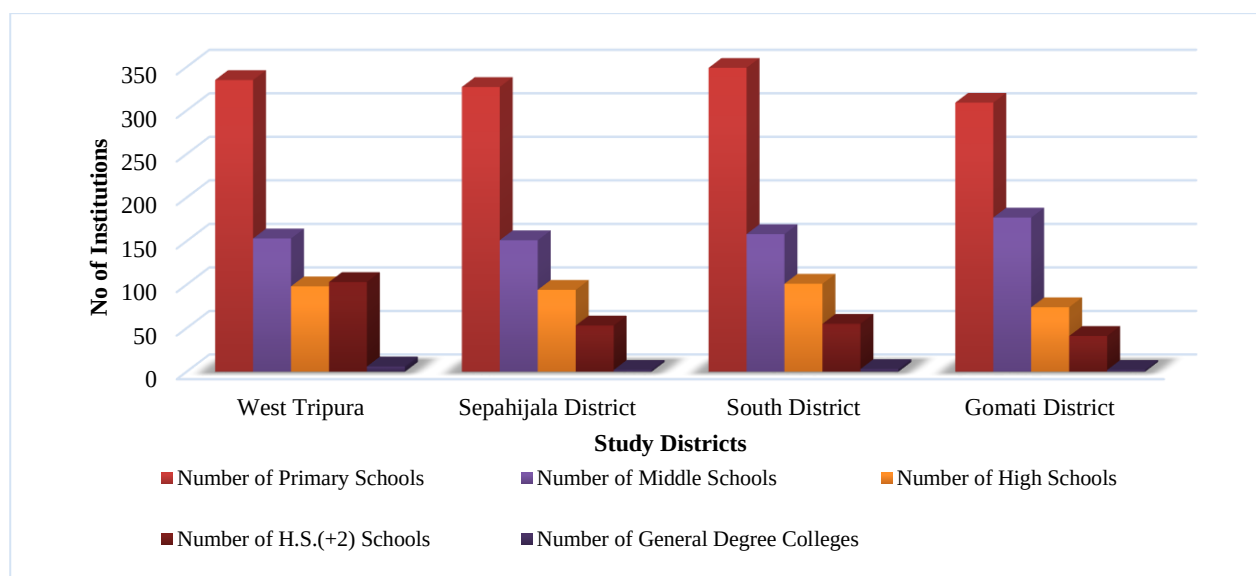
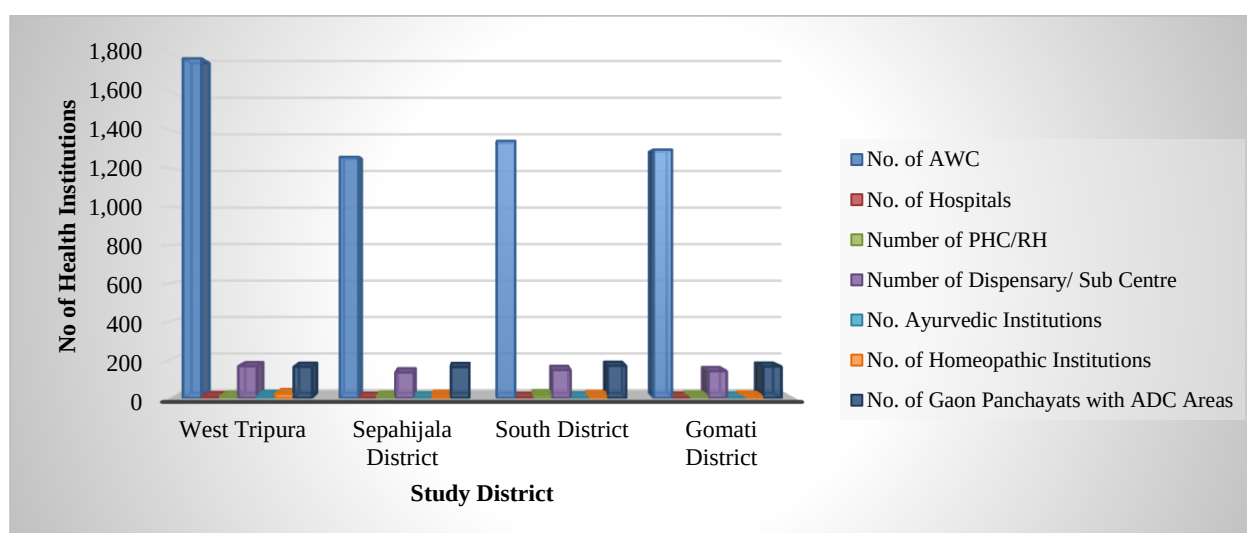


Table 3.32: Health Infrastructure in the Study Districts

Districts	No. of AWC	No. of Hospitals	Number of PHC/RH	Number of Dispensary/ Sub Centre	No. Ayurvedic Institutions	No. of Homeopathic Institutions	No. of Gaon Panchayats with ADC Areas
West Tripura	1,771	6	9	167	13	23	164
Sepahijala District	1,259	2	9	134	5	13	163
South District	1,342	2	16	147	5	12	169
Gomati District	1,297	3	10	141	4	10	165

Source: Census 2011.

Fig. 3.10: Health Infrastructure in the Study Districts of Tripura

Source: Census 2011

The above table shows the health infrastructure of the study district in the parameters of number of Angan Wadi(AWC) Centres, number of hospitals, dispensaries, Ayurvedic institutions, Graon panchayats with ADC areas.

The next section critically analyses the quality of governance and issues in the implementation of the *Jhumia*(shifting cultivators) rehabilitation and poverty alleviation programmes in the state of Tripura.

3.8 Jhumia Rehabilitation Programmes in Tripura

Problems relating to shifting cultivation through slash and burn are not new to Tripura. As early as 1876, W.W. Hunter¹¹ in his book ‘Statistical Account of the Hill Tipperah’ had remarked that the ‘regression of forests had already started in hills because of shifting cultivation practiced by almost the whole population numbering less than 50,000 who were all tribals’. Even successive Maharajas of Tripura were genuinely concerned that the practice be contained or that the tribals should be drawn to settled agriculture in place of jhum.

Tripura has a long history of jhum control and jhumia rehabilitation programmes¹² (Dev Varman, S.B.K. 1971). The first plan was drawn up in 1953-54 in which each jhumia family was allotted 5

acres of arable land and a grant of Rs. 500/- for land development and purchase of essentials to support settled farming. From this period up to 1955-56, the jhumias were settled sporadically. From 1956-57 onwards, the approach of resettlement or rehabilitation was on compact colony so that other basic amenities can be provided. Tripura has implemented various schemes and programmes for rehabilitation of jhumias and jhum land, involving as many as eight departments or agencies of the government.¹³ The data computed from various sources indicating the achievement of the various departments in achieving the targets in jhum control programmes are shown in (Table. 3.30.)

Table 3.33 A: Jhum Control Programmes achievements-Department of Tribal Welfare Department, Govt. of Tripura

Departments/Agencies & Schemes/Activities	Period/Year	Outlay/Amount spent(in lakhs)	No of Jhumia families benefited
Tribal Welfare Department			
(a) Rehabilitation of landless jhumias under settlement programme			
• Rs. 500 per family scheme	1955-70	1058.15	21,163
• Rs. 1910 per family scheme	1970-77	1357.82	7,109
• Rs. 6510 per family scheme	1975-85	5724.89	8,794
• Rs. 8000 per family scheme	1985-88	1003.20	1,254
• Rs. 25,000 per family scheme	1988-92		4,268
• Rs. 30,000 per family scheme	1992-97		4,079
• Rs. 53,000 per family scheme	1997-2000		904
(b) Jhumia settlement scheme based on:			
• Rubber Plantation	1999-04	368.10	1472
• Tea Plantation	1999-04	203.80	514
• Coffee Plantation	1999-04	36.00	120
• Horticulture Plantation	1999-04	270.10	900

Source: Vincent T. Darlong (2012) *Shifting Paradigm on Shifting Cultivation: Revisiting Challenges and Options for Transforming Lives, Landscapes and Livelihoods in Tripura.*

Table 3.33 B: Jhum Control Programmes achievements- Forest Department, Govt. of Tripura

Departments/Agencies & Schemes/Activities	Period/Year	No of Jhumia families benefited
Forest Department		
Rehabilitation of Shifting cultivators through:		
• Soil & Water Conservation Schemes	1974-83	641
• NEC assisted schemes	1975-79	400
• Rubber-based rehabilitation schemes	1983-85	1185

Table 3.33 C: Jhum Control Programmes achievements: Agriculture & Horticulture Department, Govt. of Tripura

Departments/Agencies & Schemes/Activities	Achievements			
	Period/Year	Outlay/Amount spent(in lakhs)	Area covered)in ha)	No of Jhumia families benefited
Agriculture Department				
Integrated scheme for improvement of production and productivity of jhum crops(supply of seeds, supply of fertilizer, horticultural plantation in homestead, training of jhumias)	1998-04	184.99	-	6379
Horticulture Department				
Watershed Development Project in Shifting Cultivation Areas				
• 8 th Five year Plan	1992-97	360.00	3,665	1994
• 9 th Five year Plan	1997-02	649.71	10,757	3000
• 10 th Five Year Plan	2002-03	247.40	2,474	3635

Source: Vincent T. Darlong (2012) *Shifting Paradigm on Shifting Cultivation: Revisiting Challenges and Options for Transforming Lives, Landscapes and Livelihoods in Tripura*, p.23.

Table 3.33 D: Jhum Control Programmes achievements- TFDPC & TRPC, Tripura

Departments/Agencies & Schemes/Activities	Achievements			
	Period/Year	Outlay/Amount spent(in lakhs)	Area covered)in ha)	No of Jhumia families benefited
Tripura Forest Development Plantation Corporation(TFDPC)				
Jhumia rehabilitation through rubber plantation(Department of Tribal Welfare)	2001-03	14.96	-	60
Tripura Rehabilitation Plantation Corporation(TRPC)				
Socio-economic upliftment of tribal jhumias through rubber plantation	-	-	5095.71	3977

Table 3.33 E: Jhum Control Programmes achievements- TRP & PGP and Autonomous District Council, Tripura

Departments/Agencies & Schemes/Activities	Achievements			
	Period/Year	Outlay/Amount spent(in lakhs)	Area covered)in ha)	No of Jhumia families benefited
Tribal Rehabilitation in Plantation & Primitive Group Programme(TRP& PGP)				
(a) Economic development through				
• Teak plantation	1986-02	-	14,076	11,530
• Bamboo plantation	2004-05		60	
• Cashew nut plantation	1986-98		7,850	
(b) Intensive rehabilitation of primitive tribes (to wean away from jhum)	2004-05	116.30	-	95
Autonomous District Council				
(a) Assistance for upland(jhum) farming(land preparation, supply of jhum paddy seeds, showing & weeding)	2000-04	497.80	-	*84,000
(b) (b) Integrated tribal jhumia rehabilitation through rubber plantation	1998-99	-	1500	1500

*(It is most likely that many families enjoyed the assistance more than once over the successive four years period under report).

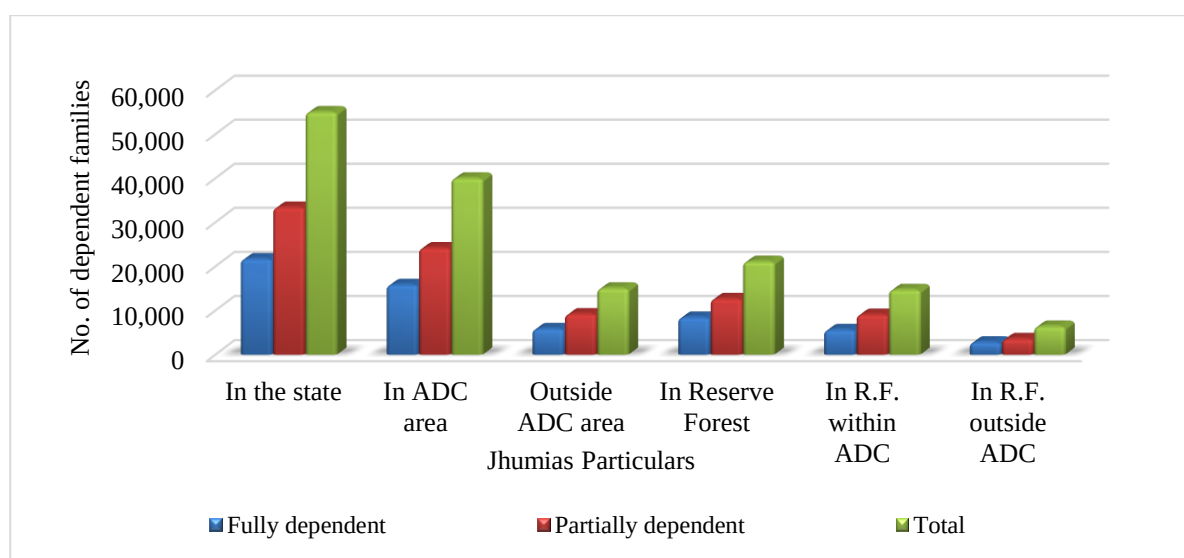
Almost all the hilly areas of the state fall within the Tripura Tribal Areas Autonomous District Council (TTAADC), which comprises 7132.56 sq km and form about 67.98% of the state. There are 40,000 jhumia families within the ADC areas, of which 21,099 families reside within the Reserve Forest areas (Table 3.31).

Table 3.34: Jhumia Statistics in the ADC, Tripura

Particulars	No. of families dependent on Jhum		
	Fully dependent	Partially dependent	Total
Jhumias in the state	21,677	33,372	55,049
Jhumias in ADC area	15,830	24,171	40,001
Jhumias outside ADC area	5,847	9,201	15,048
Jhumias in Reserve Forest(R.F.)	8,440	12,659	21,099
Jhumias in R.F. within ADC	5,622	9,082	14,704
Jhumias in R.F. outside ADC	2,818	3,577	6,395

Source: Tribal Welfare Department, Govt. of Tripura.

Fig. 3.11: Families Dependent on Jhum in Tripura.



Source: Tribal Welfare Department, Govt. of Tripura

Studies conducted by the Department of Agriculture, Government of Tripura reveals that the number of jhumias and the area under jhum in the State as 2,09,200 and 1,08,842 ha respectively. In terms of the total area affected by jhum, both Dhalai and North District were higher than the West and South Districts (See Table 3.28).

Table 3.35: Jhumia Statistics of Tripura

Districts	Total Jhumia Population	Total Jhumia Households	Jhum area sown in 2004-05	Total area affected by Jhum(in ha)
West	38,723	2,397	2,397	15,120
South	65,485	12,713	4,448	28,080
Dhalai	63,568	11,824	5,008	32,400
North	41,424	7,895	5,272	33,242
Total	209,200	40,001	17,125	1,08,842

Source: Department of Agriculture, Government of Tripura.

Direct and indirect economic loss due to jhum cultivation has also been enumerated by the scholars in the state of Tripura (Deb Barma, C.M., 2004) taking average land cleared by a jhumia family per year to be 1 ha and considering that most forest land cleared for jhum would be dominated by bamboo (See Table 3.29).

Table 36: Economic loss due to Jhum Cultivation

Sl No.	Parameters	Estimated loss
1	Loss of Rs. 10,000-15,000 nos. of bamboo(in case of muli, <i>Malocana baccifera</i>) from 1 ha of area cleared and burnt for jhum per year by a jhumia family(also in the subsequent 2 years or more, the jhumia cannot harvest any bamboo from such plot)	10,000
2	Value of bamboo shoots, wild vegetables, medicinal plants used by the tribals(per ha/year)	6,000
3	Loss of fodder, edible fruits/suckers from jhum area(per ha./year)	1,500
4	Loss of saplings, which act as natural colonizers	Unaccounted
5	Loss of ecological services rendered by birds and small mammals for seed dispersal and pollination	Unaccounted
	Total	17,500

Source: Vincent T. Darlong (2012) in `N. Devvarma, (ed.) *Shifting Cultivation in Tripura*, p.23.

Since a large part of the State is under forest cover, the problem of tribal livelihoods in forest areas is a challenging one in respect of both socio-economic and ecological development. While existing tribal organizations have demanded that people get land and forest rights, the Government itself has been attempting to balance the needs of tribal livelihoods with forest conservation¹⁴ and has also come up with a number of innovative ideas to reduce the practice of Jhum, and promote alternate livelihoods of the most successful among these is the plantation of rubber as an alternative source of income for tribals.¹⁵ However, most of these alternatives are criticized as being assimilationist in nature and a process of submerging tribal culture in the greater national culture.¹⁶ Measures to contain *jhum* cultivation have created economic uncertainties for the ethnic minorities, and settled cultivation has forced them to “assimilate into the national economy”. The nature and dimensions of change in the lives and livelihoods and also status of tribal women stand marginalized in the growing modern economy of the state. Socio-economic changes during the last few decades have introduced new gender and class issues into the purportedly egalitarian society of the tribals. Though urban tribal women have lost some of their traditional rights, the gains they have made in the spheres of education, employment or personal mobility are significant compared to rural tribal women.

3.8.1 Poverty alleviation programmes

The anti-poverty programmes have been strengthened in order to generate additional employment, create productive assets, impart technical and entrepreneurial skills and raise income level of the poor. The Government of Tripura constituted the three-tier Panchayat Raj system in the State and provided the Tripura Panchayat Act, 1993 for effective implementation of the poverty alleviation programmes and generation of employment opportunities as well as the basic services programmes.¹⁷ A number of poverty alleviation and employment generation programmes including the Mahatma Gandhi Rural Employment Guarantee Act (MGREGA) are being implemented by the State Government. The Union Government has taken the wage employment programmes, the outreach of these programmes increased especially during 1989 to 2007. These self-targeting wage employment programmes implemented by the State Government with central assistance with the objective to provide enhanced livelihood security, especially of those dependent on casual manual labour.

The economy of tribal people of the State is centered on agriculture which in tribal areas is mostly characterized by rain-fed cultivation and shifting cultivation. The tribal farmers constitute about 30 percent of the farming community and control 37 percent of the agriculture holdings. The productivity levels are much below the level attained by their counterpart non-tribal farmers. The benchmark survey conducted in 1997 revealed that the Jhumia Tribal families account for approximately 40

percent of total tribal families in the State. Apart from practice of shifting cultivation, the main problem related to agriculture is lack of cultivable land and poor irrigation facilities.¹⁸

3.9 Major Schemes/Programmes for Tribal Welfare

3.9.1 Educational Programme

In order to improve educational scenario among Scheduled Tribes people various schemes viz. boarding house stipend, pre-matric scholarship, post-matric scholarship, additive to post-matric scholarship, supply of free text books, coaching in core subjects, coaching for madhyamik dropout students, Ekalavya Model Residential Schools, Ashram Schools and Residential Schools run and managed by the Tripura Tribal Welfare Residential Educational Institutions Society (TTWREIS), merit award and up-gradation of merit, sponsoring students for various job oriented courses i.e. nursing, physiotherapy, pharmacy, air hostess courses etc., vocational training and training for skill development, pre-induction training for recruitment to para military/army etc. are being successfully implemented in the State.

3.9.2 Economic Development

3.9.2.1 Rubber Plantation:

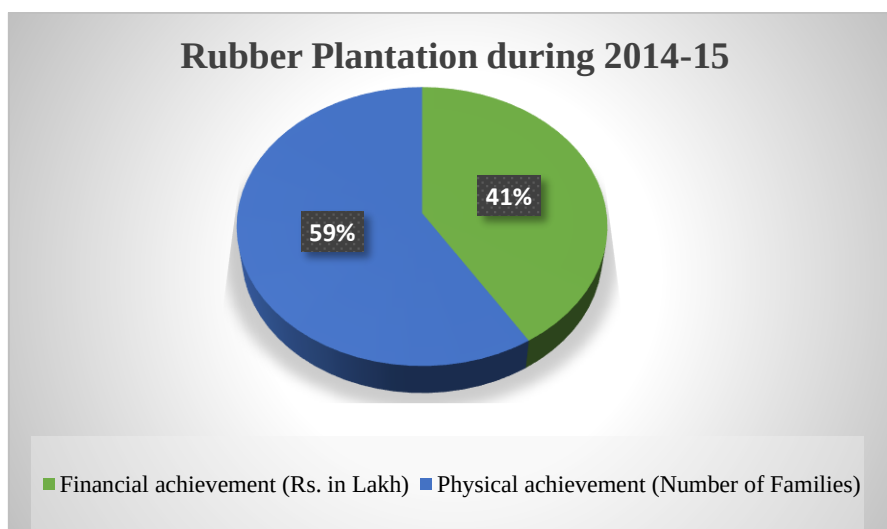
The object of the scheme is to assist the tribal people for a sustainable economic development through rubber plantation. The project is implemented over a period of seven years. The unit cost is 2,30,158/- per hectare. The grant amount of T.W. Department is Rs,1,95,158/- per family for plantation of 1.00 hectare of Rubber. Cash subsidy including planting grant and fencing subsidy from the Rubber Board subsidy is Rs. 35,000/- to be paid over span of 7 years. The beneficiaries are selected by the "Block Advisory Committee" from the fully/ partly ST Jhumia families. An account of the families supported during 2014-15 the scheme through rubber developing Agencies viz. Tripura Rehabilitation Plantation Corporation Ltd. (TRPC), TTAADC and District Administration through Block Development Officer and Sub-Divisional Magistrate are shown in the following table.

Table 3.37: Rubber Plantation during 2014-15

Year	Financial achievement (Rs. in Lakh)	Physical achievement (Number of Families)
2014-15	541.99	777

Source: Economic Review of Tripura, 2014-15.

Fig. 3.12 Rubber Plantation during 2014-15 in Tripura



3.9.2.2 Tea plantation:

Under the scheme, landless Scheduled Tribe families residing in interior areas are provided financial support. The project is implemented over a period of 5 (five) years. The unit cost is Rs.1,73,355/- per hectare. The grant amount of Tribal Welfare Department is Rs.1,06,180/- per family for plantation of 1.00 hectare of tea. Rs.66,975/- is provided by the Tea Board as subsidy. The beneficiaries are selected by the "Block Advisory Committee" from the poor ST families. The scheme is implemented with 100% grants from GOI.

3.9.2.3 Horticulture:

Landless Scheduled Tribe families residing in interior areas are eligible to get the benefit of the scheme. Rs.68,675/- as grant is provided to each selected family in installments. The grant money is utilized over the period of 5 (five) years. The beneficiaries are selected by the "Block Advisory Committee" from the poor ST families. The scheme is implemented with 100% grants from GOI.

3.9.2.4 Nucleus Budget (State Plan)

The object of the scheme is to provide financial assistance to the poor tribals for medical treatment and purchase of medicine. Financial assistance is also provided to take up need-based income generating schemes. Financial assistance upto Rs.2,500/- for treatment inside the State and Rs.8,000/- for treatment outside the State is provided under this scheme.

3.9.2.5 Rashtriya Swasthya Bima Yojana

The Rashtriya Swasthya Bima Yojana, a scheme instituted by the Government of India for the provision of health insurance services by an Insurer to the RSBY Beneficiary Family Units within defined districts of a State. The scheme is intended to benefit Below Poverty Line (BPL) population and all other 11 identified categories of beneficiaries permissible as per RSBY Guidelines in eight districts in Tripura (See Table 35). For effective operation of the scheme, partnership has been envisaged between the Insurance Company, public and the private sector hospitals and the State agencies. State Government/Nodal Agency has been assisting the Insurance Company in networking with the Government/Private hospitals, fixing of treatment protocol and costs, treatment authorization, so that the cost of administering the scheme is kept at the lowest, while making full use of the resources available in the Government/Private health systems. Public hospitals, including ESI hospitals and such private hospitals fulfilling minimum qualifications in terms of availability of inpatient medical beds, laboratory, equipments, operation theatres, smart card reader etc. and a track record in the treatment of the diseases has been enlisted for providing treatment to the identified families under the scheme.²

Table 3.38: Implementation of RSBY in Tripura

District	BPL Families	Other category of families	No. of Block	No. of CHCs/PHCs	No. of District Hospitals	No. of other hospitals	No. of Private Hospitals
Dhalai	25475	51750	6	3	1	3	
North Tripura	25886	45807	6	6		2	
Unakoti	18044	35538	3	1	1		
South Tripura	33513	54297	6	8		2	
Gomati	32008	56512	7	5	1	1	

² Available at <http://health.tripura.gov.in/>

Khowai	25868	56568	6	4		1	
Sepahijala	33744	62140	5	7		1	
West Tripura	55537	77777	6	6		3	1
Total	250075	430389	45	40	3	13	1

Source: Department of Health and Family Welfare, Government of Tripura, February, 2016, available at: <http://health.tripura.gov.in/>

3.9.2.6 Tribal Sub-Plan (TSP)

The Tribal Sub-plan (TSP) was implemented as a strategy for accelerated development of the Scheduled Tribes. It is a mechanism under which each development department of the State Government is required to quantify and set apart an amount of their plan budget provision for implementation of schemes exclusively for the Welfare of Scheduled Tribes in Tripura. The fund so quantified shall not be less than the percentage of S.T. population in the State. Accordingly, each development department has to quantify at least 31 percent of their plan fund towards Tribal Sub-plan.

3.9.2.7 Twenty Five Point Programme (TPP)

The Twenty Point Programme (TPP)-2006 is a package of Social Sector Schemes and Programmes. It consists of 20 Point and 66 items being administered by various Ministries of Government of India and implemented by State/UT Governments. The basic objectives of the programme are poverty eradication and to improve the quality of life of the poor and under privileged population of the country. The programme covers various socio-economic aspects like poverty, employment, education, housing, health, agriculture, afforestation and environment protection, drinking water, energy to rural areas and welfare of weaker section of the society etc. The programme has been implemented in Tripura in assisting the ST families for their development.

3.9.2.8 Backward Region Grant Fund (BRGF)

The BRGF scheme aims to fill-up the critical gaps in development and addressee issues of the regional imbalances. The project envisages creation of rural infrastructure including rural communication etc. An allocation of Rs.12.63 crore has been released during the financial year 2014-15 and the said amount has been fully utilized for creation of rural infrastructure in Dhalai district of Tripura.¹⁹ Implementation of Backward Region Grant Fund (BRGF) has been toned up and various projects to meet the critical gap in rural infrastructure in the district related roads, power, education, water supply, health etc. have been taken up, in Dhalai District.

3.9.3 Tripura Tribal Areas Autonomous District Council

With a view to fulfill the aspirations of the tribals to have autonomy to administer them, the Tripura Tribal Areas Autonomous District Council (TTAADC) was set up in January, 1982 under the Seventh Schedule of the Constitution of India. Later, the council was brought under the provisions of the Sixth Schedule of Indian Constitution to entrust more responsibilities and power from 1st April 1985. The activities of the Council range from primary education to maintenance of roads and bridges etc. The rehabilitation of the landless tribal, creation of employment opportunities, Agricultural Development, Soil Conservation, Flood Control, Supply of drinking water, education, transport and communication, setting up of village industries are some of the important tasks under taken by the TTAADC. Special drive to bring high lands under horticultural corps, establishment of small farms to supply inputs of Agriculture, Horticulture, Pisciculture, Animal Husbandry to the tribal families, extension of medical facilities in interior areas through mobile unit, supply of safe drinking water will also be geared up and arranged for the Scheduled tribes (ST) villages.

3.9.4 Tripura Scheduled Tribe Development Corporation Ltd.

The Tripura Scheduled Tribes Cooperative Development Corporation Ltd. was established under the Cooperative Societies Act, 1974. The Corporation was registered in the year 1979. The main objectives of the Tripura Scheduled Tribes Cooperative Development Corporation Ltd. is for development of economic condition of the poor unemployed tribal people of the state by extending financial help through providing loan under various scheme with easy terms and condition at a low rate of interest. Besides, soft loan is also provided to the ST students for higher studies.

3.9.5 Adivasi Shiksha Rrinn Yojana (ASRY)

In the financial year 2012-13, Tripura Scheduled Tribes Cooperative Development Corporation Ltd launched a scheme, named Adivasi Shiksha Rrinn Yojana (ASRY) under National Scheduled Tribes Finance and Development Corporation (NSTFDC). A scheduled tribe candidate whose annual income is not more than Rs. 81,000/- in rural areas and Rs. 1,04,000/- in urban areas is provided maximum Rs. 5.00/- lakh as loan @ Rs. 6% interest per year under the above scheme. For availing loan, an eligible ST candidates has to appeal to the Tripura Scheduled Tribes Cooperative Development Corporation Ltd. In the financial year, total amount of Rs.129.36 lakh had been given as loan to 164 ST students for pursuing higher education under this scheme.

Summary

Analysis of the economy and society in Tripura reflects that the State is characterized by geographical isolation, poor infrastructure facilities, communication bottlenecks, inadequate exploitation of natural resources (natural gas, rubber, forest etc.), higher incidence of poverty, low capital formation, backward in industrialization and high level of un-employment. According to the annual survey on employment conducted by Labour Bureau, Tripura had the highest unemployment rate of 19.7 per cent in 2015-16. The economy of Tripura had suffered from disturbed conditions of extremism and insurgency over the last two decades, which directly hindered the human safety as well as economic development process in the recent past. However, the State has come out from that disturbed phase arising out of insurgency since the fiscal year of 2005-06. The state administration has adopted a multi-pronged approach that aggressively promoted developmental work to counter the psychological hold of militants. These initiatives have included infrastructure development, wage employment programme including MGNREGA, the provision of basic services for people in affected areas, and opportunities for surrendered militants to return to the mainstream. The counter-insurgency and governance in Tripura is an exemplary model of the holistic response that other states can replicate in policy implementation. A close look into the performance of the state in the human development indicators reflects that Tripura scores well above the national standard in terms of literacy, birth rate, death rate, natural growth rate and infant mortality rate. Despite poor financial resources of its own, the State could ensure providing its share of proportionate contribution against almost all the Centrally Sponsored Schemes. However, more sustainable economic policies are essential for improvement in the standard of living as well as empowerment of the tribals in the state. Further, the financial support by the government for development of entrepreneurship and rural market linkages are the prerequisite to reduce poverty and unemployment. Also, the settlement of Jhumia families through rubber plantation need to be implemented in a manner that it may augment the livelihood of these jhumia families. In this regard, the active participation of these families in JFMCs and SHGs may be utilized for their gainful activities.

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Chapter IV

Stakeholders Participation Towards Sustainable Rubber Cultivation in Tripura

Almost on the lines of the proceeding chapter, this chapter is folded into three sections. The concepts of sustainability and sustainable rubber cultivation is placed in the first section. The second section contains the basic concepts of stakeholders, origins, typology and the concepts developed by several authors within an interdisciplinary perspective. The role of the stakeholders in sustainable rubber cultivation in the state of Tripura is analyzed in the third section.

4.1 Sustainable Rubber Cultivation: Introduction

The Rubber Tree (*Hevea brasiliensis*) is a species of natural rubber is native to rainforests in the Amazon region of South America. The first taxonomic identification and description was done by the French botanist Jean Baptiste Fusée Aublet in 1775, whose contribution led to make rubber well known in Europe. It had already been identified in proceeding years in what was called the “Rubber boom” in South America.¹ Rubber cultivation requires deep soils, and most of the trees are grown in relatively high temperatures with continuous moisture throughout the year.² Undoubtedly, Rubber is cultivated around the world but only where climatic conditions are feasible for it. However, more and more rubber is becoming adapted to moderate weather due to research and genetic improvement in cultivation techniques. The goal is to expand its production to different weather and altitude conditions. It is also called the “Para Rubber” of international commerce.³ Today, commercially produced natural rubber can also be found throughout Southeast Asia and Western Africa.

Rubber cultivation in India has been traditionally confined to the hinterlands of the southwest coast, mainly in Kanyakumari district of Tamil Nadu and Kerala. Rubber is now being grown in other areas called as non-traditional areas by Rubber Board of India. Only in so called traditional area it was introduced much earlier. Non-traditional areas are mainly hinterlands of coastal Karnataka, Goa, Konkan region of Maharashtra, hinterlands of coastal Andhra Pradesh and Odisha, the North-Eastern states mainly Tripura, Andaman and Nicobar Islands.

4.1.2 Concepts of Sustainability

Sustainability is defined in many ways in the whole gamut of social sciences disciplines among others including economics, ecology, sociology, engineering and physics. According to the ecological view, sustainability is “the degree to which a process is able to be maintained while avoiding the long term depletion of the natural resources”.⁴ In the context of environment and development, the term sustainability was formally used for the first time by the Brundtland Commission in the United Nations in 1987. Under this premise, the following meaning was used: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”⁵ In order to understand sustainability in its broader sense, some authors have analyzed the different contexts in which the term has been used. In Lelé’s⁶ (1991) review of renewable resources like forests or fisheries, for instance, sustainability is delimited as “the existence of the ecological conditions to support human life at a specified level of well-being through future generations”.⁷

4.1.3 Sustainable Cultivation

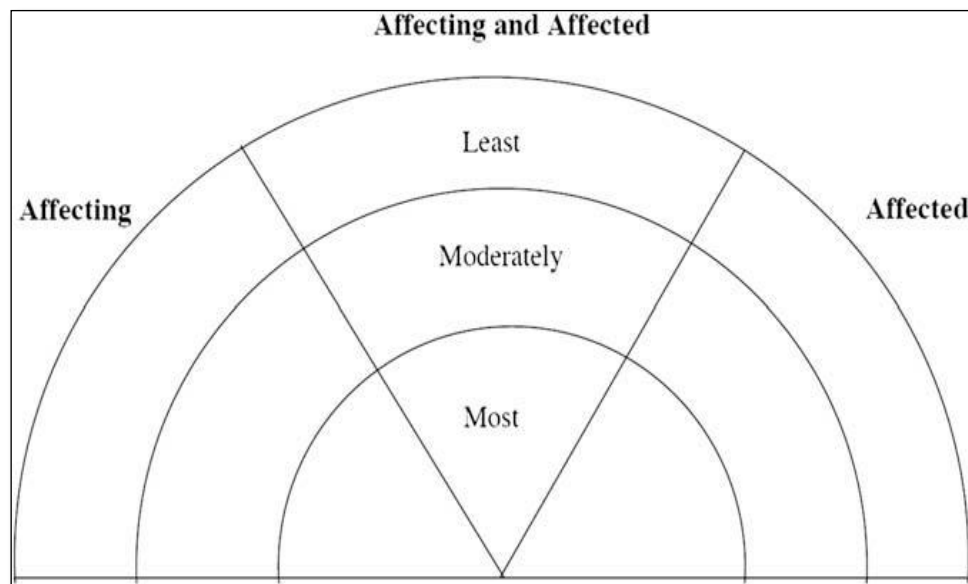
Sustainable cultivation or sustainable agriculture, integrates three main goals: environmental health, economic profitability, and social and economic equity. In this concept, the determinant aspect of sustainability is the ability to adapt to future potential changes.⁸ In view of the sustainable cultivation, it is necessary to highlight the importance of an ‘alternative’ which is defined as a possibility or choice that ensures both ecological and economic viability as well as sustainability of stakeholders. To qualify, the alternative must be able to support a stakeholder’s livelihood should rubber cultivation no longer be a possible sustainable alternative.⁹ In many rural regions of the world, farming communities have experienced improvement in their quality of life through diversification of income

sources. According to Carletto et al.¹⁰ (2007: 173) the importance of off farm income alternatives are across the board vital for rural inhabitant's income to advance and stabilize. The Food and Agriculture Organization of the United Nations (FAO, 2000)¹¹ explored that agricultural diversification that targets niche markets such as honey or exotic plants, livestock, or agro-forestry were vital in farmers hedging against risks. Such niche markets can provide possible alternative income source solutions for farmers whose income from rubber production is not considered viable or sustainable. Consequently, the consideration of alternatives to rubber income seemed pertinent to this study and analysis of stakeholders.

4.2 Definition and meaning of Stakeholder

A first definition of stakeholder comprises the identification of individuals, groups or organizations that can affect or are (positively or negatively) affected by a decision or action¹² (Figure. 1). Policy planning and development programs are moving towards methods with a social actor perspective to elucidate power relations and conflicting interests. Any public problem can affect numerous and diverse people, groups, organizations, and sectors. The solution does not depend entirely on one single actor, but rather on those who have partial power and therefore responsibility to act.¹³

Figure 4.1: Classification of stakeholders according to the degree of affection by decision

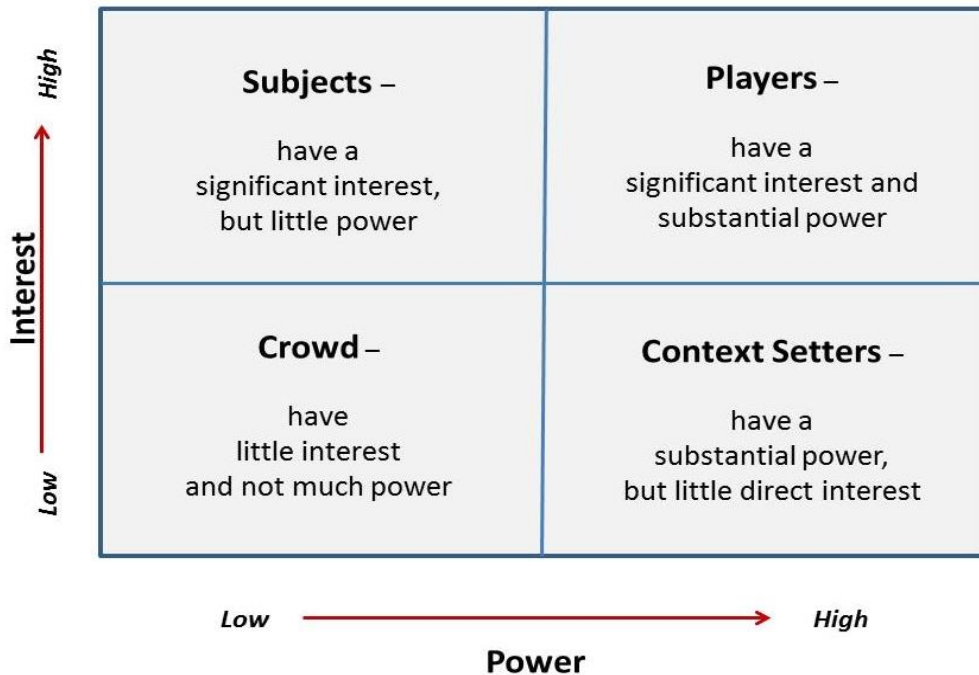


Source: Reed et al. 2009: p.1938.

Other important factors influencing stakeholder's position towards a project are power and interest. With this approach four clusters of stakeholders can be identified: (i) Players: Those who have both an interest and wield significant power; (ii) Subjects: Those who have interest but hold little power; (iii) Context setters: Those who have power but little interest and; (iv) Crowd: Those who have little interest and power.

The identification of these clusters shows key informants and may indicate the direction of future actions in increasing competence and awareness to the projects. For instance, in the case of 'Subjects' who have interest but limited power, a desired action is enhancing their capacity to get involved. This can increase their influence on decision making. For the 'Context setters', a mechanism to increase their concern are needed. Major efforts are needed to boost the participation of the 'Crowd' since they are neither interested, nor powerful in the problem-solving. In spite of the accuracy of this tool to classify stakeholders, interest and power are variables in constant change. Stakeholders may lose interest or gradually gain power if alliances are formed.¹⁴ The 'Power versus Interest Grids' (Figure 2) is a visualization of these categories.

Figure 4.2: Power versus Interest Grids

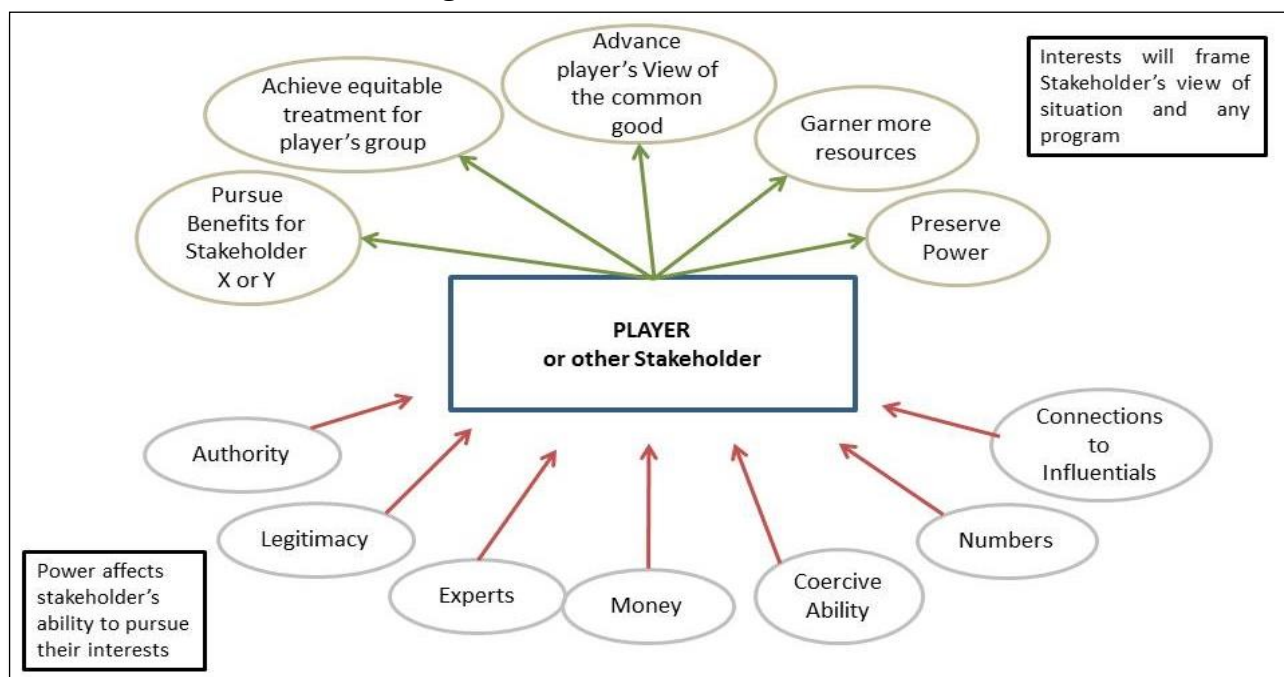


Source: Bryson et al. 2011: p. 5, cited in Sandra et.al. 2014: p.10.

Once the classification on stakeholders' interest and power is done, the analysis should follow to reveal sources of power and the usage of such power related to their interests and future plans.¹⁵ An illustration of this analysis is given in Figure 3. In the bottom of the diagram sources of power are pointed out whereas in the top arrows indicate the interest and concerns in which that power is intended to be used.

The above four clusters can be identified for pragmatic classification of stakeholders in a rural development program: (1) people who have decision authority over the program, including policy makers and funders; (2) people who have direct responsibility in implementing the program; (3) people who are intended beneficiaries of the program and their families or communities; (4) people disadvantaged by the program. Government as an abstract institution is not considered as a stakeholder, but its representatives might be since they can voice the official position from different levels of interaction with other stakeholders.¹⁶

Figure 4.3: Stakeholder influence



Source: Reed et al. 2009: p. 1936, cited in Sandra et.al. 2014.

In the following section, a detailed analysis is made on the role of the stakeholders in the rubber plantation development in the state of Tripura. The major stakeholders in rubber sector in the State include: the Rubber Board (RB), Tripura Forest Development and Plantation Corporation (TFDPC), Tripura Rehabilitation Plantation Corporation (TRPC) and Tribal Welfare Department. The role of the Industry and Commerce Department and Tripura Industrial Development Corporation (TIDCL) is also impressive in establishing many rubber based industries in the State.

4. 3 Role of the Stakeholders in Rubber Cultivation in Tripura

4.3.1 Role of Forest Department, Government of Tripura

In Tripura rubber plantation was started by Department of Forest, Government of Tripura with a visionary approach in Patichari and Manu Range covering an area 4.14 ha and 4.14 ha respectively in the year 1963 as an afforestation programme for soil conservation measures. Till 1975 A.D; 465.73 ha plantation were raised by Forest Department. The plantations were of seedling origin, seeds collected initially from rubber plantation of Kerala.¹⁷ It attained means of revolution in the rural economy of the state with the active help and support from Rubber Board in establishing the sector as the leading profit earning avenue for the state.

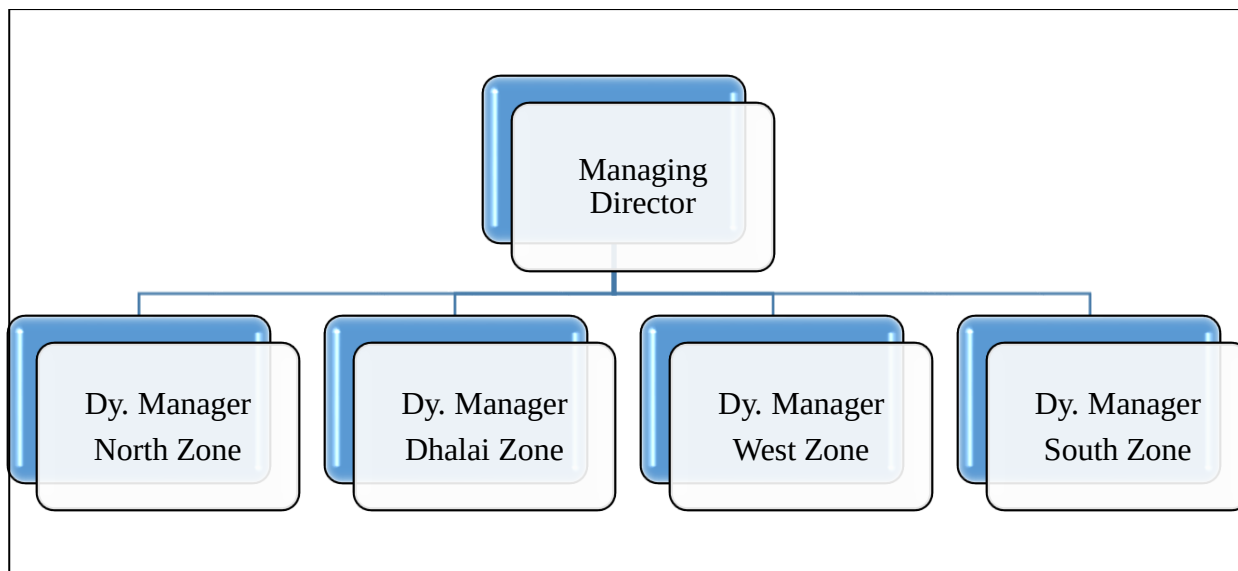
4.3.2 Role of Tripura Rehabilitation Plantation Corporation Limited (TRPC)

Tripura Rehabilitation Plantation Corporation Limited (TRPC) was set up in the year 1983 under the Companies Act, 1956 with the objective to economically rehabilitate the shifting cultivators (jhumias), tribal landless and small farmers through rubber plantation. The TRP & Primitive Tribal Group, directorate under the Tribal Welfare Department is the administrative department for the corporation. TRPC is the dominant agency for rubber plantation in five sub-divisions of Tripura, namely, Khowai, Amarpur, Kamalpur, Ambasa and Longtraï valley.

4.3.2.1 Organizational Structure

The Corporation is governed by Board of Directors having a Chairman selected by the State Government and the Managing Director is the Executive Director who executes plans through 5(five) Deputy Managers having 4(four) zonal Offices namely North, Dhalai, West and South Zone and there are ministerial and field staff as well (Fig. 4).

Figure 4.4: Organizational set up



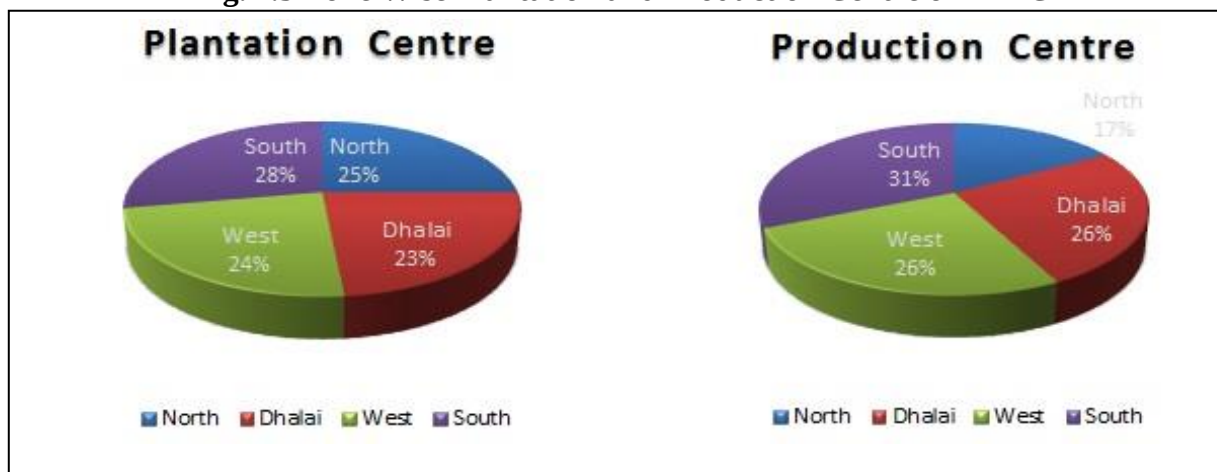
TRPC functions through 68 Rubber Plantation Centres out of which 54 Centres are in production. (Table 1).

Table 4.1: Zone Wise Plantation and Production Centre of TRPC

Zone	Plantation Centre	Production Centre
North	17	9
Dhalai	16	14
West	16	14
South	19	17
Total	68	54

Source: TRPC, Govt. of Tripura

Fig. 4.5 Zone Wise Plantation and Production Centre of TRPC



Source: TRPC, Govt. of Tripura

4.3.2.2 Objective of TRPC Ltd.

- To economically rehabilitate the shifting cultivators(jhumias), tribal landless and small farmers principally through rubber plantation,
- To wean the jhumias(shifting cultivator) away from the practice of jhum cultivation in the state
- To develop the economic condition of the marginal farmers
- To function as an extension wing of the Tribal Welfare Department for implementation of Government policy and programme
- To expand the generation of job facility in the rural areas
- To produce genuine planting materials
- Promote Intercropping of legumes and tuber crops under immature rubber plantation for food security and income during gestation period
- Rubber sheet production and its marketing
- Shelterbelt for rubber with trees bearing edibles e.g. Tree beans and commercially important species like Agar and bamboo
- Training and capacity building both for Corporation staff and its beneficiaries
- Initiate formation of welfare Fund for micro-credit with appropriate guidelines.

