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# **Report on the socio-economic impact of Natural Rubber cultivation under the block planting scheme in Tripura**

Joseph, Joby and George K., Tharian and S.K, Dey

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**REPORT ON THE SOCIO-ECONOMIC IMPACT OF  
NATURAL RUBBER CULTIVATION UNDER THE  
BLOCK PLANTING SCHEME IN TRIPURA**

**Joby Joseph, Tharian George K., S.K. Dey**

**August, 2010**



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*The working paper contains preliminary results of research work done at the Rubber Research Institute of India. It is circulated to encourage discussion and comments from all concerned. Material from this working paper may be cited or quoted with full acknowledgment.*

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## SUMMARY OF OBSERVATIONS

- The study is a pioneering attempt to assess the socio-economic impact of the Block Planting Scheme (BPS) from the angle of the beneficiaries, implementing agencies and the policymakers.
- The report 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 NR during the year 2008.
- The primary data were supplemented with secondary information gathered from relevant official sources and concerned agencies.
- The tripartite BPS involving the Rubber Board, the State Government of Tripura and the beneficiaries has been unique in its contents and mode of implementation since 1992. The present assessment covered the three completed phases of the scheme.
- The BPS is highly focused as more than 92 per cent of the area, 91 per cent of the households and 89 per cent of the BPUs are exclusively earmarked for the scheduled tribes.
- Regionally, 77 per cent of the number of BPUs and 76 per cent of the beneficiary households are located in West Tripura.
- The average size of families of sample households showed a comparatively smaller size for BPU households (4.5) than the GPU households (5.2).
- The age-wise distribution of sample households indicated a higher share of younger age-groups (less than 24 years) in the BPUs with higher employment and income earning potential.
- Conversely, the share of economically active age-group (25-59) was the highest in the GPUs with higher current income earning opportunities.
- The gender-wise composition of income earners showed that males dominated in mature BPUs (77.53%), immature BPUs (74.36%) and GPUs (95.19%).
- The economically active age-group (25-59) was the major income earning group among the three categories. The age-wise composition of income earners also showed that there was a virtual absence of child labour among the sample households.

- The gender-wise differences in literacy rates were higher in the BPU than in the GPU and the state average.
- The share of students in the higher age-group (18-24) pursuing higher education was negligible among all the three groups.
- The average size of holding in the immature BPU was 1.50ha compared to 1.84ha in mature BPU and 1.89ha in GPU. The share of area under NR varied from 67 per cent in the immature BPU to 91 per cent in the GPU.
- The average household income of mature BPU was Rs.99168 compared to Rs.46824 of immature BPU. Therefore, an annual income difference of Rs. 52344 (112%) was observed between households with and without income from rubber (mature and immature BPU). The average household income of GPU was Rs.158196.
- The compositions of income showed that rubber was the major source of income for GPU (75%) and mature BPU (66%). For immature BPU, employment was the major source of income (77%).
- The average annual income of more than 68 per cent households under mature BPU and 98 per cent households under GPU was above Rs. 60,000. Conversely, more than 46 per cent households under immature BPU earned an average annual income of less than Rs. 36,000.
- The annual consumption expenditure was Rs. 46512, Rs.42396 and Rs. 114396 respectively for households under mature BPU, immature BPU and GPU. The difference in annual consumption expenditure between households under the BPU with and without rubber income was only 9.71 per cent.
- Apparently, consumption expenditure had been guided essentially by the extent of availability of own sources of food articles and customs and conventions of the targeted groups rather than the observed differences in income.
- The composition of consumption expenditure was dominated by food, clothing, healthcare and education.
- The annual average value of household savings and assets was Rs. 72546, Rs.41966 and Rs. 183278 respectively for mature BPU, immature BPU and GPU. The difference in annual savings and assets was 72.87 per cent between households with and without rubber income under the BPU.
- Though purchase of land was an important investment option of the households under mature BPU, reliable data on the same were not available.