4.3.2.3 Programme Implementation

NABARD Refinance Scheme: The first phase of TRPC project for creation of 1200 ha of rubber plantation for 800 shifting cultivators was supported by bank loan under NABARD Refinance Scheme channeled through a consortium of three banks such as State Bank of India, United Bank of India and Tripura Gramin Bank. The target per family was 1.5 ha along with allotment of homestead land of 1.0 ha. However, this could not be continued and later 1 ha for rubber plantation per family became the standard. Rs. 75.66 lakh was utilized for raising 1063.5 ha of rubber plantation for 709 beneficiaries. The entire loan with interest was repaid from surplus against sale proceeds of smoked rubber after payment for latex to rubber.¹⁸

4.3.2.4 World Bank Aided Rubber Project:

TRPC received a loan of Rs. 173.82 lakh under the World Bank Aided Rubber Project(WBRAP) for raising 1000 ha of rubber plantation for tribal small farmers owning unarable uplands; and against that 924 ha of rubber plantation was created for 720 beneficiaries during 1993-94 to 2000-01. Rs. 247.78 lakh as the principal amount and interest was repaid and the disputed claim for Rs. 42.58 lakh was also settled through an Arbitrator.

4.3.2.5 State Plan Scheme: Since 1988-89 creation of rubber plantation for rehabilitation, except for the World Bank Aided Rubber Project, continued by utilizing initially the equity contribution and funds allocated later as Grant-in-Aid under annual plan schemes from the Tribal Welfare (TRP & PTG) budget of Government of Tripura for establishment and administration under the Grant-in-Aid to TRPC Rules, 1994.¹⁹

Successful History of TRPC Ltd.

The authorized share capital of the Corporation is Rs. 500 lakhs and as on date, the paid up share capital is Rs. 457.734 lakhs. TRPC Ltd. fulfills the mandate of the government by implementing the rehabilitation programme of the govt. providing service as a Service Corporation. During 2015 TRPC Ltd has raised 328 ha of rubber plantation for 328 tribal families. Since beginning, over an area of 9154 ha rubber plantation has been raised for 8280 tribal families till 2015-16. The unit area per beneficiary is 1 ha for raising rubber plantation. The beneficiaries are selected by the local Panchayat Samities/ADC Village Council or Block Advisory Committees. TRPC takes up creation of rubber plantations with the fund provided by the Tribal Welfare Department on land belonging to the beneficiaries involving the concerned beneficiaries directly.

TRPC has set up 65 Rubber Plantation Centres throughout the State and out of which 54 Centres are latex producing centres having with processing facilities for facilitating processing of the latex of the beneficiaries and to protect the interest of the tribal beneficiaries from the local rubber unauthorized so called traders. TRP & PTG Directorate of the Tribal Welfare Department provides Grant-in-Aid towards meeting the establishment and administration to TRPC Ltd. under the provision of the Grant-in-Aid to TRPC Rules, 1994.

TRPC Ltd purchases rubber latex from the beneficiaries at the rate fixed by the Board of Directors of TRPC Ltd. from time to time which is decided on the prevailing domestic market price of smoked sheet rubber published in the website of Rubber Board. Then TRPC Ltd. processes the latex up to a marketable stage and sells it to the license holder rubber trader. The production of rubber sheet and scrap was 6684.00 MT for last three years with Rs. 9,016.41 lakhs has been paid to 4367 tribal beneficiaries. The average annual income of the beneficiaries has come to Rs. 68,822/- per family.

TRPC Ltd. implements government's programme of economic rehabilitation of the poor tribal of the State through rubber plantation. The impact in terms of income per family per annum from the average rubber plantation area ranging from 05. Ha to 1.0 ha per family with the scheme of State planning schemes/Block grant/CSA.

Table 4.2: Achievements of TRPC

The Authorized share capital	Rs. 500.000 lakhs
Paid up share capital	Rs. 457.734 lakhs
Plantation raised from 1984 to 2015	9154 ha
Number of family benefited	8280 families
Average Income per family ranging	Rs. 68314- Rs. 1,33,000/-
Total production for last three years	6684.00 MT
Payment made to beneficiaries for last three years	Rs. 9,016.41 lakhs
Turn over for last three years	Rs. 10,320.26 Lakhs
Revenue paid to State Govt. for last three years	Rs. 262.71 Lakhs
Total number of Rehabilitation Centres	68 Nos.
Total number of processing centres	54 Nos.

Annual target for raising rubber plantation is fixed by TRPC in consultation with Tribal Welfare Department. Plantation Centre wise targets, list of beneficiaries and particulars of land for rubber plantation duly endorsed by Panchayat Samitis/ADC Village Council or Block Advisory Committees get forwarded by BDOs to concerned Zonal managers.

TRPC takes up creation of rubber plantations on such land directly involving the concerned beneficiaries subject to confirmation of the ownership status, suitability of the land for commercial cultivation of rubber, availability of planting material and feasibility taking into consideration of staff position and deployment.

4.3.2.6 Intercropping

TRPC has raised one ha of rubber plantation with arecanut as inter-crop as a trial plot so as to see its compatibility with rubber at Panbagan RPS in North Tripura. Under Gandacherra RPC, some beneficiaries have taken up cultivation of sugarcane, arhar and cow pea as intercrop in 2014 and it has been reported to be successful.²⁰

Among several other initiatives initiated by TRPC includes:

- Residential training of corporation staff on rubber related and other subjects e.g. mercantile accounting system, microcredit, health insurance, moral values, sports and cultural activities, etc.
- Establishment of Central Nursery to meet the growing demand in the State.
- Initial formation of Welfare Fund for micro-credit with appropriate guidelines
- Attempt made for 100% payment throughout individual bank account of beneficiaries

4.3.2.7 Management Plan of TRPC

TRPC promotes formation of Beneficiary Committee in each plantation centre. TRPC takes up creation and management of the rubber plantations till maturity (6th year) directly; and no money is advanced for works to beneficiaries. Officers-in charge of the Plantation Centre, however, associates and involves the beneficiaries through regular consultation meetings.

TRPC organizes training on rubber cultivation and management including tapping and processing for beneficiaries. Cost of maintenance including application of fertilizer on matured plantations, however, is borne by the beneficiaries themselves.

Provision of deed of agreement between the Corporation and each beneficiary is kept to ensure that he/she does not transfer the title of the land or lease out the plantation; and also to ensure that he or she supplies the latex to the Corporation at a price determined from time to time by TRPC in accordance to the prevailing market and the cost of processing and other overheads.

4.3.2.8 Funding Support for Rubber Plantation and Infrastructure

Tribal Welfare Department provides funds for creation and maintenance of rubber plantation excluding the subsidy amount which is provided by the Rubber Board. The beneficiaries under the guidance and maintenance of matured plantation on their own from the 7th year onward. TRPC Ltd being benevolent Corporation implements Government programme and receive fund for creation of rubber plantation on requisition against the yearly target. Processing and storage infrastructure is mainly funded by the Tribal Welfare Department and in the past in some cases by the Rural Development Department through the District Administration. The General Reserve Fund of the Corporation is used to install essential processing capacity.

4.3.2.9 Training and Capacity Building

Training and capacity building both for Corporation staff and its beneficiaries is essential for proper cultivation and management of rubber; and is also necessary for all round development of the target group. Training on tapping and processing and also on First Aid, use of Solar Disinfected Water (SODIS), mushroom cultivation, bud-grafting, bee keeping, etc. is organized by the Corporation. Beneficiaries deposit latex and scrap to the collection and processing centres established in each centre. Payment is usually made monthly for latex and scrap mostly through individual bank account of the beneficiaries. The average income from sale of latex irrespective of year of plantation ranges from Rs. 10,000/- to Rs. 18,000/- per month from 1one0 ha of rubber plantation. Rates are fixed by the Corporation based on the market trend and cost of processing and other overheads cost.

4.3.2.10 Issues and Challenges in Rubber Cultivation in Tripura

According to the Managing Director of TRPC, the following are the issues and challenges in the plantation sector and recommendations for changes at the policy level which may help in the overall growth of rubber plantation development in the state of Tripura:

- Faulty tapping is a serious problem affecting both current yield and economic life of rubber plantation particularly in the plantation owned by the tribal families. Quite a few of them engage paid untrained labour for tapping, as the family members trained for tapping would like to avoid the daily chore. However, TRPC organizes refresher training on tapping from time to time for those beneficiaries.
- About 4 cubic meters of fuel wood is required to produce 1 MT of dried and smoked rubber. The country side, as a result, is fast losing the indigenous tree cover, cost of processing is also on the rise. Use of biogas utilizing effluents from latex processing facilities does not commensurate with the cost of their installation.
- Short supply of fertilizer has been a perennial problem for rubber plantation of the North Eastern states particularly in Tripura.
- Stray cattle are a menace for juvenile rubber plantations in Tripura and plantations suffer a serious damage due to grazing during the first two years of planting (Debbarma, 2014:39-40).²¹

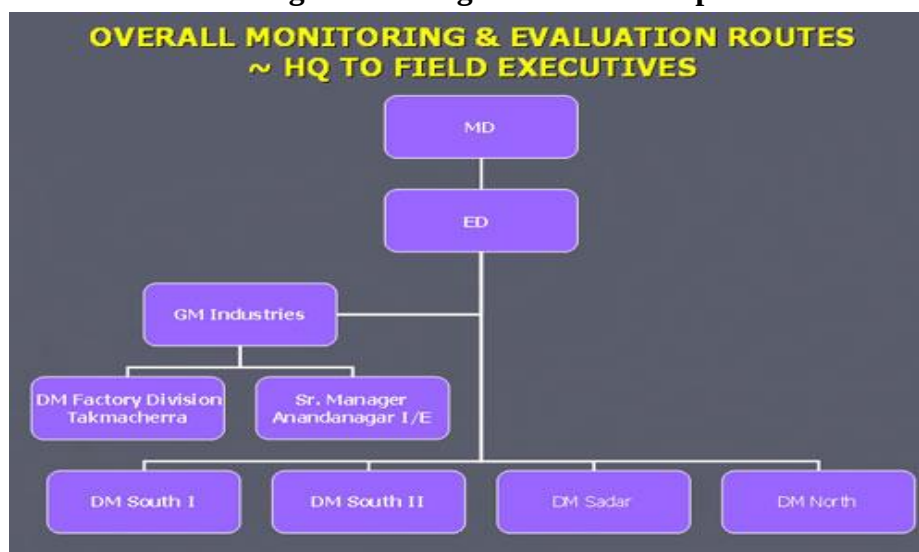
4.3.3 Role of Tripura Forest Development and Plantation Corporation Limited (TFDPC Ltd)

In 1976 Tripura Forest Development and Plantation Corporation Ltd (TFDPC Ltd) was set up as a Public-sector undertaking of the State Government with equity participation from State Government and Central Government as major activity for the rehabilitation of degraded forests lands through rubber plantations. TFDPC also took up rubber plantation for resettlement of tribal Jhumias as part of the State Government's social commitment. In the last 34 years, the Corporation had so far raised 11673 ha of rubber plantations. Out of which 2577 ha has been for rehabilitation of Scheduled Tribes, Scheduled Castes and Other Backward Classes.

4.3.3.1 Organizational Set Up

The overall activities of the corporation being performed through its various Divisions namely Sadar Division, South I Division, South II Division, North Division, Takmacherra Factory Division and TFDPC Industrial Estate. Each division looks after plantation and nursery activities besides daily tapping of latex, processing, storing of Rubber through tappers, processors and plantation workers. The Corporation Head Quarter oversees the functioning of all Divisions. Marketing of Rubber and Timber wood furniture is looked after centrally by Head Quarter.

Figure 4.6: Organizational set up

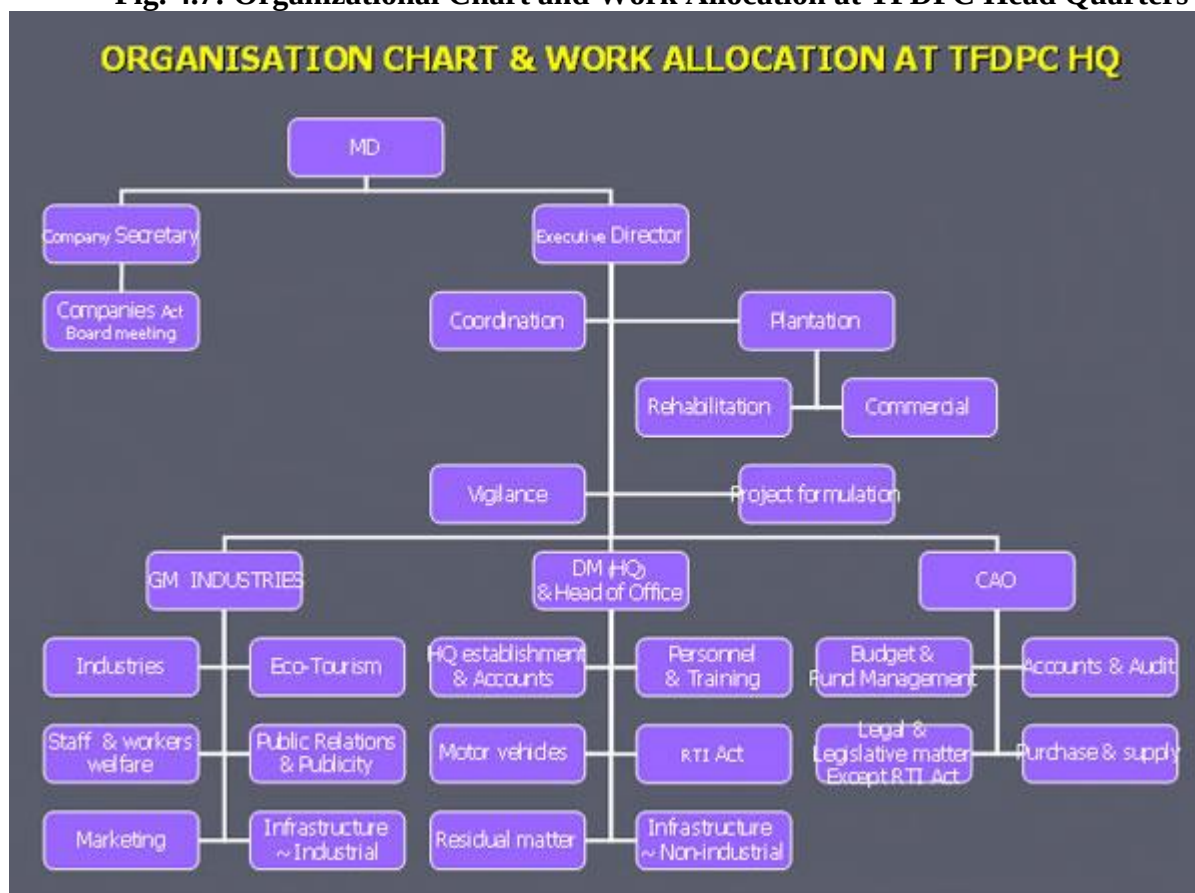


Source: <http://tfdpc.tripura.gov.in/our-organization>

4.3.3.2 Work Flows of TFDPC

Work flows or allocation in the corporate Head Quarter(HQ) of TFDPC is organised as per the organization chart given below(Fig.6).Executive Director(ED) and Company Secretary will submit files to the Managing Director(MD), Industries(GM), Divisional Manager, Headquarters(DM, HQ) and Chief Accounts Officer(CAO) will submit files and support to the Executive Director(ED). Executive Director will perform functions assigned to General manager and Divisional manager head quarter till they take up their positions in the Head Quarter. The CAO similarly will look after the functions assigned to the Company Secretary till one is appointed.

Fig. 4.7: Organizational Chart and Work Allocation at TFDPC Head Quarters



Source: <http://tfdpc.tripura.gov.in/our-organization>

4.3.3.3 Objectives of TFDPC Ltd.

The objectives of the Corporation are

- Rehabilitation of degraded forest lands through Rubber plantations.
- Rehabilitation of tribal shifting cultivators through Rubber Plantations.
- Implementation of welfare schemes of central & state Governments for economic rehabilitation of tribal shifting cultivators and other marginalized Scheduled Tribes and Scheduled Caste families through rubber plantation.
- Management of the TFDPC Plantations as well as the Welfare Plantations for sustainable production of raw rubber in marketable forms & then for sustainable production of good quality rubber-wood for further value addition.
- Promote forest/Rubber based industries and employment generation in rural areas.
- Promote Eco-Friendly Rubber wood and its products to reduce pressure on natural forests.
- Socio-economic development of rubber plantation dependent communities with responsible management practices, helping them adapt to climate change & to achieve environmental benefits

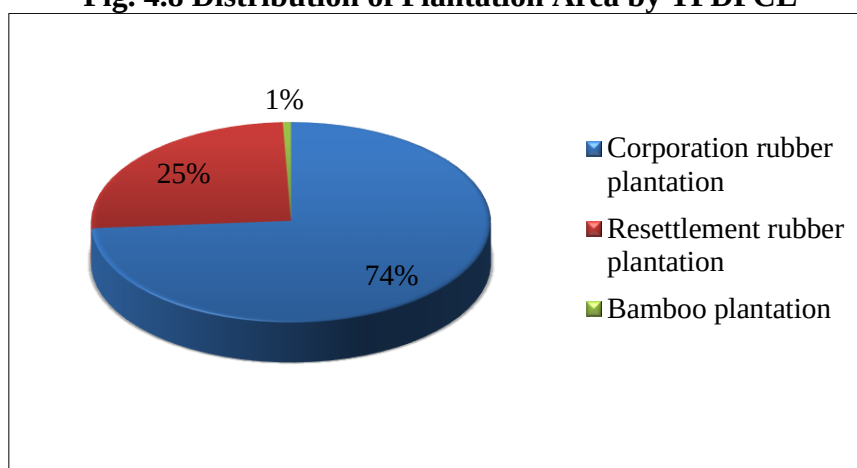
like carbon sequestration, soil conservation & protecting soil moisture as well from rubber plantations. The breakup of the plantations of TFDPCL is shown in Table 3.

Table 4.3: TFDPCL Plantation Area

Sl No.	Plantation Types	Area (ha)
1	Corporation rubber plantation	7087
2	Resettlement rubber plantation	2448
3	Bamboo plantation	64
	Total Plantations	9599

Source: *TFDPCL Management Plan Report (2013-14 to 2017-18)*, p.44.

Fig. 4.8 Distribution of Plantation Area by TFDPCL



In addition TFDPCL has 10.36 ha under Industrial Estate at Anandnagar, 19.83 ha is under use for latex processing and storage facilities in RPCs, 3.2 Ha for latex centrifuging and ICNR factory at Takmacherra, and 1.2 ha of land in the Rubber Park at Bodhjunnagar near Agartala (on lease term for 30 years from the Department of Commerce & Industries, Government of Tripura against a deposit of Rs.3.00 lakh). TFDPC Limited coordinates with forest department of Tripura in managing 580.88 ha of natural forest areas that include tree growers as well which are spread over its rubber plantation centres (RPC). TFDPCL, also, manages 15.02 ha of water bodies in the forest areas.

The Corporation adopted rehabilitation of degraded forestland through commercial rubber plantation as its primary objective in Tripura along with sustainable rehabilitation of tribal shifting cultivators. The Corporation was the pioneer in developing successful models for permanent settlement of tribal shifting cultivators through rubber cultivation by providing each family one hectare of Rubber plantation. TFDPCL organized resettlement of more than 1133 scheduled tribe families and 70 scheduled caste families under different schemes and projects as an agency of the state government. TFDPCL is the single largest rubber plantation unit in India. It has been creating employment for around 3585 people directly and to an almost equal number indirectly thus contributing significantly in employment generation particularly in rural areas of the State (TFDPCL Management Plan Report, 2013-14: p.45). The authorized capital of the Corporation is 1,000.00 lakhs with equity participation of Central Government and State Government. The existing paid up capital is Rs. 919.94 lakhs. Out of which government of India' share is Rs.29.50 lakhs and Government of Tripura Rs.890.44 lakhs.

4.3.3.4 Business Activities of TFDPC Ltd

- Commercial plantation of Rubber on degraded land.
- Presently owns about 11673 hectares of Rubber Plantation.
- Total Rubber production during 2013-14 was 2995 MT.
- TFDPC Ltd is engaged in Rubber Based rehabilitation of Tribals since 1976. Presently 2577 ha plantation has been raised for tribal beneficiaries covering 1794 nos. Tribals are getting Rs. 15000 per month to Rs. 20000 per month
- Rubber Latex Concentrate (Cenex) producing unit at Takmacherra South Tripura, having total annual production to the tune of 1000 MT.
- ISNR Factory at Takmacherra producing ISNR since 2012. Production capacity per day is 2.5 mt.
- From the existing activity the Corporation generates 10 lakhs man-days in rural areas of the state and is contributing towards socio-economic development of the state.
- Rubber Wood processing & Bamboo sector development at TFDPC Industrial Estate.

Table 4.4: Rubber Production

Year	Production(MT)	Nos. of tapping Blocks	Revenue (Rs. Lakh)	Profit (Rs. Lakh)
2009-10	3104.31	3525.00	4605.82	1886.66
2010-11	2572.68	3544.00	4912.53	2178.88
2011-12	2267.88	3528.50	4968.07	1998.40
2012-13	2701.51	3540.00	5316.26	1246.75
2013-14	2995.93	3420.50	5245.70	1196.01

Source: TFDPCL At A Glance (2013-14 to 2017-18).

- Rubber Latex Concentrate (Cenex) producing unit at Takmacherra is operating since 1994 with annual production capacity of 1000 MT. Total turnover is Rs.4 Crore and it provides jobs for 52 workers permanently.
- Corporation generates 10 lakhs man-days annually in rural areas.
- Technically Specified Rubber (TSR) Factory with investment of Rs. 2.94 Crores (approx...) with production capacity of 5 MT per day of TSR has been set up aty Takmacherra under South Tripura District.
- Valued Industrial Customers in Tripura are consuming around 24% of the total produce. Local availability of material and industry policy is a big attraction for industrialists. Prominent customers are DS Group, Balaji Enterprises, Karunamayee Rubber Industry, Hindustan Rubtex, Abhisar Buildwell Pvt. Ltd., Brite Rubber Processor and Agartala Rubber Industry.

4.3.3.5 Timber Treatment Plant

Tripura Forest Development and Plantation Corporation is the Single Largest Plantation owner in the country. Rubber plantation requires re-planting after 32 to 34 years when collection of latex becomes uneconomical. Door commercial utilization and value addition to those rubber logs felled during re-plantation, otherwise of no timber value, TFDPC started its new venture in Processing Rubber timber in the year 1999. First of its kind outside South India, 'Timber Treatment Plant' produces chemically treated and scientifically seasoned rubber wood with use value at par with class-I timber. The sawn timber is used in the furniture unit of the State. TFDPC has maximum presence in rubber plantation in five subdivisions, namely, Belonia, Santirbazar, Sabroom, Dharmnagar and Kailasahar.

4.3.3.6 Tripura Rubber Wood Factory

The success of Timber Treatment Plant at Anamndnagar and the positive impact on forest conservation through replacing use of Forestry timber by Plantation timber inspired TFDPC to take step towards setting up of solid wood board manufacturing unit. The conception of setting up the project started in the year 2000 and finally the factory started commercial production from 25th July 2008. Machineries for the Factory were imported from Taiwan, China, Germany, and indigenous machines (Sandeep Industrial Corporation, Ludhiana, Ascu Arch Timber Protection Pvt. Ltd. Kolkata). Solid Rubber wood boards (8ft x 4ft-thickness 12mm to 38mm) are main product of the Unit. Major requirement of raw material, Rubber wood logs are met by felling of older plantation for TYFDPC Ltd. The product of the factory are used in the Furniture unit of the Estate.

4.3.3.7 Unakoti Craft and Furniture Unit

Unakoti Craft and Furniture Unit is a common facility centre for manufacturing furniture and allied rubber wood products and for creation of self-employment opportunities. Commercial production started from November 2007. Most of the Machineries were imported from Taiwan.

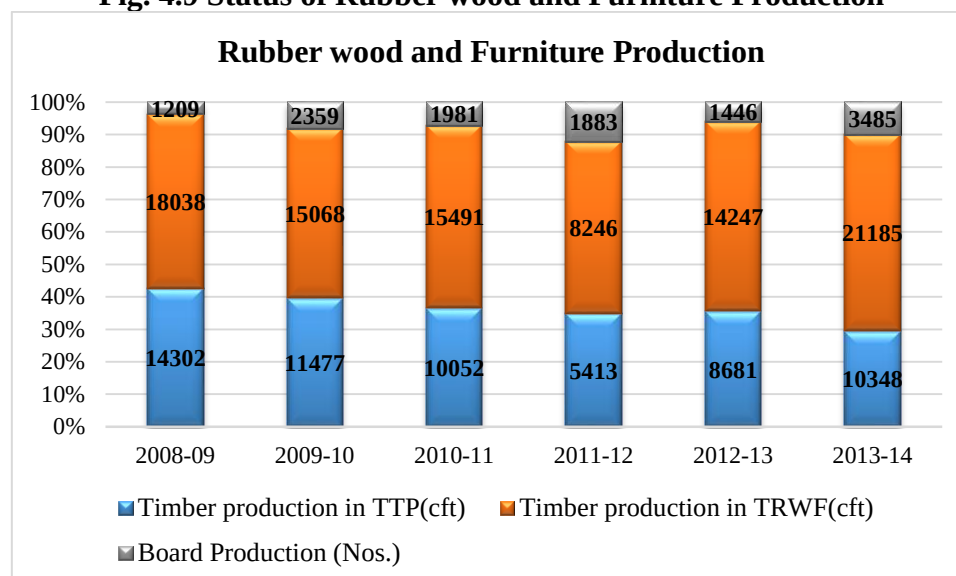
Presently, 20 Self Help Carpenter Groups and Two Local entrepreneurs in PPP mode are functioning in the unit. The unit is proud to constitute one SHG with Women carpenters. The furniture produced in the Unit is marketed mainly in the state itself.. Department of Education is the largest buyer of Rubber Wood furniture. This unit is proud to deliver furniture to all Government degree colleges, B.Ed. Colleges, IASE, some ITI Polytechnic Institutes, NIT, Agartala; Tripura University; Raj Bhawan, New Secretariat complex i/c Hon'ble Chief Ministers Office and Residence; New Assembly Hall; most of the Govt. Office and Residence in the state. The huge demand for rubber wood furniture is for its durability and quality.

Table 4.5: Status of Rubber wood and Furniture Production

Year	Timber production in TTP(cft)	Timber production in TRWF(cft)	Board Production (Nos.)	Revenue Realized (Rs. in Cr.)	Total revenue including Outstanding dues (Rs. in Cr.)
2008-09	14302	18038	1209	1.41	1.58
2009-10	11477	15068	2359	1.55	1.81
2010-11	10052	15491	1981	1.67	2.58
2011-12	5413	8246	1883	2.16	5.91
2012-13	8681	14247	1446	1.62	2.42
2013-14	10348	21185	3485	4.04	5.08

Source: TFDPC at A Glance (2013-14 to 2017-18.)

Fig. 4.9 Status of Rubber wood and Furniture Production



Source: TFDPC At A Glance (2013-14 to 2017-18.)

4.3.3.8 Door Manufacturing Factory

A door manufacturing factory has been established for manufacturing doors, windows, kitchen shutters and skin doors with project cost of Rs. 508 lakh. Treated Rubber Wood and Solid Rubber Wood Board both manufactured at TFDPC industrial estate are being used as raw material for door manufacturing Unit. “Pilak” is the brand name. Pilak is a site of archaeological importance in Santirbazar Sub-Division of South Tripura district. The factory has the assembly of machineries for manufacturing state of art design door, windows and kitchen shutters and skin doors for adding wealth to the waste. The main assembly line consists of painter, sanders, edge banding machine, hot press, CNC router, pain shop, composer and dust collection unit. Total investment is Rs. 6.90 crore, out of Rs. 5.08 crore contributed by Ministry of Commerce & Industries, Government of India, Production capacity is 40 doors per day. Employment potential is 68 persons. The future Planning of the Corporation are to: (i) Extending Rubber wood timber treatment plant to Unakoti District and South Tripura District and (ii) establishing Tire and Tube Industry in joint venture.

4.3.4 Role of Rubber Board, Tripura

Rubber Board set up its regional office at Agartala in 1979. The Rubber Board though has been promoting rubber through various extension and research and development activities have ventured into the sphere of rehabilitation in a limited extent only.²² With the technical know-how and resources available, it was felt appropriate that the Rubber Board take up economic settlement projects for the poorest of the poor sections in the remotest of the remote region of the country. A scheme for the accelerated development of rubber plantations was sanctioned by the government of India and was implemented by the Rubber Board during the VIIth period in the North Eastern Region.²³ The scheme was implemented with a view to bringing more areas under rubber plantations to step up production for meeting the increased demand of natural rubber. Though agro-climatic extremities existed in the north eastern region, its suitability for rubber plantation with the adoption of proper agro-techniques had been well established.²⁴ Major efforts were initiated by the Rubber Board only with the implementation of the scheme on the accelerated development of rubber plantations in the northeastern region during the VIIth plan period. In the scheme for accelerated development of rubber plantation in the northeastern region it was envisaged that the Rubber Board may raise large block plantations in the areas acquired/allotted by the State government and after attaining maturity to the allot the plantation to the beneficiaries in the line with the approach of FELDA in Malayasia. However, there was difficulty in getting the land in implementation of the NRETC (Nucleus Rubber

Estate and Training Centre) project in Tripura. Nevertheless there was enough scope for making use of the already allotted land to the tribals or other category of beneficiaries by motivating them in groups and making them hand over the land to the Rubber board for raising the plantation in their own allotted land which were suitable for raising the plantation in their own allotted land which were suitable for rubber cultivation. The Rubber Board proposed to raise the block planting units of a minimum extent of 50 ha. in a compact area in Tripura, where an average of 50 beneficiaries were attached and scheme was started from the year 1992 onwards.²⁵

The Board after selecting the beneficiaries/potential growers and the site with clearance from the Autonomous District Council if an area falls under their territory and also the District Administration concerned. The Rubber Board also signed an agreement with the beneficiaries stating their willingness to hand over their land to the Board for temporary period of 8 to 11 years depending upon the involvement of the Board. It was proposed to maintain the plantation up to maturity and after opening the trees and setting up the tapping and processing facilities to hand over the land after the formation of a Rubber Producer's Society (RPS) in each block to the beneficiaries themselves. To minimize component of Boards staff it is also proposed to train 2 or 3 educated beneficiaries in each block and to avail their services in the capacity as semi-skilled workers for immediate field supervision. The beneficiaries were engaged as wage earners, wage being paid as per the plantation Labour Act.

Rubber Board implemented the 'Block Plantation Project' during the Xth Plan in Tripura with 50% contribution from the Tribal Welfare department, Government of Tripura, 43% from Rubber Board and 7% from beneficiaries. With the introduction of the 'Block Plantation Project' there was sudden growth of rubber in Tripura. The project was to raise rubber plantation in 1500 ha in a span of 5 years for the settlement of 1500 tribal families. The World Bank has provided funds for this programme since 1992 in order to promote economic settlement of the tribal jhum cultivators through rubber plantation. Till 2003 Rubber Board raised 1521 ha Plantation through this scheme/project.²⁶ The following Table shows the year-wise extension of rubber plantation in Tripura from 1976-77 to 2012-13.

Table 4.6: Year-wise extension in area of Rubber Plantation in Tripura

Year	Area(in Ha)
Up to 1976-1977*	301
1981-82	3,590
1986-87	10,085
1991-92	17,860
1996-97	23,936
2001-02	30,575
2006-07	35,760
2011-12	57,620
2012-13	61,231

Source: Rubber Board, Tripura & *TFDPC, cited in *Rubber in Tripura Souvenir-Golden Jubilee Celebration (1963-2013)*.

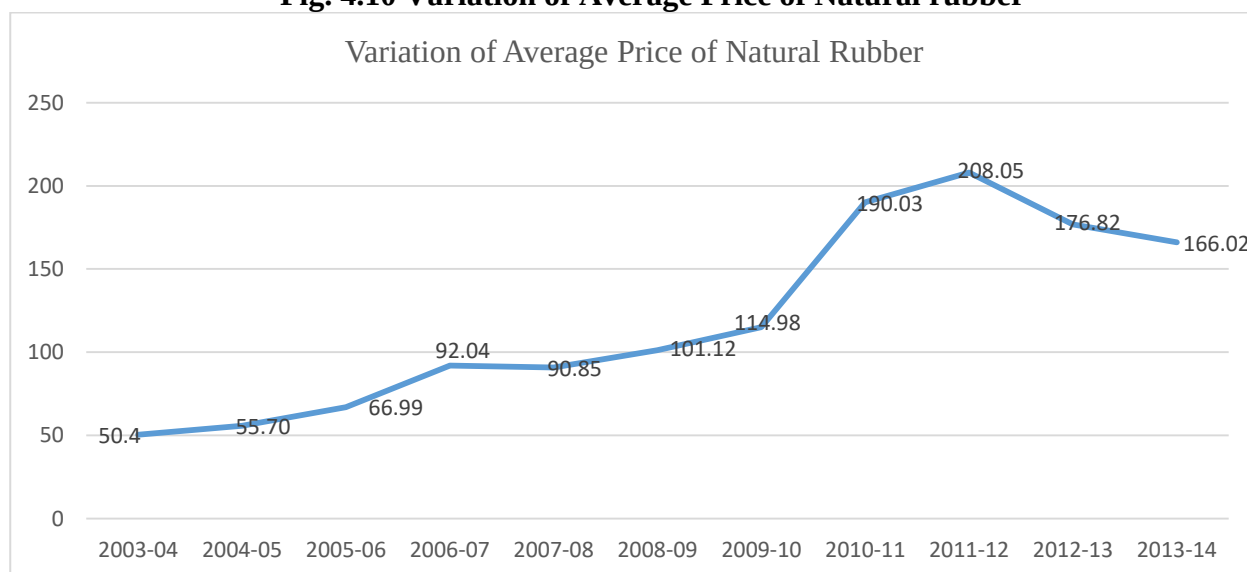
National Bureau of Soil Survey and Land Use Planning, conducted a survey as part of exploratory study for the World Bank Assistance which reveals that approximately one lakh hectares of land is suitable for rubber plantation in Tripura. As per Rubber Board, Tripura has the potential for rubber cultivation 76,637 ha of land but so far only 61,231 ha is under cultivation amounting to only 8 per cent of total area. The last few years trend of rehabilitation of Tribal family as per data available with Tribal Welfare department is as given below:

Table 4.7: Trend of Rehabilitation of Tribal Family through Rubber Plantation in Tripura

Year	Rubber Board	TRPC	TFDPC	District Administration	TTADC	Total
2005-06	0	425	20	1145	0	1590
2006-07	96	308	247	1156	0	1807
2007-08	150	351	98	1085	174	1858
2008-09	285	310	68	1185	387	2486
2009-10	0	550	0	451	267	1268
2010-11	0	0	0	1448	200	1648
2011-12	0	171	0	1572	0	1743
2012-13	0	0	0	874	0	874
2013-14	20	540	-	16	427	1003

Source: Department of Tribal Welfare, Government of Tripura, cited in *Tripura Rubber Souvenir*, 2014:32.

The growth of natural rubber in Tripura was to the maximum during 1980s. Rubber plantation was taken up at a large scale by TFDPC and TRPC after its establishment in the state (Das, 2014:31). TFDPC could raise rubber on forest land which was earlier handed over by the Forest department. However, the process of plantation on new forest land got slowed down after 1988. On the other hand, TRPC could raise plantation on beneficiary land with support from financial institutions. The degraded lands were available for rubber plantation. Due to extension programme of rubber board and active role of Government agency rubber plantation also continued in 1990's but it got slowed during 2001-05. Though area of expansion for rubber plantation by TFDPC got slowed down in the later part of 1980, however, TRPC continued rubber plantation. Due to high growth rate of rubber, large scale plantations were taken up starting from 2006-07 to 2012-13. Till 2006-07, total rubber plantation in the state was 35,760 ha whereas from 2006-07 to 2012-13, total plantation raised was 25, 511 ha. The main reason for such large scale rubber plantation was high market price of rubber. The price from 2003-04 to 2013-14 is given in the graph below. The rubber price at present has been continuously going down, which may affect the future expansion of rubber in the state.

Fig. 4.10 Variation of Average Price of Natural rubber

The cash subsidy from Rubber Board has also acted as an incentive for increase in area in the early days. The major credit for achieving such high rates in expansion of rubber goes to the implementing agencies for carrying out the extension activities in a mission approach.

4.3.5 Role of the Rubber Producer Societies in Rubber Plantation

The Rubber Producer Societies (RPS) were started by Rubber Board in 1986. The RPS has been promoted as a charitable non-profit organization having a vertical linkage with Rubber Board.²⁷ Initially the formation of these societies were confined to the traditional areas, such as Kerala and Tamil Nadu. About 1.19 million small holders were brought under the umbrella of RPs. The main objective of RPS is rural empowerment through transfer of technology and participatory approach. A large number of extension schemes are being implemented through RPS. Most of the Societies have opened Latex collection Centers for helping the grower in marketing their produce. Later on majority of these centers have been transferred into community processing and technology transfer centers. Trading and processing companies were formed with the equity participation of these RPS as a tertiary level of development. Rubber Board's extension and development activities gained momentum with the formation of RPS. It resulted in a phenomenal shift in extension strategies from interpersonal basis to group approach and further to participatory extension. Initially RPS were being used as Boards extension arm for transfer of technology and as a nodal agency for implementation of various extension schemes. It has ensured the informed participation of the stakeholders. RPs are benefited by acquisition of land and establishment of infrastructure facilities later on. Though there are 2414 numbers of RPS functioning in traditional and non-traditional area of the country, in addition to 340 numbers in NE region, they can generally be classified as good or poor performing and defunct, while the structural entity and statutory requirements for the normal functioning as well as institutional support from Rubber Board remains the same.²⁸

In the year 1992, first RPS registered in Tripura state in North Eastern Region. Presently, there are 163 RPS under four Regional Offices functioning in the state of Tripura. Group Processing Centres (GPCs) have been established in 97 RPSs. As of 2014, a total of 12047 small growers with 10199 ha. rubber area has been brought under the umbrella of RPSs. The preliminary form of RPSs in NE region was Rubber Growers Societies (RGSs). The RGSs were formed for helping Rubber Board to implement its Block Planting Schemes in the Tripura state. Rubber Board had provided all types of training on various aspects of rubber cultivation, tapping and processing were initiated till the handing over of the estates to the respective owners. The plantations were raised directly under the supervision and management of Rubber Board and handed over to the owners when it became ready for tapping. The beneficiaries were also incorporated in the schemes as wage earners. The Block Planting scheme has been proved as one of the inclusive rural development model in the state of Tripura. Later on, the RGS were transformed to RPSs for establishing community processing facilities. These RGSs have helped the rubber growers to conceive the idea of RPSs to achieve greater goals. The basic difference between RPS and RGS is that the latter did not have a structural format like bye-laws or any kind of administrative or statutory requirements. The RPS movement in Tripura, during the last two decades has been successful. However, progress lies in organization building to cater the need of the aspiring population. Clustering the ROSs in the form of Village Level Skill Development Centre (VLSDC) and District Level Skill Development Centre (DLSDC) enabling growth in opportunity and generating non-farm income can do wonders in Northeast India.²⁹ The RPS in Tripura, Northeast India which were formed subsequent to the introduction of rubber planting programme played a significant role in changing the standards of living of the villagers by reducing their socio-economic backwardness.³⁰ The contributing factors of RPS in the region are the infrastructure build-up, institutional development, better education, more exposure avenues etc. Furthermore, these developments contributed positively towards bringing an attitudinal change and hence helped to control insurgency prevailed in the tribal pockets in the state.

4.3.6 Role of Other Agencies in Rubber Plantation

Since 1998 Tribal Autonomous District Council and the office of the Sub-Divisional Magistrates are also implementing rubber plantations scheme for the tribal. The schemes for resettlement of weaker sections of the society through rubber plantations have been one of the major developmental programmes of the state. As per the record of rubber board first individual initiative to raise rubber

plantation was taken by Sri S.P., Samadder of Kakraban near Udaipur. Seeing the plantation of Patichari Shri Samadder raised rubber plantation in his own land. Likewise, Shri Sukumar Pal of Chandipur also raised rubber plantation in his own land in 1970.

Table 4.8: Rangmala RPS (Rubber Board)

Plantation Year	1992-2000-2001
Plantation in Hectare	143
Beneficiaries	72 Members
Rubber Taping Area	129.64 ha
Rubber Tappers	65 members
Block	123
Tapping Day	S/2- D/2
Price of Rubber Sheet	Rs. 122-128
Latex Collection	114.110 kg
Rubber Processing Workers	9

Source: Rangmala RSP, Sepahijala.

4.3.7 Role of Department of Industry and Commerce in the Rubber Sector

The State Government has set-up a Rubber Park at Bodhjungnagar over 90 acres of land with technical support of the Rubber Board, Government of India. All common facilities including Centralized Quality Control Lab, Training Center, Tool Room, Centralized Latex & Carbon Black Masterbatch Unit, Warehouse for Raw Material Storage, Centralized procurement of subsidiary raw material are being created in the park for rubber based industries. Keeping in view the myriad advantages and the positive factors, a large number of rubber-based industries have been set-up. These include rubber thread, tread rubber manufacturing, rubber band making, tyre retreading etc. There is a vast scope of investment in sectors like auto parts, footwear, tread rubber, vulcanized rubber, rubber band, rubber cushion and mattress, latex thread, textile fabric, hoses etc.

4.3.8 Tripura Industrial Development Corporation Ltd. (TIDCL)

TIDC's Rubber Industrial Park is located in West Tripura 6 km from NH-44 and 12 Km north-east of Agartala City and covers an area of around 240 acres. This is being developed by Tripura Industrial Development Corporation (TIDC) and the Rubber Board under the Ministry of Commerce & Industry, promoted under the ASIDE Scheme. Infrastructure Leasing & Financial Services Limited (IL&FS) Cluster Development Initiatives (CDI) has been appointed as an implementation agency for the project. Out of 50 acres of land, 35 acres will be distributed as industrial units & 15 acres will be utilized for developing common infrastructure. The growth center is equipped with basic common physical infrastructure and facilities to enable the interested entrepreneurs to set up business operations. Tripura Industrial Rubber Park aims to further India's growth in Rubber Industry. It is situated in the Industrial Growth Center of Bodhjungnagar in West Tripura and promoted by TIDC. Well laid out plots and infrastructure facilities to set up rubber-based businesses from rethreading of tyres to production of coated fabrics to the manufacturing of surgical gloves, conveyor belts, latex forms, etc.

4.4 Emerging Issues and Challenges and Future Prospects in Rubber Plantation in Tripura

Rameshwar Das, the Managing Director of TFDPC, has pointed out the following problems and prospects in the growth of rubber sector in Tripura:

- i. Productivity of natural rubber in Tripura rose from 200 to 300 kg per ha per annum during 1970s to 1000 kg plus per ha per annum against the national average of 1879 kg. Tripura is in the stage of second generation of tapping rubber, the first generation of rubber plantation in the state was of introducing the crop, learning and experimentation, whereas in the second generation, it is desired that Tripura achieves national level productivity and increases in yield as an absolute

necessity. Yield of rubber is dependent on several factors like clone and age of the tree, efficiency of the tapper, proper cultural practices.

- ii. Rubber cultivation, processing and tapping are to be very scientific and technical. Irregular tapping leads to less productivity, reduction in productive age of trees. Therefore, the rubber growers and tappers should be made aware of planting, tapping and processing. For tapping rubber, trained tappers should be engaged rather employing the younger children who have no knowledge of scientific tapping. In rubber plantation, rubber growing farmers should be made aware of importance of budgrafting, clone spacing of plantation and other silvicultural factors and fertilizer application.
- iii. Cyclone often damages the rubber plantations. Bud grafted clonal rubber trees are shallow-rooted. This leads to uprooting even in low intensity cyclones. The damage is both to mature and immature plantation. Therefore, strong rooted clones should be developed. Plantation model should be mix of seed origin, high yielding clones and low yielding clones. Due importance has to be given to Shelterbelt plantation. Further, proper insurance of the plantation for both mature and immature plantation should be continued.
- iv. Rubber plantation is vulnerable to major attack of insect and pest. Although in Tripura the rubber plants have largely been free from pest attack, however, necessary steps should be adopted to protect the plants from insect pest attack.
- v. Due to global effect on rubber trade, there is wide range of price variation. Due to increasing input cost sometimes tapping also becomes commercially unviable. Therefore, emphasis should be given on domestic consumption of latex. Although Tripura is the second largest producer of rubber, but practically there is no consumption. Therefore there is vast scope for development of rubber-based industry in the state. To neutralize the effect of price, more emphasis should be given on production of quality sheets.
- vi. Rubber also happens to be a major source of collection of honey, but in Tripura honey collection from rubber is yet to start. Lack of honey flow in rubber during the prolonged dearth period from April to December necessitates alternate bee flora for off-season management in rubber plantation based apiaries. There is scope for making apiary honey collection from rubber commercially viable, it is necessary to take up plantation of these species also in forest land (Das, 2014:32-33).³¹

Summary

It is evident from the above analysis that the dynamic leadership, dedicated works, coordinated efforts and social commitments of the several stakeholders in Tripura has led to a spectacular growth of rubber sector in the state. Rubber Board, Tripura and the Rubber Producer Societies (RPS) at the local level, Tripura Forest Development and Plantation Corporation, Tripura Rehabilitation Plantation Corporation, Tribal Welfare Department, and other agencies like Tribal Autonomous District Council and the office of the Sub-Divisional Magistrate at the district level, have led to the overall development of the rubber plantation in the region and have brought successes to the state. The role of Industry and Commerce Department is also laudable in establishing many rubber based industries in the State. In Tripura, Government of Tripura initially provided financial and technical support from Rubber Board had started rubber plantation in the tribal areas mainly involving the Jhumias (shifting cultivators) poorest of the poor. Over the years the economy in these areas are remarkably changed. Due to higher prospect and productivity of rubber in the region, people are coming forward for more and more rubber plantation. The plantation has generated employment opportunity in the state. The economic and social status of the rubber growers in the far flung villages has been raised to make a decent living, delivery of better health care and opening up path for better education. The support extended by the Government of Tripura for the rubber plantation development is a model to be emulated by other states.

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Chapter 5

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

This chapter presents the field based findings on the impact of the integrated rubber development projects on tribal livelihoods in the selected four districts of Tripura. The study covers 300 households (75 rubber growing households (including family labour/tapper and hired tappers) interviewed from each district and in total 300 households). It mainly shows the geographical diversity, social composition of the villages, villages under rubber cultivation, areas with vulnerability and better practices. The income aspects, class differentiation, gender dimension, division of labour, and ecological impact as well as effect of the rubber plantation project on the local community have been examined in detail through interview schedule and village information schedule followed by Focus Group Discussions (FGDs). The livelihood frame-work of the population under study was analyzed for its sustainability as per to the rating of the improvement in five types of capital assets viz. natural, physical, human, financial and social, forming the Asset Pentagon. This chapter has two parts. Part I deals with the socio-demographic particulars of the rubber growing and tapping households in the four districts of Tripura. Part II examines the profiles of the rubber growers and tappers and also looks at the backdrops of rubber tappers in natural rubber sector in the study area.

Introduction

The term ‘livelihood’ can be used in different ways. DFID adapts a version of Chambers Conway’s definition of livelihoods: “A livelihood comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.”¹ Livelihood plays a determining role in molding the identity of an individual in a society. Livelihood 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.² The concept of poverty and livelihood is intertwined to a very great extent. The better/superior livelihood option the higher is the chance of the individual to get rid of poverty. The inability to get enhanced livelihood options results in the persistence of poverty and inability, ultimately leading to ‘culture of poverty’. Thus, it advocates for a sustainable livelihood.³

Results and Discussion

Part I

5.1 Socio-Economic Profile of the Households

This section deals with the socio-economic profile of the rubber growers (including family labour/tappers and hired tappers) detailing the following aspects: Age group of the household members, size of the household, marital status, source of household income, educational background, health facilities, housing condition, source of drinking water, source of lighting, sanitation facility, pattern of land ownership, sources of livelihood, livestock, consumer durables and assets possessed by the tribal households, transport assets owned by the households, indebtedness, household expenditure, benefits from government any schemes and socio-cultural aspects and are also covered in this section. The study was conducted in four districts of Tripura: South Tripura, Gomati, Septhajala and West Tripura. The rubber growing tribal households (including family labour/tappers and hired tappers) belonging to eight Rubber Producing Societies (RPS) spread in six Gram Panchayats/villages were selected purposively for the study (See Table 5.1).

Table 5.1 Selection of Sample from the Four Districts of Tripura

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

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

The rubber plantation activities have a special socio-economic significance in rehabilitation of shifting cultivators, i.e., jhum cultivation done by the tribals of the State. Tripura is the second largest producer of natural rubber after Kerala. It is estimated that about 100,000 hectares can be brought under the rubber plantations in the State. In fact, this sector holds considerable potentiality for the development of the State especially in hilly rural areas. The productivity of rubber in the State is around 1200 kg/ha/year, which is quite high. The production of rubber in 2015- 16 was 49,942.68 MT in the State.⁴

5.2 Tribal Communities in the Study Area

Tripura a hilly State in the North-Eastern region of India is the homeland of different tribes. Altogether there are 19 (nineteen) tribes in the State and taken together they (ST population) constitutes 31.8 percent of the total population⁵. During the field visit we find five major schedule tribes residing in four district of Tripura. They are: Tripuri, Debbarma, Jamatia, Mog and Reang. The community wise representation of tribal households are shows in the following table (Table 5.2).