- 
- The popularity of deposits among the BPU households with the organized banking sector was mainly due to the persuasion of the institutional agencies to popularise the concept of savings.
  - More than 81 per cent of the debts of households under the three groups were borrowed from the banks. The role of moneylenders was minimal and friends and relatives were the second important source of borrowings.
  - The debts expressed as a proportion of the income was only 3.11 per cent, 3.31 per cent and 14.95 per cent of the annual income of the mature, immature and GPU households respectively.
  - During the three phases of its operation (1992-07), the BPS had been successful in fulfilling the two perceived objectives, viz., the expansion of area under NR cultivation and improvements in the income profile of the targeted groups.
  - The share of area under rubber outside the targeted schemes (45%) and the share of small holdings (81.96%) in the total area under the crop in the state bore testimony to the impact of BPS on the local peasantry.
  - The BPS has also led to an explicit shift from the conventional shifting cultivation to a settled mode of NR cultivation. In the process of change, the BPS has ensured an equitable distribution and control over land with an assured income to the beneficiary households.
  - The community approach contained in the planting operations and group marketing had been helpful in retaining the traditional cooperative spirit among the beneficiary households.
  - From the angle of the regional economy, the impact of the BPS included the catalytic role in the integration of the tribal communities with the regional and national level development programmes and interactive relationships with the organized banking sector. It also facilitated the growth of local level infrastructures such as roads, transportation and communication facilities and participatory role in community based organizations like Rubber Producers' Societies (RPS).
  - Another important outcome had been the mobilization of family labour as wage labour to the BPUs and RPS attached to the same.
  - The linkage effects of the BPS on the regional economy were negligible. The extent of awareness and skills possessed by the beneficiaries are major deterrents in effectively utilizing the income potential of the BPS.
  - This is in sharp contrast to the experience of Kerala where the surplus generated from the NR sector had been systematically channelised by the

pioneering planters for the formal and professional education of their children.

- Though the BPS had been successful as an NR based rehabilitation project its linkage effects on the regional economy were seriously constrained by the nature of human capital, the availability of infrastructural facilities and access to the same.
- The two critical components required for the effective utilization of the income impacts of the BPS are imparting skills through technical/professional education and providing access to infrastructural facilities related to higher education, healthcare, communication and transport.
- It is also essential to identify the gaps in the existing projects and linkages to potential projects for the diversification of the sources of income of the targeted groups.
- The issues related to the demarcation of individual holdings within a block and methods of income sharing in the BPU's deserve attention as the contiguous land under majority of the blocks is not clearly demarcated and the income from NR is also shared either on the basis of area under possession or on an equal basis irrespective of the production from individual holdings.
- In the short-run, close monitoring and supervision by the Rubber Board are essential for two important reasons: (i) the beneficiary households are yet to fully assimilate the agro-management practices; and (ii) the RPS attached to mature BPU's require the inputs and guidance of the Board.
- In the long-run, the concerned agencies of the state government may initiate skill oriented programmes for empowering the unemployed/underemployed youth along with improvements in the infrastructural facilities. Such policy initiatives will enable diversification of the sources of income and ensure sustainability of NR cultivation as observed in the case of Kerala and FELDA in Malaysia.
- The potential linkage effects of rehabilitation programmes like BPS can be tapped only with such comprehensive approaches as underlined by the observations emerging from the study.