Table 5.2 Community-Wise Classification

Name of the Community	Frequency	Percentage
Tripuri	147	49.0%
Debbarma	33	11.0%
Jamatia	69	23.0%
Mog	40	13.3%
Reang	11	3.7%
Total	300	100.0%

of the Respondents

Source: Primary Survey, 2017

5.2.1 Tripuri Community

Tripuri are the largest tribal community in Tripura. They have first migrated in this territory and could be introduced as aboriginal tribe of Tripura. Numerically as per 2011 Census they are 5,92,255 persons in the State and highest in number among all the tribal groups. Tripura was under rule of Tripuri kings till it merged with Indian Dominion in the year 1949. Tripuris are mainly Hindus. Due to their attainments in the field of agriculture and their engagement with modern educational and health care institutions and progress in general in all walks of life, Tripuris are now treated as an advanced tribal community among the tribes of Tripura.⁶

5.2.2 Debbarma is the surname of Tripuri Clan from Tripura or the title generally used by the Kokborok-speaking (Tibeto-Burmese) Borok (Tripuri) people, the indigenous people of Tripura, a

state in India. The Debbarma, also known as “old Tripuris,” were the first to migrate to this territory. However, they have experienced the largest transformation in all spheres of life, especially agricultural practices and are now treated as superior tribal community among the tribes of Tripura. Apart from cultivating cereals, pulses, fruits, etc. in *Jhum* fields, they also collect various plants from nearby forest for food, fodder, fuel, furniture and handicraft and for the treatment of different ailments, and depend on local medical practitioners, popularly known as *Ochoi*.⁷

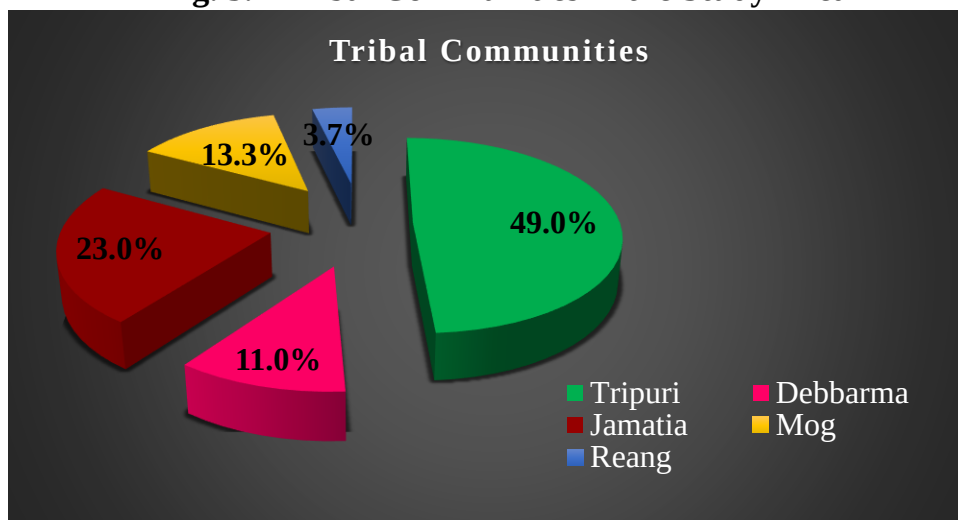
5.2.3 Jamatia Community

Jamatia is another tribal group of Tripura, having distinct feature of Mongoloid Origin. Jamatia were the major strength of Royal Army of Tripura kingdom for which they were exempted from the house taxes during princely- state. Earlier Jamatias had to live on *Jhum* Cultivation. But gradually they accustomed themselves with plough cultivation after the Tripuris. At present most of them depend on plain land cultivation beside allied economic activities⁸.

5.2.4 Mog Community

According to 2011 Census Mog population In Tripura is 37,893. Their major concentrations are at Subroom and Belonia. Mogs are Arakan tribe and migrated to Tripura through Chittagong Hill Tracts. By religion they are Buddhist. Mog community by tradition famous for their knowledge of indigenous medicine. Beside their normal economic activities some of them earn through indigenous treatment/medicine. (*Ibid.*)

Fig. 5.1 Tribal Communities in the Study Area



5.2.5 Reang Community

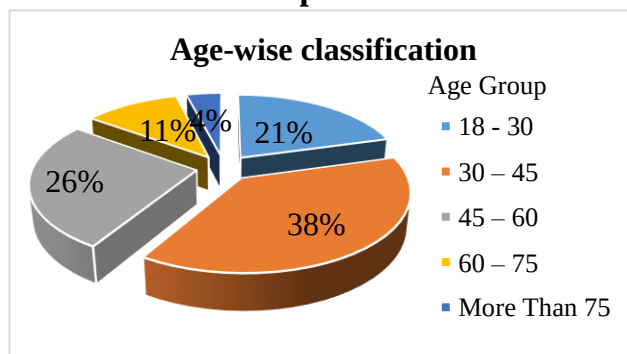
Reang are the second largest tribal community of Tripura. They are recognized as one of the 75 primitive tribes in India. Numerically as per 2011 Census they are 1,88,220 persons in this State. Reangs are said to have come first from Shan State of upper Burma (now Myanmar) in different waves to the Chittagang Hill Tracts and then to Southern part of Tripura. Due to social transition and wave of modern life, considerable changes taken place among Reangs in the field of agriculture and other economic activities, So Reangs are considered as a progressive tribe of Tripura.⁹

5.3 Age of Rubber Growers and Tappers

Table 5.3 shows the age of Rubber Grower (RG) and Rubber Tapper (RT) households among Tribal Communities in the study area. Nearly two-thirds (59%) of rubber growers fall under the age group of 18 – 45. The rubber growers in the age group between 45-60 are about one-fourth (26%), whereas rubber growers in the age group of 60 and above are the lowest (15%) in the category.

Table 5.3 Age-Wise Classification

Age Group	No. of respondent	% of respondent
18 - 30	62	20.7%
30 – 45	114	38.0%
45 – 60	79	26.3%
60 – 75	33	11.0%
More Than 75	12	4.0%
Total	300	100.0%

Fig. 5.2 Age-Wise Classification of the Respondents

Age group of the five tribal communities under the study are presented in Table 5.4.

Table 5.4 Age-Wise Classification of the Tribal Communities

Tribes/ Nos. of Persons						
Age Group	Tripuri	Debbarma	Mog	Jamatia	Reang	Total
18 - 30	24 (17%)	11 (32%)	9 (23%)	14 (21%)	4 (27%)	62 (21%)
30 – 45	56 (39%)	11 (32%)	16 (41%)	25 (37%)	6 (40%)	114 (38%)
45 – 60	40 (28%)	9 (26%)	13 (33%)	13 (19%)	4 (27%)	79 (26%)
60 – 75	19 (13%)	2 (6%)	1 (3%)	10 (15%)	1 (7%)	33 (11%)
More Than 75	6 (4%)	1 (3%)	0 (0%)	5 (7%)	0 (0%)	12 (4%)
Total	145 (100%)	34 (100%)	39 (100%)	67 (100%)	15 (100%)	300 (100%)

Gender

Out of 300 sample tribal households under study in four districts of Tripura, 249(83%) are male and 51(17%) are females (See Table 5.5). From the following table, it is apparent that Jamatia community have the highest sex ratio in the study area.

Table 5.5 Gender-Wise Classification of the Tribal Communities

Tribes/Nos. of Persons						
Gender	Tripuri	Debbarma	Mog	Jamatia	Reang	Total
Male	134 (92%)	26 (76%)	35 (90%)	41 (61%)	13 (87%)	249 (83%)
Female	11 (8%)	8 (24%)	4 (10%)	26 (39%)	2 (13%)	51 (17%)
Total	145 100%	34 (100%)	39 (100%)	67 (100%)	15 (100%)	300 (100%)

5.4 Marital Status

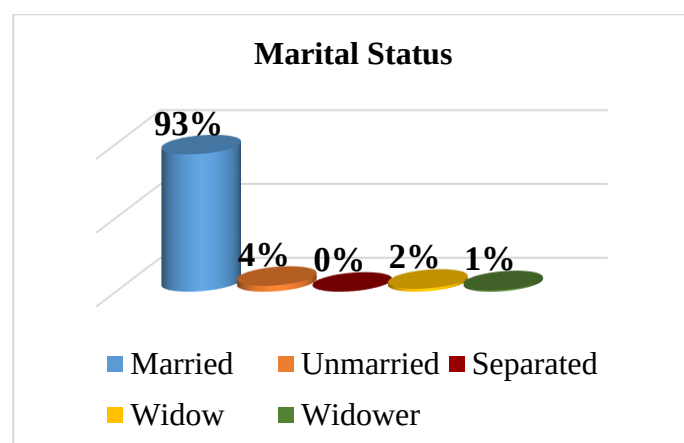
The tribes inhabiting in Tripura have unique customs and rituals for marriage. However, the institution of marriage among the tribals in Tripura has also been influenced by exposure to diverse cultures.

Table 5.6 Marital Status of the Respondents

Marital Status	Frequency	Percentage
Married	279	93%
Unmarried	12	4%
Separated	0	0%
Widow	6	2%
Widower	3	1%
Total	300	100%

Marital status of Tripura tribal communities is shown in Fig 5.3. It shows that 93 per cent of the respondents belonging to five major tribal communities in the study area are married and four per cent unmarried, two percent widow and the remaining are one per cent tribal as widowers.

Fig. 5.3 Marital Status



5.5 Size of the household

A group of persons normally living together and taking food from a common kitchen constitutes a household. The size of a household is the total number of persons living under the same roof. The percent distribution of 300 households surveyed in four districts in the state of Tripura by selected Characteristics of the household head and the number of usual household members are shown in Table 5.7. Average family size of tribals in Tripura is found to be around five (4.6), which is almost quale to the national average (4.8).

Table 5.7 Size of the Household

Household Family Size	In Numbers	In %
Below 4	170	56.67
4 to 8	118	39.33
8 to 12	11	3.67
Above 12	1	0.33
Total	300	100.00

Table 5.8 Average Size of the Sample Households

	N	Range	Minimum	Maximum	Average HH Size	Std. Deviation
HH SIZE	300	4	1	13	4.6	1.8

Fig. 5.4 Size of Household

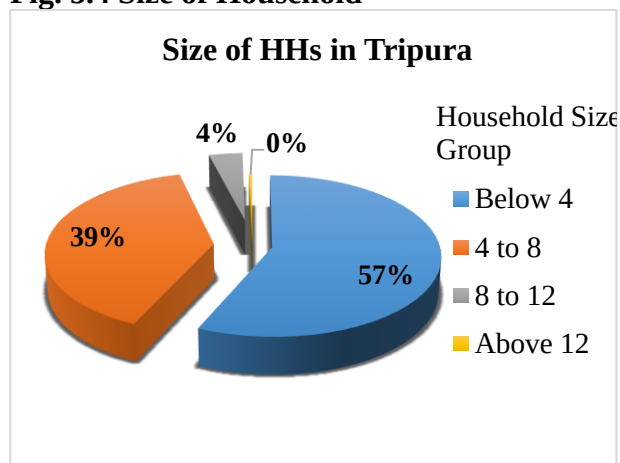


Figure 5.4 shows that the household size of 57 per cent respondents is below four, whereas 39 per cent households have the household size between four to eight members. Yet another four per cent households have household size between 8 – 12 and the lowest number of HHs (0.3 per cent) have household size of above 12 members in their household.

5.6 Education

Different organizations use the term literacy differently still today. Therefore, proper measurement of literacy cannot be done. As a result, literacy rate vary among the surveys. Literacy is the ability to identify, understand, interpret, create, communicate and compute using printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve his or her goals, develop his or her knowledge and potentials, and participate fully in the community and wider society (UNESCO 2003)¹⁰.

Table 5.9 Gender Wise Educational Profile

Gender Wise Educational Profile						
Educational background	Illiterate	Primary	Secondary	Higher Secondary	Above	Total
Male	21.7%	28.7%	25.3%	5.3%	2.0%	83.0%
Female	6.7%	5.7%	3.7%	1.0%	0.0%	17.0%
Total	28.3%	34.3%	29.0%	6.3%	2.0%	100.0%

The educational standards of tribal women are very low. Hardly few woman tribes are able to complete the class 12th standard and others generally do not go beyond secondary level. Tribal women tappers have to carry out family works as well as tapping continuously. In rare cases children or husband may help them in the allied works of tapping. Most importantly, there is no gender discrimination regarding wage rate in the field of tapping. The above table notes that the literacy rate is 71.6 in the study area. In view of their low income group of the state belonging and tribal background, the literacy rate much higher – a fact needs to be highlighted.

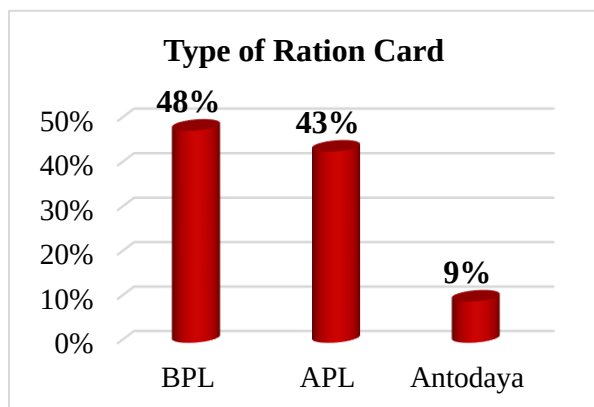
Table 5.10 Community Wise Educational Profile

Tribes/Percentage						
Educational Background	Tripuri	Debbarma	Mog	Jamatia	Reang	Total
Illiterate	23	38	23	39	20	28
Primary	39	24	41	27	33	34
Secondary	26	32	26	33	47	29
Higher Secondary	10	3	8	1	0	6
Above	3	3	3	0	0	2
Total	100	100	100	100	100	100

5.7 Possession of Ration Card

PDS (Public Distribution Systems) cardholders in Tripura are divided into above poverty line (APL) and below poverty line (BPL) categories, besides there is a separate Antyodaya Anna Yojana (AAY) category for the extremely vulnerable families. However, due to targeting errors, several poor families fell under the APL category and were excluded from the food security system as they had to procure Rs. 13 per kg for rice (a maximum of 20 kgs) from the PDS shops.

The implementation of National Food Security Act (NFSA), 2013, has enhanced effective food security coverage in the state. Under the new rules, the priority and AAY households are entitled to procure rice under the PDS at Rs 2 per kg. Further, the state has decided to continue providing grain under the PDS to non-priority (APL) households with the Centre's assistance.¹¹

Fig. 5.5 Type of Ration Card**Table 5.11 Type of Ration Card**

Type of Ration card	No of Respondent	% of respondent
BPL	143	48%
APL	129	43%
AAY	28	9%
Total	300	100%

The above Fig 5.5 shows the possession of ration card by the rubber growers and tappers family. Out of 300 households under study, 143 households (48%) have BPL Card, whereas 129 households (43 per cent) of the study sample have APL card and the remaining (9%) family have Antodaya card. It shows that about three-fifths of the (57%) households belong to below poverty line. A community-wise classification of ration cardholders is shown in Table 5.12

Table 5.12 Classification of Ration Cardholders by Community

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%)
Antyodaya	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%)

5.8 Household Income

Household income includes all receipts of the household and its members during the surveyed period. The income is estimated in total and monetary form. Monetary income includes regular receipts from: wages and salaries, other earnings, entrepreneurship, property, pensions, social benefits, regular inter-household transfers, as well as sale of property and other irregular receipts. Total income includes monetary and valued income in kind. The monthly wage earning by the rubber producing households shows that majority (70.7%) of the rubber producers get monthly income less than 10000(See Fig. 5.6). Below this band 22.3 % rubber producer earn between Rs. 10000 to 20000, while a very small proportion of them (5%) earns between Rs. 20000 to 30000. On the upper end of the scale are those (1.3%) who earn between Rs. 30000 to 40000. And, it is mere 0.7 per cent surveyed respondents who have member in their family earning above 40000 in a month.

Table 5.13 Monthly Household Income

Monthly Wages (Rs.)	No. of respondent	% of Respondent
<10000	212	70.7
10000 - 20000	67	22.3
20000 - 30000	15	5.0
30000 - 40000	4	1.3
> 40000	2	0.7
Total	300	100

Fig. 5.6 Monthly HHs Wages

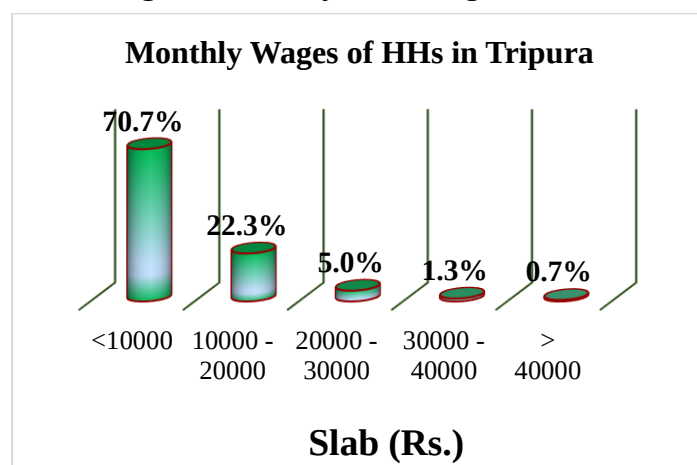


Fig. 5.7 shows the major source of income of rubber producing households. Around 1/3 surveyed population are engaged in primary sources and rest of 29 per cent population engaged secondary activities. Fig. 5.8 represent the Monthly per capita Income (MPCI) of Rubber Producer HHs. The total monthly per capita income of total surveyed HHs is Rs. 10402. Monthly per capita income from primary source is Rs. 8643 and Rs. 7003 from secondary sources

Fig. 5.7 Major Sources of Monthly Income

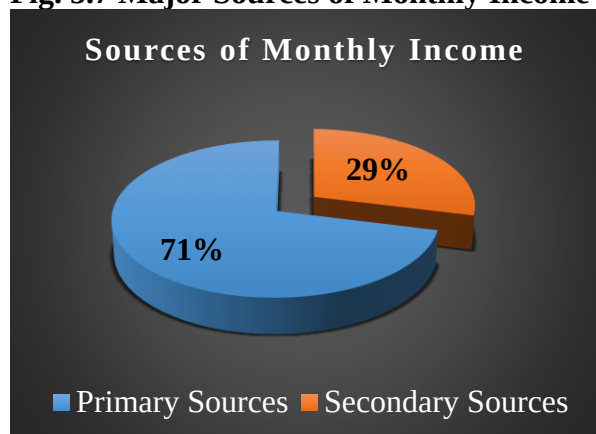


Fig. 5.8 Monthly Per Capita Income of Tribal HHs

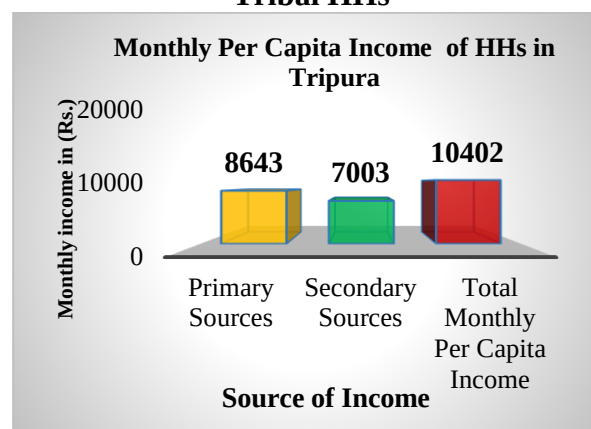


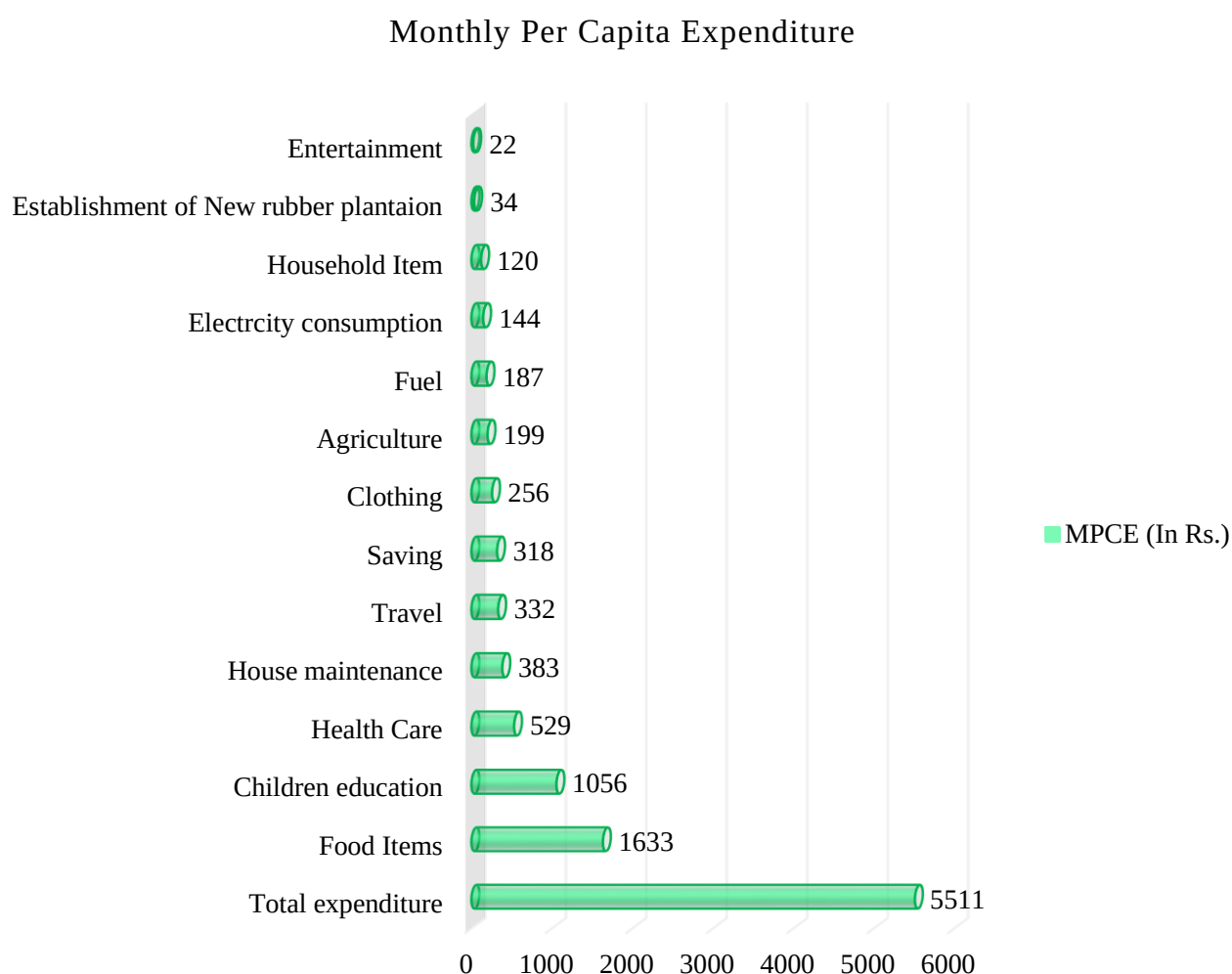
Table 5.14 Community Wise Monthly Household Income

Monthly Income	Tribes/Percentage					
	Tripuri	Debbarma	Mog	Jamatia	Reang	Total
<5000	23%	18%	36%	40%	7%	27%
5000-10000	41%	35%	46%	31%	73%	41%
10000-20000	23%	41%	18%	24%	20%	24%
20000-30000	9%	3%	0%	3%	0%	5%
>40000	4%	3%	0%	1%	0%	3%
Total	100%	100%	100%	100%	100%	100%

5.9 Expenditure

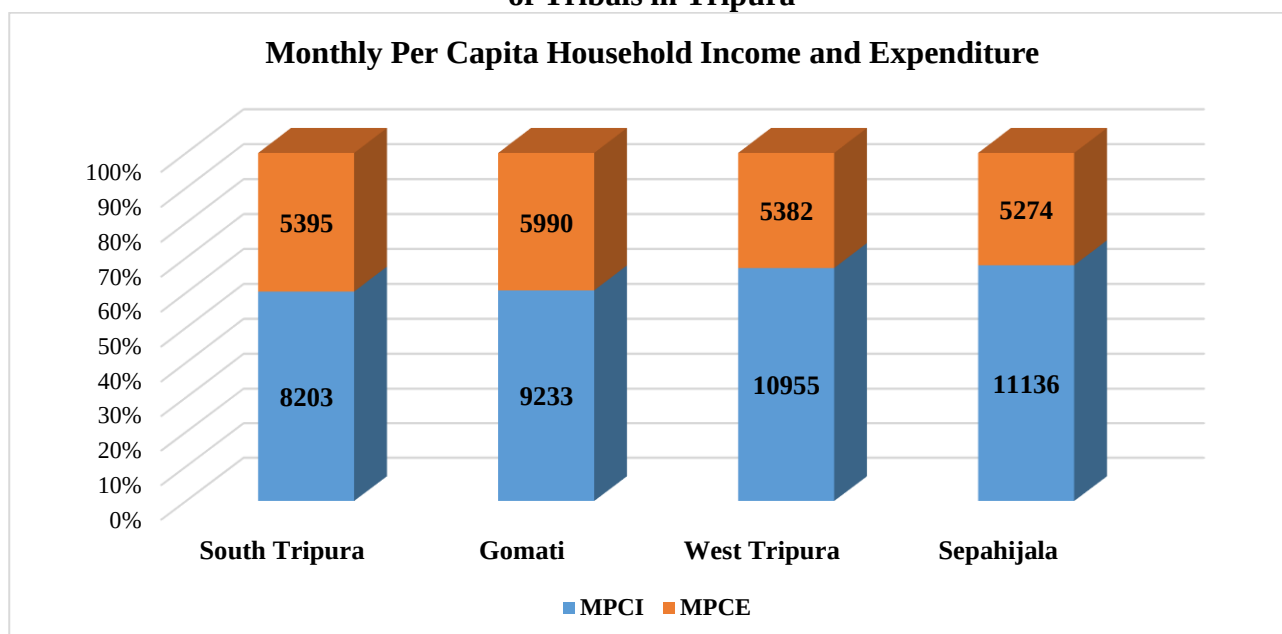
Household monthly per capita expenditure (MPCE): Generally household consumer expenditure is measured as the expenditure incurred by a household on domestic account during a specified period, called reference period. It also includes the imputed values of goods and services, which are not purchased but procured otherwise for consumption. In other words, it is the sum total of monetary values of all the items (i.e. goods and services) consumed by the household on domestic account during the reference period. The imputed rent of owner-occupied houses is excluded from consumption expenditure. Any expenditure incurred towards the productive enterprises of the households is also excluded from the household consumer expenditure. Monthly per capita expenditure (MPCE) is the household consumer expenditure over a period of 30 days divided by household size¹². In fact, monthly per capita expenditure (MPCE) analysis is calculated by dividing total expenditure from different items of a particular household by size of the household. Accordingly, the data was collected for monthly expenditure on the following items: food, clothing, foot wear, personal care, health, education for children, transportation, fuel, entertainment, expenses on farming operation, electricity consumptions, purchase of household items and also Consumer durables, establishment of new rubber plantations and savings/assets. Variables of household incomes and expenditures are estimated average per household and per person and as structure.

Fig. 5.9 Monthly per Capita Household Expenditure of Tripura Tribals



The above figure 5.9 shows that the average monthly per capita expenditure of tribal households stands at Rs 5511. Their highest expenditure is on food items (Rs.1633) and children's education (Rs. 1056). On the other hand, they spend minimum on entertainment, Rs. 22 only and little more on establishment of new rubber plantation (Rs.34). The district-wise monthly household per capita income and expenditure among tribal households under survey in Tripura is shown in figure 5.10.

Fig 5.10 District-wise Comparison of Monthly Per Capita Household Income and Expenditure of Tribals in Tripura



5.10 Occupational Profile

The nature of economic activity performed by a person is determined by his/her occupation. However, for classifying the occupation of a person the ‘National Classification of Occupations (NCO 1968)’ is used. In an occupational classification, the grouping of occupations has to be based on the fundamental criterion of ‘type of work performed’. Agriculture is the mainstay of Tripura’s economy and paddy being the principal crop. It is cultivated twice in a flat land. The paddy of April/August is *Aush*, that of August-November is called *Aman* and that of December-march is called *Bora*. Jhumming or shifting cultivation is also practiced in the tribal pockets of the state. Studies shows that the agricultural output has not been in consonance with an increase in demand over a period of time. An increase in agricultural output has been offset by a sharp rise in demand¹³. However, rubber plantation in the waste/high lands has been promoted in a big way and now it is a major source of income for both the rubber growers/plantation owners and the rubber tappers who work as daily wage labourers in rubber tapping and processing activities.

From Table 5.15 it is apparent that the majority of the surveyed respondent are engaged in rubber growing (76.7%) and rubber tapping (23.3%) activity. In addition to this, the tribal households are also engaged in agricultural and allied activities, including firewood collection, vegetable production, cottage industry, livestock’s fishery and handicraft etc.

Table 5.15 Occupational Profile of HHs

Occupational Profile	Frequency	percentage
I. Rubber Plantation	300	100%
Rubber Growers	230	76.7%
Rubber Tappers	70	23.3%
I. 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’s(animal husbandry)	61	20.3%
Fishery	13	4.3%
Handicrafts and handloom	7	2.3%

The table shows that 5.15 per cent tribal households are in service. This includes, all those who have joined as soldiers (Jawns) in Indian Army Border Security Force (BSF), Central Reserve Police Force (CRPF), Tripura State Rifles (TSR) and others working as Manager, industrial Security guard, drivers and helpers in hotel. A little over one-fourth about 27 households (9.0%) are working as agricultural wage labourers, whereas majority of 92 tribal households (30.6%) are engaged in non-agricultural work. Yet another 8 tribal households (2.7%) of the study sample were engaged in petty business as a source of earning. We also found 32 tribal households were still practicing jhum cultivation, mostly in South and Gomati district. The topographical situations of the land of South Tripura have constrained them to continue with this subsistence farming method. That apart, Jhumming requires a very minimum capital investment that can easily be borne by the tribal families. In South Tripura district, the population of Jhumia families are about 4,589 and area under Jhum is 16050 ha.¹⁴

In the traditional *Jhum* economy of Tripura, tribal women usually participated in almost all economic activities though there was some sort of a division of labour on the basis of gender and age¹⁵ (Chakraborty 1993:13). Ganguly (1993) holds that in the 'Jhumia society' women might not be equal to their male counterparts in every respect, but they are economically less dependent on them. It also makes them less vulnerable to ill treatment or suppression.¹⁶

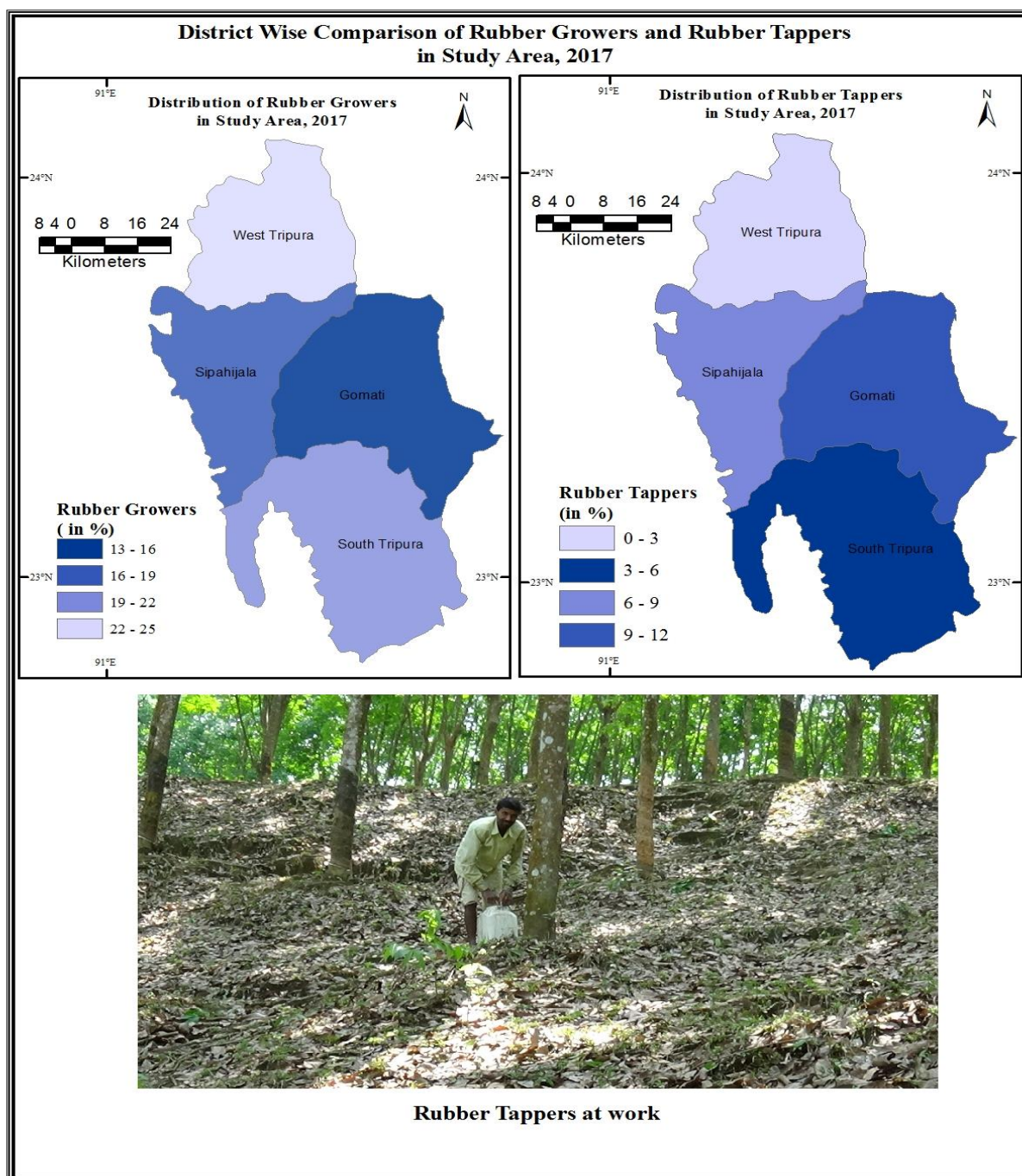
Tripura is endowed with favorable climatic conditions which offer immense scope for cultivation of various kinds of horticultural crops including fruits, vegetables, spices, nuts, flowers and other ornamentals. The horticultural sector has been establishing increasingly its credibility for improving the productivity of land, generating employment, improving the economic condition of farmers and entrepreneurs, enhancing export and above all, providing nutritional security to people. Nevertheless, it was only under the Eighth Plan that horticulture received some recognition in terms of investments in the country and the state as well in continuation, special thrust was given only in the Ninth Plan period, assigning priority in resource management, diversification and value addition¹⁷. Table 5.14 shows 14 tribal households (4.7%) of the study sample were also engaged in horticultural activities in the study areas in Tripura. Fishery, animal husbandry and village and cottage industry, handloom and handicrafts also contribute significantly to the economy of the state like agricultural and non-agricultural credit societies for instance, one-fifth (61) tribal households (20.3%) of the sample study were having livestock raising/animal husbandry as a source of livelihood. Yet, another 13 households (4.3%) of the study sample were having fishery ponds for household consumption and also for sale in the local market.

The Handloom Industry plays a dominant role in the economic development of rural people of Tripura. In Tripura there are 1,37,177. Handloom weavers as per the National Handloom Census conducted by the Government of India. 22,250 nos. weavers belong to 50 Handloom Clusters. Out of 50 these Handloom Clusters, 14 are in West Tripura, 5 in Khowai District, 9 in Sepahijala District, 6 in Gomati District, 5 in South Tripura, 5 in Dhalai District, 2 in Unakoti District and 4 in North Tripura¹⁸. The tribal women weave their fabrics for domestic use and also for ritual purposes. The Directorate of Handloom, Handicrafts and Sericulture has taken efforts to bring the weavers to commercial weaving so that they can generate some income to improve their livelihood. The Government has extended various supports and provides backward-forward linkage to the weavers by State Plan Scheme and Centrally Sponsored Project/ Schemes for upliftment of socio-economic condition of weavers' community. The rubber plantation as a source of income has become the first choice of occupation for the unemployed tribal youth population. Interestingly, it was reported by few tribal household workers that they had to work in the rubber plantation, because other sources (driver, shopkeepers, and handicraft etc.) didn't ensure regular income for meeting their day-to-day needs.

Table 5.16 District-Wise Occupational Profile of Tribal Households

Occupational Profile	Frequency	Percentage Points	South Tripura	Gomati District	West Tripura	Shipaijala District
I. Rubber Plantation	300	100	75	75	75	75
Rubber Glowers	230	76.70	67(22.3)	41(13.0)	71(23.7)	51(17.0)
Rubber Tappers	70	23.30	8(2.7)	34(11.3)	4(1.3)	24(8.0)
II. Other Occupational Activities						
Service	14	4.70	8(2.7)	2(0.7)	2(0.7)	2(0.7)
Agriculture Labourers	27	9.00	10(3.3)	2(0.7)	7(2.3)	8(2.7)
Daily Wages	92	30.60	24(8.0)	30(10.0)	30(10.0)	8(2.7)
Jhum Cultivation	32	10.70	8(2.7)	19(6.3)	1(0.3)	4(1.3)
Firewood collection	32	10.70	0(0)	17(5.7)	8(2.7)	7(2.3)
Vegetables	14	4.70	1(0.3)	1(0.3)	7(2.3)	5(1.7)
Petty business	8	2.70	1(0.3)	2(0.7)	2(0.7)	3(1.0)
Livestock's	61	20.30	12(4.0)	16(5.3)	19(6.3)	14(4.7)
Fishery	13	4.30	6(2.0)	2(0.7)	2(0.7)	3(1.0)
Handicraft	7	2.30%	4(1.3)	0(0)	2(0.7)	1(0.3)
Total	300	100%	74(24.7)	91(30.3)	80(26.7)	55(18.3)

Map. 5.1 District Wise Comparison of Rubber Grower and Rubber Tappers

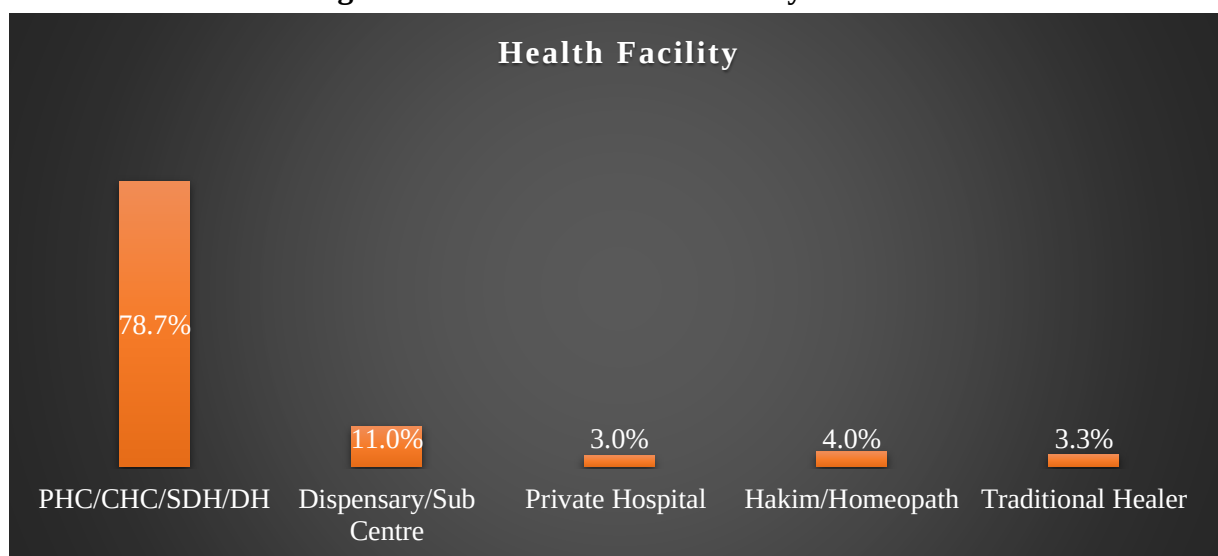


5.11 Health

Health is defined by the World Health Organization [WHO] as a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity.¹⁹ Health is one of the vital elements that determines human development and progress in a given time and space. Good health and long life are valued possessions. In the words of Nobel Laureate, Amartya Sen, "*Bad health is constitutive of poverty, premature mortality, escapable morbidity, undernourishment are all manifestations of poverty. I believe that health deprivation is really the most central aspect of poverty.*"²⁰ Tripura, being located in south-west corner of the North-Eastern Region, has suffered due to infrastructure and other bottlenecks, which has adversely affected its economic development.

The high incidence of poverty and backwardness are also reflecting on the health condition of the State. Although the state suffers due to shortage of adequate health manpower, concerted efforts made by the State Government, there has led to a positive change in the health scenario in recent years.²¹ The main focus under the health and family welfare sector is "health care for all" in the State with particular reference to the poor in general and tribal populace. The State has comparatively performed better in the field of health & medical facilities, thanks to resources, both physical and material under the national rural health mission (NRHM) a centrally sponsored scheme. Additionally, the State Health Department, taken great strides in providing comprehensive health insurance coverage, especially to poor people.

Fig 5.11 Health Facilities Availed by the HHs



The above fig. 5.11 shows the preference of the members of the surveyed households for the health check-up. More than three-fourth (78.7%) respondent from the tribal community preferred to go to the Public Health Centre (PHC)/Community Health Centre (CHC) and Sub-divisional Hospital (SDH) for health check-up. About 11 per cent tribal household members reported of availing the health care facilities at Dispensary and Sub-centres. Those who reported visiting private hospitals for health care comprised mere 3 percent, whereas almost equal proration (3.3%) used traditional healing practices in case of sickness. However, another 4% tribal households still rely on the *hakim/homeopathy* for treatment.

5.12 Housing Characteristics

Every structure, tent, shelter, mud walled, thatched, brick walled etc. is a house irrespective of its use. It may be used for residential or non-residential purpose or both or even may remain vacant.

Fig. 5.12 Housing Structure

Table 5.17 Dwelling Status

Housing Status	No of HHs	% of HHs
Mud walled & thatched house	36	12
Mud walled & tin-roof	253	84
Brick walled & concrete-roof	11	4
Total	300	100

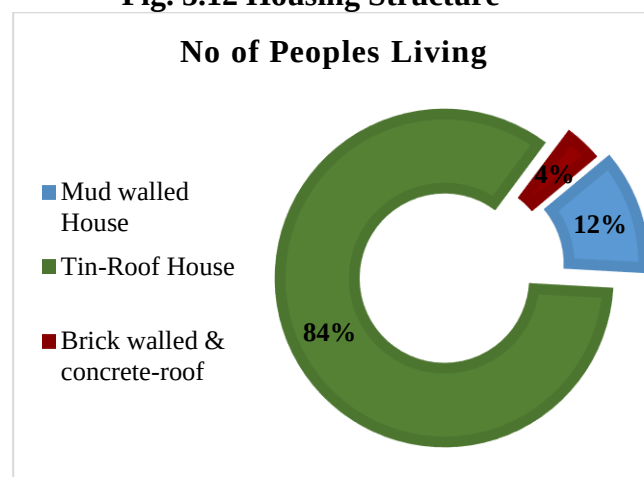
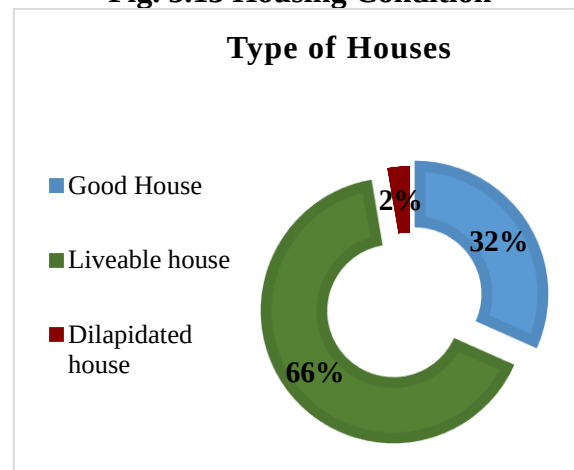


Fig. 5.12 shows that an overwhelming majority of 84 per cent tribal households reside in tin-roofed house, indicating these households belonging to lower middle income groups. A very small fraction of tribal households merely four per cent who are well-off, thus belonging to high income groups live in brick-walled and concrete-roof house. Yet another 12 per cent tribal households live in mud-walled house.

5.12.1 Housing Condition

Housing condition is a significant physical asset for livelihood. In our sampled households around 66 per cent live in liveable houses as perceived by them and 32 percent HHs live in good condition houses. Only 2% households live in dilapidated type of houses.

Fig. 5.13 Housing Condition

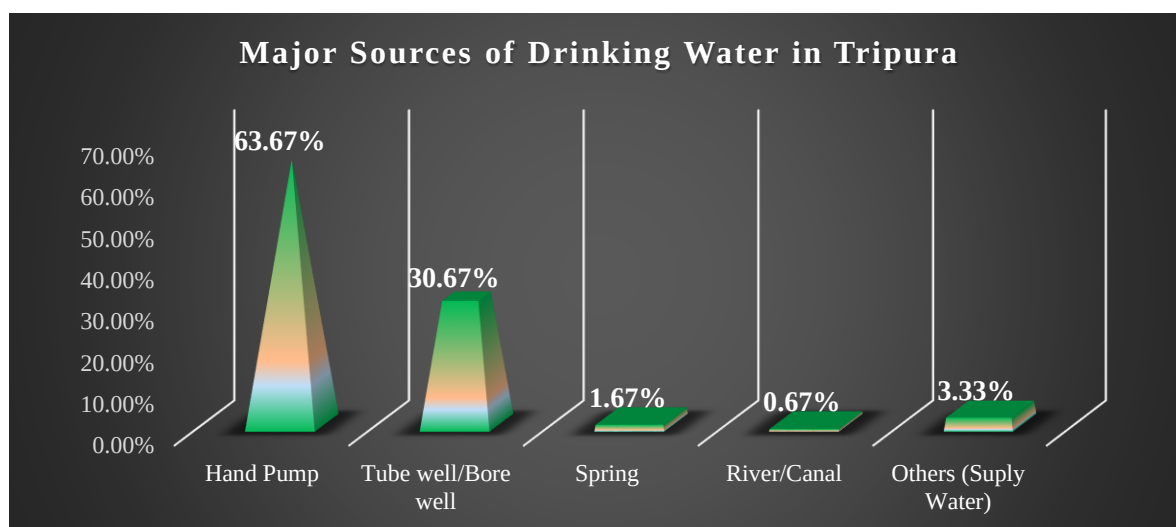


5.13 Source of Drinking Water

The safety and accessibility of drinking water are major concerns throughout the world. Health risks may arise from consumption of water contaminated with infectious agents, toxic chemicals, and radiological hazards. Therefore improving access to safe drinking water can result in tangible improvements to health.²²

Majority of 63 per cent (Fig. 5.14) of tribal households affirmed using water from hand-pump for drinking purpose, while, it is tube well for 30.7 per cent surveyed tribal households and the rest (2.34 %) rely on river and canal. Only about 3.33 per cent tribal households reported using potable water supplied by the government of Tripura. There is high level of contamination of iron and manganese in the groundwater of Tripura, we were told.

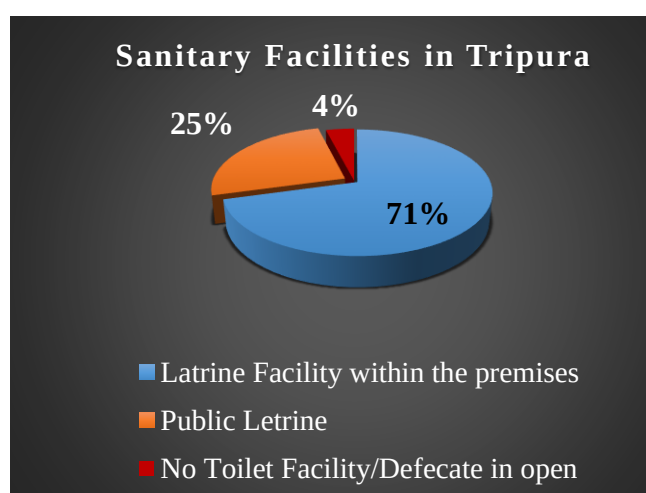
Fig.5.14 Major Source of Drinking Water Facilities



5.14 Sanitation

Swachh Bharat Mission SBM(G) earlier known as Total Sanitation Campaign (TSC) is a comprehensive programme to ensure sanitation facilities in rural areas with broader goal to eradicate the practice of open defecation. As a part of reform principles, SBM (G), was initiated in 1999 when Central Rural Sanitation Programme was restructured making it demand driven and people centered. It follows a principle of "low to no subsidy" where a nominal subsidy in the form of incentive is given to rural poor households for construction of toilets²³. SBM (G) gives strong emphasis on Information, education and communication (IEC), capacity building and hygiene education for effective behavior change with involvement of PRIs, CBOs, and NGOs etc. The key intervention areas are individual household latrines (IHHL), school sanitation and hygiene education (SSHE), community sanitary complex, anganwadi toilets supported by rural sanitary marts (RSMs) and production centers (PCs). The main goal is to eradicate the practice of open defecation by 2019²⁴.

Fig. 5.15 Sanitary Facilities



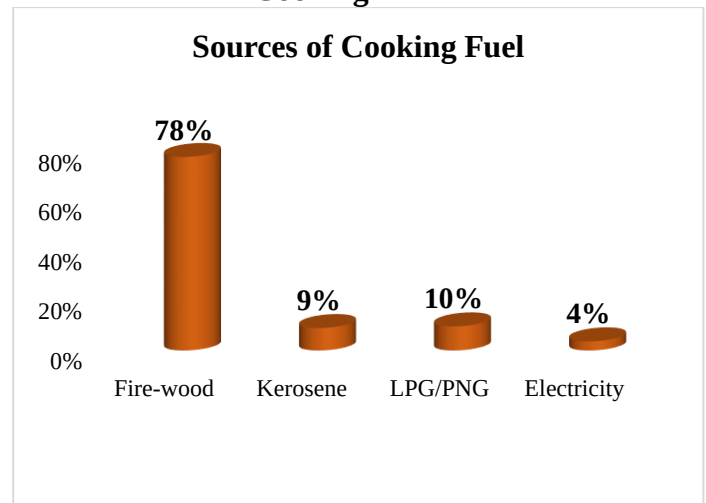
About 71 per cent of the tribal household in the four districts of Tripura are having latrine facility within their own premises, whereas 25 per cent of the tribal households using public toilets for sanitation. The tribal households still going for open defecation comprise a tiny fraction, four per cent of the tribal households, covered under the survey.