## SECTION I

# BACKGROUND OF THE STUDY

### Introduction

Historically, the objectives, nature and mode of institutional interventions in India's natural rubber (NR) sector during the past six decades had been unique compared to other major NR producing countries. Though the nature and mode of interventions were subjected to refinements to address the contextually-specific issues the long-term strategies had been subsumed under the two broad macro economic objectives of the country, viz., self-sufficiency and import substitution, since 1947. The policy initiatives to achieve the two well defined objectives were justified in the specific context of the country's emergence as a net importer of NR due to the growth of a large and diversified indigenous rubber products manufacturing industry in the post-independence phase compared to the export oriented production of NR in other major producing countries. To a large extent, the sustained growth of both NR production and rubber products manufacturing sectors in the country had been facilitated by protection from external competition through tariff and non-tariffs barriers during the period 1947-1991 (George and Joseph, 1992; George, 1999; Mohanakumar and George, 2001; George et al, 2002; Joseph and George, 2002). However, the growth of NR production sector during this period was primarily nurtured by a comparatively remunerative and stable price under the policy compulsions to ensure adequate domestic supply to cater to the consumption requirements of the rubber products manufacturing industry (George et al, 1988). Broadly, the two policy components of the concerted efforts to ensure self-sufficiency in NR production in the post-independence phase had been attempts to improve productivity in the traditional regions and expansion of NR cultivation to the non-traditional regions. The institutional interventions to expand NR cultivation to non-traditional regions were initially routed through public sector corporations promoted by the respective state governments since the 1960s. The experiences of the subsequent schemes to involve local peasantry in the non-traditional regions varied mainly due to region-specific factors.

In this backdrop, the interventions to expand NR cultivation and the outcomes in the North-Eastern (NE) region consisting of seven states in the country, viz., Tripura, Assam, Meghalaya, Nagaland, Manipur, Mizoram and Arunachal Pradesh, provide valuable guidelines on the feasibility of the schemes from the region-specific contexts. The perceived objectives of the interventions in this region were: (i) expansion of area under NR by weaning away the local people from shifting cultivation to settled modes of cultivation; (ii) providing

a basis for sustainable sources of income; and (iii) to integrate the economically and socially marginalized groups (ESMGs) into the mainstream development process. Among the NE states, the progress of NR cultivation in Tripura has been impressive compared to other states for three important reasons. First of all, about 47 per cent of potential area identified suitable for cultivation in the state was brought under NR compared to less than 16 per cent in the entire NE region. Secondly, the close coordination among the agencies implementing rubber planting schemes for the rehabilitation of ESGMs have led to notable improvements in the income profile of the beneficiaries in Tripura. Thirdly, the rehabilitation schemes for the targeted groups have been proved to be more effective in the state compared to other states. Prima facie, the convergence of policy initiatives by the Rubber Board and the State Government of Tripura had been instrumental in the successful outcomes of the community-specific programmes. Among the various schemes launched by the concerned agencies, the tripartite Block Planting Scheme (BPS) involving the Rubber Board, the State Government of Tripura and the beneficiaries deserves due attention for its objectives, strategies and outcomes. The scheme has played a crucial role in popularizing NR cultivation in the state, especially in the tribal areas (Rubber Board, 2007; Rajeevan and Majumdar, 2005).

In order to evolve a comprehensive understanding and a realistic assessment of the BPS, it is necessary to focus the analysis in the background of the geography, agro-climate and socio-economic profiles of the beneficiaries in the state for three important reasons: (i) the agrarian systems and cultural practices evolved in Tripura have been influenced by the sprawling hilly terrain, natural calamities such as occasional floods, drought and hailstorm and inadequate infrastructural facilities; (ii) the region-specific land tenurial systems and practice of shifting cultivation that reflected the socio-economic organization and cultural ethos of the targeted groups; and (iii) proactive interventions by Government of India (GOI) in the form of sector-specific rehabilitation and development projects aimed primarily for the benefit of ESGMs in the state. The peculiar geography, social customs, nature of human capital, availability and access to infrastructural facilities and livelihood options in the state led to a higher dependence of the workforce on agricultural sector<sup>1</sup>. Hence, strategies to utilise the land in possession and family labour have assumed priority in the policy options. In this context, NR cultivation has emerged as a more feasible option to ensure a settled mode of cultivation with sustainable sources of income than other land use options.