5.16 Cooking Fuel

A survey of 300 households in four districts in Tripura shows a distinct profile of energy use for cooking in Tripura. Firewood based energy remains the largest supply source with 78 per cent, whereas, 10 per cent rural/tribal households have LPG/PNG gas connection. Kerosene based energy

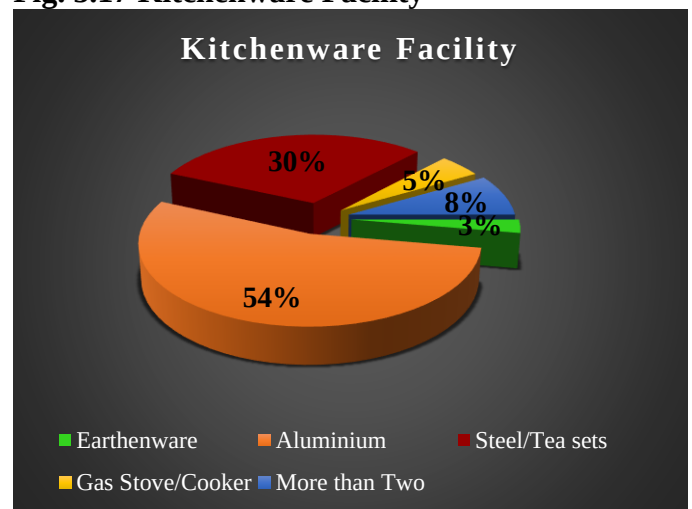
use among the rural/tribal households in the study area is also still prevalent among 9 per cent of the respondents. Use of electrical energy in these households, show a very low 4 per cent in the study area. The details of energy use pattern are given in Fig. 5.16. Thus, it is clear from the table that tribal people in Tripura are mostly using firewood as their principal source of energy for cooking and heating purpose. This source of energy has its share of ill-effects like, local deforestation, health issues and ecological issues. Biogas can be the solution for the socioeconomic problems faced by the people living in rural areas of Tripura.²⁵ For the biogas technology can minimize the dependency on fossil fuel and if it is used wisely then it can also open doors for financial opportunities. Use of biogas is being promoted by the government machinery but so far the impact has been nearly negligible.

Fig. 5.16 Households by Fuel Used for Cooking



Kitchenware is any tools, utensils, appliances, dishes, and cookware, that can be used in the process of food preparation, cooking or baking, or the serving of food .Kitchenware can also be used to hold or store food before or after preparation. Fig. 5.17 shows that the tribal community in the study areas in Tripura are mostly using Aluminium utensils (54%), whereas the percentage of other sources is less. As it is observed that 8 per cent tribal households were using more than two sources of kitchenware. Steel/chinaware sets, gas stove being more expensive compared to aluminium, or earthenware for that matter, therefore still not opted by a very large proportion of tribal households

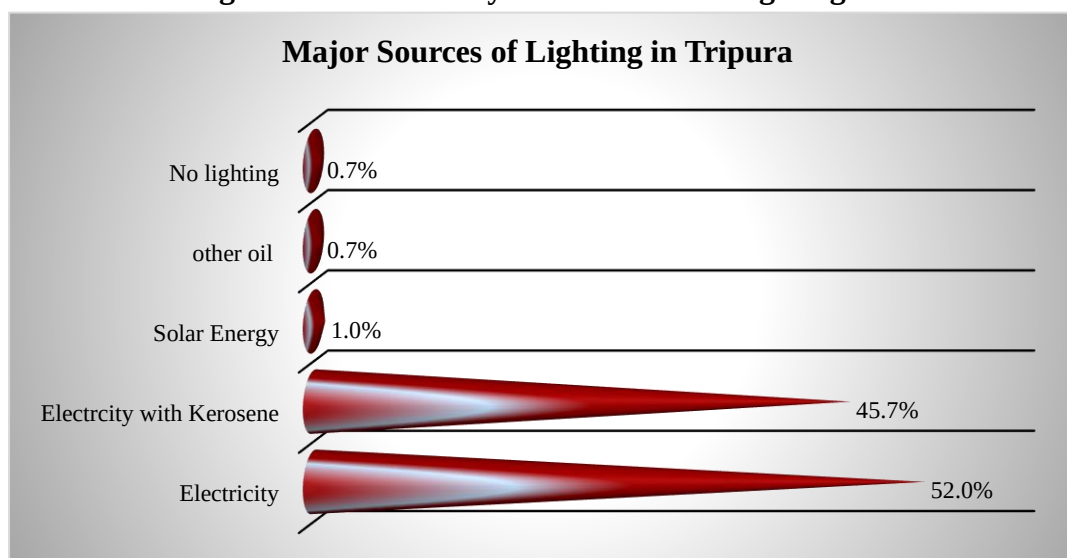
Fig. 5.17 Kitchenware Facility



5.17 Lighting

The following figure depicts the household's main source of lighting. It shows that 52 per cent tribal households in the study area have grid electricity connection, whereas, 45.7 per cent households use Kerosene. Thus, it was observed however, that almost 97 per cent ST households have various sources of lighting facility (including electricity and Kerosene) within the premise.

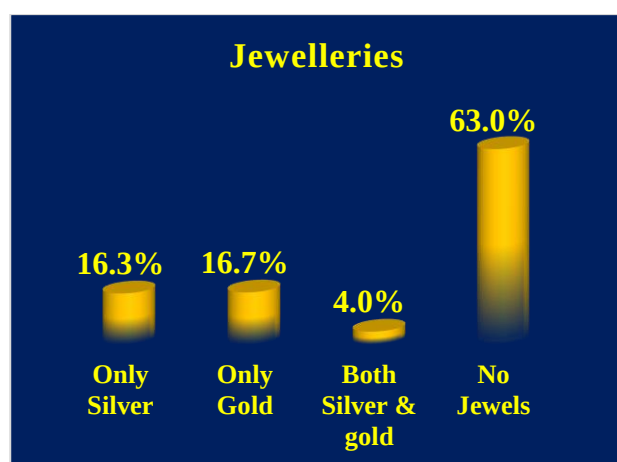
Fig. 5.18 Household by Main Source of Lighting



5.18 Tribal Jewelleries in Tripura

The jewelleries of Tripura are very unique and are crafted by local people. The jewelleries are made of mainly bronze, silver and copper. The uniqueness of these jewelleries lies in its coin shaped designs. Coins of metals are made to form a necklace or earrings or anklets or even headbands. The women prefer to wear big and heavy bangles known as “Kara” for traditional occasions. Animal horns and bones are also used for jewellery making. Apart from the coin jewelleries, there are also the handmade bamboo and cane jewelleries. The village craftsmen use their art to transform bamboos into various items such as bamboo bangles, bamboo earrings, cane trendy necklaces and many other articles. The bamboo earrings are very light weight and all the bamboo jewelleries come in various attractive colors also. Tripuri men usually do not prefer wearing jewelleries. On specific occasions, some may wear metal rings along with headbands and belts made of coins. This attire looks great with the traditional costume. This is not to dreams that occasionally men also wear a single “Kara” or bangle in one hand²⁶. However, the tribals especially from Debbarma community have been influenced by the Bengali culture and they wear the ornaments made of gold, silver etc. The following table depicts the use of gold and silver jewelleries by the tribal communities in the state.

Fig. 5.19 Possession of Jewelleries



It was noted from the fig (Fig. 5.19) that only 37 per cent ST households had jewels for as traditional ornaments and 16.3 % jewels were made of silver alone. Nearly 16.7 per cent have also gold jewelleries but only few (4%) tribal households have both type of jewelleries.

5.19 Land and Livelihood

The pattern of ownership of land in Tripura is complicated by the fact a large area under forests, are not available for individuals practice of shifting cultivation in forest areas²⁷. Land is one of the most crucial and vital resources of tribals, their economy being predominantly limited to land and forest. It is also an important factor determining socioeconomic status and power in society. Possession of land gives status, stability and determines the life style of every community. The Government of Tripura is one of the few governments to have implemented land reforms, the most important components of which are the restoration of alienated land to tribal families and distribution of government-owned land. Until 2005, land amounting to 7,147 acres had been distributed to around 9,000 tribal families. Another 37,349 families received 34,598 acres of government owned khas land between 1997 and 2005.

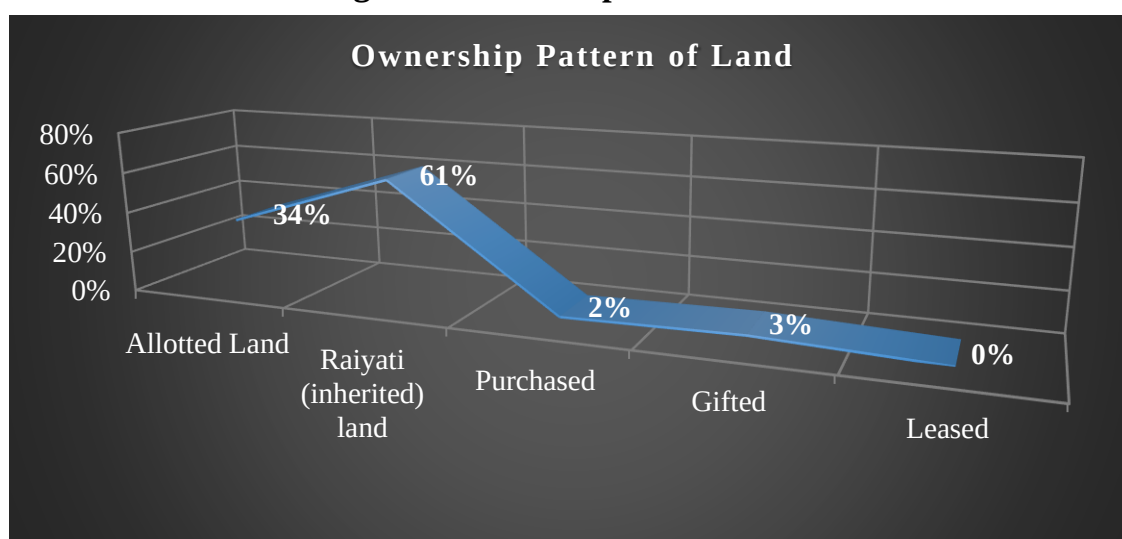
The Scheduled Tribes and Other Traditional Forest Dwellers (recognition of forests rights) Act, 2005, that came into force on December 31, 2007, said, “Those tribals primarily residing in forests and who depend on forests and forest land for a livelihood and have been residing in the forest for 75 years are eligible to get the settlement in the forest land.” Besides demanding reduction in stipulated period, the state government asked for settlement in the forest land for non-tribals as well. After the enactment of the tribals Forest Right Act by the Centre, as many as 129,249 tribal families and 32,937 non-tribal families have applied to the government for getting settlement in the forest through this *patta* system. Tripura government has so far distributed land deeds among 82,000 tribals, who account for about 33 per cent of Tripura’s 3.5 million population²⁸.

5.19.1 Patterns of Land Ownership

Land ownership in Tripura is of allotted, *rayati* (inherited), purchased, gifted and leased in nature. Customary laws of inheritance among tribals in Tripura is patrilineal with daughters sometimes receiving land only as gift from their fathers.

Though the system of inheritance is patrilineal among the Tripuris, the father usually gives daughters some land. This is a kind of gift and the prospective heirs do not raise any objection against the practice²⁹. Similarly, among the Jamatias and Halams and Mogs of Tripura daughters do not inherit paternal property; but in practice, the rule is not strictly adhered to. Hence, there are many instances of daughters receiving a share of the family property³⁰.

Fig. 5.20 Ownership Pattern of Land



From the above Fig 5.20 it is apparent that the 61 per cent tribal households have inherited (*Raiyati*) land and 34 per cent people have allotted land in the study area. That apart only 2 per cent people have purchased land and 3 per cent people have gifted land.

5.19.2 Ownership of Livestock

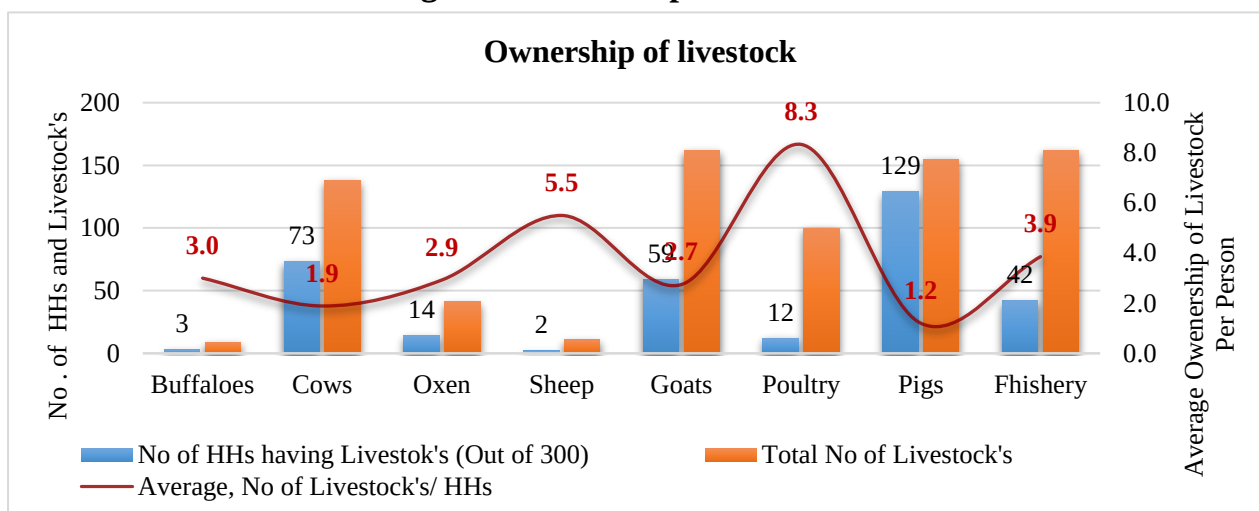
Under livestock based livelihoods, majority of tribal households are engaged in raising buffaloes, cows, oxen, sheep, goat rearing, poultry, piggery, fish culture mainly as a supplementary source of income. Pig rearing is popular among tribal population. Out of 300 tribal household 213 HHs (71%) have livestock and remaining 87 HHs (29%) do not possess any livestock. Further, 121 tribal households (40.3%) out of 213 tribal HHs, 159 tribal HHs have multiple livestock such as buffaloes, cows, sheep etc.

Table 5.18 Ownership of Livestock

Type of Livestock	No of HHs having Livestock (Out of 213)	Total No of Livestock	Average, No of Livestock/ HHs
Buffaloes	3	9 (1.2)	3.0
Cows	73	138 (17.7)	1.9
Oxen	14	041 (5.3)	2.9
Sheep	2	11 (1.4)	5.5
Goats	59	162 (20.8)	2.7
Poultry	12	100 (12.9)	8.3
Pigs	129	155 (19.9)	1.2
Fishery	42	162 (20.8)	3.9

According to field survey (see figure 5.21), goats and fishery constitute majority of 20.8 per cent of the total livestock population in Tripura, followed by pigs (19.9%), cow (17.7%), poultry (12.9%), oxen (5.3%), sheep (1.4%) and buffalo (1.2%). While the average ownership of livestock's per household is 3.6.

Fig. 5.21 Ownership of Livestock



5.19.3 Consumer Durables

Consumer durables are a category of consumer products that do not have to be purchased frequently because they are made to last for an extended period of time (typically more than three years). They are also called durable goods or durables. The survey data shows that 276 tribal households (92%) possess consumer durables and assets, whereas 24 tribal households (8%) do not possess any consumer durables and assets those who belong to very poor tribal family.

Table 5.19 Consumer Durables and Assets

Type of consumer durables	No of HHs have own Durables (Out of 300)	Total No of Durables	Average, No of Durables/ HHs
Radio	6	6	1
Television	213	226	1.06
Mobile Phone	245	371	1.51
Pressure cooker	34	37	1.09
Gas stove	33	37	1.12
Refrigerator	48	52	1.08
Fans	235	433	1.84
Others	3	2	0.67
HHs with no Consumer Durables	24	0	0

Fig.5.22 Consumer Durable and Assets

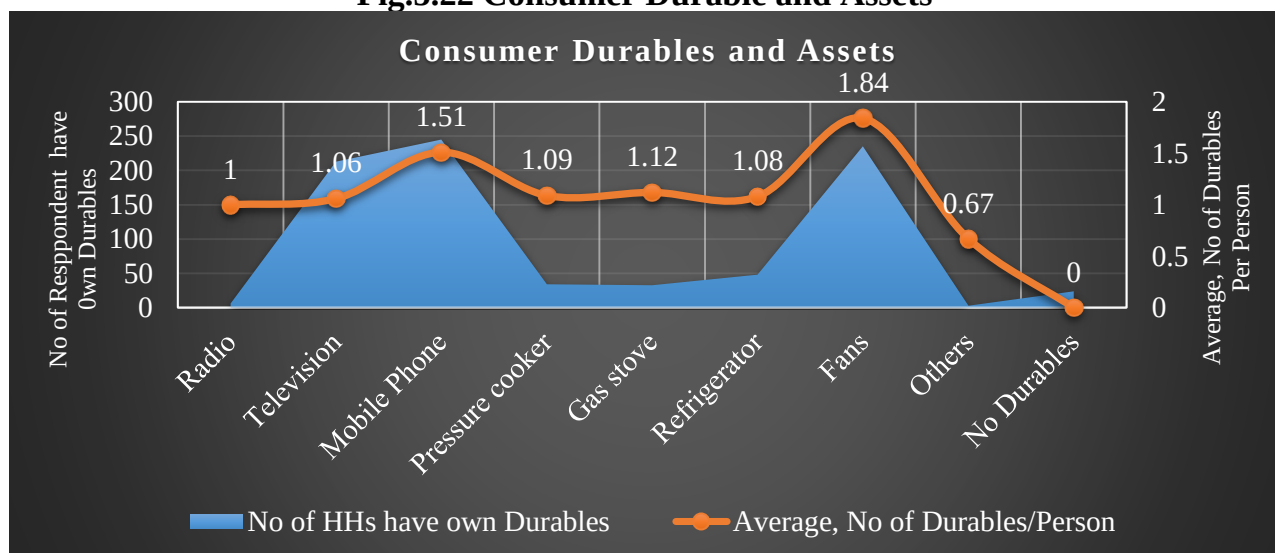


Fig.5.22 shows that the average number of consumer durables per person and total no of consumer durables in their HHs. Mobile phones (1.51) and fans (1.84) are largest no of consumer durable frequency in the households and radio (1) is the lowest frequency in all consumer durables. And only 8 per cent of HHs do not possessed any consumer durable items.

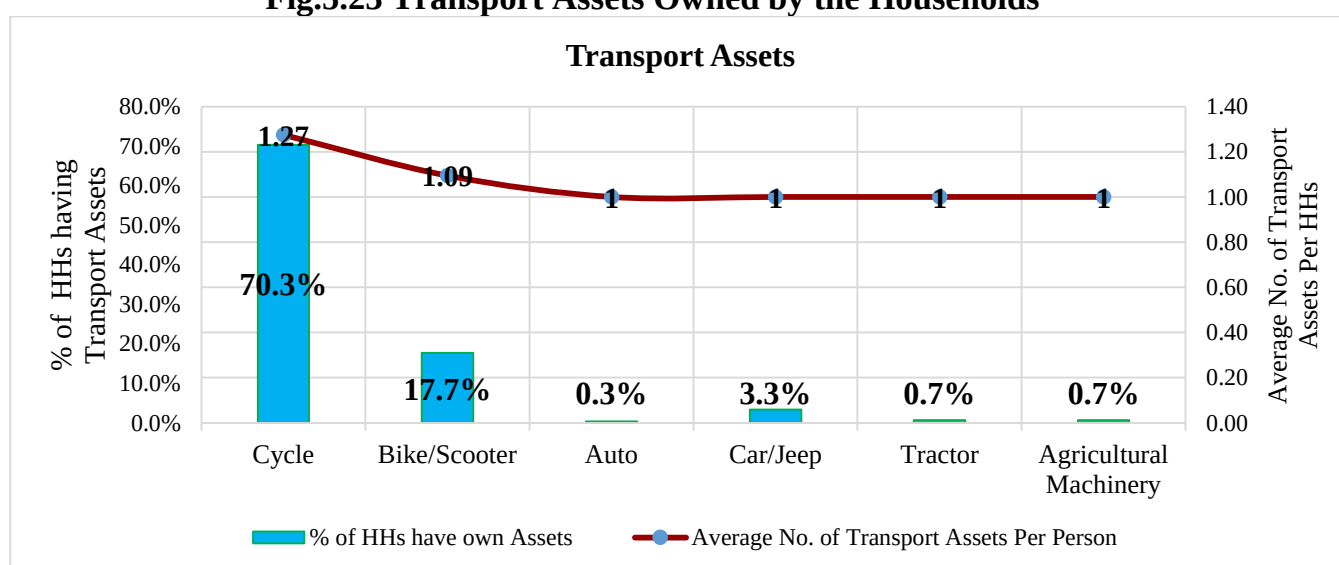
5.19.4 Transport Assets

The availability of the following modes of transport - Bicycle, Bike/Scooter, Auto, Car/Jeep, Tractor and Agricultural Machinery was ascertained among the tribal households in the study area. The survey enquired about the availability of transport assets and their number of ownership.

Table. 5.20 Transport Assets

Transport assets	Total No. of Transport assets	No of HHs having Assets (out of 300)	Average No. of Transport Assets Per Person
Bicycle	269	211	1.27
Bike/Scooter	58	53	1.09
Auto	1	1	1
Car/Jeep	10	10	1
Tractor	2	2	1
Agricultural Machinery	2	2	1
No own assets	0	70	0

Fig.5.23 Transport Assets Owned by the Households



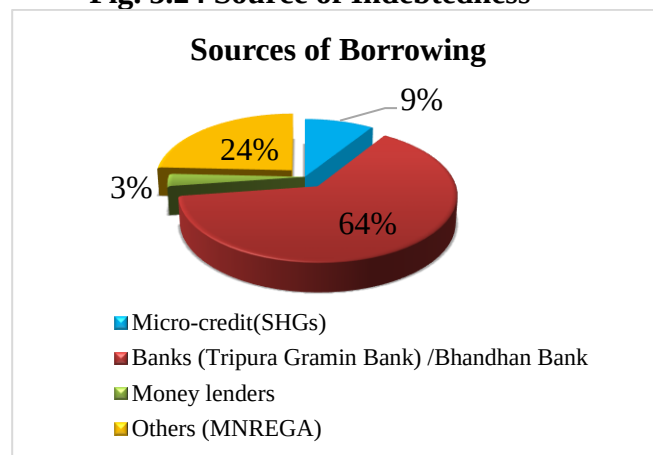
The above Fig.5.23 shows the average number of transport assets per person. Accordingly, cycle appears to be the major transport assets of the tribal and rural HHs, whereas cycle (1.27) also happens to be the largest number of transport assets among the HHs. Frequency of the other transport assets is less amongst the households. It was observed that the 23.3 per cent HHs do not have any transport assets.

5.20 Indebtedness

Indebtedness indicates economic condition of the tribal households in the study area. This also reflects unequal distribution of socio-economic opportunities and benefits, arrests social progress and misdirects social efforts³¹. The survey results indicate that one-third of tribal households out of 300 sampled household (63.6%) have taken loan from the nearest Tripura Gramin/Bandhan Bank (Table 5.21). Another 24.2 per cent tribal households have borrowed from other sources including MGNREGA Fund. Few Self Help Groups (SHGs) are existing in the study area and these SHGs are linked to Tripura Gramin Bank that have extended loan to 9 per cent tribal households. These borrowers are members of those groups in the neighbouring villages.

Table 5.21 Source of Indebtedness

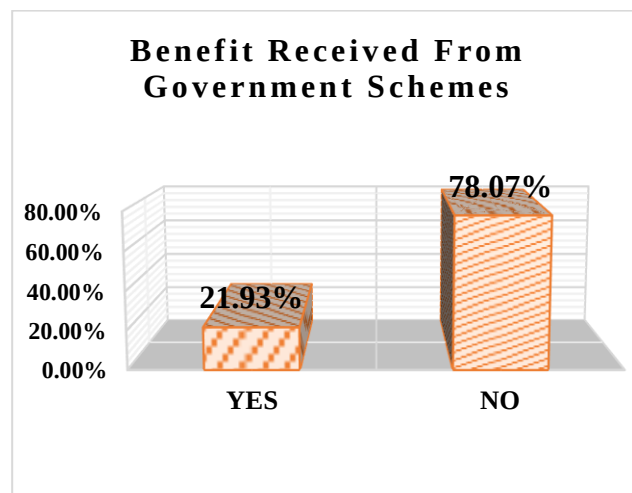
Sources	No of Household that have acquire loans	% of Household that have acquire loans
Micro-credit(SHG)	9	9.1%
Banks (Tripura Gramin Bank) /Bhandhan Bank	63	63.6%
Money lenders	3	3.0%
Others (MNREGA)	24	24.2%

Fig. 5.24 Source of Indebtedness

5.20.1 Government Scheme and Development Programs

From the following fig.5.25 it is noted that out of 300 informants, only around 22 per cent household have received benefits from government schemes such as IAY, MGNREGA etc. In other words, those who have not received benefit from any of the official schemes so far accounts for as high as 78 per cent, a very high figure.

Thus, the study indicates that there is no visible impact of plethora of development schemes/programmes implemented in the study areas covered in the four districts in Tripura aimed at enhancing education, health and drinking water facilities. Further, the study also reveals that Reangs happens to be the most backward among the tribal groups in the state as compared to Debbarmas, Mogs, Tripuri and Jamatia.

Fig. 5.25 Benefit Received by Tribal Households from Government Schemes

5.21 Socio –Cultural Aspects

The cultural heritage of the State is exceptionally unique in nature. Most of the people of the State pursue different religion, faith and belief in their way of life and living in a very congenial manner keeping peaceful co-existence³². Most of the inhabitants of the State are Hindus and rest are Muslims, Christians and Buddhists and so on. The major language of communication of the State is Bengali which was the State language of Manikya dynasty for a very long time. Besides this, Kokborok is also spoken as second State language by some in Tripura. In fact, a few other dialects of different communities are also prevailing here. A mixed culture has developed over a long period of time, yet there remains sharp difference in respect of religion, caste, creed, language, food habits, dress and also some other traditional aspects of life³³. Society and Culture of Tripura represents a fine blend of traditional and contemporary aspects. The society of Tripura primarily comprises of a number of tribal groups. Along with the tribal culture and beliefs in the state, the culture of the Bengali and Manipuri flow side by side. The social structure of Tripura shows a harmonious co-existence of various tribal and non- tribal communities. There are various marriage customs and property inheritance system that showcases the inherent traits of the society of Tripura. The cultural domain of Tripura is rich with a wide gamut of various multi-dimensional features. Festivals, folk dance and

music are the prime elements of the Tripura culture.³⁴ The socio-cultural status of the informants (tribal households) have been analysed with the help of selected indicators as shown in table 5.22. Possession of ration card is an important subsistence tool for the rural poor; it also provides proof of identity and a connection with government databases. India's public distribution system (PDS) is based on the ration card, which it uses to establish identity, eligibility, and entitlement. Similarly, possession of voter identity card for the rural households is a sense of pride and it enables the households to vote and participate in the electoral processes. It was observed during the survey that almost every households in the study area have identity card, be that ration card, or voter identity card. Ration card.

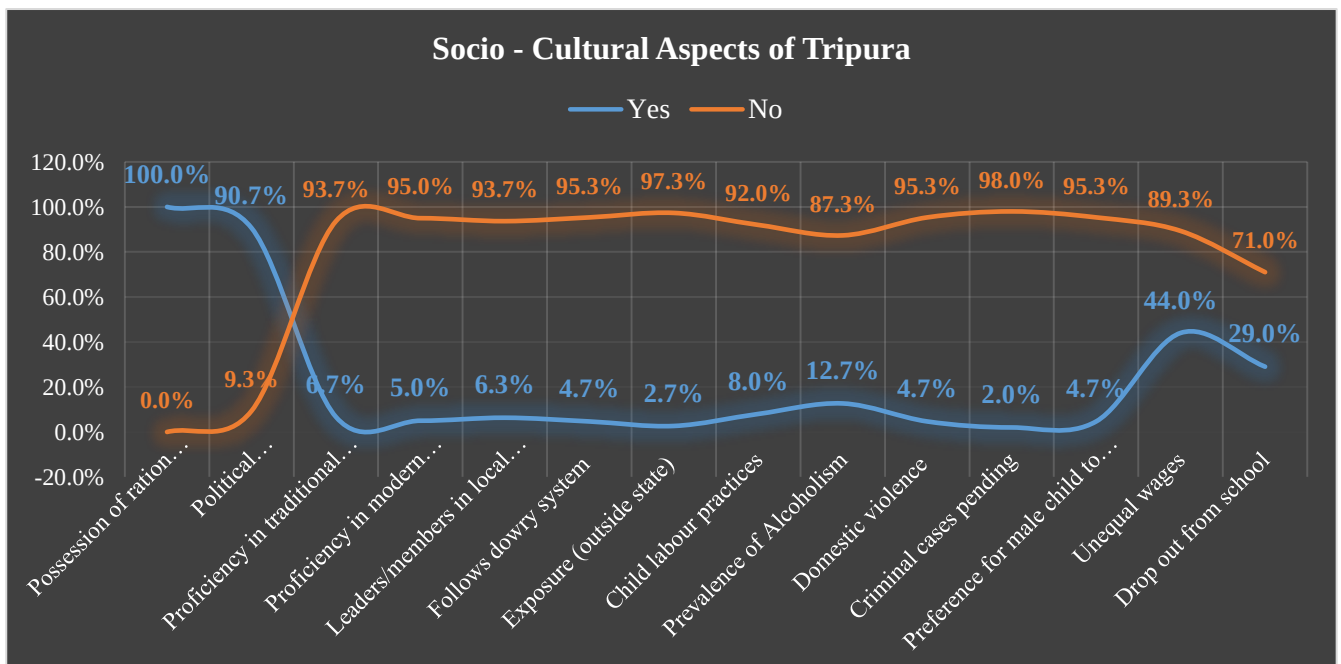
The system of dowry has not yet taken the villainous shape as it took in the non-tribal communities, but it has made its entry in to the tribal pockets³⁵. It is often argued that work participation capacity of tribal girls in the state of Tripura was instrumental in fetching a 'price' for them in marriage settlements³⁶. This does not mean that woman in tribal society of Tripura have been reduced to a position of 'marketable commodity'. Rather, the practice of bride price prevalent among the *Tripuris*, *Riangs*, *Jamatiyas* or *Kukis* could be seen as an indicative of the higher social status being attached to their women folks. One pointer to such a condition is the widespread practice of 'marriage by service' under which a young man has to serve at the residence of girls' parents for a certain period (from six months to three years) to prove his credibility, capability and morality. However, the institutions of marriage and the bride price has been changing over a period of time due to the process of urbanisation and migration of tribals to the urban areas in the state. Bride price is being gradually replaced by dowry systems. The changing marriage practices of urban tribals also bear the imprint of the local Bengali culture. The social evils called dowry is fast growing among them and this has undermined the traditional status of tribal women in the state³⁷. Even for the tribals living in remote areas, exorbitant dowry demands of prospective grooms are not uncommon in contemporary times. Indeed, urban tribals have almost given up their age-old marriage customs like bride price, marriage by service, observing exogamy, serving liquor to the bridegroom party during marriage ceremony, called *Ochai* (tribal priest) to perform marriage rites etc. Interestingly, more than 95 percent tribal households reported that they didn't follow dowry system i.e. neither they take nor give dowry during the marriage. It was reverse in case of 4.7 per cent households that revealed there is practice of dowry in marriage. It needs mentioning, however, that dowry is being practiced vigorously among Debbarma community, either in cash or kind like gifts, gold, furniture etc.

Table 5.22 Socio – Cultural Status of Tribals

Types of Socio-Cultural Status	Yes	No
Possession of ration card/voter ID Card	300 (100.0%)	0 (0.0%)
<i>Political consciousness/affiliation</i>	272 (90.7%)	28 (9.3%)
<i>Proficiency in traditional music/dance</i>	20 (6.7%)	281 (93.7%)
<i>Proficiency in modern cultural items</i>	15 (5.0%)	285 (95.0%)
<i>Leaders/members in local bodies</i>	19 (6.3%)	281 (93.7%)
Follows dowry system	14 (4.7%)	286 (95.3%)
<i>Exposure (outside state)</i>	8 (2.7%)	292 (97.3%)
<i>Child labour practices</i>	24 (8.0%)	276 (92.0%)
<i>Prevalence of Alcoholism</i>	38 (12.7%)	262 (87.3%)
Domestic violence	14 (4.7%)	286 (95.3%)
<i>Criminal cases pending</i>	6 (2.0%)	294 (98.0%)
Preference for male child to female child	14 (4.7%)	286 (95.3%)
<i>Unequal wages</i>	132 (44.0%)	268 (89.3%)
Drop out from school	87 (29.0%)	213 (71.0%)

Almost 95 per cent households reported that domestic violence or wife beating is not common among the tribal communities in Tripura. Preference for son or male child is also not the case among tribal communities in general, through a small fraction, 4.7 per cent tribal household revealed their preference for male child. School dropout among tribal children is a major concern, about 29 per cent tribal households reported dropping of their children from school. Though Tripura has achieved the first position in literacy attainment in the country, quality of education starting from primary to higher level has not improved. There are many schools that also lack required amenities like drinking water, infrastructures and school toilets. Lack of toilets in the government schools forced many girl students to leave the schools. The Fig 5.26 shows the different socio – cultural aspects of surveyed tribal households of Tripura.

Fig. 5.26 Socio – Cultural Aspects of Tribals in Tripura



Part II

5.22 Profile of the Rubber Growers and Tappers

This section deals with the profiles of the rubber growers and tappers spread across four districts in Tripura, detailing the following aspects: gender by pattern of ownership, community-wise classification of rubber growers in the study area, their general educational attainments, livelihood patterns, community-wise ownership of mature and immature rubber, district wise distribution of mature and immature landholdings, arrangement for tapping, involvement of family labour (hired tappers) in plantation, existing facility for sheet rubber processing, rate of adoption of improved tapping techniques in rubber tapping and processing, rubber selling point and market price of rubber are closely examined. It also looks at the backdrops of tappers in natural rubber sector in the study area including the following aspects: involvement of tappers in rubber tapping, job satisfaction, task of employment, distance factor, professional backdrop, type of training undergone, nature of wage payments, incentives received by the tappers engaged in plantation and reasons for change in employer. The socio-economic and ecological impact of rubber plantation on the project beneficiaries has been critically analyzed. While applying the 'before and after approach' it provides a detailed analysis of the status of the tribal households. The results of measurement of Range equalization method (UNDP method of HDI) in the indicators of the five capitals such as human, natural, physical, financial and social has also been analyzed in detail.

5.23 Defining Rubber Tappers and Growers

The simplest definition of 'rubber tapper' involves what one actually does - tap rubber.³⁸ This definition is often used by the NGOs, researchers, development agencies and government officials. Indeed, rubber tapping is the process through which tappers i.e. workers collect latex from the rubber trees. Rubber tappers are only found in mature gardens. Rubber trees gain maturity after six years. Rubber cultivation occurs in the hilly areas where there is no chance of water logging.³⁹ In Tripura rubber tappers are involved in various duties i.e. collecting latex from the tree, carrying those in house/rubber centre and producing rubber sheets.⁴⁰ Most of the rubber growers are called small growers of tribal origins without having their own processing or manufacturing factories.⁴¹

Rubber is most suited to *tilla* (low longitudinal mounds) lands that dot the landscape in the area in Central Tripura. The planting of rubber on the gentle prominences called *tillas*, is the most effective utilisation of these landscape features. The acreage under rubber in Tripura is perpetually growing with the support of the State Government and the Rubber Board of Government of India. The rubber tree can grow to a height of 25-30 m, but tapping of latex starts when the plants attain a minimum height of 150 cm and a girth of 50 cm (Dikshit 2014: 627). The tribal rehabilitation programmes jointly implemented by the Rubber Board and the Government of Tripura have achieved considerable success, helping the poor tribals enhance their income substantially.⁴² The empowerment of the rubber growers, in particular by forming societies of their own, has been the most important step. These societies hold regular meetings at certain intervals to discuss decisions and other challenges. This has minimized the role of government officials to that of facilitators- to provide technical know-how through training and workshops and to assist in marketing. Even cash subsidies are given directly to the societies, without the involvement of any intermediaries. The entire process has resulted in tremendous confidence-building among the beneficiaries.⁴³

5.24 Gender by Ownership Pattern

The term ‘Gender’ is widely understood as a social construct. Gender remains an important area of study and several rural development programmes implanted in the developing countries including India focus on gender.

Table 5.23 Gender by Ownership Pattern

Gender	Gender by RG	Gender By RT	Total Respondent
Male	192 (64.0%)	57 (19.0%)	249 (83.0%)
Female	38 (12.7%)	13 (4.3%)	51 (17.0%)
Total	230 (76.7%)	70 (23.3%)	300 (100.0%)

Fig. 5.27 Gender Ownership Pattern of Rubber Grower and Rubber Tapper

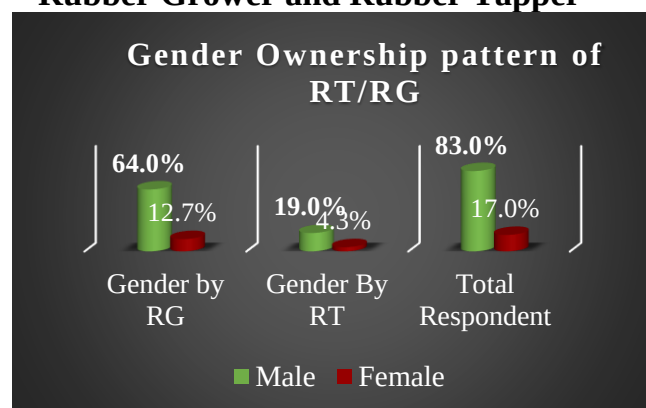


Fig. 5.27 shows the gender ownership among the RG and RT in four districts of Tripura. Out of 76.7 per cent rubber growers in the study area, 64 per cent growers happen to be male and 12.7 per cent are female. Among the rubber tappers (23.3%), 19 per cent tappers are male and 4.3 per cent female. Thus, the study reveals that the representation of percentage of male are quite high (83%) in both the rubber growers and rubber tappers category. Out of 17 percent female tappers, 4.3 per cent of rubber tappers works as wage labours in rubber tapping and sheet processing at the rubber producer society (RPS). Tribal women who are engaged in tapping work are exposed to various problems, like, tapping in early morning, collecting latex from trees, carrying the latex to house etc. Women are perforce engaged in this kind of occupation that falls largely in male domain, because of lack of alternative employment opportunity available to them in rural areas.

Table 5.24 Community-Wise Rubber Growers and Tappers in the Study Area

Tribes/Percentage						
Occupation	Tripuri	Debbarma	Mog	Jamatia	Reang	Total
Rubber Growers	116	28	35	37	14	230
Tappers	29	6	4	30	1	70
Total	145	34	39	67	15	300

From the above table (Table 5.24) it is evident that largest number of rubber growers are found among the Tripuri tribes (116 households), whereas the Jamatia community has more number of rubber tappers (30 households) in the study area.

5.25 Education

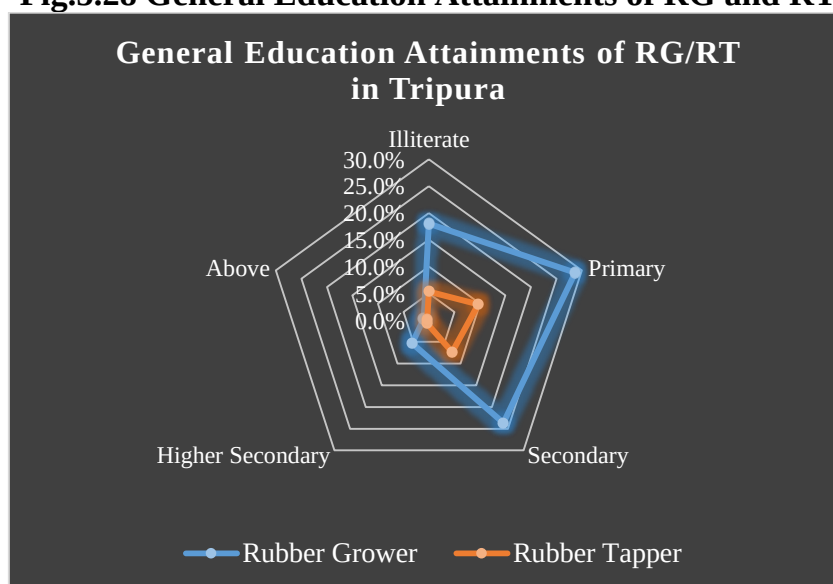
Literacy rate and educational attainment are considered to be key variables affecting demographic indicators like fertility, mortality and migration. It also greatly contributes improvement in quality of life. Fig. 5.28 shows that the educational standards of rubber tappers/workers in rubber plantation are very low. Hardly few tappers are able to complete the higher secondary education (i.e. class 10th) and above, whereas there is some improvement in the level of education among the small rubber growers at the higher secondary level (i.e. 5.3%). A negligible numbers, merely one per cent rubber growers have attained education above higher secondary level. Taking rubber grower and rubber tappers together, there are 23.3 per cent respondents who are illiterate. Similarly, at the primary level,

comprise six per cent 38.3 per cent households have received education up to primary level, whereas 31 per cent respondent have attended secondary level education. Those who have gone up to higher level comprise six per cent and further up, above higher secondary level merely 1.3 percent. In addition to the low level education the rubber plantation workers lack other type of skill for employability in other sectors. On the other hand, the worker in rubber plantation are treated as skilled workers for tapping of rubber demands specific skills.

Table 5.25 General Education Attainments of RG and RT

Educational standard	Illiterate	Primary	Secondary	Higher Secondary	Above	Total Respondents
Rubber Grower	18.0%	28.7%	23.7%	5.3%	1.0%	76.7%
Rubber Tapper	5.3%	9.7%	7.3%	0.7%	0.3%	23.3%
Total Respondent	23.3%	38.3%	31.0%	6.0%	1.3%	100.0%

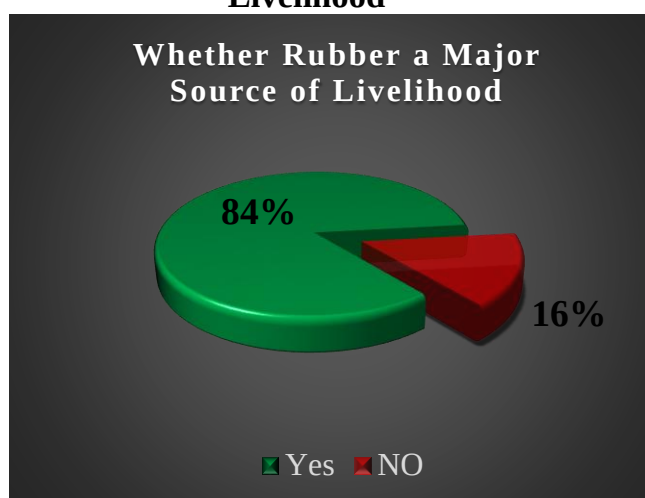
Fig.5.28 General Education Attainments of RG and RT



5.26 Livelihood

The assets, activities and capabilities which provide livelihood status to the tribal people are numerous and multifold: Size of land, mature rubber plantations, selling of jhum products, their ability to call on friends or neighbors for help at times of need, community support, quality of labour available at household level, skills of the family member, their physical fitness to do hard work, their access to common property resources and also benefit from the common property resources.⁴⁴ Natural rubber plantation in Tripura has made a new road map to the tribal people's economy. With the establishment and development of rubber plantations in the state, it has also created many other related avenues to come into being and play an important role in improving the tribal people's economy. Rural youths who were earlier involved in agriculture, jhum cultivation, business and other wage employment are now engaged with rubber plantation and development in the state. Rubber, therefore, has rightly taken a good shape in the rural foothold influencing the rural livelihood and also improving the living standard of the rural people. As rubber has been in the spree of ever increasing mode, penetrating in the rural areas in the state, it has actually helped rural unemployed youth for employment generation as rubber taper and other related jobs depending on the same resource.⁴⁵

Fig.5.29 Rubber a Major Source of Livelihood



From the above Figure 5.29 it is evident that natural rubber production and tapping has been a major source of livelihood for as high as 84 per cent tribal households in the four districts of Tripura. It does not happen to be a major source of earning for the remaining 16 per cent tribal households.

5.27 Rubber Tapping

Once the rubber tree is matured. i.e. when it attains harvestable age of 7 to 8 years; girth dimension 50cm, it is ready for tapping. Latex is obtained from the bark of the rubber tree by tapping. Tapping is a process of controlled wounding during which thin shavings of bark are removed. The aim of tapping is to cut open the latex vessels in the case of trees tapped for the first time or to remove the coagulum which blocks the cut end of the latex vessels in the case of trees under regular tapping.⁴⁶ Budded plants are tapable when they attain a girth of 50 cm at a height of 125 cm from the bud union. Virgin panels and renewed panels are opened at the same height i.e., 125 cm. It is economic to begin tapping when 70% of the trees in the selected area attain the standard girth. Advanced planting materials like polybag plants, selecting and planting vigorous material help to reduce the immaturity period.

Skill development and improvement is most important in harvest technology. This has direct impact on production, productivity and life of the trees. The Rubber Board runs regular Tapping Skill Development schools at different locations to impart training on latex harvesting/ processing for 30 working days, which enables the grower/ tapper to get expertise in tapping skill. Apart from the conventional schools, the Rubber Board has also been conducting short term Intensive Training programme for 8 days on Tapping and Produce processing. This is intended mainly for up skilling the existing tappers. The Rubber Board has undertaken Skill Development Training Programme with support of Rubber Skill Development Council (RSDC).⁴⁷

Fig.5.30 Present Arrangement for tapping

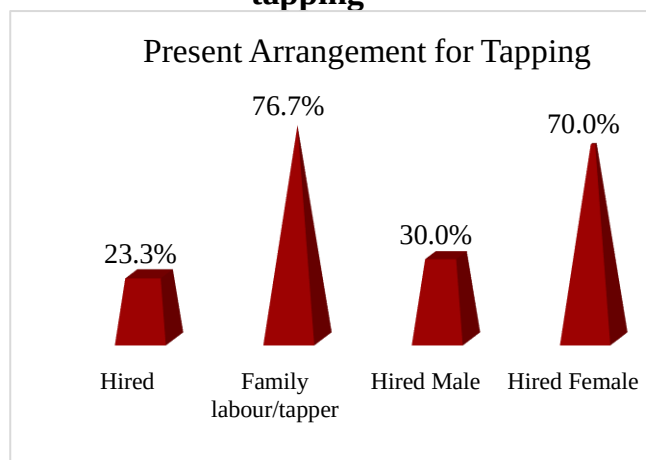


Table 5.26 Present Arrangement for Tapping

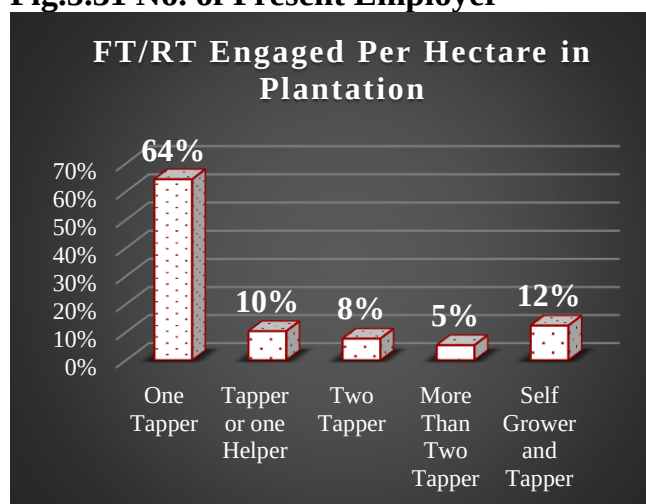
Present Arrangement for Tapping		Total
Hired	23.3%	100.0 %
Family labour/tapper	76.7%	
Hired Male	30.0%	100%
Hired Female	70.0%	

Figure 5.30 provides information regarding the present tapping arrangement. Family labour/tapping is quite common among the tribal rubber producing households in the state.

Table 5.27 Family Labour (Tapper)/Hired Tapper Engaged Per Hectare in Plantation

Family Tapper/Hired Tappers engaged Per hectare in Plantation	Frequency of FT/RT	% of FT/RT
One Tapper	193	64%
Tapper or one Helper	31	10%
Two Tapper	23	8%
More Than Two Tapper	16	5%
Self-Grower and Tapper	37	12%
Total	300	100%

Fig.5.31 No. of Present Employer



Majority of rubber growers engage their family members (76.7%) for tapping rubber, whereas, only 23.3 per cent rubber producing households hire local rubber tappers. Among the hired rubber tappers, 21 (30%) tappers are male and 49 (70 %) are hired female tapper. Although majority of (64%) of rubber producing households engage only single rubber tapper, there are even significant number of respondents who have one tapper

and helper for rubber plantation (10%) and 8 per cent of rubber producer have two tapper for the tapping. A small fraction of 5 per cent respondent even have more than 2 tapper for rubber plantation work. However, it is observed that 12 per cent respondents are self-grower and tappers.

5.28 Land Holding

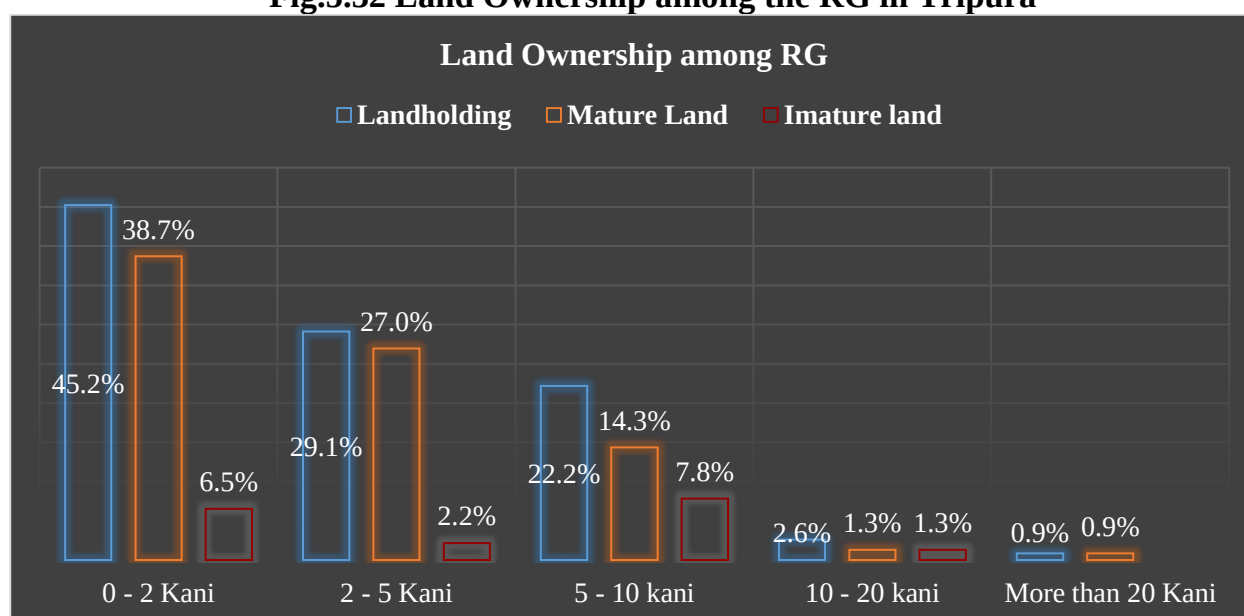
Fragmentation of land holding is still continuing as a part of social phenomenon. The average size of the land holding has declined from 1.25 hectares in 1976-77 to 0.50 hectare in 2005-06. Small and marginal farmers constitute 96% of the total farmers in the state (All India 81%).⁴⁸ Community wise possession of landholdings in the study area is shown the following table (Table 5.28).

Table 5.28 Possession of Landholdings

Tribes/No. of Persons						
Landholding	Tripuri	Debbarma	Mog	Jamatia	Reang	Total
<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%)

The rubber tree takes around six to seven years to mature and latex production starts thereafter. Rubber plantations have two distinct stages in its economic life- the immature phase and the mature phase. Growing rubber trees is a high cost and long term investment i.e. the first phase is the age of all expenses and no return. The expenditures in the rubber plantations can be classified in two broad heads: Material Cost and Labour Cost.⁴⁹ Accordingly, the land in which rubber plantation is grown and is in an immature stage is referred as 'immature land' and the land in which tapping of latex rubber tree is initiated is classified as 'mature land'.

Fig.5.32 Land Ownership among the RG in Tripura



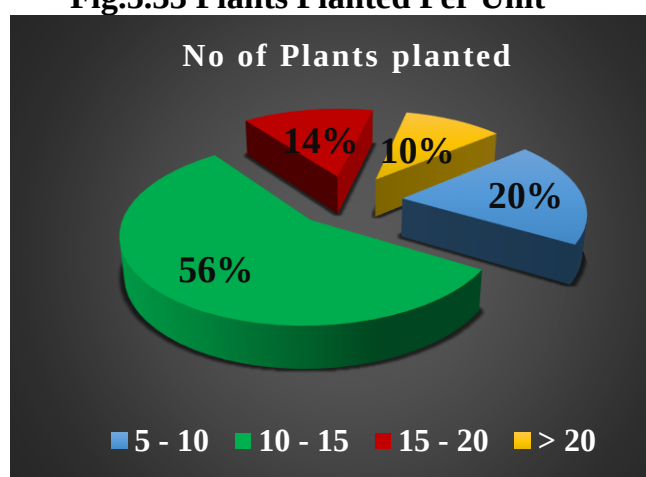
It is evident from fig. 5.32 that more than four-fifth of the tribal households (82.2%) have mature land and only 17.8 per cent households have immature land. That apart, 38.7 per cent tribal HHs have mature land holding below 2 kani and only 6.5 per cent HHs have immature landholding below 2 kani. It is noted from above figure that only few household (0.9%) have mature landholding 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). The following table (Table 5.29) shows the district-wise distribution of land holding possessed by the tribal communities.

Table 5.29 District-Wise Distribution of Mature and/Immature Land Holdings

South Tripura						
Types of Land /Farm Size	0 - 2	2 - 5	5 - 10	10 - 20	More than 20	Total Land
Landholding	17.0	8.3	0.9	0.0	0.0	26.1
Mature Land	13.9	7.8	0.9	0.0	0.0	22.6
Immature land	3.0	0.4	0.0	0.0	0.0	3.5
Gomati District						
Landholding	5.7	3.9	10.4	1.3	0.0	21.3
Mature Land	5.2	3.5	7.4	0.9	0.0	17.0
Immature land	0.4	0.4	3.0	0.4	0.0	4.3
West Tripura						
Landholding	12.2	10.4	4.8	1.3	0.4	29.1
Mature Land	10.0	10.0	2.2	0.4	0.4	23.0
Immature land	2.2	0.4	2.6	0.9	0.0	6.1
Shipaijala District						
Landholding	10.4	6.5	6.1	0.0	0.4	23.5
Mature Land	9.6	5.7	3.9	0.0	0.4	19.6
Immature land	0.9	0.9	2.2	0.0	0.0	3.9

[Note: unit in Kani and % in figures]

Fig.5.33 Plants Planted Per Unit



The Figure No 5.33 showed the number of Rubber plants planted per unit by rubber producer. Majority (56%) of the rubber producer planted 10-15 plants per unit (Kani) followed by 20 per cent of rubber producer with planted 5-10 plants per unit. Whereas, only 10 per cent people planted above 20 tree per unit.

5.29 Establishment of Rubber Nursery

Rubber Nurseries are established and maintained for raising various propagation materials for planting.

Table 5.30 Area Required for Various Types of Nurseries

Area Required for Various Types of Nurseries for Producing Planting Materials Necessary for 100 ha.						
Planting Material to be Produced	Spacing (cm)	Density (per ha)		No. of plants* required for 1 ha of main field	Area required (ha)	
		Initial	Final		Effective	Gross**
Budded stumps	30 x 30	111110	74074	500	0.675	0.750
Seedling stumps	30 x 30	111110	88000	550	0.625	0.695
Stumped buddings, Maxi	90 x 90	12350	9880	500	5.000	5.550
Stumped buddings, Mini	60 x 60	27775	22220	500	2.000	2.500
Polybag 2 - 3 whorls	---	---	25000	500	2.000	2.500
Polybag 6 - 7 whorls	---	---	18000	500	2.750	3.400

Source: Rubber Board, India⁵⁰

These include seedling stumps, budded stumps and advanced planting materials like polybag plants, stumped buddings and soil core plants. Mother plants or source bushes for the multiplication of budwood are also grown in nurseries. Raising of plants is easier and cheaper in nurseries than in the main field. Moreover, nurseries offer an opportunity for selection of vigorous and uniform plants.

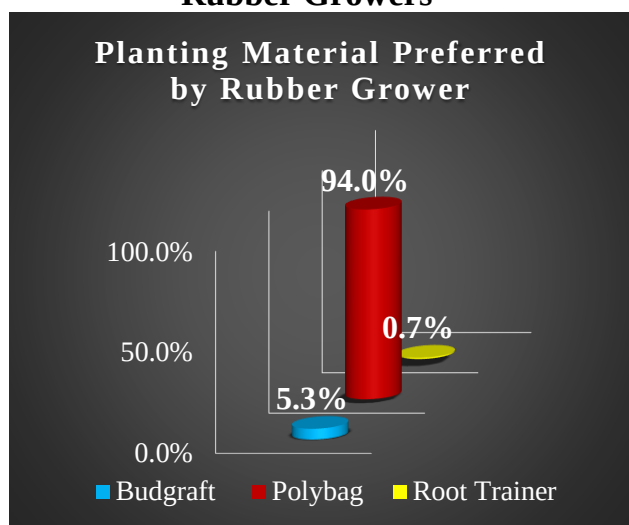
5.29 (a) Rubber Planting Material

Planting materials in polybags are prepared by two different methods. Budded stumps are planted in polybag and the scion allowed to develop till they are ready for planting in the field. In the other method, germinated seeds are planted in polybags and bud-grafted when five to six months old. The former gives greater opportunity for selection of the most vigorous plants and avoids wastage of bags containing poor seedlings and budding failures. The roots of budded stumps can be treated with indolebutyric acid (IBA), a hormone which enhances root growth. Dipping root in cow dung slurry before planting enhances root development. Polybag plants are advanced planting materials which contribute to reduction in immaturity period. Bagged plants should be transplanted to the field, with minimum disturbance to the root system for proper establishment. Such plants also help to achieve a uniform standard and are also useful for vacancy filling and late planting. Because of these the use of polybag plants has become very popular.⁵¹

5.29(b) Bud grafting

Budding is a process of in grafting the bud of a plant into another plant. This technique is frequently adopted for fruit trees but can also be used for many other kinds of nursery stock. An extremely sharp knife is necessary for budding. The principle involved in budding is the replacement of the shoot system of a plant with that of another more desirable plant. In this process, a patch of bark of the seedling plant (stock) is replaced by a patch of bark with a dormant bud (bud patch) taken from the clone to be multiplied. The bud patch and the bud should be handled very carefully and hygienically to avoid damage to them. The bud patch gets attached to the stock permanently and becomes a part of it. The stock is then cut off above the budded portion and the grafted bud develops in to a shoot (scion) exhibiting the characters of the plant from which it was taken. The new tree thus formed is a two-part tree, comprising a root system belonging to the stock plant and a shoot system contributed by the donor of the bud.⁵²

Fig.5.34 Planting Material Preferred by Rubber Growers



From the above figure 5.34, it was noted that almost 94 per cent rubber producing households preferred polybag plants as a material of planting and whereas, only 5.3% prefer bud-grafting and 0.7 per cent households preferred root trainer as planting material for rubber plantation. Thus, majority of the households reported that poly bag is the most preferred planting material in rubber plantation.

5.29(c) Root Trainer Plants

Root trainers generally used have a length of 26 cm with a capacity of 600 cc. The specific features like tapering shape, vertical ridges in the container wall, drainage hole at the bottom are all incorporated with the purpose of properly training the structural development of roots and hence the container is termed as root trainer. Cured coir pith mixed with the appropriate quantities of single phosphate, neem cake, bone meal, fungicides and pesticides is used as the potting medium. After planting budded stumps, preferably grafted budded stumps, the root trainers are stacked in carriers made of iron rod or bamboo splints. Initially the base of the container is covered with top soil and the roots growing out of the soil put beneath the containers is removed, roots are pruned and the plants along with the containers are kept suspended in air for hardening for a minimum of eight weeks. During the hardening process the tap root resumes growth in a few days and undergoes natural air pruning near the hole at the bottom and thus prevent its coiling inside the container. This stress induces emergence of large number of lateral roots into the well aerated potting medium. The vertical ridges of the container wall direct these roots downwards and thus prevent its circular growth. These lateral roots also undergo air pruning and as a result a hardened root trainer plant will have a root system consisting of central tap root and large number of lateral roots well oriented without any deformity. The root plug is separated from the container just before transplanting to the field. The root trainer plant is kept up right down and the brim of the container is tapped against a hard surface so that root plug comes out of the container without causing any damage to the roots. A planting hole is made in the refilled pit by pressing the empty container itself and the root plug is inserted into it. The soil is pressed slightly from the sides and all other cultural practices are adopted as in the case of polybag plants.⁵³

5.29(d) Intercropping

During the initial years of a rubber plantation, the land area is not fully occupied by the rubber plants and inter spaces are available in the plantation which receive plenty of sunlight. These interspaces can be utilized for growing intercrops, which will help the farmer to generate additional revenue. Intercrops should be planted at least 1.5 meter away from plant bases. Intercrops should be separately and adequately manured.⁵⁴ The common Intercrops cultivated in Rubber Plantations are such as banana, pineapple, tea, ginger and turmeric, medicinal plants and tuber crops.

Studies on intercropping in immature rubber plantation in Tripura shows that intercropping is not very popular in the state. In immature rubber plantation growers can cultivate various crops/fruits like banana, pineapple, tea, ginger and turmeric, medicinal plants and tuber crops. The growers who are interested in intercropping are basically produce banana and pineapple. The reasons for producing

banana is because the market price of banana is high and the banana leaves used as food for animals, increase productivity of the soil and uses during festivals/worships.⁵⁵

5.29(e) Rubber Processing

The main crop from a rubber plantation is latex, a milky white dispersion of rubber in water, which is harvested by the tapping process. Two to three hours after tapping, the latex collected in the cup is transferred to a clean bucket. About 70-80 per cent of the crop from a rubber plantation is in the form of latex. The latex which gets solidified in the tapping panel (tree lace) and the collection cups (cup lump) also form part of the crop and are collected by the tapper in a basket just prior to tapping. The latex spilt and/or overflowed to the ground (earth scrap) when gets dried up is also collected as scrap once in a month. These are collectively called field coagulum. Latex and field coagulum are highly susceptible to bacterial action and therefore it is essential to process these into forms that will allow safe storage and marketing.⁵⁶

5.29(f) Latex Properties

Latex is a white or slightly yellowish opaque liquid with a specific gravity, which varies between 0.974 and 0.986. It is a weak lyophilic colloidal system of spherical or pear shaped rubber globules suspended in an aqueous serum. The rubber globule is surrounded by a protective layer of proteins and phospholipids, which impart the lyophilic nature to latex. The stability of latex is due to the negative charge present on the protective layer. Also it contains a variety of non-rubber constituents both organic and inorganic, in addition to rubber. The proportion of these constituents may vary with clone, soil nutrition, climate etc.

Table 5. 31 General Composition of Latex

Rubber	30-40%	Resins	1-2.0%
Proteins	2-2.5%	Sugars	1-1.5%
Ash	0.7-0.9%	Water	55-65%

Sources: Rubber Board India, 2017

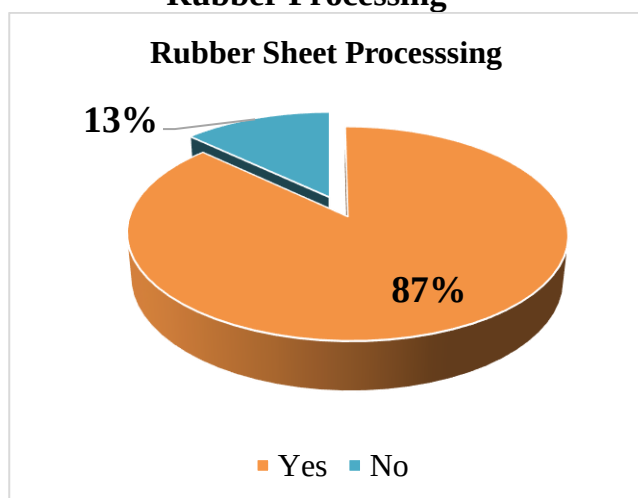
Fresh latex, as it comes out from the tree is slightly alkaline or neutral. It becomes acidic rapidly due to bacterial action. The formation of organic acids neutralizes the negative charge on rubber particles and the latex gradually gets coagulated on keeping. Therefore, fresh latex cannot be kept for long without preservative treatment. Latex can be processed into any of the following forms:

- (i) Preserved field latex and latex concentrate,
- (ii) Sheet rubber,
- (iii) Block rubber and
- (iv) Crepe rubber.

Field coagulum can be processed only into crepe rubber or block rubber.⁵⁷

During the field study to the Rubber Processing Societies (RPS) in the study area, it was observed that most of the RPS have existing facilities for sheet processing such as processing shed, roller and smoke house.

Fig. 5.35 Existing Facility for Sheet Rubber Processing



Majority of the respondents those who are RPS members (87%) reported that the RPS in their locality have all the processing facilities. However, 13 per cent respondents, those who are individual rubber growers and not member of any RPS in the area reported that there is no processing facility in their locality, hence they sell the latex in the open market.

5.30 Rubber Selling

Compared to other commodity in the state, along with market linkages, Natural Rubber is the only crop which enjoys a farm gate price above 95%. This is attributed to the network of dealers distributed throughout the state coupled with the bargaining power of the RPSs and market intervention of Rubber Board through its companies like M/S Manimalayar Rubbers (P) Ltd and Tripura Latex Pvt Ltd.⁵⁸ M/S Manimalayar Rubbers (P) Ltd, a company registered under companies act with Head office at Kottayam in Kerala. It is a joint venture of Rubber Board and Rubber Producers Societies. The company has been incorporated with the sole objective of strengthening of the RPS sector by acting as an apex body of RPS's and assisting them in marketing of their crop ensuring better price. The company is also involved in the distribution of almost all estate inputs required by growers at reasonable price. The total rubber traded by this company during 2015-16 is 4410.72 MT.⁵⁹

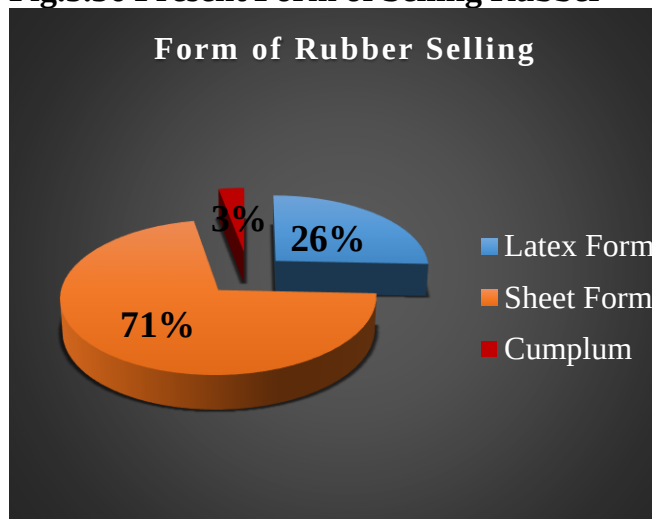
The Rubber Producer societies (RPS) at the local level collects field latex from the small and marginal rubber growers who are the members of the societies at the local level. The RPS has the all the processing facilities including as processing shed, roller and smoke house. The RPS have the record of processing good quality of rubber sheets. The major share of the sheets sold by the RPS as RSS 5. The rubber sheet produced at the RPS is routed through the Manimalayar Rubber Private Limited, Agartala promoted by Rubber Board India. Manimalayar's Rubber Private Limited, Agartala is the Wholesale sellers of rubber friction compound, natural rubber materials and 3-grade rubber in Tripura.

With the objective of further strengthening of this sector, a new company namely M/S Tripura Latex (P) Ltd has been established exclusively with 17 Rubber Producers Society of Tripura and two Rubber Boards companies. It has its registered office at Agartala since 2008. Now the company is actively involved in generating quality planting material and marketing of field latex. During 2015-16 the company produced & distributed 2,40,695 nos budded stumps & 2,24,929 nos of polybag plants. They also have traded latex equivalent to 1697.91 Metric Ton dry rubber during 2015-16.⁶⁰ The Tripura Latex Private limited has devised process for collecting and channelling of rubber to the designated firm. Latex is collected through different Rubber Producer Society (RPS) which in turn is channelized to the D.D. Group, Tripura (Dharam Pal and Satya Pal Group).⁶¹

Studies shows that the individual growers/farmer's share in consumer price for sheet rubber is usually lower when the produce is sold directly to the dealer compared to the counterparts in RPS sector.⁶² Technically the transaction costs including the dealer's margins incurred in the individual growers

sector were higher and to that extent that producers share is affected. Though the marketing efficiency through the dealer channel is higher, it is lower than the channels operated by the RPS network.

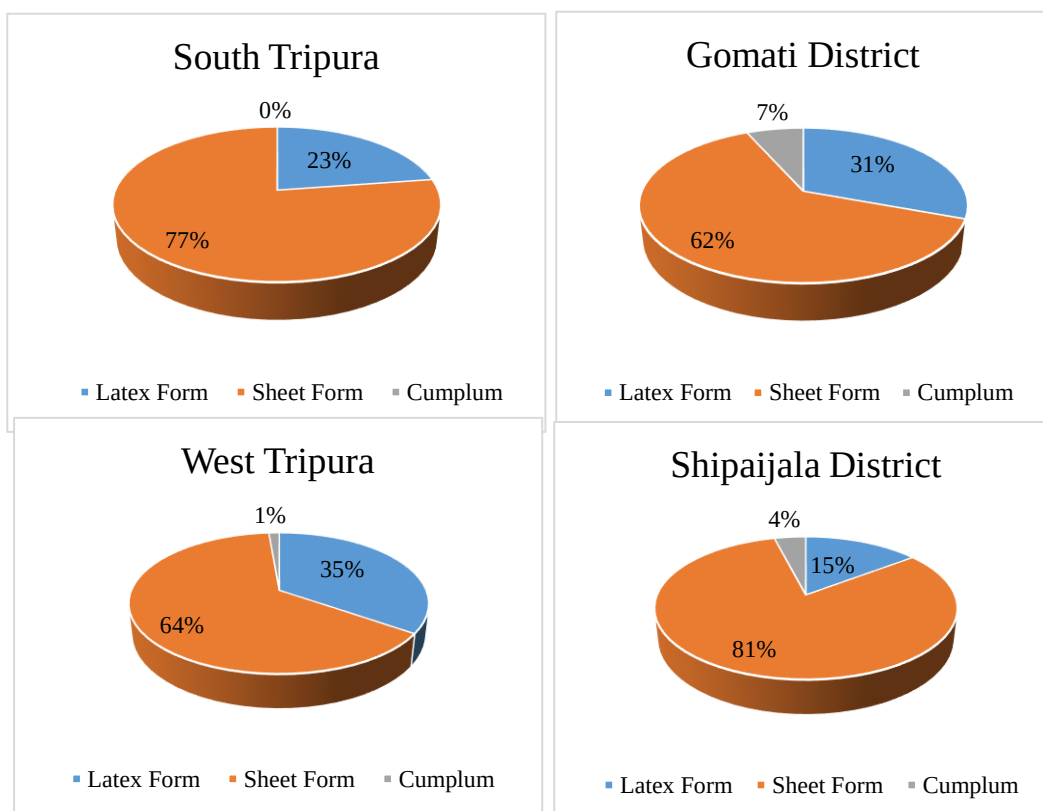
Fig.5.36 Present Form of Selling Rubber



The major grades of natural rubber sold in Tripura are the Sheet Rubber and Preserved Field Latex (PFL). It is evident from fig. 5.36 that 71 per cent of the respondents reported that the preferred sale of rubber is in the form of sheet rubber and 26 per cent of respondents responded that it is sold in the form of preserved field latex (PFL). Another 3% of respondents stated that selling of rubber in the form of cumplum is in practice in the study area.

The Rubber Board of India (RBI) had earlier identified aged plantation, unskilled tapers and poor quality of planting materials and lack of care as the factors contributing low productivity of natural rubber in Tripura. Substantial number of rubber trees in the state are very old, probably planted way back in 1963.

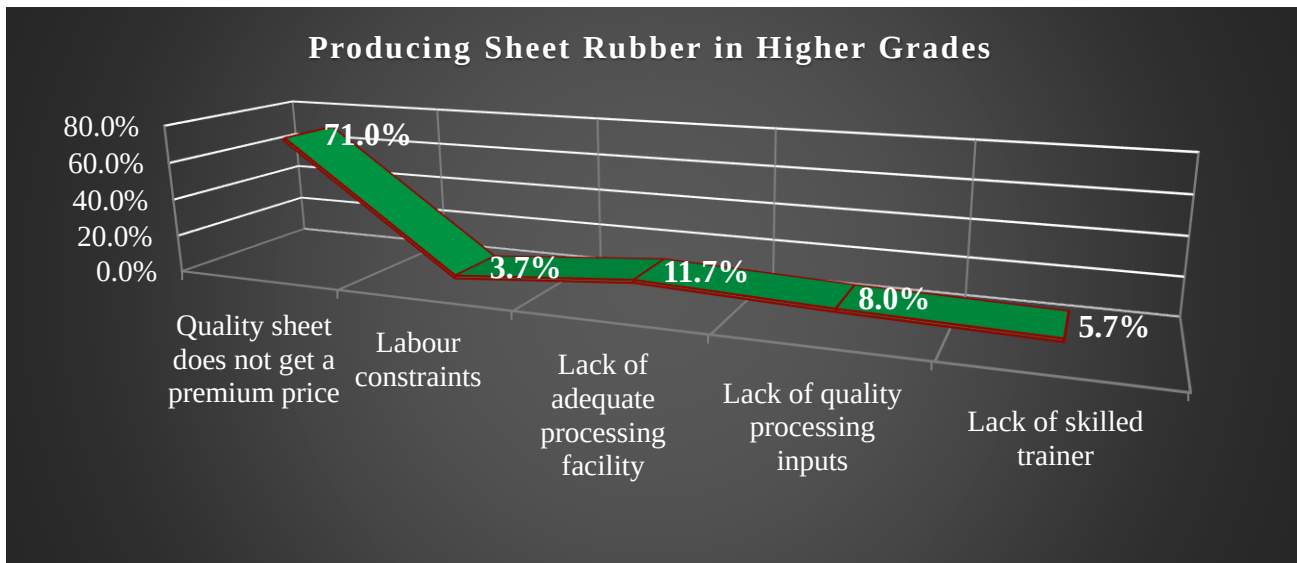
Fig.5.37 District-Wise Comperssion of Rubber Sale in Various Forms



It was suggested by Rubber Board India to expedite the re-plantation in government-run rubber estates. Tapping process is very much important to increase productivity. Although Rubber Board has taken initiatives to impart training in tapping, the number of skilled tappers in the region is still a problem. Since late 2013, the natural rubber price in India has gone down due to multiple factors such as uncertainty in world economy, weaky global equity market, the China factor, low crude oil prices

and lower demand than forecast⁶³. Despite of producing high quality product, it does not attract a higher price in the Indian market. During the field survey, 71 per cent of surveyed tribal households reported that even high quality of sheet rubber didn't get a premium price in the market. Another 11.7 % rubber growing households reported that there was not adequate processing facilities in the locality in processing sheet rubber and 8 per cent tribal households stated that there was lack of quality processing inputs. To 3 per cent rubber growing households, was it is labour constraint in producing rubber sheet in higher grades. Since the minimum wage rates under MGNREGA has increased, tribal villagers prefer to work in wage employment programmes, rather working as rubber tappers in low wage payment.

Fig. 5.38 Challenges in Producing Sheet Rubber in Higher Grades

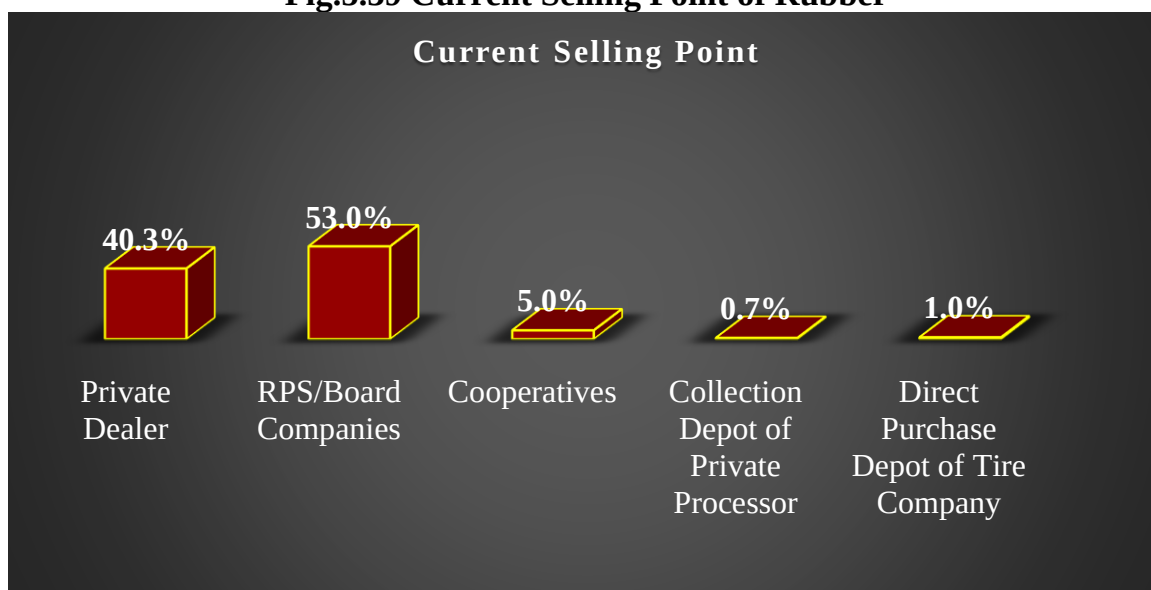


Thus, one of the major problems faced by the plantations is the inadequate supply of skilled tappers. When labour shortage started to affect the productivity, timely intervention in the form of propagation of low frequency tapping (LFT) was adopted. Accordingly, rubber trees are tapped in a lesser frequency rather than following daily tapping. This also helps in addressing the tapping panel dryness of the rubber plantation. Recently, few RPS (Rangmala RPS in West Tripura) have initiated the rubber tapper's bank to retain the skilled rubber tappers to carry out the rubber tapping and processing of sheet rubber at the respective societies.

5.31 Rubber Selling Point

The following Fig. 5.39 shows the current selling point of sheet rubber and preserved field latex (PFL) to different agencies in the state of Tripura.

Fig.5.39 Current Selling Point of Rubber

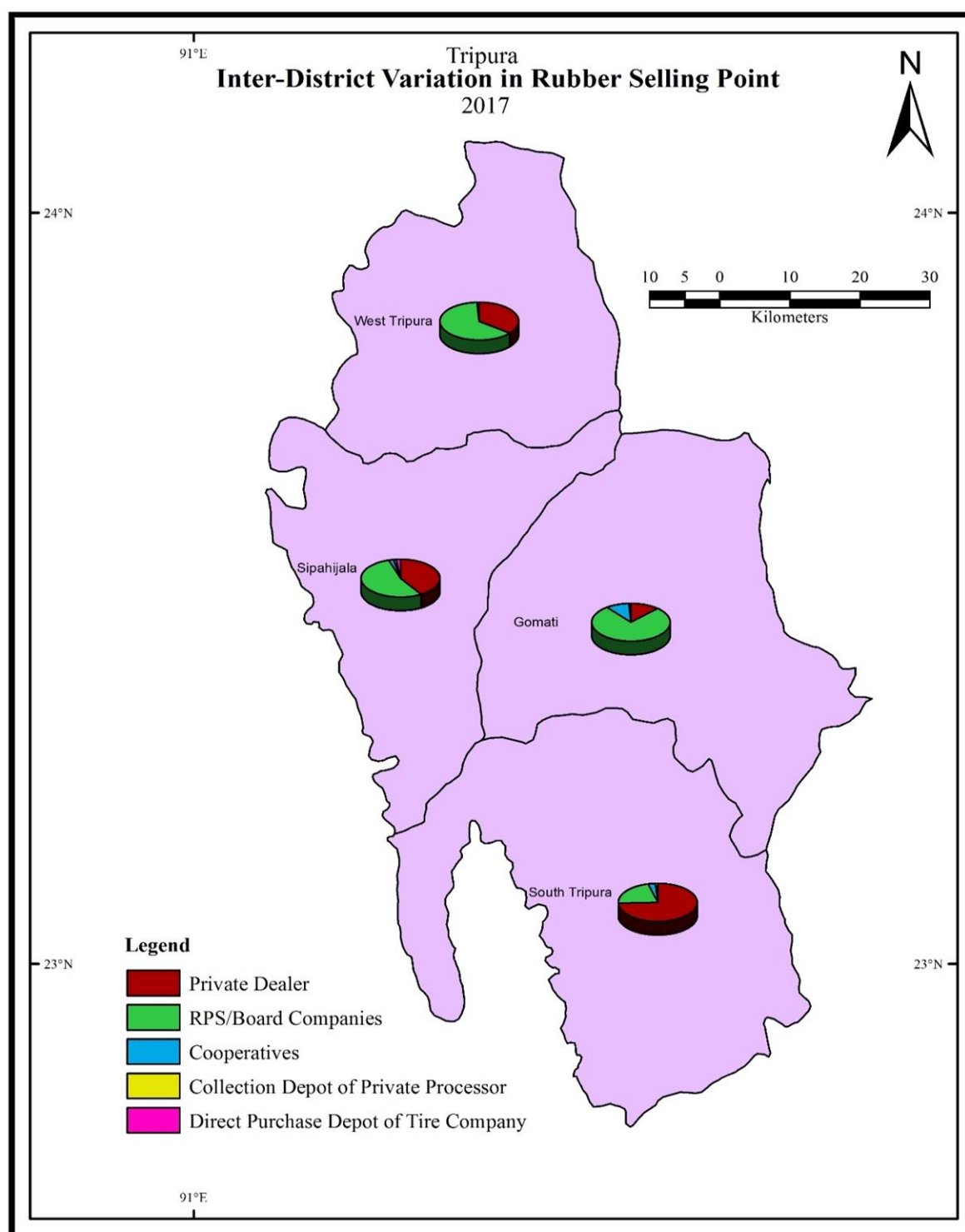


Little more than half (53%) surveyed tribal households reported that they deposited the preserved field latex to the RPS/Board companies and another 40.3 per cent rubber producing households preferred to sell it to the private dealer. Only 5 per cent households preferred to deposit to the cooperatives, 0.7 per cent tribal household's sold it at collection depot of private processor and rest 1 per cent households sold it at the direct purchase depot of the tire company.

Table 5. 32 District wise Current Selling Point of Rubber

<i>Present Rubber Selling point</i>	<i>South Tripura</i>	<i>Gomati District</i>	<i>West Tripura</i>	<i>Shipaijala District</i>
<i>Private Dealer</i>	75%	15%	33%	39%
<i>RPS/Board Companies</i>	20%	72%	65%	55%
<i>Cooperatives</i>	4%	12%	1%	3%
<i>Collection Depot of Private Processor</i>	1%	0%	0%	1%
<i>Direct Purchase Depot of Tire Company</i>	0%	1%	0%	3%

Map. 5.2 Inter-District Variation in Rubber Selling Point in Tripura



Sources: Primary Survey, G. Mohapatra, 2017

5.32 Market Price of Rubber

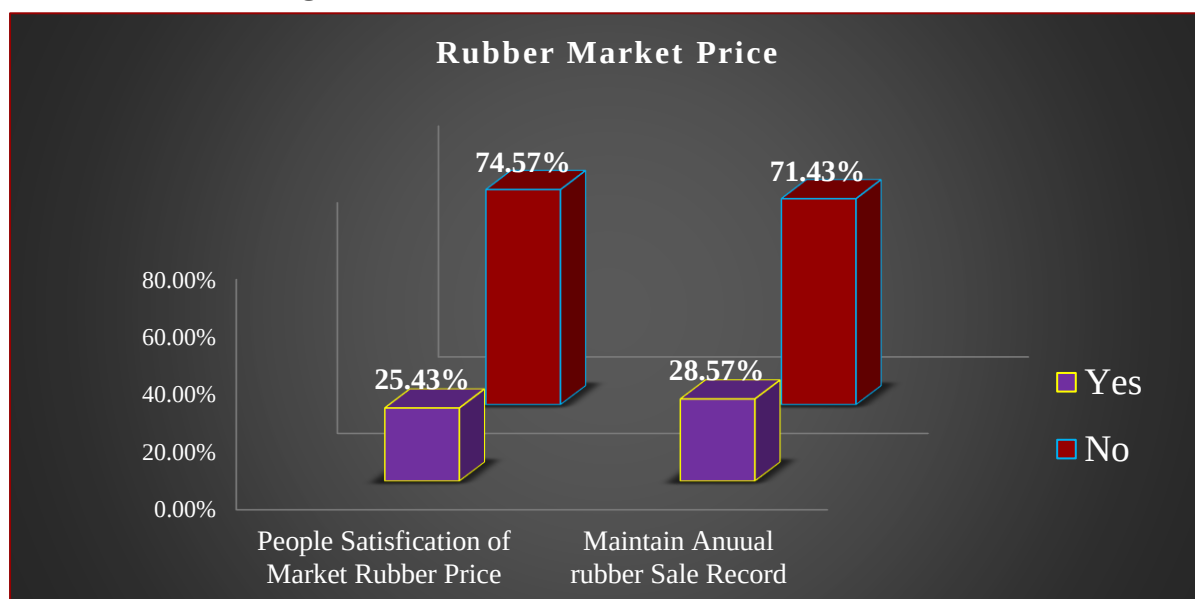
Table 5.33 shows the present status of selling rubber in Tripura. The average market price of sheet rubber is Rs. 119.12. However, since January 2017, there was an upward trend in the price of RSS-IV (ribbed smoked sheet) to Rs. 158 per kg in the market.

Table 5.33 Status of Sale of Rubber in Tripura

Condition of Rubber Sale in Tripura	Units Rs. & Kg.
Average Market price of Rubber (In Rs.)	119.12
Average Selling of Rubber Per Person Annually (In Kg)	982.05
Monthly Per Capita Income(MPCI) through Selling Rubber (In Rs)	9445.63
Annual Per Capita Income (APCI) Through Selling Rubber (In Rs.)	113347.62

The average annual selling of rubber per persons stands at 982.05 kg. Further, if we calculate the average annual income of the tribal households from selling rubber, it comes around Rs. 113347.62 per annum.

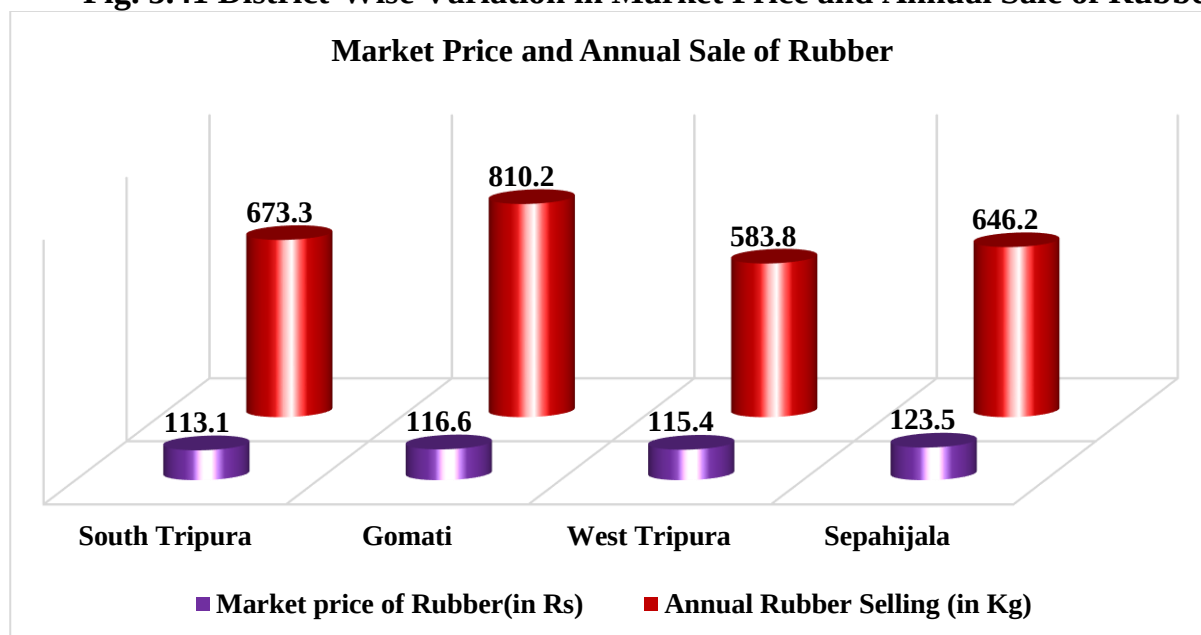
Fig. 5.40 Satisfaction of Market Price of Rubber



Since, the rubber price in the market has gone down significantly, the tribal rubber growers are unhappy about the market price, expressing unwillingness to sell rubber at the lower prices, anticipating a further increase in price. Nearly three-fourth (74.57%) rubber producing households reported that they were not satisfied by the rubber market price. Maintaining the sale record of rubber is not a common practice among the tribal rubber growers, generally the rubber producing societies (RPS) maintains the sale record. However, few tribal households (28.57 %) have reported maintaining their annual rubber sale record.

The members of the Rubber Producer Societies (RPS) sell sheet rubber and latex to Manimalayar Rubbers (a Rubber Board promoted trading company), hence the rubber price is determined on the basis of revised Kottiyam price as displayed in the Rubber Board site weekly and or monthly. However, apart from selling rubber sheet and latex to RPS, the individual rubber growers sell rubber to Private agencies like Tripura latex private limited and other private agencies at different prices. Thus, there is inter-district variation in rubber price (See Fig. 5.41).

Fig. 5.41 District-Wise Variation in Market Price and Annual Sale of Rubber



5.33. Backdrops of Rubber Tappers

Studies on rubber tappers in Tripura reveals that the tappers who hail from unprivileged sections of the society, are also poor in the economy, education and exposure. Skill is the determining factor which ultimately ends up with low profiles for productivity, quality, wages, job satisfaction and growing discontents (Majumdar et al. 2017).⁶⁴

5.33.1 Involvement of Tappers in Rubber Tapping

Tapping system varies from clone to clone. Generally budded trees are tapped as half spiral alternate daily system and seedlings as half spiral third daily system. Rubber Board has been recommending for third day system to avoid tapping panel disease. Moreover there are intensive tapping systems such as high level tapping, upward tapping and puncture tapping.⁶⁵

Fig. 5.42 Adoption of Tapping System

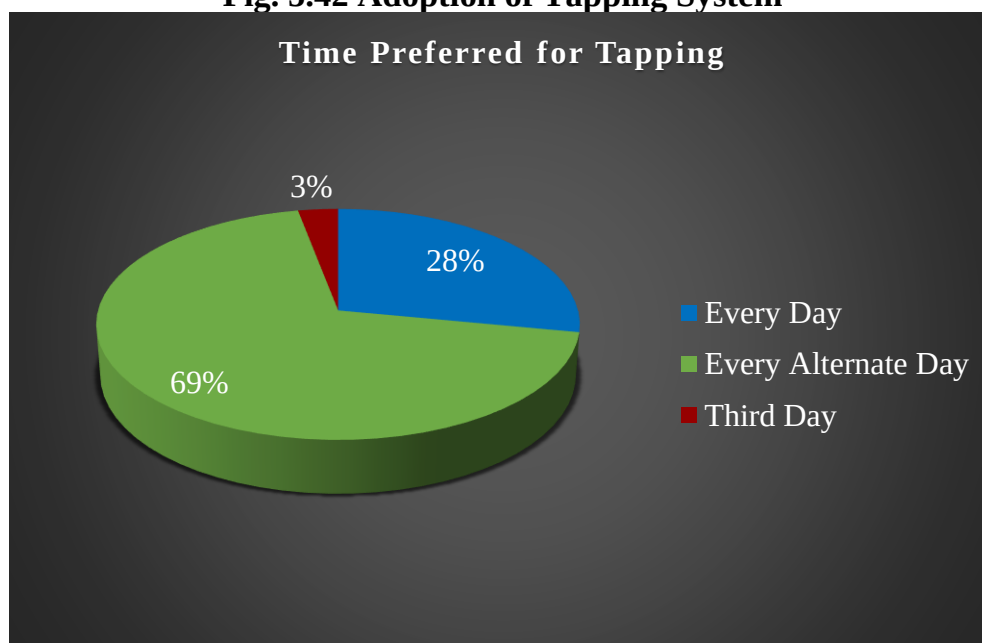
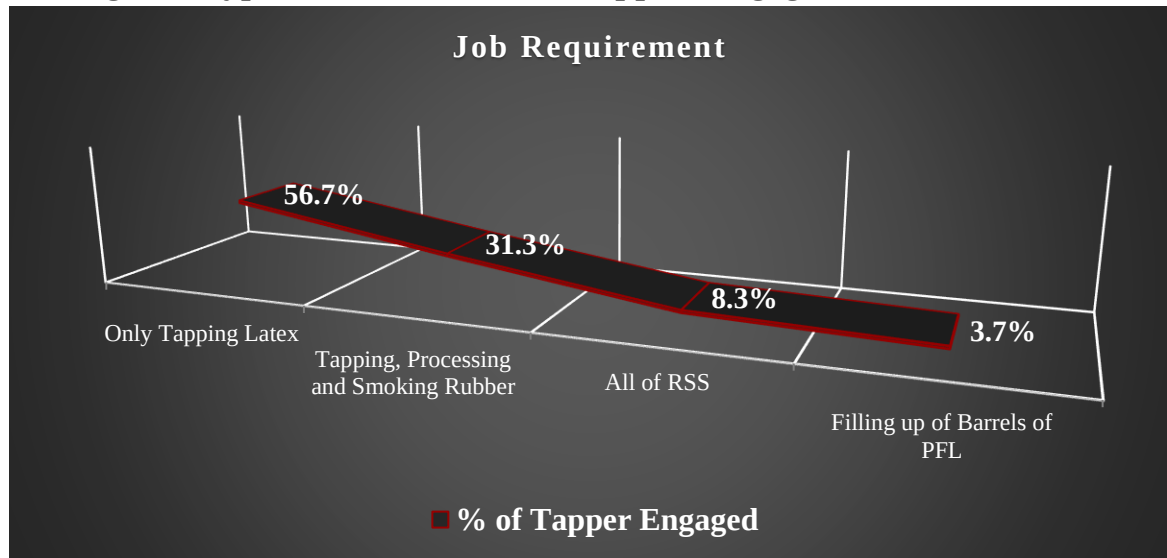


Figure 5.42 provides information regarding time preferred for the tapping in rubber plantation. Out of 70 rubber tappers(including family labour/tapper and hired tappers), most of the tappers under study (69%) work in the plantation on every alternate day, while 28 per cent tappers work in the plantation every day and only 3 per cent tapper preferred work third day (after every two days). Majority (56.7%) of rubber tappers do the jobs of tapping, while 31.3 per cent tappers do both tapping and processing. All jobs of tapping, processing, and smoking(all for RSS) are done by 8.3 per cent tappers, while 3.7 per cent have responsibilities only up to filling up of barrels of PFL.

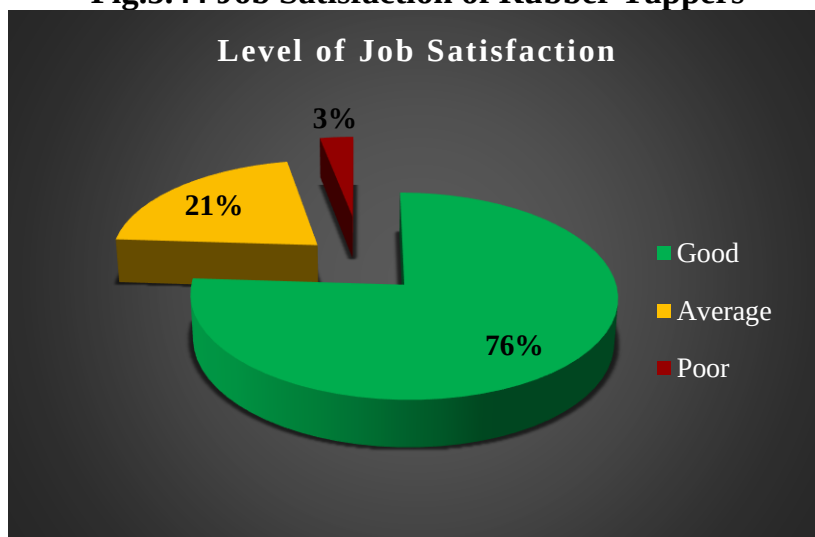
Fig.5.43 Type of Jobs the Rubber Tappers Engaged in Plantation



5.33.2 Job Satisfaction

It is observed from the following figure that almost over three- fourth (76%) tappers expressed good job satisfaction. For 21 per cent respondent it is mere average while for 3% it has been poor.

Fig.5.44 Job Satisfaction of Rubber Tappers



5.33.3 Task of Employment

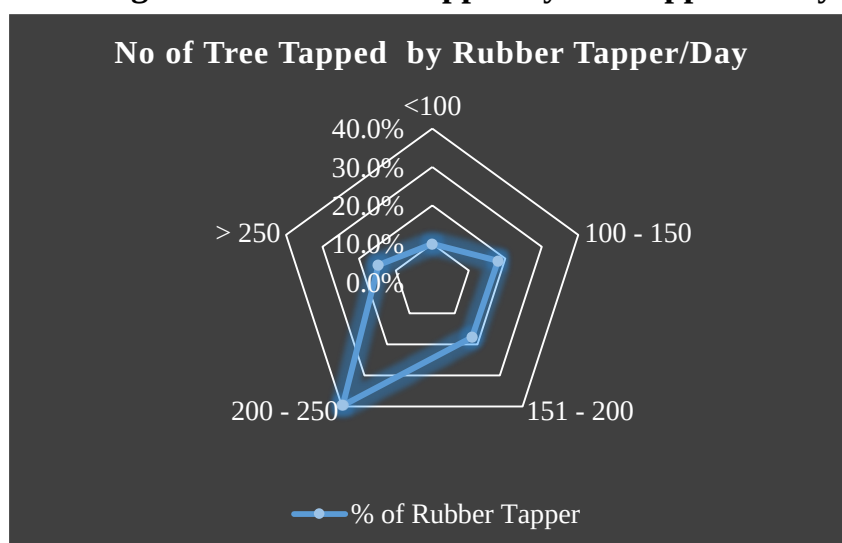
Rubber tapping is preferred in the early morning, since late tapping reduces the exudation of latex due to increased transpiration by the trees leading to lower turgor pressure in latex vessels. Such reduction is more marked in the summer months. For pre-dawn tapping, headlights are used. The number of trees allotted to a tapper for a day's tapping is known as tapping task. Task size is fixed on the basis of stand of trees per ha and topography of land. Normal tapping task in India varies from 300 to 400 trees. Task size is reduced when double cut or other intensive systems are adopted.