## **Geography, agro-climate, demography and the economy**

Tripura, an erstwhile princely state, acceded to the Indian Union as a 'C' category state on October 15<sup>th</sup> 1949. It became a full fledged state on 21<sup>st</sup> January 1972 (GOT, 2009). The total geographical area of the state is 10,491.69 sq. km and around 60 per cent of the same is

highlands leaving only about 27 per cent of the land for cultivation (GOT, 2007). The land locked state is surrounded by Bangladesh on its north, south and west. Hence, about 84 per cent of the total border is international and the rest is with Assam and Mizoram. The state is connected by road with the rest of the country only through National Highway – 44 which runs through the hills to Cachar District in Assam<sup>2</sup> (GOT, 2008). The geographical isolation from the mainland set inherent limits to integration with the national economy and the state continued to be predominantly a traditional inward-oriented agrarian society. The administrative divisions of the state consist of four districts, viz., West Tripura, South Tripura, North Tripura and Dhalai. At the disaggregate level, there are 17 sub-divisions, 40 blocks and one Tribal Autonomous District Council.

Tripura is located between 22°56' to 24°32' north latitudes and 91°09' to 92°20' east longitudes and accounts for 0.32 per cent of the total geographical area of the country (Bhattacharyya et al, 1996). The terrain in Tripura consists of parallel hills and ridges alternated with narrow valleys. The elevation of hills gradually increases in the east. The altitudinal difference varies from 914m above msl in the eastern range to 244m above msl in the western range. The climate is humid subtropical characterized by high rainfall. The annual rainfall is in the range of 2000-3000 mm and humidity ranges from 42 to 100 per cent. The reported water deficit of the state is in the range of 100-150 mm due to seasonal dry spells during the post-monsoon period (ibid). The length of moisture availability period exceeds 270 days which is indicative of perhumid condition. The soils of the state can be broadly divided into three groups, viz., hill soils, tilla soils and alluvial soils. The hill soils are very deep, fine loamy and well drained. The tilla soils are also very deep, fine to fine loamy and well drained. These soils favour growing a wide range of horticultural and plantation crops. The alluvial and flood plain soils are also, in general, very deep and fine to fine loamy but less drained. The relative shares of these soils in the total area are 40.2 per cent, 30.8 per cent and 29 per cent respectively. Based on the variability in rainfall (P), potential evapotranspiration (PE), actual evapotranspiration (AE), relation between P and PE, AE and PE and length of growing period (LGP) for normal cropping system, the entire terrain of Tripura has been divided into eight agro-ecological zones (ibid). In this agro-climatic setting, about one lakh ha is identified as suitable area for NR cultivation (Rubber Board, 2007). An important feature of land use pattern in the state is that about 60 per cent of the total area is classified under forest whereas the share of net area sown is only 24.20 per cent. Table 1 shows the classification of land use pattern in Tripura.

As per census 2001, the total population of the state was 31,99,203. The native tribals formed the majority of the population till early part of the 1950s. However, the relative share of Scheduled Tribes (ST) in the total population declined to 31.1 per cent in 2001<sup>3</sup>. The share of Scheduled Castes was 17.4 per cent in the total population. Therefore, combined share of ESMGs was more than 48 per cent. The demographic transition of the state changed



Table1. Land use classification in Tripura (2006-07)

Category	Area (ha.)
Area under forest	629429 (59.99)
Land not available for cultivation (other than forests)	139163 (13.26)
Other uncultivable land (excluding fallow land)	20806 (1.98)
Fallow land	5862 (0.56)
Net area sown	253909 (24.20)
Total geographical area	1049169 (100.00)

Figures in parentheses indicate respective shares.

Source: GOT, 2009

the existing land relations<sup>4</sup>. Tripura has the second highest density of population (305 per sq. km) next to Assam among the NE states. The district-wise density of population of Tripura shows a lower density in the districts where ST population is more and topography is hilly. Almost 83 per cent of the State's population is living in rural areas. The gender-wise composition of the population showed that males constituted 51 per cent of the population (GOT, 2010). The age-wise distribution of the population indicated that 59 per cent of the population belonged to the age group of 15-59 followed by the age group of 0-14 (33.7%) and 7.3 per cent were in the age of above 59. The literacy rate of the state was 73.66 per cent (GOT, 2007).