Table 5.34 No of Tree Tapped by the Tappers Daily

No of Tree Tapped per Day	No of Rubber Tapper	% of Rubber Tapper
<100	30	10.0%
100 - 150	54	18.0%
150 - 200	53	17.7%
200 - 250	119	39.7%
> 250	44	14.7%
Total	300	100%

It is evident from above table that nearly two-fifth (39.7%) of rubber tappers tap between 200 to 250 trees daily followed by 18% tappers tapping 100 to 150 trees on daily basis and almost equal proportion (17.7%) having tapping task of 150 to 200 trees. Another 10 per cent tappers tapping less than 100 trees daily while 14.7 per cent rubber tappers tap maximum number of more than 250 tree for daily. An experienced tapper normally taps between 250 and 350 trees. Trees are usually taped on alternate or third day, which varies from plantation to plantation.

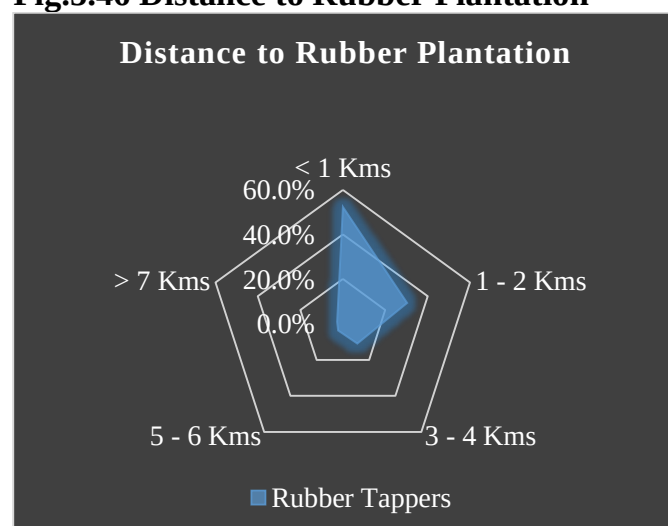
Fig. 5.45 No of Tree Tapped by the Tappers Daily



5.33.4 Distance Factor

Most of the Rubber tappers (52.3%) have their place of work within 1 km from their place of residence. A distance of 1 to 2 kilometer remains for 30.3 per cent rubber tappers while 11 per cent tapper/grower have it in between 3 to 4 kilo meters. Rubber producer who have to venture 5 to 6 km for their work place pertain between to 3.7 per cent while 2.7 per cent of them have to go beyond 7 km for rubber tapping/growing.

Fig.5.46 Distance to Rubber Plantation



5.34 Professional Backdrop

From the following table (Table.5.35) it is evident that little more than half (54%) tappers (including self-growers and tappers) had undergone training for tapping rubber through Rubber Board.

Table 5.35 Training of Tapper

Training For Rubber Tapping	Yes	No	Total
% of RG/RT	54.0%	46.0%	100%
Frequency	162	138	300

Rubber tappers (including self-growers and tappers) were provided with various kinds of training (Table 5.36). Half (50%) of tappers (including self-growers and tappers) were provided with training for rubber tapping whereas 34 per cent respondents were provided with all type of training (including rubber tapping, sheet preparation, tapping and sheet collection). Another 10 per cent surveyed respondents were provided training for tapping and sheet collection and the remaining 6 per

cent respondents were provided training for sheet rubber preparation.

Table 5.36 Types of Training

Type of Training	Frequency	% of RG/RT
Rubber Tapping	81	50%
Sheet Preparation	9	6%
Tapping and Sheet Collection	17	10%
All type of Training	55	34%
Total	162	100%

5.34.1 Nature of Wage Payments

Wage rate is considered as the important determinant of labour supply. A weakness of major standard theories of agricultural wage determination is the lack of sufficient empirical foundation. Even though the agricultural wage rate in India is considered to be sensitive to demand and supply factors, market forces cannot be considered as major determinants of wage rate in the labour market of rubber tappers.

Fig.5.47 Nature of Wage Payment

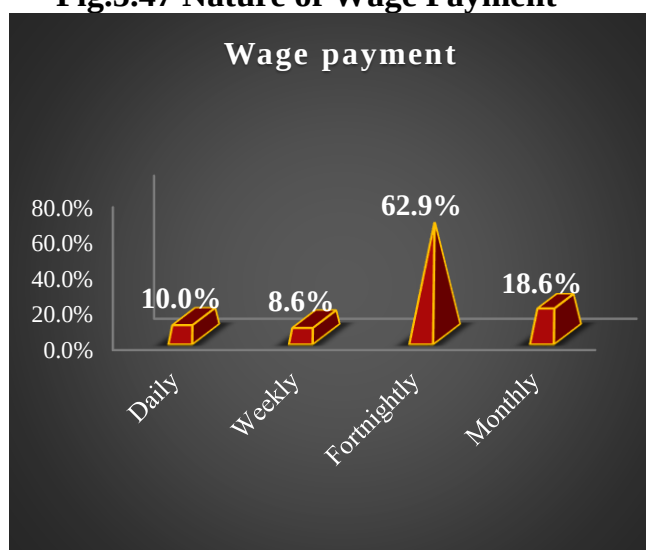


Figure 5.47 shows the nature of wage payment to the rubber tappers employed by the growers in their plantation for performing the tapping task. Majority (62.9%) rubber tappers reported that they have received their wage payments fortnightly followed by 18.6 per cent tappers received wage payment on monthly basis. However, only 10 per cent tappers work on daily basis on cash payment while nearly 8.6 percent work on weekly basis of payment.

5.34.2 Incentives to Rubber Tappers

Apart from the wages, the rubber tappers get a few additional benefits, both pecuniary as well as non-pecuniary.⁶⁶ Pecuniary benefits include incentives, rainy day allowances, bonus, sickness and paid holidays. Incentives are provided to those labourers who have collected excess quantity of dry and scrap rubber. Rainy day allowances are paid @ Rs. 30-40 per day if the normal work is disrupted. Generally, the sick leave wages are at two-thirds of daily wage rate. On national holidays if he/she worked on the immediate day before and after the national holiday.

Fig. 5.48 Incentives to the Labourers Engaged in Plantation



Fig. 5.48 shows that only 30 per cent rubber tappers reported that they got festival allowances during *Durga puja*, Christmas and in tribal festivals like *Garia puja* and *Ker puja* and rest of 70 per cent tappers revealed that they didn't get any annual or festival allowances from the owners of the plantations.

Fig.5.49 Facilities and Benefits Provided to the Labourer

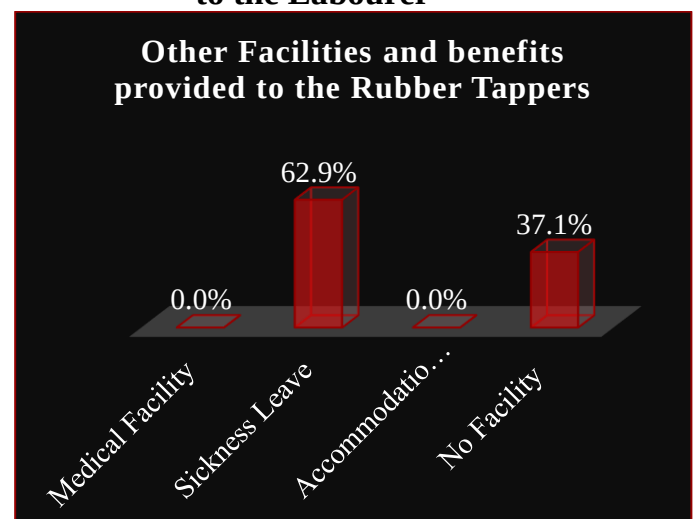


Figure 5.49 shows that 62.9 per cent rubber tappers have reported that they had availed sickness leave, while 37.1 per cent revealed that they didn't avail such facility either medical or sickness leave as such.

5.34.3 Changes in Employers

As per Table 5.37, nearly two-thirds (62.9%) of the study sample have never changed their employers while 37.1% tapper have been found to have more than one employer in their professional carrier.

Table 5.37 Changes in Employers

Rubber Tapper ever changed their employer	% of RT	Frequency
Yes	37.1%	26
No	62.9%	44
Total	100%	70

The following fig. 5.50 show that the major reasons for employers change. 31 per cent hired rubber tappers have reported that they had to change their employers due to low wage payments. About 23 per cent tappers marked excess distance to the plantation as the reason for such changes. They have reported to found plantations close to their places of residences to get absorbed there subsequently. Another 15 per cent tappers said they had to change the employers because of their rude behavior. Another 19% respondent blamed working atmosphere for the change happened to them. Rest 12% declined to name any reason that forced them to change their employers.

Fig. 5.50 Reasons for Employer Change



5.35 Positive Impact of Natural Rubber Plantation

Rubber plantation and development in the state of Tripura has significantly improved the quality of life, particularly among the rehabilitated jhum cultivators. There are several instances of children's of the rubber growing tribal families attaining higher education in the state.

Table 5.38 Positive Impact of Rubber Plantation

Positive Impact	Yes	No
Enhanced Income sources	293 (97.7%)	7 (2.3%)
Employment	291 (97.0%)	9 (3%)
Long term assets	275 (91.7%)	25 (8.3%)
Children education	281 (93.3)	19 (6.3%)
Soil conservation & utilization of fallow & barren lands	285 (95%)	15 (5%)
Honey/Apiary	32 (10.7%)	2689.3%)

Source: Field Survey 2017.

Rubber is a major source of income for the tribal households and has resulted in several positive externalities, as reported in Table 5.36.

- ❖ Almost all (97.7%) the farmer believe that the biggest positive contribution of rubber is its regular income generation potential.
- ❖ Source of employment was found to be the second another major positive impact as reported by 97 per cent respondents.
- ❖ Among other positive impacts of rubber, are (i) possession of long term assets (91.7%); (ii) benefits of soil conservation and utilization of barren fallow lands (95%) and (iii) Source for funding children's education.

5.36 Negative Impact of Natural Rubber Plantation

At the same time, the response of the rubber growers and tappers also highlight some of the negative externalities they face due to rubber plantations in their locality (Figure 5.51). Almost all the respondent (98%) reported that rubber plantation affected the local weather conditions. There is a growing concern among large number of people in the state that the increasing trend of high temperature in the state is due to the indiscriminate way of growing rubber. However, there is no empirical evidence to substantiate this view.

Again, 93.7 per cent respondents viewed that rubber is a cause for increased disease and health problems mainly arising from the foul smell during rubber processing which is difficult to control. Most of the negative responses addressed by the rubber growing tribal households were pertaining to environment/ecology, rubber plantation affecting soil fertility, decline in paddy productivity, dry lands, decline in forest cover, decrease in water level, foul smell, and health issues. Studies shows that mono-culture rubber always runs the risk of disease and damages, which has not received adequate attention in the policy circles especially in this region, which is quite known for its agro-biodiversity.⁶⁷

Fig. 5.51 Negative Impact of Rubber Plantation

Response of Rubber Growers and Tappers

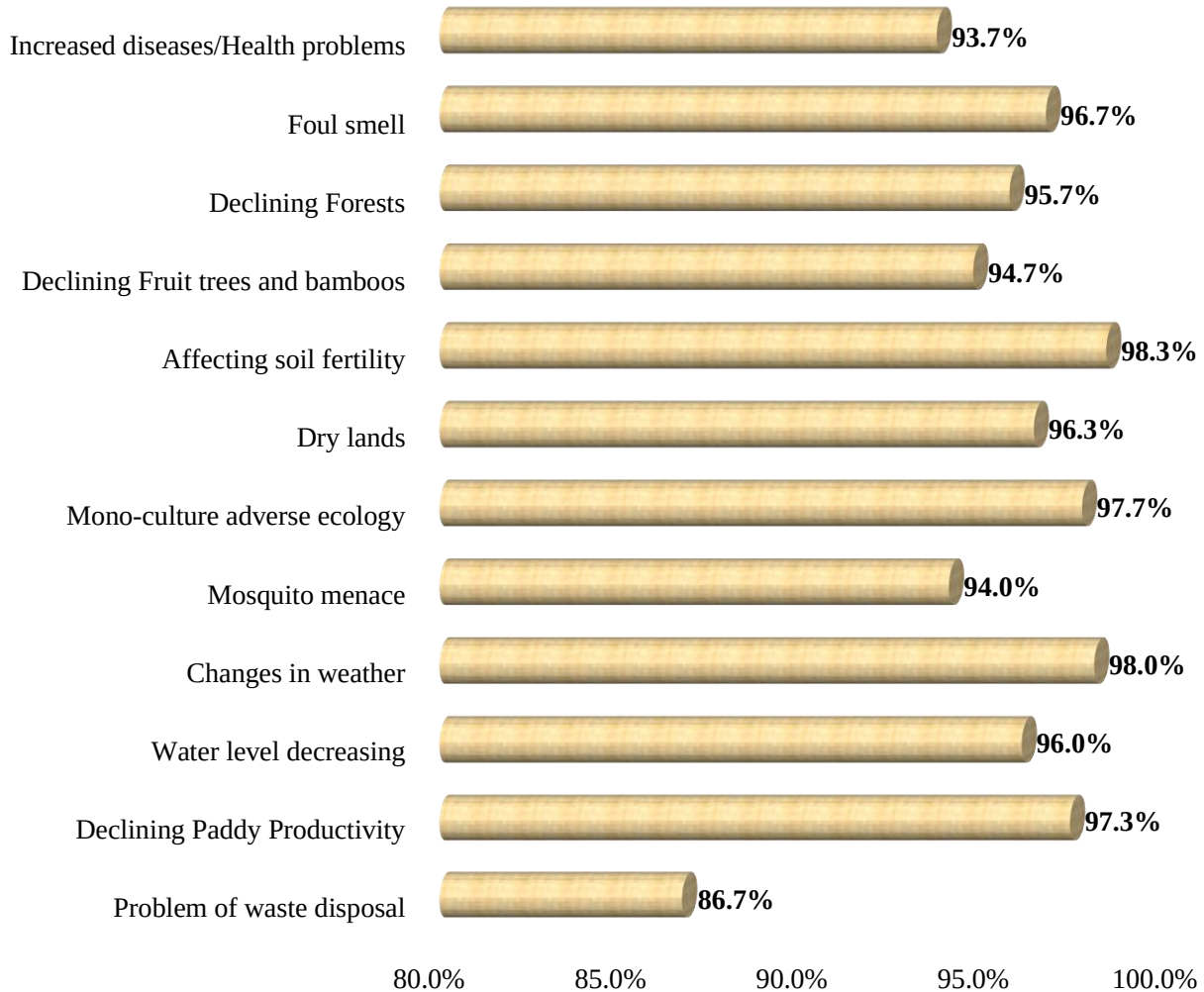


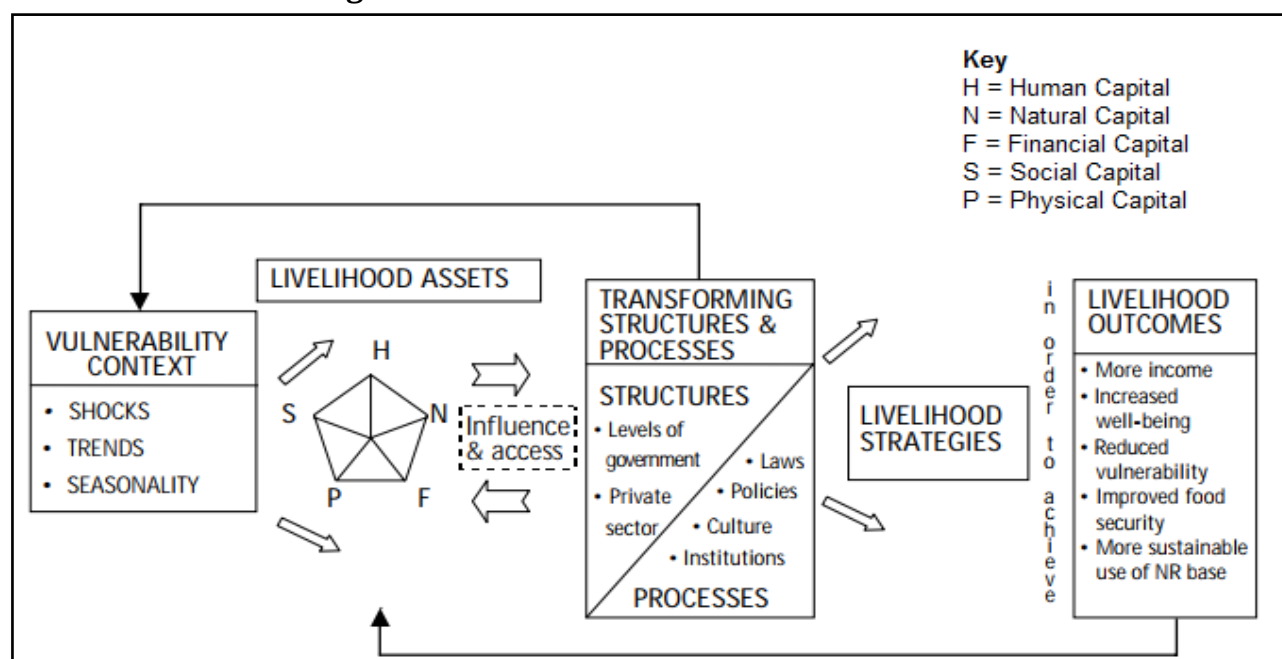
Table 5. 39 Status of Households before and After Rubber Plantation

Status	Prior to Rubber Scenario	Post Rubber Scenario
1. Household Income	Rs.3500 to 4500 per month	Rs.10000 to 25000 per month
2. Main Occupation	Agricultural work, Daily wages, Firewood collection, jhum cultivation and vegetable and fruit sellers	Regular work in plantation, Rubber tapping, Processing, Supplying field latex to RPS and managing RPS.
3. Food & clothing	Dirty and scruffy in appearance, not able to purchase new clothes during festive occasions, food scarcity, high prevalence of food insecurity and hunger among households	Sufficient food and adequate clothing
4. Health-care of family	Traditional healing practices	Accesses to Primary Health Centres, Govt. & Pvt. Hospitals for medical treatments
5. Attitudes and Habits	Vulnerable; often misguide by anti-socials(militants)	Focus on development, socio-economic upliftment and improvement in lifestyle
6. Education	Poor, large scale illiteracy, high dropout rate	Literacy increased, decrease in dropout rate, higher female literacy
7. Well being	No saving habits, poor health, poor housing, poor clothing, under-nutrition	Saving in banks, buying new lands, rubber plantations, and livestock's, cultivation of rubber, better housing, and better nutrition, buying new consumer durables, Owned TVs, Bikes, Car, Jeep and tractors.
8. Village Infrastructure Facilities	Non- Existent(Kutch muddy roads get nuddy and slippery during rainy season)	Much Improved-brick roads, cemented and bricks houses, availability of electricity, improved drinking water and sanitation, existence of anganwadi centres, schools,

5.37 Sustainable Livelihoods Framework

The DFID has developed a 'Sustainable Livelihood Framework' (SLF)⁶⁸ which is one of the most widely used livelihoods framework in development practices. Sustainable livelihoods assets (SLA), an element within this framework is concerned first and foremost with people and it 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.

Fig. 5.52 Sustainable Livelihood Framework



Source: DFID, Sustainable Livelihoods Guidance Sheets (2000)

The approach is founded on a 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. The study has assessed the impact of rubber plantation on the rubber producing households in the four district of Tripura, applying the sustainable livelihood approach (SLA) to analyses the five capital assets such human, natural, physical, financial and social collected through household surveys. Range equalization method (UNDP method of HDI) was adopted to elucidate the five capitals.⁶⁹

5.37.1 Methodology of Calculate Score Value:

The range equalization method has been adopted for measuring the indicators of the five capital. First, the values of every indicator of the five capitals are acquired into percentage values. Second, the scale-free aggregate indices ranging 0 to 1 of each indicator of the five capitals are obtained with higher value suggesting greater strength. This is done by subtracting the minimum percentage value from each indicator and then dividing it by the indicator-range i.e. maximum percentage value subtracted by minimum percentage value, for each indicator of the five capitals.

Formulae: $S_{vi} = (Actual\ X_i - Min\ X_i) / (Max\ X_i - Min\ X_i)$, where, X_i is percentage value of an indicator, Min is minimum, Max is maximum and S_{vi} is scale free value. The scale free values of each indicator are obtained then add and divided by the total strength of indicator to obtain the composite index (score value). Here, scale-free values are obtained so that while using composite index there is no biased toward the highest indicator values.

Formulae: $C_i = S_{vi} EX_i / NX_i$, where, $S_{vi} EX_i$ is added scale free value of indicators, NX_i is number of indicator and C_i is composite index. Applying the formulae, scale free values of each indicator and score values of the five capitals are obtained.

Table 5.40 Sustainable Livelihood Assets of RPHH in Tripura

Indicators	RPHH (N=300)
	Percentage
Human Capital	
Working population	100
Literacy Rate	79.7
Health Facilities	68.3
Political consciousness/affiliation	90.7
Drop out from school	29.3
Human Capital Index (Score Value)	0.63 (2)
Natural Capital	
Size of landholding in hectares	
0 - 2	38.5
2 - 5	24.6
5 - 10	20.6
10 - 20	2
Above 20	0.7
Type of land	
Mature land	76.7
Immature land	23.3
Land Ownership	
Allotted Land	34
Raiyati (inherited) land	60.7
Purchased	2
Gifted	3.3
Housing Status	
Mud walled & thatched house	12
Mud walled & tin-roof	84.3
Brick walled & concrete-roof	3.7
Natural Capital Index (Score Value)	0.32 (3)
Physical Capital	

Medical Centers within the premises	92.6
Electricity	96.7
Sanitary Facilities	95.3
Safe Drinking Water Sources	94.3
Work place within 5 KM	85.7
Jewels	37
Consumer Durables	92.1
Physical Capital Index (Score Value)	0.80 (1)
Financial Capital	
Monthly Income	
<10000	70.7
10000 - 20000	22.3
20000 - 30000	5
30000 - 40000	1.3
> 40000	0.7
Sources of Livelihood	
Primary Sources	71.3
Secondary Sources	28.7
Incentives Provided	45.7
Livestock's	20.3
Financial Capital Index (Score Value)	0.41 (2)
Social Capital	
Micro-credit(SHG's)	3.7
Banks (Tripura Grameen Bank)/Bhandhan Bank	20.3
Household received benefit from a Government scheme	21.9
Social Capital Index (Score Value)	0.64 (2)

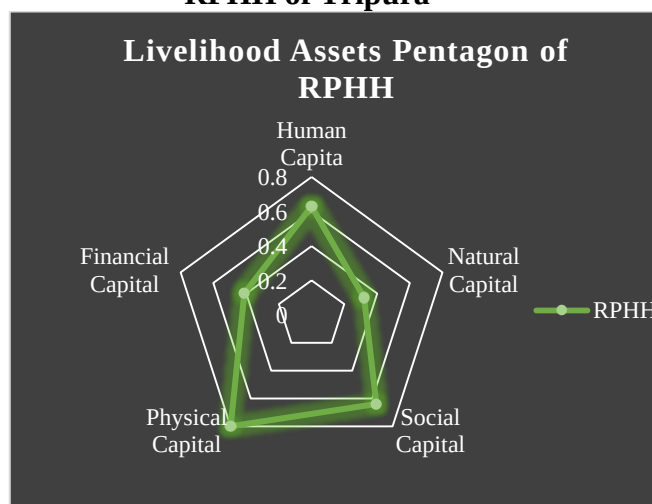
(Score Values Compute by the researcher)

Note1: figures in parentheses indicate the hypothetical scores of sustainability of the assets. Accordingly, 1 represent 0.67 - 1 score value (highly sustainable), 2 represent 0.34 - 0.66 score value (moderately sustainable) and 3 represent 0 - 0.33 score value (unsustainable).

5.37.2 Livelihood Assessment:

The asset pentagon lies at the core of the livelihoods framework, 'within' the vulnerability context. The pentagon was developed to enable information about people's assets to be presented visually, thereby bringing to life important inter-relationships between the various assets. To understand the strength and weakness, the score values of five capitals of RPHH is diagrammatically represented by livelihood asset pentagon (fig. 5.53).

Fig. 5.53 Livelihood Assets Pentagon of RPHH of Tripura



Above figure (fig.5.53) analyses the livelihood status of Rubber Producing Households (RPHH), the indicators and score values is compared in the table 5.40.

Human Capital of the surveyed households are moderately sustainable with score value of RPHH(0.63), as it is observed that there is increased working population (100%) among rubber growers (family labour) and hired tappers mainly associated with rubber plantation such as tapping, processing, 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%) and political association (90.7%) and health facilities (86.3%) among the RPHH in the study area.

The natural capital of the RPHH are unsustainable with score value (0.32) due to possession of small and marginal landholdings. Most of the lands possessed by RPHH are inherited (*raiya*) and homestead in nature. Allotted lands are 34 per cent only. Few RPHH have gained in land holding size as they have been allotted land that is 1.5 hectare (ha.) of that 1 ha. for rubber plantation and 0.5 ha for homestead.⁷⁰ However it varies from place to place on availability of land.⁷¹ Physical capital shows huge difference in score value, as RPHH found highly sustainable (0.80) due to availability of electricity, provision of water and sanitation facilities and access to medical centres and accessed market and use of consumer durables.

The financial capital score value of RPHH (0.41) shows moderately sustainable. Taking the income of the rubber growers into consideration, 70.7% of RPHH earned more than one lakh per annum, from collecting field latex, rubber sheet processing and other sources like petty shops, driving etc. The score value of RPHH in social capital (0.64) is moderately sustainable. The RPHH in the surveyed localities have a strong inbuilt in social capital as they are closely tied on the basis of kinship network. This social bonding enable them to take decision in adopting rubber plantation and achieved socio economic success. RPHH have better-of physical capital (infrastructure) and human capital (literacy, working population) and social capital (trust, norms and network with SHGs, Banks). Social capital is found higher among the RPHH whereas the lack in natural capital (landholdings) as most of the tribal household belong to small and marginal growers in the study area. High income from rubber plantation has strength the coping strategies of the RPHH.

5.38 Impact of Rubber Plantation and Development

Figure 5.53 summarizes the overall impact of rubber plantation and development on tribal livelihoods in the indicators of income, asset, food and clothing, children's education, family health care, changes in the attitude and habits, well-being and improvement in village infrastructure. Perceptions of the rubber growers and rubber tappers (including family tappers and hired tappers) about the changes occurred due to the rubber based interventions has been classified in low, moderate and high category.

Fig. 5.54 Impact of Rubber Plantation on the Rubber Growing and Tapping Households in Tripura

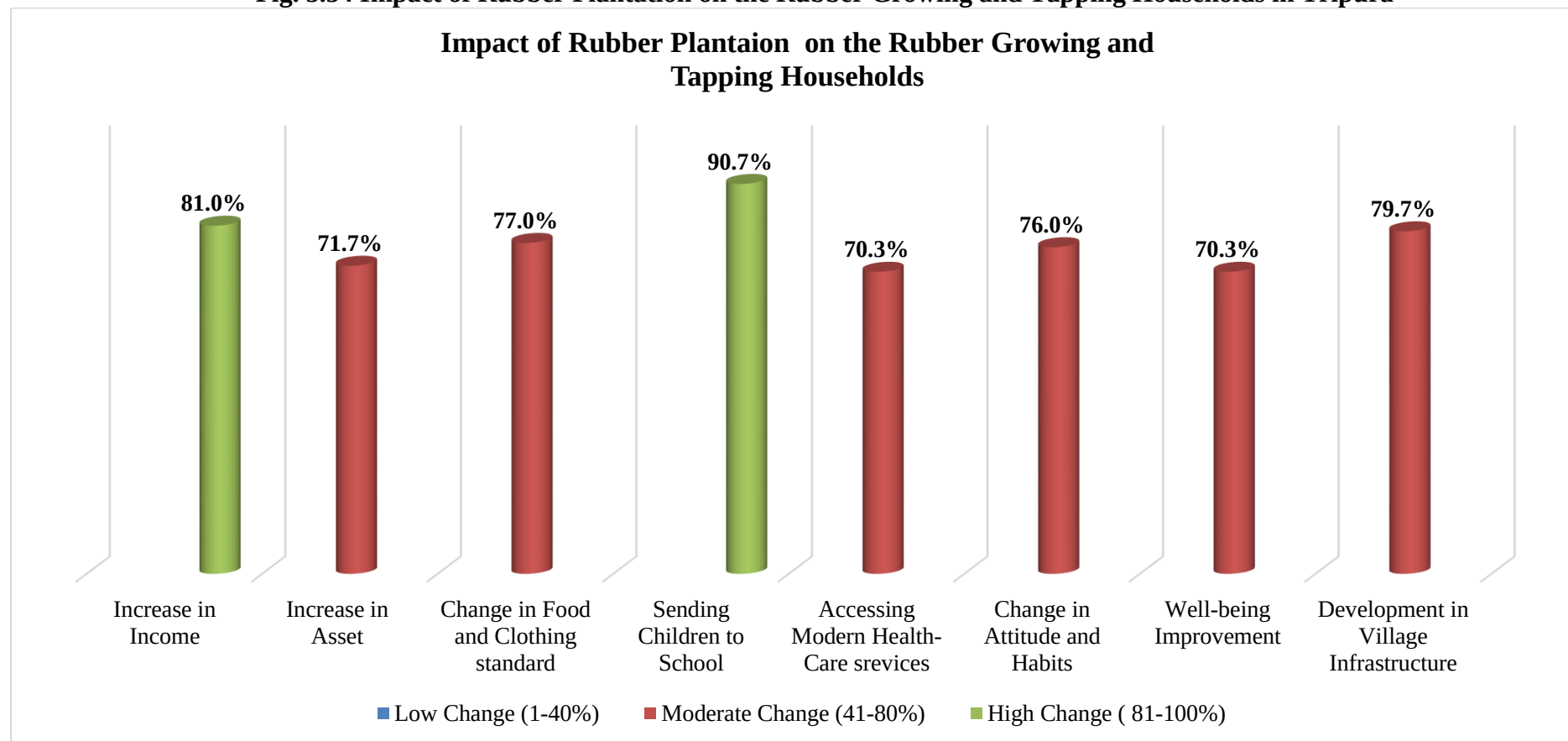


Figure 5.54 shows that the natural rubber plantation and development in the study area have brought high level of changes among the rubber growing and tapping tribal households in the indicators like income and improvement in children's education. Changes in the food and clothing standard, healthcare facilities, attitudinal changes and habits, development of village infrastructure, asset creation and the overall well-being of the tribal households shows that these have brought moderate change among the surveyed households in the state of Tripura. In nutshell, the study shows that the rise in the level of income of the rubber growers through plantation has also led to asset creation and brought significant changes in all the spheres.

5.39 Summary

Rubber plantation and development in the surveyed districts of Tripura have certainly reduced poverty, enhanced the socio-economic condition of the erstwhile poor *jhumias* (shifting cultivators) and landless families (now RPHH) and strengthened their coping strategies to overcome crisis and shock. The living standards of the tribal households have improved significantly in terms of income, asset creation, food and clothing, children's education, family healthcare, changes in the attitude and habits, improvement in village infrastructure and overall well-being. However, study also explores that the rubber producer/growers must possess the basic knowledge of the estate management. Template marking is an important tool to monitor tapping and production. Although the rubber tappers (including family tappers and hired tappers) are in the working age group, however they are not much educated and professionally trained. They belong to underprivileged sections of the society and hail from very low income groups. These tappers get absorbed into jobs or employments available within their own village since out-migration is not common among the tribal communities in the state. Most of the tappers enter this job without prior professional training skills. Their inefficiency coupled with lack of confidence and professionalism not only make them impressive but also fail to fetch remunerative wages and additional incentives for them. Thus the study recommends for imparting skill-based training to the tappers in taping, processing and managing the rubber plantation. Salary/wages structure can be fixed along with incentives for better productivity and quality to bring out competitiveness. The study also suggest that the scrap rubber percentage has to be lowered down and mechanism for preserved field latex (PFL) and RSS should be promoted for better price.

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Chapter – 6

Best Practices and Case Studies in Livelihood Promotions through Rubber Plantation in Tripura

In this chapter an effort is made to document the best practices/case studies in livelihood promotions through natural rubber plantation and development in the selected four districts of Tripura. It provides an account of the impact of rubber development projects on the lives and livelihoods of the marginal and small rubber growers and tappers in the state. The study findings also presents organizational structure, functions and role of the rubber producer societies at the local level in plantation development and marketing of rubber in the region.

I. Introduction:

The notion of ‘best practices’ has been derived from the political and administrative world of anti-poverty strategies.¹ The concept has been used in social research from an interdisciplinary perspective to learn from successful experiments of reducing poverty, which can be transferred to different national and cultural settings. The evolution of the concept coincides with a decade of shifting paradigms in development theory on how to combat poverty in the 1990’s. The dominant philosophy of macro-economics and structural adjustment as major tools to eradicate poverty and social exclusion now incorporates the building of human capital to enhance the human factor and its potential in the construction of pro-poor communities.² Oyen (2002: 21) classifies a best practice as an intervention that reduces poverty, reduce it to a sizeable degree, prevent loss of gains and ensures that none of the formerly poor slips back in to poverty as candidates for best practice. Further, he views that an intervention that manages to reduce several kinds of poverty rather than just one component in the complex pattern of poverty production as a leading candidate for a best practice.³ Studies by Joshi, Moore, Miller and Cimadamore et.al.⁴ emphasize the ‘participation’ as a crucial variable in the process of an intervention becoming a best practice. Thus, different kind of participations which in turn may lead/yield different kinds of impact on the future of a best practice. Some of these are best practice cases that can provide important lessons and have tremendous potential for context based replication and up scaling. Careful documentation of best practice cases can provide guidelines for policy making and planning of new projects as well as their effective implementation.⁵ However, caution must be exercised while analyzing issues of replicability of a ‘best practice’ case.

The State Divisions of Planning Commission of India in collaboration with the Human Development Resource Centre (HDRC) and UNDP India (2002)⁶ prepared a compendium of case studies of Government’s development initiatives that successfully achieved the intended goals and made a signal contribution to improvement in governance and implementation practices. It focused on three key areas: Human development and social services, land and water management and areas of major public interface with Government. The volume while analyzing several successful practices and case studies elsewhere in India, it also made reference to Tripura’s Rubber Block Plantation sector⁷ that has helped in improving livelihood security as well as stabilizing previously environmentally unfriendly cultivation (jhum) practices. The success of block plantation in Tripura encouraged the state to pursue a similar model in the Tenth Five-Year Plan and in the successive five year plans. The project has given a boost to small and marginal farmers and has encouraged them to undertake the cultivation of rubber as a viable, self-employment activity. Further, the study

proposed to platform rubber as a growth engine for development and the rehabilitation of tribal *jhumia* families as well as the development of downstream industries.

II. Evolution of Rubber Industry in Tripura

Rubber plantation was raised for the first time in Tripura in 1963 by the State Forest Department. Rubber Board responded by opening its first (one-man) office at Agartala in 1967. The Tripura Forest Development & Plantation Corporation Ltd. (TFDPC), a state government undertaking established in 1976, adopted rehabilitation of degraded forests through rubber plantation as its primary objective. Rubber has been identified as one of the thrust areas in Tripura, in view of its suitability to the terrain and the acceptability amongst the people.⁸

TFDPC implemented a project for rehabilitation of 100 tribal shifting cultivators through rubber plantation at its Warangbari Plantation Centre in West Tripura under a centrally sponsored scheme. The families worked on payment of wages for establishment of their own plantation with the hope of a good earning from sale of latex on maturity. The project caught the imagination of the planners as well as beneficiaries. The Warangbari experience was the precursor for establishment of another public sector undertaking, Tripura Rehabilitation Plantation Corporation Ltd. (TRPC) in 1983. It was set up with the primary objective of economic rehabilitation of tribal shifting cultivators (*jhumias*), tribal landless and small farmers mainly through rubber plantation. This rehabilitation model was utilized *mutatis mutandis* by the Tribal Welfare Department, Tripura Tribal Areas Autonomous District Council (TTAADC) and finally by the Rubber Board in its highly acclaimed Block Plantation scheme (BPS).⁹

The BPS was initiated by the Government of Tripura to develop the rubber sector and empower tribal communities to manage and sustain cultivation of the crop. It was implemented with assistance from the Central Government, the Rubber Board and the World Bank. The Rubber Board also had various incentive schemes for the development of the rubber industry, such as planting material subsidy, fencing subsidy, planting grant, smoke house subsidy and sheeting rollers subsidy. The project involved taking up of block plantation of rubber in a specific area with about 40-50 ha. The project adopted an integrated approach and brought simultaneous development of the plantation areas as well as various services including village roads, *balwadis*, health care centres, and drinking water schemes. Community participation was ensured through empowerment of groups comprising Rubber Producers' Societies (RPSs) and Women Thrift Groups (WTGs). Each BPS had one Rubber Board Officer in charge of this operation. Plantation was taken up on individual lands that are owned by the beneficiaries who work on their plantations. Each beneficiary was paid wages. Such a method created a sense of ownership and attachment to the plantation among the beneficiaries.¹⁰

III. Organizational Structure and Functions of Rubber Producers' Societies (RPS)

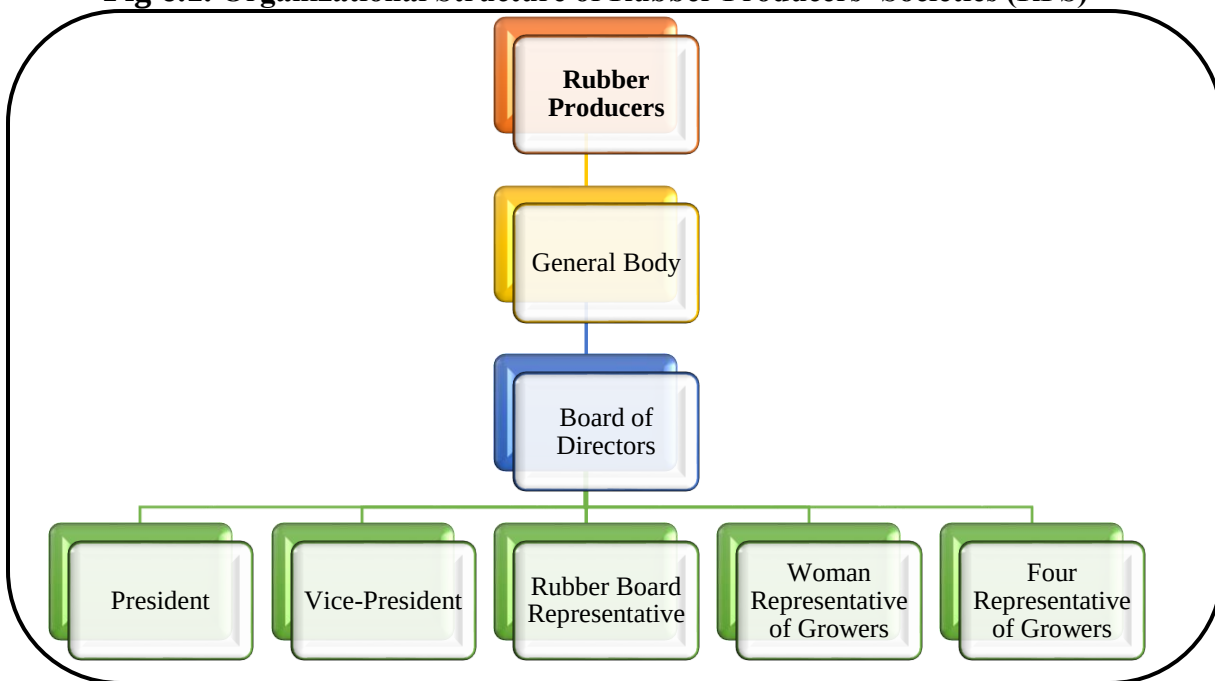
Rubber Producers Societies (RPS) are voluntary associations of small growers, self-help groups of rubber growers, registered under the Charitable Societies Act., 1955. The RPSs were presumed to function as a non-profit making institution in imparting technical and scientific know how to the members or the general improvement of the area and in particular for the socio-economic development of the small growers of rubber. Among the 2592 RPSs across the country; 2343 RPSs are located in traditional area, 153 RPSs are located in non-traditional area, i.e. in Tripura and 96 in other north east region.¹¹

Rubber Producers Societies to be registered, must have at least seven small holders and the rubber growers have to pay an entrance fee of Rs.50 and annual subscription fee of Rs.10. After the spot inspection by the field officer, the rubber board provides approval to those RPS, which constitutes 50 or more number of members. Mostly, the field officer of Rubber Board takes the initiative in identifying the promoters and the also assist in the formation of the RPS. Membership is open to rubber small growers owning less than 5 hectare of rubber plantation and who agree to market minimum quantity, according to their bylaws, of the rubber latex and scrap, produced in holdings situated in the area through the society. Funds of the society shall be raised through admission fee, annual subscription, donation, loans and advance from the members, subsidies and loans from other financial institutions including banks, cooperative societies, rubber board, government etc. The ultimate authority of the RPSs is vested in the hands of General body. Members of the general body are elected, in a democratic manner, in annual general body meeting. One third of the total general body members are elected annually and proportionately members in previous general body are relieved from their duties and responsibilities.¹² RPS assists in transfer of new technologies to members. It also assists common marketing of members rubber grade-wise and at remunerative prices. RPS also promote and assist group approach for new planting, replanting, productivity enhancement, availing of bank finance, Rubber Board grants etc. RPS also establish and run common crop processing facilities that help members to upgrade the quality of rubber. It also raises nurseries and supply high yielding planting materials to members. Members of RPS receive supplies of various inputs from Rubber Board and other possible sources and distribute among eligible members¹³.

IV. Role of Rubber Producer Societies in Marketing of Natural Rubber

Rubber producer societies plays a major role in marketing the sheet rubber in the rubber sector. Several institutional innovations carried out during the last six decades were instrumental in transforming the state's agricultural sector from jhum cultivation to commercial cultivation of natural rubber. Some of the major production centric interventions: Tripura Forest Development and Plantation Corporation (TFDPC), Tripura Rehabilitation Plantation Corporation (TRPC), Block Planting Units-Rubber Producer Societies (BPU-RPS) schemes of Rubber Board and marketing interventions including establishment of NR processing and rubber production units in the state.¹⁴ Studies show that there are six different channels which are followed by the organized and unorganized segments in the state of Tripura in marketing sheet rubber.¹⁵ 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. 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 (grade) RSS 5 only rather than as RSS 4 or other superior grades.

Fig 6.1. Organizational Structure of Rubber Producers' Societies (RPS)



➤ **Major Marketing Channels for Sheet Rubber in Tripura**

Fig. 6.2 Organized Sector

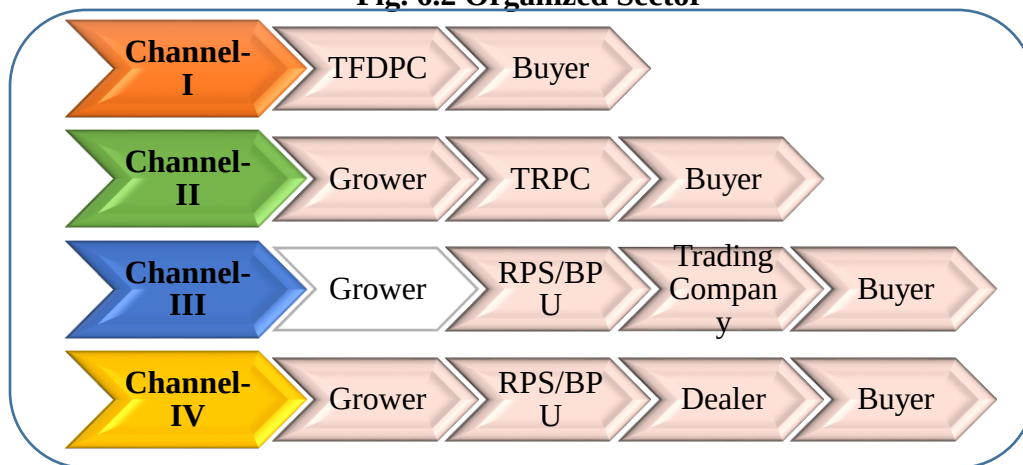
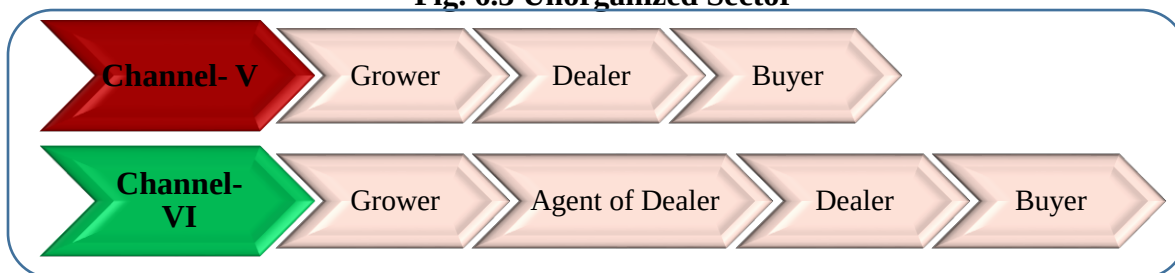


Fig. 6.3 Unorganized Sector



V. The Case Study of Rubber Producer Societies in the Study Area

5.1 Debdaru Rubber Producers Society (RPS) (South Tripura)

Debdaru Rubber Producers Society (RPS) falls under Debdaru Gram Panchayat in South Tripura District. The Debdaru RPS consists of its President, Vice President besides five executive members and a field officer. The RPS has 123 rubber growers and total area under rubber plantation is 85.22 hectare. Majority of the rubber growers (69) under Debdaru RPS are from *Bengali* community and rest 54 rubber growers belongs to Reang, Mog and Tripuri tribal community. Area under rubber plantation of the rubber growers is shown in Table 6.1.

Table 6.1 Number of Rubber Growers under Debdaru RPS, Debdaru

Name of the Community	Number Rubber Growers under Debdaru RPS	Total Area under Plantation
Reang	22	15.45
Mog	14	13.43
Tripuri	18	8.38
Non-Tribal (Bengali)	69	47.96
Total	123	85.22

Source: Data Compiled from the Register of Debdaru RPS

The weekly sale record of dry rubber by Debdaru RPS in the month of January 2017 is shown in Table 6.2. Debdaru RPS sales dry rubber to Tripura Latex Private limited, Agartala. The monthly average sale of dry latex by Debdaru RPS is 3139.91 kg(approximately). The average rate of selling dry rubber after processing is of Rs. 107.88. From selling dry rubber to the Tripura Latex, the RPS earns Rs. 3.38 lakhs monthly. The RPS purchase dry rubber from the rubber grower's at the rate of 100 per kg.

Table 6.2 Sale of Dry Rubber by Debdaru RPS as on 17-02-2017

Delivery date of latex	Dry Rubber (Kg.)	Rate	Total
09-01-2017	887.79	94.17	83603.18
18-01-2017	888.70	106.00	94202.20
25-01-2017	802.17	113.50	91045.30
31-01-2017	561.25	124.08	69639.90
Total and Average Rate	3139.91	107.88	338491.58

Plate 6.1 Debdaru Rubber Producer Society work process



5.2 Santaram Para Rubber Producer's Society (Sepahijala District)

Santaram Para RPS comes under Sepahijala District of Tripura. It was established under the Block Plantation Scheme in 1994. The society has 124 registered rubber growers/members who are all from schedule tribes (STs). The total area under plantation is of 131.67 hectre. The plantation area is divided in to 136 rubber blocks and per block there are 251 rubber trees. On an average, rubber tapping is done for 15 days in a month and the cumulative total of tapping days are about 257 days. Details of the Santaram Para RPS is shown in Table 6.3.

Table 6.3 Details of Production/Sale of Rubber at Block Planation Center Santaram Para RPS from 1995 to 2016

Year of plantation	Total Planted Area (Ha)	Initial Planting points	No. of Trees Now Present	year in which tapping started	Extent of Area Under Tapping (Ha)	No of trees under tapping
1995	35	15000	10788	2002	35	9366
1996	35	15000	10400		35	8948
1997	43	18018	13784		43	12560
2001	1.07	500	470			
2003	4.00	2000	1680			
2006	12.00	5160	4480	2014	7.5	3300
2007	1.6	518	471			
Total	131.67	56196	48073		120.5	34174

Table 6.4 Details of Production/Sale of Rubber Santaram Para RPS from 1995 to 2016

Production		
Items	During the Months	Cumulative Total (April)
Quantity of latex produced (Wet wt.) kg	7227	382531
No of Sheets Produced (Wet Wt.)	5701	173856
Quantity of Sheets Produced (Dry wt.) kg	2000	75605
Quantity of scrap produced (Dry wt.) kg	1180	33732
Sale		
Quantity of Sheet sold RSS 4 & Rate (Kg)	Nil.kg@.nil	36845 Kg
Quantity of Sheet sold RSS 5 & Rate(Kg)	1437.kg@.	41864 Kg
Total Quantity of Sheets (10+11) (Kg)	1437.Kg	78709 Kg
RSS-4 Amount realized(Rs)	Nil	3721160
RSS-5 Amount realized (Rs)	145816	3980797
Sheets Amount realized (13+14) (Rs)	145816	7701957
Quantity of Scrap Sold & Rate	867Kg@.73	31299 Kg
Scrap Amount Realised(Rs).	63291	1910213
Quantity of Latex Sold & Rate (DRC) (Kg)	Nil	34829 kg
Latex Amount Realised (Rs).	Nil	3400422
Total Amount Realized (15+17+19) (Rs)	209107	13012592

About 563 kg of rubber sheet and 313 kg of scrap are kept in stock in the Sanataram RPS. The annual production of the various grades of rubber sheet and their price for the year 2016 is shown in Table 6.5.

Table 6.5 Annual Production of Graded Rubber Sheets from April 2015 to March 2016

Graded Rubber Sheet	Total Production (kg)	Amount (Rs)
Rubber Sheet Rss -IV Kgs	36845	3721160
Rubber Sheet Rss -V Kgs	31223	2999580
Lot Rubber Kg	10641	981217
Dry Latex Kg	34829	3400422
Rubber Scrap Kg	31299	1914338
Total Income	144837	13016717

Table 6.6 provides the production details of various grades of sheet rubber of Santaram Para Rubber Producer Society for the year 2017.

Table 6.6 Annual Production of Graded Rubber Sheet in 2017

Name of the BP UNITS			Name of the Sub-division	Total Area in ha		No. of beneficiaries			No. of Plants under tapping	
Santarampara			Bishalgarh	131.62		124			36574	
Year / Months	Tapping Days	Rain Days	Rubber Sheet RSS 3 Kg	Rubber Sheet RSS 4 Kg	Rubber Sheet RSS 5 Kg	Lot Rubber Kg	Dry Latex Kg	Rubber Scrap Kg	Total productivity	Total Amount
April 2017-March 2017	242	64	30050	10400	13104	-	49130	23840	127924	12889993

Plate 6.2 Collection of Field Latex and Rubber Sheet Processing at Santaram Para RPS



5.3 Rangmala Rubber Producer Society (West Tripura)

The block plantation scheme (BPS) of Rangmala RPS was established under BPS scheme in 1992 in Rangmala Gram Panchayat of Sepahijala district. The society approved by Rubber Board consists of the President, Vice President, five executive members and a field officer. There are 72 rubber growers/beneficiaries in the society. The plantation is divided into 123 blocks and 285 number of trees were planted which are now in the mature stage. The rubber tappers are hired and employed by Rangmala RPS in tapping and collecting field latex. It takes about 24 days to complete tapping each block/trees. The cumulative total of tapping days in a year is 138 days. The following table depicts year-wise details of the production and sale of rubber by Rangmala RPS to Manimalayar Rubber Pvt. Limited (Rubber Board).

Table 6.7 Year-wise Rubber Plantation of Rangmala RPS starting from 1992-95 to 2001

Year of plantation	Total Planted Area (Ha)	Initial Planting points	No. of Trees Now Present	Year in which tapping started	Extent of Area Under Tapping (Ha)	No of trees under tapping
1992-95	80	32000	22000	2000	80	Nil
2000	30.58	4766	8624	2007	30.58	Nil
2001	19.56	7334	5376	2008	19.56	Nil
Total	130.14				130.14	3524

Table 6.8 Production of Rubber at Rangmala RPS

Items	During the Months	Cumulative Total (April)
Quantity of latex produced (Wet wt.) kg	19832	92229
No of Sheets Produced	4400	24500
Quantity of Sheets Produced (Dry wt.) kg	2120	12087
Quantity of scrap produced (Dry wt.) kg	2100	12800

Table 6.9 Sale of Rubber by Rangmala RPS

Item	During the Month	Cumulative Total (April)
11. Qty. of Sheet sold RSS 4 & Rate. Kg	2173 @Rs.42	7728
12. Qty. of Sheet sold RSS 5 & Rate. Kg	@Rs.	3290
13. Total Quantity of Sheets (11+12) Kg	2173	4.018
14. RSS-4 Amount realized Rs.	244758	924973
15. RSS-5 Amount realized Rs		373690
16. Sheets Amount realized (14+15) Rs	244758	1298663
17. Qty of Scrap Sold and Rate Kg	@Rs	5699
18. Scrap – Amount Realized Rs.		351055
19. Qty. of Latex Sold & Rate. (DRC) Kg	5546 @Rs.	23136
20. Latex – Amount Realized Rs.	434102	2536494
21. Total Amount Realized(16+18+20) Rs.	678860	4186212

About 810 kg of rubber sheet and 7101 kg of scrap are kept in stock in Rangmala RPS. The following table shows details of production and sale of various graded rubber sheets, collection of latex from the rubber growers and scrap in the year 2016.

Table 6.10 Details of Production/Sale of Rangmala RPS from January to December, 2016

Graded Rubber Sheets	Quantity(in Kg)
RSS-4	14115
RSS-5	8902
Latex Dry	76865
Scrap	26693

Plate 6.3 Rubber Sheet Processing and Rubber Wood Collection at Rangmala RPS



5.4 Daria Bagma Rubber Producer Society (Gomati District)

Daria Bagma RPS was established in Bagma village in Gomati district under the block plantation scheme (BPS) in 1994. The RPS is approved by Rubber Board in 2004. Financial assistance in the form of subsidy was provided by Rubber Board and Tribal Welfare Department, Government of India. There are 55 rubber growers and/or beneficiaries in the Daria Bagma RPS who are clubbed in two categories in two: 'A' category and 'B' based on the possession of land for rubber plantation. There are 46 beneficiaries under the 'A' category of growers, possessing less than 1.60 ha of land for rubber plantation and in the 'B' category there are 12 members having more than 1.60 ha of land for rubber cultivation. At present there are 58.76 ha. of land under tapping. The plantation is divided into 120 blocks and number of plants per block was 170 in the beginning, but gradually increased to 234 at present. The total number of trees under tapping in Daria Bagma RPS is 17786. Total rubber tapping days is 299 days. During 2015-16, production of rubber per 300 number of plants is 1604.13 kg.

The total income of the Daria Bagma RPS is of Rs. 88,86,653 and the total expenditure of the RPS in processing rubber sheet is Rs. 29,02,660. Thus, net income paid to beneficiaries is in tune of Rs. 57,60,000. Income obtained per beneficiaries i.e 'A' category beneficiaries stands at Rs. 1,08,000 and that of B category beneficiaries is Rs. 93,000. The tappers and markers wages paid by Daria Bagma RPS is of Rs. 16.03 lakhs annually and the processing workers working at the RPS are paid Rs. 3.19 lakhs per annum.

Table 6.11 Block Plantation Centre, Daria Bagma RPS At a Glance (2015-16)

Daria Bagma RPS	
Year of commencement of the project	2004
Area Planted by the Rubber Board	
1994-99 ha with existing plant(nos.)	21,185
1998 (46 ha damage plant) (nos.)	16, 306
Total 52.41 ha with existing plant (nos.)	14,878
2007 to 2011 Year of commencement of the Project	
2007 - 12.93 ha With existing Plant(no.)	4072
2008 - 12.98 ha With existing plant(no.)	4088
2009 - 7. 42 ha With existing plant(no.)	2337
2010 - 1.64 ha with existing plant(nos.)	516
2011 - 1.62 ha with existing plant(nos.)	510
Total 36 ha with Existing plant(nos.)	11525

Table 6.12 Employment Generation at the Daria Bagma RPS

Tappers	40
Processing Workers	4
Day Watcher Man	2
Night Guard's	2
Field Supervision	2
Manager	1
Grand Total	51 Nos

Table 6.13 Production of Graded Rubber Sheets in Daria Bagma RPS

Total Production	Quantity(Kg.)
R.S.S – IV	42485
R.S.S – V	31880
Lot Sheet	4026
Scrap Rubber	8442.500
Grand Total	868333.500
Items in Stock in 31/3/2016	Quantity(Kg.)
Stocking of Rubber Sheet	5910
Stocking of Scrap Rubber	1500
Grand Total	7410

Plate 6.4 Working Structure of Daria Bagma RPS, Gomati District



5.5 Kanchani Rubber Producer Society (Gomati District)

Kanchani RPS was established under the Block Plantation Project in 1994 in Bagma in Udaipur district. The society was approved by Rubber Board. There are 60 rubber growers in the society. The society sales various graded rubber sheet, latex, rubber lot and scarp rubber to Manimalayar Rubber Private limited, Agartala and earns Rs. 99.12 lakh annually. The business turnover of the society from rubber plantation is Rs. 1.12 crore. At present the society has bank deposits of Rs. 13,28,898 in Tripura Gramin Bank, State Bank of India, Udaipur and including cash in hand. The society has a welfare fund for its beneficiaries, as of 2016, worth Rs. 7,64,582. Kanchani RPS pays Rs. 67.2 lakh to the rubber growers who sell field latex to the society and the tappers hired by the society are paid Rs. 29.1 lakh annually. Besides the processing workers of the RPS are paid of Rs. 2600 only.

Table 6.14 Kanchani Colony Rubber Producer Society, Bagma

Balance (Bank Deposits)	Amounts Rs
Cash in Hand	13,334
SBI- Udaipur	10,67546
TGB - Bagma	2,48018
Total Bank Balance	13,28898
Growers Contribution	
Sale of Growers Rubber RSS-4 49667kg	4914394
Sale of Growers Rubber RSS-5 34326 kg	3222238
Sale of Grower Rubber Lot 3078 kg	296207
Sale of Grower Rubber Scrap 9020 kg	617742
Sale of Grower Rubber latex 10320.86 DRC	862316
Total	9912897

Plate 6.5 Collection of Field Latex and Rubber Sheet Processing at Kanchani Colony RPS



5.6 Khathansa Rubber Producers Society (West Tripura)

Khathansa RPS was established under Block Plantation scheme in 2002-2003. The RPS is constituted with a president, vice president, five executive members and a field officer. The RPS is approved by Rubber Board. The society has 81 rubber growers, 3 rubber tappers and 4 workers. The RPS produces the highest quality of graded rubber sheets (1X). The society sales various graded rubber sheet, latex, and scarp rubber to Manimalayar Rubber Private Limited, Agartala and earns Rs. 44.51 lakh annually. The society has bank saving and cash in hand of Rs. 99,982. The society has the business turnover of Rs. 45.7 lakh.

Khathansa RPS pays Rs. 39.5 lakhs to the rubber growers who sale filed latex to the society and the wage labourers working in processing rubber at the RPS gets Rs. 3.16 lakh. The tappers hired

by the RPS are paid very low amount of Rs. 24,000. The RPS however, gives festive allowance to the labourers of Rs. 9,600.

Table 6.15 Details of Kanchani Colony Rubber Producer Society, Bagma

Balance (Bank Deposit)	Amount (in Rs.)
Cash in hand	28907
Cash at United Bank of India	67694
Cash at Union Bank of India	3381
Bank Interest	7917
Membership fees	20160
Rubber – Sheet, latex and crap	
RSS iv 21644 kg	2118171
RSS V 17086 kg	1607675
Latex (DRC6279 kg)	721942
Scrap 5000kg	3950
Total	4451738

Plate 6.6 Rubber Nursery, Field Latex Collection and Rubber Sheet Processing at Community Rubber Processing Centre, Khathansa RPS



VI. Case Studies on the Rubber Growers and Tappers

The next section analyses the case studies of the rubber growing and tapping tribal households in the study area.

Plantation and Tribal Livelihood

Traditionally, the tribals of Tripura have been the 'jhum' cultivators. However, due to demographic changes and in relation to the unavailability of virgin forest lands, the extent of land available for jhum has shrunk.¹⁶ In course of time, the system of cultivation got declined owing to the scarcity of land and also falling of jhum cycle.¹⁷ However, scholars argue that the shortage of land is also the consequences of the extension of settlements and settled cultivation in the state as well as it was also the inevitable results of the development of the state.¹⁸ This in turn induced the scheduled tribes to find another alternative way of living. Owing to the higher employment potentiality, income returns and better marketing strategy, natural rubber cultivation among the tribal households has been one among the major source of livelihood. Rubber plantation provides direct employment to the small and marginal growers and the rubber tapping tribal households (SC/ST) and the tribal women.

Case Study 1 Increased educational attainment and income of the plantation household

Padam Kumar Debberma, 35 years old, unmarried, is a resident of Rangmala village under Rangmala Gram Panchayat of Sepahilala district. Belonging to Tripuri tribal community, he lives in his mud-walled and tin-roof house. His is a BPL family. He has few livestock's including a cow and pig and goat. Only graduate in the village, he is a small rubber grower on his 10 *kanni* of mature land. He reported at the age of 18, while studying, he was also partly engaged in rubber plantation. At present, rubber plantation is his major source of income, Rs. 17,000 monthly. He is a member of Rangmala Rubber Producer Society (RPS), Rangmala. He collects field latex on every alternate day and deposits the latex at Rangmala RPS. Pvt. (Rubber Board), Agartala. He taps more than 250 rubber trees per alternate day. The minimum distance from his house to the plantation is 5 kms. Recently, he has undergone a 15 days training for rubber tapping, collection and processing of latex, organized by the Tripura Skill Development Mission and Manimalayar Rubber (Rubber Board). He said that training was very useful, as he learnt many things including not cutting the total bark of the plant or marking rubber tree which has very bad impact on the plant. He also works at RPS in processing rubber sheet. He is happy with his earnings, he gives credit to rubber plantation that he could afford to complete his study and meet other household expenditure including the cost of food grains, clothing and health care. This study shows rubber as a source of income has transformed the live and livelihood of the respondent.

Plate 6.7 Livelihood Activities in Rangmala Village



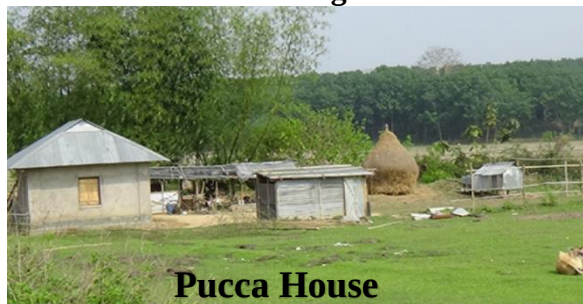
Integrated Approach to Sustainable Livelihoods

The field finding from four districts of Tripura shows that rubber is a major source of income among the tribal households. In addition to rubber cultivation, the tribal households also earn from other alternate sources such as paddy cultivation, livestock raising, fishery, horticultural activities in the high lands, including banana cultivation and bamboo-based rural livelihood activities in the state. Handloom weaving is also a secondary source of employment and income to the tribal cultivators. Tripuri women in the rural households prefer to weave their own *risa* and *rinai* which are part of their traditional dress. Other handloom products which are woven include *lungi*, *sari*, *chaddar*, and *scarves*. Thus, an integrated approach to livelihood is being adopted by the tribals and the state has been instrumental in promoting rural and tribal livelihoods through enactment of various policies and programmes. The present study explored that there is rise in the level of income among the tribals which has further led to asset creation, and improvement in the living condition including health and education.

Case Study. 2 Mixed Cropping System with Natural Rubber

Rebati Mohan Jamatia, 67 year old, lives in Bagma village under Killa R.D. block of Gomati district. He belongs to Jamatia tribal community. He is illiterate. He lives with his son and daughter-in-law and all of them work in rubber plantation, their major source of income. His son also works in sheet processing in the Daria Bagma RPS on a monthly salary of Rs. 5,000/-. They also grow paddy cultivation in half kanni. They also own a fish pond. Rebati Mohan has 12.5 *kani* land, out of which 12 kanni is used for rubber plantation and remaining half kani is used for paddy cultivation. The house looks good with mud walled and tin-roof. This is a well-off house with valuable assets including a television, four mobile phones, five ceiling fans, two pressure cooker, one gas stove, one refrigerator, three cycles, one tractor and ten *vori* of gold jewelries. The household is also endowed with a good number of livestock: seven cows, twelve poultry and two pigs. Milk is sold in the village and in the local market and the household earns good income from raising livestock. Rebati Mohan has savings bank account in Union Bank. Although the family members works in rubber plantation, they also hire two tappers (one male and female each). The tappers taps more than 250 trees on every third day. The hired tappers/workers get Rs. 170 as wage payment per day. Latex collection per month on an average is 100 litre which is deposited at the Daria Bagma RPS. The price of field latex per litre is of Rs. 151, but Rebati Mohan is not satisfied with the price of field latex. He said, it is very low. The total monthly household income of Rebati Mohan from all sources is Rs 35,000. He revealed that before rubber plantation he earned hardly 12,000/ per month. After starting rubber plantation, the family income has increased significantly.

Plate 6.8 Village infrastructure of Daria Bagma Village, Gomati District



Pucca House



Kuchha House with tin-roof



Electricity conction in the Village



Toilets and handpump in the household premise

Case Study.3 Improvement in Living Conditions of the plantation household

Sotish Debberma, 28, is an inhabitant of Rangmala village of Charilam block in Sepahijala district of Tripura. He is married and has three children. He belongs to Tripuri tribal community. Sotish and his wife are educated and have completed secondary education. His daughter and son have started going to nursery school. Rubber cultivation is his main source of income. He taps rubber tree and his wife also assist in the collection of field latex and scrap rubber. Sotish also works in the Rangmala RPS in rubber processing. He is a member of the RPS. He started rubber cultivation at age of 21; earlier, he was engaged in jhum cultivation. He viewed that jhum crops production was not sufficient to meet the food requirements throughout the year as his income was low. However, after shifting from jhum cultivation to rubber cultivation, his income has increased significantly. Interestingly, he also works in MGNREGA. His monthly income is of Rs. 10,000. He possess 2 *kani* land on which he has mature rubber plants. Sotish reported that after working in RPS and in his own plantation, he has a stable source of income and through this income, he has purchased some household assets like television, mobile phone and bicycle. He shared that rubber plantation has helped in the improvement of his living standard to a significant extent.

Plate 6.9 Village Infrastructure in Rangmala Village, Sepahijala district



Case Study. 4 Educational Attainment of Plantation Household

Budhhalaxmi Debbarma, 51 years old woman, is a resident of Chandra Mohan Para, under Charilam Block of Sepahijala district. Her husband is 60 years old. The family has six members, elder son (29 years old) is married and two younger sons are unmarried. The second son is pursuing graduation from Tripura University. The third son is in 12th standard. She is from Tripuri tribal community. Her family is APL. Her husband works in a private company. Income of the household from rubber cultivation is Rs. 20,000/- per month. Her husband earns 15,000/- from private job. Budhalaxmi lives in mud walled and tin-roof house. She has hand pump and toilets in the premises. She use firewood and L.P.G. gas for cooking. The household has steel utensil set. Budhalaxmi possess some silver jewelries. She has three cow and one pig. She has valuable assets like television, two mobile phones, one pressure cookers and a refrigerator. Her husband possess a motor bike and a bicycle. She hires one male tapper for tapping field latex and collection of field latex. The tapper taps 250 rubber tree per alternate day.

Monthly collection of latex is of 41 litre, which is deposited to Santaram Para RPS. The price of latex per litre is Rs. 155 per kg. The tapper is paid Rs. 180 per day. She gives festival allowance to the tappers during Durga puja and Garia Puja. Budhalaxmi said that earlier her monthly family income was hardly Rs. 5000-6000/-. But after joining rubber plantation her family income increased substantially and now together with her husband's salary, it stands at Rs. 35,000/ per month. She is satisfied with the works associated with rubber tapping and processing.

Plate 6.10 Livelihood Activities in Chandra Mohan Para Gram Panchayat



Case Study 5 Improvement in the Living Conditions of the Rubber Growing Household

Ganga Joy Reang, 58 year old, is a resident of Jolaibari village in East Pillak block of South Tripura. He belongs to the Reang community. He is from APL family. He has seven dependent members in his family. Made of mud walled and tin-roof, his housing condition is good. He has been engaged in rubber cultivation since his youth, and it has been more than 35 years that he has been working in plantation sector. He is only 10th pass and his two sons are graduate. His monthly earning is around Rs.15000 to 20000. He has three goats and one pig. Ganga Joy has one television, two mobile phone, three ceiling fan and one motor bike. He also possess half *tola* of gold and jewelries. He has 11 *kani* of land on which he grows rubber plants. Both Ganga Joy and his two sons are engaged in rubber plantation in terms of managing the plantation and works as processing worker at the RPS. However, they have also hired two tappers for rubber tapping and collection of field latex. The tappers tap 150 to 175 rubber tree per alternate day. The Rubber Board has fixed the minimum basic wages (including the Variable Dearness Allowances (VDA) for the rubber tappers/processing workers (for adult male/female) of Rs. 254 for 8 hours of work, but the wage payment paid to the tappers hired by the rubber growers varies

from place to place. Ganga Joy said that he has been paying Rs. 160-200 per day to his tappers. He also pays allowances to the tappers especially during *Durga Puja* and the tappers also avail sick leave. He has undergone training for tapping, collection and processing of rubber under Tripura Skill Development Mission and Rubber Board at Debbaru RPS. He reported that these days there was difficulty in getting skilled tappers for rubber tapping and processing. For, the wage rates in MGNREGA and agricultural work has gone up, the workers prefer to work in those sectors. This case study reveals that with steady high income, good housing condition, and educational opportunities available for the family members and possession of valuable assets, the socio-economic conditions of the respondents have improved significantly. This case study validates this point.

Plate 6.11 Livelihood Activities in South Tripura



Sources of Tribal Livelihood

A significant number of persons and families in Tripura continue to depend on rubber plantation. The study findings from four districts of Tripura show that natural rubber production and tapping has been a major source of livelihood for a very high proportion, as high as 84 percent tribal households. Further, the study reveals that the average income of an adult worker from jhum (from a combination of rice cultivation and harvest of *muli* bamboos) was merely Rs 4,000 to Rs 5000 per month. After rubber cultivation, the income of the tribal household has increased, on an average, to the tune of Rs. 10,000- 15,000 monthly.

One of the most important strategies adopted for *Jhumia* rehabilitation in Tripura is the raising of rubber plantations. The rubber plantation project was conceived as a lucrative alternative to Jhum cultivation. By the time of the 9th five-year plan, the raising of rubber plantation had become one of the main strategies for rehabilitation of *Jhumias* through the World Bank aided India Rubber

Project. The ‘rubber for the poor’ project being one of the main efforts to provide tribal and other marginal farmers with a steady income. The rubber option looked attractive because it had the potential of providing Jhumias with a substantial income along with cash crops like pineapple and pepper which were grown with it.¹⁹

Case Study. 6 Rubber as a Major Source of Livelihood

Krishna Mohan Tripura, 59, is a resident of Jolaibari village under Debbaru Gram Panchayat of South Tripura. He belongs to Tripuri tribal community. He is illiterate but he is placed in APL family, comprising ten members. It is a joint family. His two sons are graduate. Another son is 12th pass who earns Rs. 5000 per month from a private sector job. His house is made of mud walled and tin roof and is in a good condition. He has 6 kanni of land out of which 3.5 kanni of land is used for rubber plantation and remaining 2.5 kanni of land is use of paddy production. Before he was practicing jhum cultivation and was engaged in paddy cultivation for household consumption. He has one cow and ox and two pigs. He has one televisions, four mobile phones, three pressure cookers, one gas stove, one refrigerator and four ceiling fans. Among transport assets, he has three bi cycles. He had earlier received of Rs. 20,000 for construction of house under Indira Aawas Yojana (IAY). Apart from paddy cultivation, rubber has been one of the major source of income. His two sons and himself works in the plantation starting from tapping rubber, collection of field latex and processing work at the RPS. He earns Rs. 10,000 monthly from rubber plantation. He taps more than 250 rubber trees every day in the early morning. Together, his and his two son’s income stand around Rs. 20,000 per month.

Plate 6.12 Village infrastructure of Debbaru Gram panchayat



Case Study. 7 Shifting to Settled Cultivation

Thuong Mog, 55 year, is a rubber grower in Debbaru village (South Tripura district). A graduate and classified as APL family, he belongs to Mog tribal community. He is from APL family. He is married and has four members in his family. His 14 years old son is studying in 7th standard and his 12 year old daughter is in 6th standard. He lives in brick walled and concrete-roof house with good housing condition including toilet facility within the premise. He has a hand pump in the household premises for drinking water and household use and also a tube well for minor irrigation purpose. He has grid electricity connection at home and also has solar lighting system for personal use. He has 15 kanni of land out of which 12 kanni land is under mature rubber plantation and another 3 kanni land is used for paddy cultivation. His monthly income mainly comes from rubber cultivation (Rs. 50,000/ per month) and earning from other sources including selling paddy and renting tractor is Rs. 15,000/ per month. He possess high value items/assets including two television, three mobiles, two gas stove, refrigerator and a motorbike. He also owns a tractor which he lends on rent for agricultural work in the nearby villages. He has taken loan of Rs. 1,20,000/- from Tripura Gramin Bank for purchasing the tractor. He is the member of Aurobinda RPS. He hires four male tappers for tapping and collection of field latex. These four tappers tap 850 tree per day. He deposits around 1100 kg field latex to the RPS annually. He pays Rs. 200 per day/per person as wage payment to the tappers but payment is made on weekly basis. In addition to this, he gives festival allowance to the workers during *Durga Puja* and *Garia Puja*. The tappers are allowed to avail sick leave as and when required. Thuong stated that food crops that was produced earlier through shifting (jhum) cultivation was not adequate to meet the household requirement. The income from selling firewood and jhum cultivation was very low. That is why he had to shift to settled cultivation (paddy plantation). The rubber plantation under block plantation scheme (BPS) started in Baikhora in 1992 and tapping started in the year 2000. The rubber cultivation as stated by Thuong has changed the entire scenario, it has enhanced the income of the family to a significant extent. He is investing in children's education and is now capable of providing good health care to his family. To him, rubber remains an important crop and it is certainly a 'wonderful crop', he added.

Plate 6.13 Interaction with the respondents of Bagma village



Household Well-being

Household well-being has been defined in the selected elements/indicators of home amenities (the housing condition, source of energy for lighting, expenses on domestic items); kitchen facilities(primary source of energy for cooking, and ownership of appliances); education(expenses on education and number of literate persons in the house); hygiene(improved hygienic conditions and availability of water and sanitation within the household premises); entertainment(expense on entertainment and ownership of consumer goods); communication(expense and ownership of telephone instruments and mobile); transportation(modes of transportation and ownership of vehicles like bicycle, motor cycle, scooter etc.) and access to health care.²⁰ India occupies a very low position in the World Happiness Report, 2016 which is at 118 out of 157 countries graded.²¹

Case Study. 8 Improvements in the Household Well-being

Rabi Chandra Debbarma, 60 years old small rubber grower, is a resident of Khayaripur village under Rambabu Gram Panchayat in West Tripura district. He belongs to the *Tripuri* tribal community and has seven members in his BPL joint family. Both Rabi Chandra and his wife are illiterate. However, both his sons and daughter-in-law are educated till 9th standard. His elder son is in private sector job and his younger one works with him in rubber plantation. He is a member of Khathansa RPS and his younger son works at the RPS in rubber processing. Rabi Chandra has seven kanni of land, out of which 4 kanni is used for rubber plantation and in another 3 kanni he grows paddy. His house is made of mud-walled and tin-roof. He has drinking water facility and toilets within his premises. The main earning source of Rabi Chandra is from rubber plantation that fetches him around Rs. 25,000/- per month. Paddy crops is for household consumption only, however, they also sell extra food grains in the open market to meet the household needs. Additionally, his both sons earns nearly 10,000/ per month. He has eight goats and one pig. He has one television, three mobile phones, one refrigerator and cycle. He collects 90 liter of field latex per month and deposit it at the Khathansa RPS. Rabi Chandra recalls those days when he was engaged in jhum cultivation, the jhum crops produces were not sufficient enough to meet the food requirements in his family. Then, there was hardly any alternative source of income for them. At some point of time, assuming that rubber cultivation may be profitable, Rabi Chandra shifted to rubber plantation. He vows that after shifting to rubber plantation, his income through plantation has increased substantially; he is now able to fulfil the household needs also, and he could educate his two sons. Not only rubber crop has helped him to escape from food insecurity but has also improved the economic conditions of his family, he added empathetically.

Plate 6.14 Livelihood activities among the tribal households in Rambabu Gram Panchayat



Plantation labour and gender

Gender analysis of plantation labour shows that the rubber tappers in the plantation are mostly male workers (81%). The share of women employed in this sector is obviously very low (19%). This study confirms to the findings of earlier studies that a major difference between jhum cultivation and rubber plantation is low participation of women in the entire period. Following maturity of rubber plantation, tapping is mostly done by men and processing of latex into rubber sheet is also done by men, thus, rubber has mainly become a man's crop and not women's.²² Out of 300 respondents surveyed in the four districts of Tripura, 36 respondents are female hired tappers who works in collection of field latex only.

The socio-economic condition of the rubber tappers in the study area shows that most of the tappers are illiterate, have limited exposure and economically very poor. The rubber workers live with the bare minimum facilities. The tappers are paid very low wage payments of Rs. 170-200 per day. In fact, 37 percent tappers revealed they had to change their employer because of low wage payments and also due to their rude behavior.

Case Study. 9 Women's labour in the Rubber Plantation

Katti Kumari Jamatia, 45 year old woman, is a small rubber grower from Bagma ADC village under Killa RD block of Gomati District. Her husband is an ex-BSF *Jawan*, now working as a car driver. Her daughter is 19 years, studying in 12th standard in the neighboring village. Katti Kumari belongs to Jamatia tribal community. She has studied till 9th standard and her husband is 10th pass. She lives in mud-walled and tin-roof house. She has a hand pump and toilet facility within the premises. She uses firewood for cooking purpose and have few aluminum utensils. The house is having electricity concoction. The family possess 8 kanni of land, both in the name of kaati kumara and her husband in which they grow rubber. Her husband earns Rs. 10,000 monthly and her income from rubber cultivation is of Rs. 15,000/- per month. Katti Kumari works in the plantation and also hires one tapper for tapping rubber tree and collection of field latex. She pays Rs. 174 as wage payment to the tapper and she pays on weekly basis. The tapper taps around 200 rubber trees per alternate day. On an average she deposits 178 litre of field latex at Kanchani Colony RPS. Per litre of latex, she gets Rs. 120 from the RPS. She has one ox, goat and a pig. She has one television, two mobile phone, two ceiling fan and a refrigerator. Her husband possess a Jeep which he has purchased after retirement. Thus family is from above poverty line (APL). Katti Kumari said that if she is able to meet the household expenses including providing education to her daughter is because of rubber plantation. However, she revealed that the work load is increasing day by day because of rubber tapping. She has to go to the rubber plantation for tapping in the early morning and collect latex; on return she has to take care of her child and household work including cooking food.

Plate 6.15 Livelihood Activities in Gomati District



Financial debt and its impact

The extent of indebtedness among the sample households and the sources of borrowings are summarized in chapter five. The main sources of their debt are: *Bandhan* bank, Tripura Gramin Bank (TGB), co-operative banks, moneylenders, micro-credit (SHGs), friends and relatives. Rate of interest varies depending on the sources of debt. Usually friends and relatives do not charge any interest on loans. Loans from financial institutions such as commercial banks and co-operative society are available at 10 to 12 percent interest per annum. The tribal households in the study area have availed housing loans for repairing of old houses and construction of new houses, for children's education, crop loans and loans to self-help groups.

Survey results indicate that one-third sample household of the tribal have taken loan from banks and other financial institutions to meet their monetary needs. And most of the tribal households covered in the study had taken loan from the nearest Tripura Gramin/*Bandhan* Bank and few tribal households had borrowed from other sources, including Self Help Groups (SHGs) operating in the study area. Most of the tappers families are indebted. They depend more on co-operative sector because of its democratic set up in organizational level and simple procedures for getting small loans. Other sources are commercial banks, moneylenders etc. As the income is not enough to meet even the day-to-day expenses, the debt burden is always increasing (see case study 10).

Case Study. 10 Indebtedness among Rubber Tappers

Nayang Mog, 28 year old, belonging to Mog tribal community, is a rubber tapper in Kaishimukh village in South Tripura. He is illiterate. He is married and having four dependent members in his family. His elder son is of 12 years old and is studying in 5th standard and his 6 years old daughter is in 2nd standard. His a BPL family that lives in a mud-walled, thatched house. He has 1 kanni of allotted land provided earlier by the state government under jhumia rehabilitation programme, though before he still practices jhum cultivation for subsistence. His monthly income from tapping rubber and collection of field latex is around Rs. 7,000 only. He does not have any livestock and assets as such. Recently, he has received government assistance for construction of house under Indira Awas Yojana (IAY) and toilet under SBM (Gramin). He borrowed Rs.25,000/- from the *Bandhan* bank as collateral free small enterprise loan for rubber plantation in the year 2015 @ 10 per cent interest rate per annum. Since then, he has been repaying the loan on installments. However, the living expenses has been increasing day by day as he has to invest on his children education and to meet other household expenditure. In this scenario, it is increasingly becoming difficult to repay the loan. Because of low wage payments under rubber tapping, he has to search for work in other agricultural and non-agricultural work including works on the construction sites.

Early phase of rubber plantation necessitates active involvement of family (hired) labour till the completion of the calendar of operations. However, an increasing shortage of hired rubber tappers in the plantation sector is observed in the recent years. Since rubber tapping and collection of field latex requires more physical labour and also the wages payed to the tappers is low compared to MGNREGA related work, tappers prefer to work under MGNREGA and even on the construction sites. Although the Labour Department, Government of Tripura has revised the minimum wages for the tappers/processing workers (for male and female) of Rs. 238 only for 8 hours of work, and for rubber plantation field worker (for male and female) of Rs. 230 only for 8 hours of work, they

rubber growers/plantation owners pay low wage payments to the hired tappers i.e. between Rs. 170- 200 only.

Case Study. 11 Economic status of the Rubber Tapper

Urbamani Debbarma, 42 year old, is a resident of Rangmala village under Charilam block of Sepahijala of Tripura. He belongs to the *Tripuri* tribal community and placed under APL family category. He has four dependent members in his family. His housing condition is good and is made of mud walled and tin-roof. He has been engaged in rubber tapping since his youth, working for more than 15 years in rubber tapping. He is only 8th pass and his wife has studied till 5th standard. His elder daughter is of 13 years old and is studying in 9th standard and his two sons of 11 and 6 years old are studying in 7th and 4th standard respectively. He has 15 kanni of raiyati (inherited) land. This land has been rented out to Rangmala RPS for rubber cultivation and in return he gets Rs. 40,000 for every three months. He also works as a rubber tapper in Rangmala RPS on daily wage basis. He taps 250 to 300 rubber tree per alternate days. Urabani Debbarma is paid Rs. 200-250 as his daily wage by the RPS. He is also getting festival allowances especially during *Durga Puja* and *Garia Puja*. When required, he also avails sick leave. He has undergone training through Rangmala RPS for planting rubber trees, tapping techniques, disease identification and control, and processing of latex to produce rubber sheets. These training have enhanced his skills to a great extent. His monthly earning from all sources is Rs.18000 to 20000(approximately). He owns a cow, two oxen, three goats and one pig. Urbamani also has a television, two mobile phones, two ceiling fans and a bicycle. He reported that food crops that was produced earlier through shifting (jhum) cultivation was not sufficient to meet the household requirements. The income from selling firewood and jhum crops was also very low. That is why he shifted from jhum cultivation to rubber plantation. After working in the plantation, the economic conditions of his family has improved to a significant extent, there is improved access to food as well as education and health care of his family members.

Case study 12 Living Condition of the Rubber Tapper

Halprue Mog is 21 years old, lives in Moharipur village under Radaha mohan Gram Panchayat of West Tripura. He is married and has one year old son. He belongs to *Mog* tribal community. His family comes under below poverty line (BPL). He has passed 8th standard and his wife completed education till 10th standard after marriage. His housing condition is good and is made of mud walled and tin-roof. Rubber cultivation is his main source of income. He is a member of Debbaru RPS. Recently, he received training on rubber cultivation techniques, tapping, disease and pest management, including processing of latex to produce rubber sheets. He taps rubber tree and his wife also assist in the collection of field latex and scrap rubber. He also works in the Khtanasa RPS in rubber processing. His wife collects fire-wood for cooking purpose. Halprue taps more than 250 rubber trees every alternate day. The minimum distance from his house to the plantation is less than a kilometer. He has a hand pump and toilet within the premises. The house is having electricity connection. He possesses 2 *kani* of allotted land earlier provided by the state government under *Jhumia* rehabilitation programme. He is still practicing jhum cultivation for subsistence. His monthly income from tapping rubber and collection of field latex is of Rs. 7,000 only. Apart from working at the RPS, he also works in MGNREGA. He has one cow, one oxen and a pig. He has purchased some household assets like television, mobile phone, pressure cooker and bicycle. He is happy with his earnings through rubber plantation and other sources. He shared that rubber plantation has helped in the improvement of his living standard to a significant extent.

Plate 6.16 Village Infrastructure of Radaha Mohan Gram Panchayat



Skill Development in Rubber sector

The Tripura Skill Development Mission²³ along with the Rubber Board of India in the year 2016 have conducted six training and capacity building programmes for the tribal youths (including the rubber tappers and small growers) in the entire state. More than 180 tribal youths have been trained on various activities in the rubber sector such as the techniques of soil preparation, planting and propagation, spiral marking on tree, removing thin layer of bark, collection of latex, coagulation of latex, maintenance of plants, pest and disease control etc. so as to enable the growers to achieve optimum production level of 400 kg per hectare per annum. The Tripura Skill Development Mission had earlier released Rs. 1,636,200 to meet the expenses for imparting training to the local youth's in the rubber sectors in the state. These training were mostly conducted at the local level at the Rubber Producers Society (RPS) spread across four districts of Tripura. It was observed during the field study that such trainings were held at Khathansa Block Plantation unit in West Tripura under technical support from Rubber Board. in the month of September, 2016. The trainees are mostly small rubber growers having their own rubber gardens; however due to lack of knowhow of proper techniques, their productivity has not been enhanced correspondingly, resulting in less return. As a matter of fact, rubber plantation and production has been practiced by large number of people in the state, many of the growers have not undergone formal trainings and therefore, do not have appropriate skills of managing the plantation activities. In this scenario, Skill Directorate in collaboration with Rubber Board has stepped in to train the rubber growers of the state. Similar short duration training programmes on rubber tapping, including training in carpentry in rubber woods were also arranged in the TFDPC production centre at Nagicherra in West Tripura.

Conclusion

From the above discussion, it is evident that the Rubber Producer Societies at the local level plays an important role in livelihood promotion among the tribal rubber growing households in the study area especially in rubber plantation and, in transferring new technologies to the members as well as establishing a robust market linkages with the rubber companies such as *Mani Malayar Rubber Pvt/. Ltd.* (under Rubber Board) and *Tripura Latex Pvt. Limited.* Apart from this, the Rubber Producer Societies 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 price. A close look into the documentation of case studies/best practices in livelihood promotions through natural rubber plantation and development in the four districts Tripura reveals that natural rubber plantation among the tribal households has certainly led to the increase in educational attainment and income of the plantation households, there is more adoption of mix cropping system along with natural rubber among the rubber growing households, the living conditions of the tribal households has improved to a significant extent. Natural rubber has been a major source of livelihood of a considerable size of tribal population in the study area and most importantly, there is shift from shifting (*jhum*) to settled cultivation and improvement in the household well-being. However, there is no noticeable change in the socio-economic conditions of the hired rubber tappers in general and women tappers in particular. The study findings reveals that there is growing indebtedness among the rubber tappers. Thus, ensuring the minimum wage payment to the rubber tappers urgently requires the state intervention. The success stories of the block planation scheme (BPS) has been further replicated in the non-traditional regions of north-eastern states of Maharashtra, Odisha, West Bengal and Andhra Pradesh.

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Chapter 7

Observations, Conclusions and Policy Recommendations

As the concluding part of the report, this chapter summarizes the main findings of the study. This also entails a review of the stated objectives, methodology, theoretical framework and explorations of the research questions. The emerging issues and the recommendations based on the findings have also been incorporated.

7.1 Towards an Integrated Approach to Tribal Development

Several high level committees and commissions were constituted by the Government of India following independence in formulating policies and programmes and setting up national level institutions to develop the tribal areas in the country. Among the several recommendations of the expert committees, the need for adopting an integrated approach to tribal development was emphasized in promoting development among the tribal communities. For instance, the Renuka Ray's Committee (1959) emphasized that while each aspect of development was important in its own place, integrated programmes based on agriculture, forestry, handicrafts and village industries needed greater degree of emphasis to be determined by a systematic survey of the needs and possibilities in each area.¹ Likewise, the Dhebar Commission (1962) also stressed on integrated approach by touching the broad strategy and indicating socio-economic development as a general goal. The Expert Committee (1972), headed by S.C. Dube, advised the formation of new strategy for tribal development through first time bound integrated area development and other programmes as per genius of the people concerned. An Integrated Tribal Development Programme (ITDP) was also launched during the Fifth Five Year Plan (1974-79) period. The states were directed to frame tribal sub-plans for areas of tribal concentration. A review of development of Scheduled Tribes was undertaken on the eve of Fifth Five Year Plan whereupon the Tribal sub-plan (TSP) strategy came into being.²

7.2 Natural Rubber and Tribal Livelihoods

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.³ Households use these assets to increase their ability to withstand shocks and manage risks that threaten their well-being. The UNDP (2000), in its Millennium Development Goals, considers livelihood as an important factor responsible for eradicating extreme hunger and poverty and thereby attaining a better human development index (HDI). Plantation can be defined 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.⁴ Plantation is being distinguished from peasant agriculture by its large scale enterprise which normally requires more labor per unit of land.⁵

The Rubber Board, a statutory body of the Government of India, was set up under the Rubber Act 1947 for the overall development of the rubber industry in the country. The Regional Specialization Index (RSI) for the North Eastern Region Vision 2020 Document identified a list of major crops in which different states in Northeast India have a comparative advantage and emphasized that efforts be made to promote their cultivation. Each state in Northeast India demonstrates certain production advantages: Arunachal Pradesh for instance in small millets, Assam in tea, Meghalaya and Mizoram in ginger, Manipur in chillies, Nagaland in small millets

and maize, Tripura in natural rubber and Sikkim in maize.⁶ Rubber plantations provide gainful self-employment and sustainable livelihoods. It generates direct employment-around 1,000 man-days/ha. During the immature phase it provides permanent jobs for seven persons per 10 ha. It provides indirect employment-nursery, production and distribution of plantation inputs, growing intercrops in rubber plantation, rubber dealers, processors, rubber wood cutting, sale, processing and furniture making. It has potential for export of natural rubber (NR) goods to neighboring countries when production increases. Besides, it also provides ecological benefits such as green leguminous ground cover and green umbrella above the soil. It purifies the atmosphere through carbon sequestration, improves soil properties through addition of organic matter, keeps the soil cool, enriches fertility, porosity, and its water intake capacity.⁷ Growth of natural rubber plantations has been one of the important success stories of Tripura. Rubber cultivation in Tripura was started in 1960s. Rubber has been identified as one among the thrust areas in Tripura. In view of its suitability to the terrain and the acceptability amongst the people.

Tripura is India's second largest natural rubber producing state after Kerala. At present, around 75000 hectares land or nearly 7 per cent of the State's land area is under rubber cultivation compared to 700 hectares in the mid-1970s. However, the target is to spread it up to one lakh hectares with an additional target of another 1.5 lakh hectares under the Right to Forest Act for the tribal sections.⁸ Tripura produces 50,000 tonnes of rubber per year. More and more plantations are reaching the yielding stage and the productivity levels are also encouraging. In view of the area under plantations together with the growth and rubber production trends, there is a vast potential for the setting up of rubber-based industry units in the State.⁹

In practice, individuals, groups (ST/SC) and institutions (Rubber Plantation Development Corporations) plant natural rubber in the state at large. The Block Plantation approach (BPA) introduced in Tripura has emerged as a successful governance initiative in the state where the cohesive development of the rubber sector has resulted in the empowerment of tribal communities to raise, manage and sustain cultivation of the crop. In the early 1990s, the Rubber Board, introduced two of its projects in the promotion of natural rubber plantation development in the state of Tripura: Group plantation (1992-1993) and the Block plantation (1994-96). These schemes were implemented through an integrated approach, while ensuring extension of various schemes like, *Balwadi* (Nursery Schools), health camps, ensuring provision of safe drinking water, sanitation, road connectivity etc. at the village level. During the pilot phase, some 3490 families spread over 58 colonies, majority of whom were from below poverty line were elevated way above poverty line. The macro impact of this has been that it ushered a silent socio-economic revolution in the far-flung hamlets of Tripura. Later on, these two schemes led to the creation of community level institutions like Rubber Producers Society (RPS), facilitating women's empowerment through self-help groups (SHGs) and women thrift groups providing continuous paid employment, ensuring additional sources of income, utilizing fallow and barren up lands.

The main objective of the RPS is to empower the rural and tribal communities through transfer of technology and participatory approach. The RPS in the state of Tripura have implemented a good number of extension schemes. Most of the societies have opened latex collection centres for helping the growers in marketing their produce. Later on majority of the centres have been transformed into community processing and technology transfer centres. Trading and processing companies were formed with the equity participation of these RPSs as a tertiary level development. The availability of large quantities of high quality of rubber has helped in setting up rubber based industries which are mostly located at present in the rubber parks in Tripura. There is a long history

of jhum(shifting) cultivation by the tribal families in the forested areas of the state. In realizing jhum cultivation economically unsustainable, Government of Tripura has encouraged the tribals and the other marginalized groups to switch over to rubber plantation in the uplands (*tilla*). Thus, the Block plantation approach has brought these unutilized lands into productive use, thus contributing to the economic wellbeing of small and marginal farmers and jhumia tribal families.

Several state level studies have indicated the possibility of increasing the area under rubber plantation to about 100000 ha in the state.¹⁰ In view of this, Tribal Welfare Department, Government of Tripura initiated an ambitious programme to increase area under rubber plantations. This programme was implemented with financial assistance from Government of Tripura, the Rubber Board and the World Bank. In the BPA, the crop is raised, maintained and handed over to ST rubber growers by the Rubber Board after 6 years, but the financing of the project is done by the State Government and the Rubber Board and the World Bank (1994-2000). As of now, the BPA plantations are still raised by the Rubber Board with joint funding by the state Government and the Rubber Board.

7.3 Social Capital Management

Social capital defined as ‘features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit’¹¹ has been largely utilized by the RPS in promoting tribal livelihoods in Tripura. Social capital is further defined as those voluntary processes developed within civil society which promote development for the collective whole.¹² The social capital utilization in the context of RPSs in NE region, particularly in Tripura is rather appreciable with regard to the responses to various indicators of social capital such as the average membership of growers in RPSs, participation in meetings and training programmes, awareness level, time spent for RPS related activities, attitude of members, collective leadership, and responsibility etc.¹³ A random study on the organizational structure of rubber producer societies in Tripura revealed that about one-fourth of memberships in the RPS were held by women. The number of women in the board of directors varies from 2 to 3 out of seven in most of the RPS. This trend is rare in traditional rubber growing regions in India where women are more or less completely out of the bound of RPS.

This study was conducted in four districts of Tripura: South Tripura, Gomati, Sephaijala and West Tripura. The rubber growing tribal households (including family labour/tappers and hired tappers) belonging to eight Rubber Producing Societies (RPS) spread in six Gram Panchayats/villages were selected purposively for the study. The criteria for identifying the study area was mainly geographical diversity, social composition of the villages, villages under rubber cultivation, areas with vulnerability and better practices. The sample size for the study comprises 300 tribal rubber grower households (75 households in each district). The main objectives of the study were to examine the socio-economic and ecological impact of integrated rubber development projects on the tribal communities (including rubber growing and tapping households) in the state of Tripura.

A pilot study was conducted with the help of Tripura Industrial Development Corporation Ltd. (TIDC) and extension officers of Manimalayar Rubber Pvt. Ltd. (a Rubber Board promoted company) in the selected Gram panchayats/villages before constructing the household interview schedule and village information schedule to identify the rubber growing regions in the respective districts and the Rubber Producer Societies in the study area. The income aspects, class differentiation, gender dimension, division of labour, and ecological impact and effect of the rubber plantation project on the local community have been examined in detail through interview

schedule and village information schedule followed by FGD. The study has documented the best practices/case studies in livelihood promotions through natural rubber plantation and development in four districts of Tripura. Secondary data available with Rubber Board, TFDPC, TRPC and Tribal Welfare Department, have been collected and analyzed in detail.

Review of case studies of rubber plantation in the state of Tripura reveals that the introduction of rubber industry in the state has influenced the economy, land-use pattern, the tradition and culture of the involved society and facilitated technological improvement in resource use, leading to overall development of the rubber growing regions in the state. One of the major factors behind the success of rubber plantation in Tripura includes the formation of Rubber Producer Societies (RPS) and establishing their vibrant linkage with rubber growers, Rubber Board and other agencies. The RPS in the region have greatly enhanced the rubber area production, and productivity through its intervention in harvesting, processing and marketing by associating with the Rubber Board and the companies jointly promoted by Rubber Board and Tripura Industrial Development Corporation (*Chapter 2*). Tripura Rubber Park, promoted jointly by Tripura Industrial Development Corporation and Rubber Board, India plays a vital role in promoting the rubber industry in the State. The Government of Tripura provides excellent initiatives to the rubber companies under Tripura Industrial Incentive Promotion Scheme 2017. These include: Central Package of Incentives (for large projects), State incentives under Tripura Incentive Scheme (for medium projects), Prime Minister's Employment Generation Program-based incentives (for micro projects), and Swabalamban, a State Government scheme (for tiny projects).¹⁴

Implementation of natural rubber plantation programmes has led to the improvement in the economic status and opened up a new work culture in the state of Tripura. Achievement in the sphere of education through the integrated rubber plantation programme is remarkable. Further, studies reveals that job opportunities generated through implementation of rubber plantation programme has led to minimizing the unrest prevailing in the society.

A close look into the performance of the state in the human development indicators reflects that Tripura scores well above the national average in terms of literacy, birth rate, death rate, natural growth rate and infant mortality rate (*Chapter 3*).

Analysis of the economy and society in Tripura shows that the State is characterized by geographical isolation, poor infrastructure facilities, communication bottlenecks, inadequate exploitation of natural resources (natural gas, rubber, forest etc.), higher incidence of poverty, low capital formation and industrialization as well as high level of un-employment. The economy of Tripura had suffered from disturbed conditions of extremism and insurgency over the last two decades which directly hindered the human safety as well as economic development process in the recent past. Eventually, the State came out from that disturbed phase arising out of insurgency since the fiscal year of 2005-06. Thereafter, the state administration adopted a multi-pronged approach that aggressively promoted developmental work to counter the psychological hold of militants. These initiatives have included infrastructure development, wage employment programme including MGNREGA, the provision of basic services for people in affected areas, and creating opportunities for surrendered militants to return to the mainstream (*Chapter 3*).

The stakeholder's analysis on sustainable rubber cultivation in the state of Tripura informs that dynamic leadership, dedicated works, coordinated efforts and social commitments of the several stakeholders in Tripura has led to a spectacular growth of rubber sector in the state. The major stakeholders in rubber sector in the State include: the Rubber Board (RB), Tripura Forest

Development and Plantation Corporation (TFDPC), Tripura Rehabilitation Plantation Corporation (TRPC) and Tribal Welfare Department. The role of the Industry and Commerce Department and Tripura Industrial Development Corporation (TIDCL) is also impressive in establishing many rubber based industries in the State (*Chapter 4*).

Review of studies shows that rubber plantation has generated employment opportunity in the state. The economic and social status of the rubber growers in the far flung villages has gone up by all means, making them afford a decent living, availing better health care and better education for their children. The support extended by the Government of Tripura for the rubber plantation development is a model to be emulated by other States (*Chapter 4*).

From the analysis of the organizational structure, functions and role of the rubber producer societies at the local level it is apparent that RPS plays an important role in livelihood promotion among the tribal rubber growing households in the study area especially in rubber plantation and, in transferring new technologies to the members. It is also instrumental in establishing a robust market linkages with the rubber companies such as *Mani Malayar Rubber Pvt. Ltd.* (under Rubber Board) and *Tripura Latex Pvt. Limited*. Apart from this, the Rubber Producer Societies 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 price (*Chapter 6*).

A close look into the documentation of case studies/best practices in livelihood promotions through natural rubber plantation and development in the four districts of Tripura reveals that natural rubber plantation among the tribal households has certainly led to the increase in educational attainment and income of the plantation households. There is more adoption of mix cropping system along with natural rubber among the rubber growing households. The living conditions of the tribal households has improved to a significant extent. Most importantly, it has led to a move from shifting (*jhum*) to settled cultivation and improvement in the household well-being. However, there is hardly any change in the socio-economic conditions of the hired rubber tappers in general and women tappers in particular. The study findings reveals that there is growing indebtedness among the rubber tappers. Thus, ensuring the minimum wage payment to the rubber tappers urgently requires the state intervention (*Chapter 6*).

As a hilly State in the NER of India, Tripura is the homeland of 19 (nineteen) tribes (STs), comprising 31.8% of its total population. 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-third (59%) of rubber growers fall under the age group of 18-45. Thus, it is clear that majority of the RG/RT belongs to the working age group.

Out of 300 surveyed households, 249(83%) are male and 51 (17%) are female. Since rubber tapping requires considerable amount of physical labour women find it little difficult to cope with the multiple load including estate management. Women members do the domestic work, take care of the family members and collect and store firewood (fuel) for use during the monsoons.

The educational background of the respondents shows that 61.3 per cent male members have attended education at the primary (28.7%), secondary (25.3%) and higher secondary (5.3%) level. But only 2 percent have gone upto the higher secondary level. Whereas 10.3 per cent female members have received education mostly at primary (5.7%), secondary (3.7%) and hardly 1

percent have attained higher secondary level. The literacy rate however, is 71.6 per cent in the study area. In view of their low income profile, and tribal background, the literacy rate is much higher – a fact needs to be highlighted and appreciated too.

Considerably, the educational standards of tribal women are very low. Very few of them are able to complete the class 12th standard. In fact, they do not go beyond secondary level. Tribal women tappers have to carry out family works as well as tapping continuously. In rare cases children or husband help them in the allied works of tapping. Most importantly, there is no gender discrimination regarding wage rate in the field of tapping. The average family size of the tribals in the study area in Tripura is 4.6, which is almost equal to the national average (4.8). An overwhelming majority of (84%) of the tribal households under study reside in tin-roofed house, belonging generally to lower middle income groups. A very small fraction of tribal households, merely four per cent who are well-off, and belonging to high income groups live in brick-walled and concrete-roof house. Yet another 12 per cent tribal households live in mud-walled house.

More than three-fourth (78.7%) respondents from the tribal communities preferred to go to the Public Health Centre (PHC)/Community Health Centre (CHC) and Sub-divisional Hospital (SDH) for health check-up. The State has comparatively performed better in the field of health and medical facilities, thanks to resources, both physical and material created under the national rural health mission (NRHM) a centrally sponsored scheme. Additionally, the State Health Department, taken great strides in providing comprehensive health care insurance coverage, especially to poor people. The RSBY scheme of Government of India intended to benefit Below Poverty Line (BPL) population and all other 11 identified categories of beneficiaries permissible as per the guidelines is in operation in eight districts in Tripura. For effective operation of the scheme, partnership has been envisaged between the Insurance Company, public and the private sector hospitals and the State agencies.

The main sources of drinking water in the study area is hand pump, as affirmed by 63 per cent of tribal households, while it is tube well for 30.7 per cent surveyed tribal households and the rest (2.34%) rely on river and canal water. Only 3.33 per cent tribal households reported using potable water supplied by the government of Tripura. The respondents reported that there is high level of contamination of iron and manganese in the groundwater of Tripura. The main goal of the Swachh Bharat Mission (Gramin) is to eradicate the practice of open defecation in the rural and tribal areas. It is heartening to note that nearly three-fourths (71%) tribal households in the four districts of Tripura covered in the study, are having latrine facility within their own premises, whereas 25 per cent of the tribal households using public toilets. A very marginal (4%) tribal households still go for open defecation. Firewood based energy remains the largest supply source for three-fourths (78%), and only 10 per cent rural/tribal households have LPG/PNG gas connection. Kerosene based energy use among the rural/tribal households in the study area is limited to only 9 per cent of the respondents. A very low (3%) households in the study area make use of electrical energy. Tribal women spend a significant amount of their time daily on fetching water and collecting firewood from faraway places.

Over half (52%) cent of the tribal households have grid electricity connection in the study area, whereas, 45.7 per cent households use Kerosene, 1 per cent households use solar energy and 0.7 percent use oil for lighting. Thus, it was observed that almost 99.3 per cent ST households have sources of lighting facility (including electricity and Kerosene) within the premise. However, the households without lighting facility was 0.7%.

It is apparent that 143 HHs (48%) have BPL Card, whereas 129 HHs (43%) have APL Card and the remaining 9% have *Antodaya Card*. That three-fifths of the (57%) households belong to below poverty line. The monthly wage earning of the majority (70.7%) of rubber producers is less than 10000 rupees. Below this band 22.3% rubber producer earn between Rs. 10000 to 20000, while a very small proportion of them (5%) earns between Rs. 20000 to 30000. On the upper end of the scale are those (1.3%) who earn between Rs. 30000 to 40000. Merely 0.7 per cent surveyed respondents who have member in their family earning above 40000 in a month. The average monthly per capita expenditure of tribal households stands at Rs 5511. Their highest expenditure is on food items (Rs.1633) and children's education (Rs. 1056). On the other hand, they spend minimum on entertainment, Rs. 22 only and little more on establishment of new rubber plantation (Rs.34).

Occupational Profile and Livelihood

Agriculture is the mainstay of Tripura's economy and paddy being the principal crop. However, rubber plantation in the waste/high lands has been promoted in a big way and now it is a major source of income for both the rubber growers/plantation owners and the rubber tappers who work as daily wage labourers in rubber tapping and processing activities.

The occupational profile of the surveyed households shows that out of 300 sample households, 230 tribal households (76.7%) belong to small and marginal growers, whereas 70 tribal households (23.3%) are from rubber tapping tribal households. In Tripura, majority of the rubber producers belong to backward and under privileged groups. In most of the cases, the growers engage family labour for rubber tapping. In addition to this, the tribal households are also engaged in agricultural and allied activities, including firewood collection, vegetable production, cottage industry, livestock's fishery and handicraft etc.

Five per cent tribal households are in services. This includes, all those who have joined as soldiers (*Jawans*) in the Indian Army, the Border Security Force (BSF), the Central Reserve Police Force (CRPF), the Tripura State Rifles (TSR). Some of them also are employed as manager, industrial security guard, drivers and helpers in hotel. A little over one-fourth about 27 households (9.0%) are working as agricultural wage labourers, whereas majority of 92 tribal households (30.6%) are engaged in non-agricultural work. Yet another 8 tribal households (2.7%) of the study sample were engaged in petty business. It is also observed that 32 tribal households were still practicing *Jhum* cultivation, largely in South and Gomati district. The topographical situations of the land of South Tripura have constrained them to continue with this subsistence farming method.

Land and Other Assets Ownership

Land ownership in Tripura is of allotted, *rayati* (inherited), purchased, gifted and leased in nature. It is apparent that about two-thirds (61%) tribal households have inherited (*Raiyati*) land and 34 per cent people have allotted land in the study area. On the other hand, only 2 per cent people have purchased land and the remaining 3 per cent people have gifted land. More than four-fifth of the covered tribal HHs (82%) have mature land and only 17.8 per cent have immature land for rubber plantation. Little less than two-fifths (38.7%) tribal HHs have mature land holding below 2 kani and only 6.5% HHs have immature landholding below 2 kani. Only few HHs (0.9%) have mature landholding of more than 20 kani. Thus, it is evident that majority of rubber growers in the study area belong to small and marginal growers.

Ownership of assets among the surveyed HHs shows that 276 HHs including RG&RT (92%) possess consumer durables and assets, whereas 24 tribal HHs (8%) that don't possess any household assets belong to very poor tribal family. Goats and fishery constitute majority of 20.8 per cent of the total livestock population in Tripura, followed by pigs (19.9%), cow (17.7%), poultry (12.9%), oxen (5.3%), sheep (1.4%) and buffalo (1.2%) by the rest 52.7 percent households. The average ownership of livestock per household is 3.6.

Indebtedness

Indebtedness not only indicates economic condition of the tribal households in the study area, but also reflects unequal distribution of socio-economic opportunities and benefits, arrests social progress and misdirects social efforts. The survey results indicate that more than half of tribal households out of 300 sampled household (63%) have taken loan from the nearest *Tripura Gramin/Bandhan Bank*. Another 24.2 per cent tribal households have borrowed from other sources including MGNREGA Fund through bank. Few Self Help Groups (SHGs) operated in the study area are linked to Tripura Gramin Bank have extended loan to 9 per cent tribal households who happen to be its members. The rest 9.1 per cent tribal households had borrowed from the local money lenders. Thus, the incidence of indebtedness is widespread among the tribal in the study area. Out of 300 respondents, only around 22 per cent household had received benefits from government schemes such as IAY, MGNREGA etc.

Socio-Cultural Aspects

Socio-cultural aspects of the tribals reflects that most of the respondents(95%) do not follow dowry system; also domestic violence or wife beating and preference for son or gender discrimination for that matter is not common among the tribal communities. However, it needs mentioning that dowry either in cash or kind like gifts, gold, furniture etc. is gaining acceptance rather speedily 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 per cent tribal households reported dropping of their children from school. Though Tripura has achieved the first position in literacy attainment in the country, quality of education at all levels has not improved. There are many schools that also lack required amenities like drinking water, infrastructures including toilets. Lack of toilets in the government schools forced many girl students to drop out.

Profile of Rubber Growers and Tappers

Out of 76.7 per cent rubber growers (RG&RT) in the study area, 64 per cent tapper happen to be male and 12.7 per cent are female. Among the rubber tappers (23.3%), 19 per cent tappers are male and 4.3 per cent female. Thus, the study reveals very high male representation (83%) in both the categories of rubber growers and rubber tappers. Tribal women engaged in tapping work are exposed to various arduous exercises, like, tapping in early morning, collecting latex from trees, carrying latex to house etc. Because of lack of alternative employment opportunity available to them in rural areas women are perforce engaged in this kind of occupation that falls largely in male domain.

The largest number of rubber growers are found among the Tripuri tribes (116 out of total 300 households), whereas the Jamatia community has more number of rubber tappers (30 households). Natural rubber production and tapping has been a major source of livelihood for as high as 84 per cent tribal households in the four districts of Tripura. Majority of rubber growers engage their family members (76.7%) for tapping rubber, whereas, only 23.3 per cent rubber producing households hire local rubber tappers. Among the hired rubber tappers, 21 (30%) tappers are male

and 49 (70 %) are hired female tapper. More than four-fifth of the tribal households (82%) have mature land and only 17.8 per cent households have immature land. That apart, 38.7 per cent tribal HHs have mature land holding below 2 kani and only 6.5 per cent HHs have immature landholding below 2 kani. Only few household (0.9%) have mature landholding of more than 20 kani. Thus, it is evident that majority of rubber growers in the study area belong to small and marginal growers.

Majority of the RPS members (87%) reported that the RPS in their locality have all the processing facilities. Little more than half (53%) surveyed tribal households reported that they deposited the preserved field latex to the RPS/Board companies, 40.3 per cent preferred to sale it to the private dealer whereas only 5 per cent took recourse to cooperatives. Those who sold it to collection depot of private processor or to the direct purchase depot of the tire company accounted for less than one per cent households. The average annual selling of rubber per persons stands at 982.05 kg, fetching around Rs. 1 lakh. Since, the rubber price in the market has gone down significantly, the tribal rubber growers expressed unwillingness to sell rubber at the lower prices. Infact, nearly three-fourth (74.57%) rubber producing households reported unhappiness with the rubber market price.

Work Schedule

Out of 70 rubber tappers(including family labour/tapper and hired tappers), most of the tappers under study (69%) work in the plantation on every alternate day, while 28 per cent tappers work in the plantation every day and only 3 per cent tapper preferred work third day (after every two days). Majority (56.7%) of rubber tappers do the jobs of tapping, while 31.3 per cent tappers do both tapping and processing. All jobs of tapping, processing, and smoking(all for RSS) are done by 8.3 per cent tappers, while 3.7 per cent have responsibilities only up to filling up of PFL barrels. An experienced tapper normally taps between 250 and 350 trees. Trees are usually taped alternate or third day, which varies from plantation to plantation. In the surveyed area, between 200 to 250 trees are tapped daily by nearly two-fifths (39.7%) of rubber tappers, followed by tapping of 100 to 150 trees on daily basis by 18% and almost equal proportion (17.7%) having tapping task of 150 to 200 trees. Another 10 per cent tappers tapping less than 100 trees daily while 14.7 per cent rubber tappers tap maximum number of more than 250 tree for daily.

Although the Labour Department, Government of Tripura has revised the minimum wages for the tappers/processing workers (for both male and female) at Rs. 238 for 8 hours of work, and for rubber plantation field worker (for S/he) at Rs. 230 for equal hours of work, the hired tappers are actually paid between Rs. 170- 200 only by the rubber growers/plantation owners. Most of the rubber tappers (52.3%) have their place of work within 1 km from their place of residence.

Capacity Building

Half (50%) of tappers (including self-growers and tappers) were provided with training for rubber tapping whereas 34 per cent respondents were provided with all type of training (including rubber tapping, sheet preparation, tapping and sheet collection). Another 10 per cent respondents had received training for tapping and sheet collection and the remaining 6 per cent for sheet rubber preparation.

Wages and Allowances

Majority (62.9%) rubber tappers received their wage payments fortnightly followed by 18.6 per cent tappers for whom it was on monthly basis. Only 10 per cent tappers worked on daily basis on cash payment and little less than those (8.6%) worked on weekly basis. Earlier, tappers used to take advance wages of Rs. 1,000 to 5,000 from growers. But after slump in the rubber price, this practice has almost taken a nosedive. But tappers still avail other benefits like assistance for house

construction, children's education and also incentives during festive occasions. Only 30 per cent rubber tappers reported getting festival allowances during *Durga puja*, Christmas and in tribal festivals like *Garia puja* and *Ker puja* and 62.9 per cent rubber tappers reported availing sickness leave.

Nearly two-thirds (62.9%) of the study sample have stood with their employers while 37.1% tapper claimed to have more than one employer during their occupational carrier. 31 per cent hired rubber tappers changed their employers due to low wage payments. About 23 per cent tappers marked long distance to cover to reach the plantation as the reason for such changes. When they found plantations close to their places of residences, they got absorbed there subsequently. To another 15 per cent tappers it was rude behavior of their employer. Another 19% respondent blamed unpleasant working atmosphere for the change happened to them. The rest 12% declined to name any reason that forced them to change their employers. Almost over three-fourth (76%) tappers expressed good job satisfaction. For 21 per cent respondent it is mere average while for 3% it has been poor.

Impact of Rubber Plantation, Progress and Change

Rubber plantation in the study area have brought significant changes among 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 plantation has led to asset creation and brought also significant changes in all the spheres.

Almost all the respondent (98%) agreed that rubber plantation affected the local weather conditions. Again, 93.7 per cent 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 come out so far. Most of the negative responses pointed out by the rubber growing tribal households were pertaining to environment/ecology. Rubber plantation affecting soil fertility for instance leads to decline in paddy productivity, decline in forest cover, decrease in water level, foul smell and health issues.

The natural rubber cultivation in Tripura has no doubt helped in generating employment opportunities for the rubber workers (tappers) and growers and diversifying the rural livelihood base in the region. However, several researchers at the North Eastern Space Application Centre(NESAC) in Umiam, Meghalaya while tracking the expansion of rubber plantation in the north eastern region have cautioned that it may threaten the traditional rich diversity of the region's forest as has happened across Southeast Asia. Thus, there is a need for systematic and region-wide monitoring to quantify the losses of natural vegetation due to rubber plantation and its impact on the local eco system. Further studies suggests that the growth in rubber in the region has happened at the cost of forests. The loss of natural forests is at times overlooked because rubber plantations look like forests. The mono-culture rubber plantations lack rich diversity of native forests.¹⁵ Strategy may be developed for mixed plantation, i.e. rubber mixed with other trees rather than monoculture plantation. According to Viswanathan¹⁶, the integrated farming systems are of great significance in the context of emerging rubber plantations. A rubber-based agroforestry system, as opposed to rubber monocultures, is recommended as it would improve the micronutrient levels of soils in the plantation.

The study has explored the role of social capital among the tribal communities in livelihood promotion in the forested areas in Tripura. The study has followed the Range Equalization Method of UNDP (Ghosh et.al. 2006) and examined the livelihood assets of the rubber growers and plantation workers, namely human, natural, physical, financial, and social capital.

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 to the type of society they belong to. Human Capital of the surveyed households are moderately sustainable with score value of rubber producing households (RPHH) (0.63). It is observed that there is increased working population (100%) among rubber growers (family labour) has increased and also among hired tappers associated with rubber plantation such as tapping, processing, 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%) and political association (90.7%) and health facilities (86.3%) among the RPHH in the study area.

Natural capital/assets include land ownership, possession of mature and immature land for plantation and housing status of the tribal communities in the study area. The plantation households lack access to basic amenities and mostly dependent on natural assets. The natural capital of the RPHH are unsustainable with score value (0.32) due to possession of small and marginal landholdings. Most of the lands possessed by RPHH are inherited (*raiya*) and homestead in nature. Allotted lands account for 34 per cent only. Few RPHH have gained in land holding size as they were allotted 1.5 hectare (ha.) of land: 1 ha. for rubber plantation and 0.5 ha for homestead. However it varies from place to place on availability of land. Physical capital/assets comprise health care facilities, electricity, water supply and sanitation, possession of jewels and consumer durables owned by the tribal communities. Physical assets on the whole, are considered a reflection of the quality of livelihood the tribal communities possess. It shows huge difference in score value, as RPHH found highly sustainable (0.80).

Livelihood is highly dependent on the financial assets of an individual. It broadly covers wages, income sources, possession of livestock's, access to credit facility and saving habits. The more the financial assets, the higher will be the probability to acquire other livelihood assets. It also indicates whether individual's wages are enough to make a decent living and gives a sense of their access to credit facilities from financial institutions like banks, and cooperative societies as well as their saving habit and financial inclusion features. The financial assets/capital score value of RPHH (0.41) shows moderately sustainable. Taking the income of the rubber growers into consideration, 70.7% of RPHH earned more than one lakh per annum, from collecting field latex, rubber sheet processing and other sources.

The social assets/capital 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 etc. The score value of RPHH in social capital (0.64) is moderately sustainable. The RPHH in the surveyed localities have a strong inbuilt social capital as they are closely tied on the basis of kinship network. This social bonding enable them to take decision in adopting rubber plantation and achieving socio economic success.

The rubber producing households have better-of physical capital (infrastructure) and human capital (literacy, working population) and social capital (trust, norms and network with SHGs, Banks). Social capital is found higher among the RPHH whereas they lack in natural capital (landholdings) as most of the tribal household belong to small and marginal growers in the study area. High income from rubber plantation has strengthened the coping strategies of the RPHH.

7.4 Constraints/Bottlenecks

The study highlights the major constraints the rubber growers face in planting and processing natural rubber in the study area. Nearly three-fourths (71%) of surveyed tribal and rubber growing households reported that even high quality of sheet rubber didn't get a premium price in the market. Another 11.7 % rubber growing households reported lack of adequate rubber-sheet processing facilities in the locality and to another 8 per cent tribal households it was lack of quality processing inputs. Finally, to 3 per cent rubber growing households, it was labour constraint in producing rubber sheet in higher grades. Consequent to the growing popularity of employment opportunities under MGNREGA there is serious constraints of the supply of family labour to the immature rubber plantations in the State.¹⁷ Since MGNREGA linked minimum wage rates are at a premium, tribal villagers prefer not to work as rubber tappers.

Faulty tapping is a serious problem affecting both yielding and economic life of the rubber plantation particularly in the plantation owned by the tribal families. About 4 cubic meter of firewood is required to produce 1 MT of dried and smoked rubber. As a result, the country side is fast losing the indigenous tree cover, cost of processing also is on the rise. Use of biogas utilizing effluents from latex processing facilities does not commensurate with the cost of their installation. Stray cattle are a menace for juvenile rubber plantations in Tripura and plantations suffer a serious damage due to grazing during the first two years of planting.

7.5 Conclusion

Implementation of rubber plantation programme in the surveyed districts of Tripura has triggered a number of benefits. This has certainly reduced poverty, enhanced the socio-economic 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 the attitude and habits, improvement in village infrastructure and overall well-being. It has helped significantly in the capacity building of the rubber producer societies (RPS) involved. The RPS at the local level plays an important role in livelihood promotion among the tribal rubber growing households in the study area especially in rubber plantation and, in transferring new technologies to the members as well as establishing a robust market linkages with the rubber companies such as *Mani Malayar Rubber Pvt/. Ltd.* (under Rubber Board) and *Tripura Latex Pvt. Limited.* Apart from this, the Rubber Producer Societies 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 price. Employment opportunities generated through implementation of rubber plantation programme has minimized the unrest in the state, which is an added advantage. The success stories of the block plantation scheme (BPS) has been further replicated in the non-

traditional regions of north-eastern states of Maharashtra, Odisha, West Bengal and Andhra Pradesh.

7.6 Policy Recommendations

The study has made several recommendations based on the interaction with the beneficiaries (rubber growing and tapping tribal households) and the other stakeholders involved in the process of implementation of rubber development projects in the state. The recommendations are centered around skill impartation, awareness building and diversification etc.

Problems and Prospects

- Cyclone often damages the rubber trees both in mature and immature plantations. Since bud grafted clonal rubber trees are shallow-rooted, these are uprooted and damaged even in low intensity cyclone. *Therefore, strong rooted clones should be developed. Further, shelterbelt plantation should be promoted to protect the trees from wind and soil erosion.* Above all, insurance of the plantation for both mature and immature plantation should be continued as it was already introduced by Rubber Board earlier.
- Spread of natural rubber plantations in the State needs to be regulated to avoid conversion of dense and reserved forest areas by adopting use of mixed cropping methods instead of rubber mono-cultures to balance between socio-economic development and ecosystem resilience.

Awareness

- Rubber cultivation, processing and tapping are to be very scientific and technical. Irregular and faulty tapping leads to less productivity, reduction of economic life of rubber plantation, particularly in the plantation owned by the tribal families. Quite a few of them engage paid untrained labour for tapping, as the family members trained for tapping would like to avoid the daily chore. Rubber Board should make aware the growers about bud-grafting, clone spacing of plantation and other silvicultural factors, fertilizer application and also sensitize not to use untrained tappers. The rubber producer/growers should also be imparted basic knowledge of the estate management.

Diversification

- Rubber also happens to be a major source of honey collection, but this has not started so far in Tripura. Thus, there is scope for making apiary honey collection from rubber commercially viable. It is therefore, necessary to take up plantation of these species also in forest land.
- Wage payment for the rubber tappers engaged in the plantation and rubber processing workers at the RPS level should be fixed along with incentives for better productivity and quality to bring out competitiveness.
- Rubber plantations present high risks in terms of plantation failure and price fluctuations as they are monoculture in nature. Thus, it is recommended that *the small rubber growers should be encouraged to adopt mixed cropping systems with other cash/economic plants such as fruit, medicinal plants, and timber, which will enrich local biodiversity and also provide short- and long-term sustainable benefits to farmers.*

Contingency and Welfare Funds

- Wage structure of the tappers should be made remunerative, not as fixed salary but as incentives for better production and quality of tapping.
- Tappers Welfare Fund based at the RPS level should be created to give medical expenses and other contingencies to the needy workers/tappers.

Skill Development and Training

- Focusing on skill development and training needs of rubber sector, the Rubber Skill Development Centre(RSDC) was set up as a Sector Skill Council(SSC) - a collaborative programme of National Skill Development Council (NSDC), All India Rubber Industries Association (AIRIA) and Automobile Tyre Manufacturers' Association (ATMA). The extension-delivery system of Rubber Board, joining hands with RSDC could develop and conduct programmes for various professions/occupations in NR production sector and provide certified training programmes to augment number of trained persons and create centre of excellence for training in plantation and processing subsectors in non-traditional areas.
- The structured training programmes for skill development and skill improvement in harvesting (tapping) is another user-friendly strategy of Rubber Board's extension machinery well received by the stakeholders. In continuation, the Tripura Skill Development Mission and Rubber Board must upscale their Skill based training programmes in all the rubber growing areas.
- The objective of the RPS is to empower the rural and tribal communities through transfer of technology and participatory approach. It provides market linkage to the field latex collected from the rubber growers at the local level. Further, the RPS can play a key role in the following areas:
 - (i) Impart skill based training to rubber tappers and processors at RPS level so as to achieve better quality and competitiveness
 - (ii) Update the technical and managerial competitiveness of the rubber growers and rubber plantation workers/tappers
 - (iii) Wide RPS coverage needs to be extended to all unrepresented areas in the State
 - (iv) Create a contingency fund at the RPS level to meet the unforeseen future expenses of the members of the RPS (including the rubber growers and tappers).
 - (v) Create employment opportunities by linking it with wood processing units in the State.
- The RPSs of a geographically compact area can be clustered with equity participation to form village level skill development centres (VLSDC). The VLSDC can impart need based trainings such as tapping and processing, budding and nursery management, planting and maintenance, rain guarding, grading and bundling of sheets etc. Apart from this, training on soft skill development such as computer, electronic, handicraft making, fabrication, weaving, tailoring etc. can also be imparted for empowering youth and women to earn their livelihood. Further, entrepreneurial skills like plumbing and carpentry could be developed among the tribal youths at the village skill development centres.
- District Level Skill Development Centers (DLSDC) can be formed for advanced training by linking village level clusters with public sector banks, State departments and Central

Government. This apex level skill development centre can issue certificates to the trainees, provided they maintain the required standards in the delivery of services. Thus, clustering the RPSs in the form of village and district level skill development centres enabling growth in opportunity and generating nonfarm income can do wonders in the state.

- Sufficient funds for instant, even advance payment against purchase of rubber has to be arranged by RPS on priority. Credit sale of estate inputs, which brings producers close to the buyers, also seeks affluence on the part of RPS.
- RPS has to have sufficient trained tappers so as to retrench inefficient, unproductive and detrimental ones.
- Scaling up and increasing capacities of the existing Group Processing Centers with the scope for providing employment to a group of young tappers from the local area
- Setting up of rubber based industry and wood processing factories in few more locations in Tripura, which could potentially employ the young tappers in the state.

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Annexure - I

Project: Impact of Integrated Rubber Development Projects on Tribal Livelihoods in Tripura: A Sociological Study

Part- I

Household Questionnaire

I. Identification

1.1 District	
1.2 Tehsil/Taluk:	
1.3 Block:	
1.4 Revenue Village/Town/City:	
1.5 Hamlet/Ward:	

1.6 Name of Household Head:

1.7 Age:

1.8 Gender (1 = Male, 2=Female)

1.9 Marital Status:

(Code: 1= Married, 2=Unmarried, 3=Separated, 4=Widow, 5=Widower)

1.10 Name of the community:

1.11. Size of Household:

Sl No.	Relationship to Head of Household	Sex	Age	Marital Status	Educational Standard
1					
2					
3					
4					
5					

1.12 Type of Ration Card held (1 = IAY, 2=BPL, 3= APL, 4=Any other):

1.13 Household income levels (Monthly):

Total Monthly Household Income	Code
<10,000	A
10,000 – 20,000	B
20,000 – 30,000	C
30,000 – 40,000	D
> 40,000	E

1.14 Sources of Annual Average Income

Sources	Code	Income
Primary Source	1	
Secondary Source	2	
None of This	98	
Total		

II. Educational Background

2.1 Whether your child is at school going age and not going to school (1=Yes, 2=No):

2.2 If yes, reasons for children not going to school (specify):

III. Health Facilities

3.1 Is any member of this household covered by a health scheme or health insurance?

Yes..... 1 No.....2 Don't know.....8

3.2 If yes, please specify

3.3. When members of your household get sick, where do they generally go for treatment?

Health Facilities availed by the members of the HH	Codes
PHC/CHC/SDH/DH	1
Dispensary/Sub Centre	2
Private Hospital	3
Vaidya/Hakim/Homeopath (AYUSH)	4
Pvt. Doctor/Clinic	5
Traditional Healer	6
Pharmacy/Drugstore	7

IV. Characteristics of Housing

4.1 Dwelling Status

(a) Mud walled & thatched house (b) Mud walled & tin-roof (c) Brick walled & concrete-roof

4.2 Housing Condition

(a) Good house.....1 (b) Livable house.....2 (c) Dilapidated houses.....3

V. Sources of Drinking Water

5.1 Main sources of drinking water

(a) Covered well (b) Un-covered well (c) Hand pump
(d) Tube well/Bore well (e) spring (f) River/Canal
(g) Pond/Lake (h) other sources (specify)

5.2 Sanitary Facilities

What kind of toilet facility do members of your household usually use?

(a) Latrine facility within the premises.....1
(b) Public Latrine.....2
(c) No Toilet Facility/Defecate in Open.....3

VI. Cooking Fuel

6.1 Types of Fuel Used for Cooking

(a) Fire-wood (b) Crop residue (c) Cow dung cake (d) Coal/Lignite/Charcoal
(e) Kerosene f. LPG/PNG (f) Electricity (g). Biogas (h) Any other

VII. Kitchenware

(a) Earthenware (b) Aluminum (c) Steel/tea sets (d) Gas stove/cooker

VIII. Main Source of Lighting

(a) Electricity (b) Kerosene (c) Solar energy (d) Other oil (e) Any other (f) No lighting

IX. Jewels

(a) Silver (b) Gold

X. Land Ownership

10.1 Pattern of land Ownership

(a) Allotted land.....1
(b) Raiyati(inherited)land.....2
(c) Purchased.....3
(d) Gifted.....4
(e) Leased.....5

10.2 Land ownership in the present habitation or at their native place (Circle the appropriate code based on the type of land the household poses and tick on the acres of land owned by the household. If none of the households own land of any type write the code 98 in the appropriate column.

Sl No.	Type of land	Codes	No land	> 1 acre	1.1 – 2.5 acres	2.6 – 5 acres	< 5.1 acres
a.	Wet	1					
b.	Dry	2					
c.	Fallow	3					
d.	Others(Specify)						
e.	None of the households own land	98					

10.3 Out of this land, how much is irrigated?

- (a) In acres.....
 (b) None.....95
 (c) Do not know ...98

XI. Details Sources of Livelihood

Source	Code	Details (in Quantity)	Total Value(Rs.)
Salary	A		
Agricultural labourer	B		
Non-agricultural labourer	C		
Daily Wages	D		
Rubber	E		
Jhum(Shifting Cultivation)	F		
Firewood collection	G		
NTFP Collection	H		
Vegetables & fruits	I		
Business	J		
Livestock	K		
Fishery	L		
Piggery	M		
Poultry	N		
Handicrafts	O		
Credit/loan	P		
Others(if specify)			

XII. Livestock

12.1 Livestock ownership (circle appropriate code and put tick mark in the column of own/leased wherever applicable. If the household does not own any livestock use column 98 in the first column)

Sl No.	Type of Livestock	Codes	Owned	Leased	Number of livestock
a	Buffaloes	1			
b	Cows	2			
c	Oxen	3			
d	Sheep	4			

e	Goats	5			
f	Poultry	6			
g	Pigs	7			
h	Others(specify)	8			
i	No livestock	98			

XIII. Consumer Durables and Assets

13.1 Consumer durable owned by the household (circle appropriate code and record number of consumer durable owned by the household. If the household does not own any type circle the code 98 in the first column)

Sl No.	Type of consumer durables	Codes	Number of consumer durables
a	Radio	2	
b	Television	3	
c	Telephone	4	
d	Mobile Phone	5	
e	Pressure cooker	6	
f	Gas stove	7	
g	Refrigerator	8	
h	Fans	9	
i	Jewels(Silver/Gold)	10	
j	Others(specify)_____		
k	None of the households own any type of consumer durables	98	

13.2. Transport assets owned by the households (Provide number of households) Circle appropriate code and record number of households owning transport assets in appropriate cells. If none of the households own transport assets of any type circle the code 98 in first column

Sl No.	Transport assets	Codes	Number of assets own
a	Cycle	A	
b	Bike/Scooter	B	
c	Auto	C	
d	Bullock cart	D	
e	Car/Jeep	E	
f	Heavy vehicle	F	
g	Mobile	G	
h	Tractor	H	
i	Agricultural machinery(plough/Pump set/Roller/smoke house/tiller)	I	
j	Others specify_____		
k	Household own no assets	98	

XIV. Source of Indebtedness

14.1 (Circle appropriate code that households that have taken loans. If none of the households taken loans from any type of lenders / others circle the code 98 in first column)

Sl. No.	Sources	Codes
a	Money lender	1
b	Micro-credit(SHG's)	2
c	Micro-finance institutions(MFIs)	3
d	Banks (Tripura Grameen Bank) or any other bank	4
e	Relatives	5
f	Friends	6
g	Others (specify)	7
h	the household has not taken any loan	98

XV. Household Expenditure

Item	Code	Period of reference(per month or full year)	reference(per month or full year) Value in Rs per specified period at current prices)
Food items	A		
Clothing	B		
House(construction/maintenance)	C		
Fuel	D		
Electricity Consumption	E		
Children's Education	F		
Newspaper and Magazines	G		
Entertainment	H		
Savings/assets	I		
Health care	J		
Travel	K		
Purchase of household items	L		
Land purchase	M		
Agriculture	N		
Establishment of new rubber plantation	O		
Salary Payments	P		
Travel	Q		
Total Expenditure	98		

XVI. Govt. Scheme and Development Programmes

16.1 Whether the members of the household received any benefit from a Government scheme (Yes=1, No=2).

If yes, specify

XVII. Socio-Cultural Aspects (Use code 1 for Yes, 2 for No)

- (a) Possession of ration card/voter ID Card
- (b) Political consciousness/affiliation
- (c) Proficiency in traditional music/dance
- (d) Proficiency in modern cultural items
- (e) Leaders/members in local bodies
- (f) Follows dowry system
- (g) Exposure (outside state)
- (h) Child labour practices
- (i) Prevalence of Alcoholism
- (j) Domestic violence
- (k) Criminal cases pending
- (l) Preference for male child to female child
- (m) Unequal wages
- (n) Drop out from school

Part-II Information about Rubber Growers and Tappers

I. Profile of the Rubber Growers

- 1.1 Name of the rubber grower/employer:
- 1.2 Gender by Ownership pattern (1 = Male, 2=Female)
- 1.3 Age of the Rubber Grower and Tapper
 - a) 18-30 yrs
 - b) 30-40 yrs
 - c) 40-50 yrs
 - d) 50-65 yrs
 - e) 65-70 yrs
- 1.4 Educational status: Illiterate/Primary/Middle/Matriculate/UG/PG/above
- 1.5 Is rubber a major source of livelihood? (1=Yes, 2=No)

II. Rubber Plantation

- 2.1 Ownership pattern of the plantation
 - a) Individual.....1
 - b) Group.....2
 - c) Proprietorship.....3
 - d) Cooperatives.....4
- 2.2 Farm size's number of units
 - a) 1/2 – 2 ha.
 - b) 2-5 ha.
 - c) 5-10 ha.
- 2.3 Extend of rubber Plantation
 - Mature ha,
 - Immature ha
- 2.4 How many plants are planted per unit?
- 2.5 Type of planting material preferred (budgraft; polybag; root trainer)

- 2.6 Are the planting materials received from private nurseries of poor quality?
(1=Yes, 2=No)
- 2.7 Whether private nurseries must be regulated by Rubber Board?
(1=Yes, 2=No)
- 2.8 Whether Rubber Board nurseries should ensure adequate supply of planting materials?
(1=Yes, 2=No)
- 2.9. Whether RPS should be assisted to establish nurseries?
(1=Yes, 2=No)
- 2.10 Are plantation requisites available in open market at competitive rates?
(1=Yes, 2=No)
- 2.11 Whether plantation requisites should be provided through RPS with price concession?
(1=Yes, 2=No)
- 2.12 Are your decisions to adopt rain guarding/plant protection dependent on rubber price?
(1=Yes, 2=No)
- 2.13 Will you adopt rain guarding even if materials are not provided through RPS?
(1=Yes, 2=No)
- 2.14 Will you adopt plant protection measures even if materials are not provided through RPS?
(1=Yes, 2=No)

III. Rubber Tapping & Profiles of Rubber Tappers

- 3.1 Present arrangement for tapping
 a) Own.....1
 b) Hired.....2
- 3.2 If hired for rubber tapping (1 = Male, 2=Female)
- 3.3 Number of rubber tappers engaged per hectare in your plantation?
 a) One tapper
 b) One Tapper One Helper.....1
 c) Two Tapper.....2
- 3.4 What is the number of women labourer engaged in rubber tapping?
 a) 0 b) 3 c) 5 d) 10

3.5 Educational Status of the Tappers

Status	Code
Illiterate	0
Primary	1
Secondary	2
Higher Secondary	3
Other, specify_____	98

Duration of Employment

3.7 What time is preferred for tapping by the growers?

- a) Everyday.....1
- b) Every alternate day.....2
- c) After two day.....3

3.8 Type of job the tapper is engaged in:

- (a) Only tapping latex
- (b) Tapping and processing and smoking rubber
- (c) All for RSS
- (d) Filling up of Barrels of PFL

Level of Job Satisfaction

3.9 Job satisfaction of the rubber tappers

Satisfaction	Code
Very good	1
Good	2
Average	3
Very poor	4

Task of Employment

3.10 How many trees are tapped by the tappers daily?

- A. <100
- B. 100-150
- C. 151-200
- D. 201-250
- E. 251-300
- F. >300

Distance Factor

3.11 What is the distance between the work place and place of residence of the rubber tappers?

- (a) <1 km
- (b) 1-2 km
- (c) 3-4 km
- (d) 5-6 km
- (e) 7-8 km
- (f) 9-10 km

3.12 Do you maintain the labour engagement records? (1=Yes, 2=No)

3.13 Whether the rubber tappers have undergone training for tapping? (1=Yes, 2=No)

- 3.14 If yes, what type of training is provided to the rubber tappers in rubber production?
- Tapping.....1
 - Sheet preparation.....2
 - Tapping and sheet collection.....3
 - All type of training.....4
- 3.15 If no, are you willing to send the tapper for training if facilities are available in the vicinity?
(1=Yes, 2=No)
- 3.16 Are you ready for self-tapping if training is provided? (1=Yes, 2=No, 3= can't say)
- 3.17 Will you avail if collective tapping facility (tapper bank) is provided through RPS?
(1=Yes, 2=No)
- 3.18 What is the pattern of payment for the labourer engaged in rubber tapping?
- Daily.....1
 - Weekly.....2
 - Fortnightly.....3
- 3.19 What is the minimum wage rate declared by the Government of Tripura for rubber tapping?
- Male tappers/processing workers.....
 - Female Worker (rubber tapper).....
 - Male Rubber Plantation Field Worker.....
 - Female Rubber Plantation Field Worker.....
- 3.20 What is the actual wages paid to the *female workers* vis-a—vis *male workers* in rubber tapping?
- 3.21 What are the incentives provided to the labourer engaged in rubber production?
- Annual bonus.....1
 - Festival allowance.....2
 - No.....0
- 3.22 What are the other facility and benefits provided to the labourer?
- Accommodation/housing.....1
 - Crèche.....2
 - Medical facility.....3
 - Sickness leave.....4
 - No.....0
- 3.23 Which Tapping techniques is preferred/
- Low Frequency Tapping (LFT).....1
 - Intensive tapping.....2
 - Both.....3
- 3.24 Whether there is difficulty in getting skilled tappers? (1=Yes, 2=No)

Changes in Employers

3.25 Whether the rubber tappers ever changed their employer? (Yes=1, No=2).

3.26 If yes, what are the reasons for employer change?

(a) Less Wage (b) Distance (c) Behavior (d) Work Atmosphere (e) Others

3.27 How frequent the rubber tappers change their employers?

(a) Once (b) Twice (c) Thrice (d) five times (e) Six times

Multi-tasking

3.28 Is there any case of the tappers simultaneously working with more than one employer? (Yes=1, No=2)

3.29 (a) If yes, how may present employer the rubber tappers have at present?

(a) 1 (b) 2 (c) 3 (d) 4+

3.30 Rank the following eight measures to retain/attract tappers in rubber sector in the order of importance (Rank of ordering from 1 to 8)

- | | |
|--|----------------------|
| (a) Tapper bank arrangement through RPS | <input type="text"/> |
| (b) Certification of skilled tappers | <input type="text"/> |
| (c) Improved/mechanized knives to reduce the drudgery of tapping | <input type="text"/> |
| (d) Pension scheme for tappers | <input type="text"/> |
| (e) Medical benefits | <input type="text"/> |
| (f) Productivity linked incentives | <input type="text"/> |
| (g) Additional welfare measures for tappers by Rubber Board | <input type="text"/> |
| (h) Attractive wages | <input type="text"/> |

IV. Rubber Processing

4.1 Existing facilities for sheet processing (Put tick marks)

- a) Processing shed
- b) Roller
- c) Smoke house

4.2 Present form of sale (Latex; Sheet; Cuplump)

4.3 If selling in the form of latex, why? (Put tick marks)

- a) Labour can be minimized
- b) Processing cost can be saved
- c) No processing facility
- d) Tappers reluctance for sheet processing
- e) Not much difference in price realization compared to other processing forms
- f) Easier management

- 4.4 If selling in the form of rubber sheet, why? (Put tick marks)
- a) Stock holding possible
 - b) No exploitation on DRC
 - c) More bargaining power
 - d) Lack of latex selling facility
 - e) Price of rubber sheet is more than latex
- 4.5 What are the challenges in producing sheet in the form of RSS V
- a. Quality sheet does not get a premium price commensurate with efforts
 - b. Labour constraints
 - c. Lack of adequate processing facility
 - d. Lack of quality processing inputs
 - e) Lack of skilled trainer
- 4.6 Are you willing to sell in the form of cuplump/fresh coagulam instead of latex/sheet?
(1=Yes, 2=No)
- 4.7 If not, why? (Put tick marks)
- a) Sheet processing facilities are available
 - b) Already facility available to sell as latex
 - c) Sheet is better for stockholding
 - d) Limited access to block rubber factories
 - e) Difficulties in stocking of cup lump & chance for pollution
 - f) Exploitation on DRC
 - g) Causes distress sale

Sale of Rubber

5.1 Current selling point:

- a. Private dealer
- b. RPS/Board Companies
- c. Cooperative
- d. Collection depot of private processor
- e. Direct purchase depot of tire company

5.2 What is the price of rubber in the market?

5.3 How much rubber do you sell annually?

5.4 Are you satisfied with the market price of the rubber sheet? (1=Yes, 2=No)

5.5 Which periodical sale is preferred by the grower?

- a) Fortnightly.....1
- b) Monthly.....2

5.6 Do you maintain the annual sale records? (1=Yes, 2=No)

5.7 Rank the following four major problems faced in selling the produce?

a. Disputes on DRC

b. No uniform standard followed in grading

c. Reducing price from the reported market rate

d. Delay in settlement of price

5.8 Rank the following five options which can provide relief during low price phases?

a) Comprehensive crop insurance scheme covering price risk

b) To motivate saving in Incentive deposit scheme of Govt. during high price

c) Procurement of rubber by public agencies at notified prices

d) Direct cash support by state and central governments

e) Incentives for retaining tappers

5.9 Technical and financial support expected (Rank the following)

a) Enhanced planting subsidy

b) Supply of inputs with price concession

c) Financial assistance for activities of RPS and cooperatives

d) Promote group approach in farm management

e) Advisory services through IT enabled channels

f) Promote farm mechanization

VI. Economics/ Cost of Rubber Production

6.1 What is the input cost per unit?

6.2 How much is your infrastructure development cost in every 5 years?

6.3 How much is the recurring cost per unit?

6.4 How much is the miscellaneous costs per unit?

6.5 How much is the annual Production of Natural Rubber per unit in farm size?

6.6 How much is the annual profit of rubber grower from the production per unit?

7.2. Negative Impact of Rubber Plantation

Sl No.		Responses of the Rubber Growers(Yes/No)
1	Problem of waste disposal	
2	Declining Paddy Productivity	
3	Water level decreasing	
4	Changes in temperature	
5	Mosquito menace	
6	Mono-culture adverse ecology	
7	Dry lands	
8	Affecting soil fertility	
9	Declining Fruit trees and bamboos	
10	Declining Forests	
11	Foul smell	
12	Increased diseases/Health problems	

7.3 Status of Household Before and After

Sl No.	Status	Prior to rubber scenario	Post rubber scenario
1	Household Income(per month)		
2	Main occupation		
3	Food & clothing		
4	Children's education		
5	Health-care of family		
6	Attitude and habits		
7	Education		
8	Well-being		
9	Village Infrastructure Facilities		

7.4 Investigator's Observation

Investigator's Name:

Signature

Annexure – II

Impact of Integrated Rubber Development Projects on Tribal Livelihoods in Tripura: A Sociological Study

Village Information Schedule

1. Identification of Village

Name of the Village	
Gram Panchayat	
Gram Panchayat (within ADC=1, Outside ADC=2)	
Block	
District	
No. of BPL households	
No. of APL Households	
No. of very poor households (Antodaya)	
Total number of households in the village	

2. General (Village) Analysis: Positive Impacts of Rubber Block/Group Plantations) on Tribal Livelihoods

Particulars	Control-tribal Non-rubber area/village)	Treatment(Rubber area in the Tribal Village)
Dominant Groups/Communities in the village (Name of the Group)		

Year of commencement of the Rubber Development

Name of Scheme/Prorogramme (Please tick the appropriate one) (a) Block plantation(1992-1993) (b) Group Plantation Centres(1994-1996) (c) Any other scheme relating to rubber plantation development		
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Main Source of Income (please tick the appropriate one)

a. Salary b. Daily wages c. Rubber d. Others(Jhum etc)		
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Secondary/Supplementary Sources (please tick the appropriate one)

a. Shifting cultivation b. Firewood collection c. Vegetables etc. d. Livestock e. Handicrafts f. Others		
Institutional help, if any received from non-rubber component		
Growth of rubber plantation industry in any: During Block Plantation-BPs(1994-15)		
During Group Plantations(1994-1996)		
Any other scheme relating to rubber plantation development		

Do you think animals/ dairying is contributing significantly to your income? Yes/No.

If yes, then in what way?

Level of Significance	Code	Control-tribal Non-rubber area/village)	Treatment(Rubber area in the Tribal Village)
Very Significant	5		
Moderate	3		
Not significant	0		
Can't say	98		

3. Infrastructure Development in the Village (After BPS/GP Centre)

Parameters	Control-tribal Non-rubber area/villages)	Treatment(Rubber area/ Tribal Village)
Frequency of Public Conveyance: A. Auto(shuttle service) B. Jeep(shuttle service) C. Bus		
Possession of Own conveyance: A. Bicycle B. Bike		

C. Auto D. Jeep E. Heavy vehicle		
Road (per km) A. Mud road B. Brick road C. Tarred		
Building(Dwelling Status) A. Thatched houses B. Tin-roofed houses C. Concrete-roofed		
Availability of electricity in the village (Yes/No)		
Healthcare & hygiene A. No facility B. One facility C. Between 2-5 facility D. Above 5 facilities		

Which stream you visit/prefer for health issues. Tick the appropriate box

Ailments	Allopathic	Ayurvedic	Homeopathy
Accident			
Cold/minor ails			
Old age problem			
Other			

Drinking Water(pucca well/pipe)		
Sanitary toilets		
Presence of Village level Institutions • Crèche/Anganwadi • Primary Health Care Centre(PHC) • Auxiliary Nurse Midwife(ANM) • Village Level Organizations(VLOs) • Rubber Producers Societies(RPS) • Women Self Help Groups(WSHG) • Women Thrift Groups(WTGs)		
Business centre(shops) in the village		

Any type of Development in the village last 5-10 year. 1=yes, 2=No. If yes please specify_____

4. Human Resources

Parameters	Control-tribal Non-rubber area/villages)	Treatment(Rubber area in the Tribal Villages)
Level of education • Without formal education • Up to Primary • Up to Secondary • Up to Higher Secondary • Graduation & above		
Empowerment through exposure • Presence of any agency or professional • Visitors • Outside village • Outside district • Outside state • Outside country • Possession of radio • Newspaper subscription • Possession of TV • Possession of Telephone		
Personality/posture • Poor • Average • Good • Very good • Excessive • Moderate • Nil		
Job opportunities • Tappers/Processing Workers • Rubber Plantation Field Worker • Wage employment other than rubber cultivation (MGNREGA etc.)		

5. Financial Resource Development

Parameters	Control-tribal Non-rubber area/villages)	Treatment(Rubber area in the Tribal Villages)
Expenditure on food & clothing		
Children's education		
Health-care of family		
Expenditure for Community celebration		
Growth of local business		

6. Negative & Positive Impact

Parameters	Control-tribal Non-rubber area/villages)	Treatment(Rubber area in the Tribal Villages)
Affinity towards cosmetics		
Affinity towards fast foods		
Cultural evasion		
Alcoholism		

7. Are you aware of any NGO working in livelihood sector in your area? Yes /No.

If yes, specify.

8. Remarks and Suggestions