In 2007-08, the Gross State Domestic Product (GSDP) at current prices was Rs.10,8214.3 million. The reported annual growth rate of Net State Domestic Product (NSDP) in real terms was 7.16 per cent (GOT, 2010). The composition of the NSDP was dominated by the tertiary sector (52.85%) followed by the primary sector (24.65%) and the secondary sector (22.50%)<sup>5</sup>. The per capita income of the state was Rs.28806. In the total workforce of the state, 78.68 per cent was main workers with more than 183 days of employment (ibid). Another important feature of employment was the concentration of the workforce in rural areas (84.72%). The gender composition of the workforce has been dominated by the male workers (71.69%). The rural concentration of the workforce and a cropping intensity of 176 per cent underline the structural dependence of the population on agriculture. The area under NR accounted for 16.21 per cent of the net area sown in the state during 2007-08. The

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growth of industrial sector in the state has been hindered by geographical isolation, lack of trained manpower and technical know-how, absence of proper communication and transport networks and ethnic multiplicity. Though the income as well as the availability of infrastructural facilities have been improving, these were not sufficient to meet the requirements of the region (ibid).

### **Why this study?**

Though commercial cultivation of NR in the state can be traced back to 1963 it was confined to plantations under public sector undertakings with minimum involvement of the local peasantry till the mid 1980s (Bhowmik, 2006). The year 1967 marked the formal entry of Rubber Board for the promotion of NR cultivation in the state. The first phase of the Rubber Plantation Development (RPD) scheme also did not make any significant change in the structure of the rubber cultivation in the state (Joseph and Rajasekharan, 1991). Subsequent to the phase I of the RPD scheme, “the Accelerated Development of Rubber Plantation” (ADRP) was introduced in the State and this scheme provided a big push for the rubber plantation industry in Tripura (ibid). The development of infrastructures such as the Rubber Board’s offices, regional research complex, nurseries, Nucleus Rubber Estate & Training Centre (NRETC), District Development Centre (DDC) and Tappers’ Training Schools (TTS) of adequate scales were established under the project (Rubber Board, 2010).

The genesis of the sectoral shift towards the growth of area under the local peasantry was the formal launching of state sponsored schemes initiated since 1976-1977. The state agencies involved are: Tripura Forest Development and Plantation Corporation Ltd. (TFDPC), Tripura Rehabilitation Plantation Corporation Ltd. (TRPC), Tripura Tribal Area Autonomous District Council (TTAADC) and Office of the Sub-divisional Magistrate/Block Development Officer (SDM/BDO). The Rubber Board has been implementing the BPS in collaboration with the tribal/scheduled castes welfare departments of the state government since 1992. Table 2 shows area under various NR promotion schemes and the shares of targeted groups in the state.

Table 2 is illustrative of the highly focused nature of all projects favouring the STs except the TFDPC. The share of the STs in the total area under the BPS spearheaded by the Rubber Board is more than 92 per cent. The combined share of area under various agencies is about 55 per cent of the total area under NR in the state and the remaining 45 per cent of the area is not covered by the targeted schemes of the agencies. Hence, it is plausible to surmise that expansion of NR cultivation under non-targeted category has been in response to the achievements realised by the targeted groups. In sum, the cumulative effect of the schemes has been a steady growth of NR cultivation under the smallholdings and its share in the

Table 2. Agency- wise status of rubber plantation projects in Tripura (2008-09)

Sl. No.	Name of the organization/Agency	Area (ha) STs	Area (ha) SCs	Area (ha) own	Area (ha) total
1	Rubber Board (BPS)	3250.43 (92.87)	249.57 (7.13)	...	3500 (100.00)
2	TFDPC	2835.83 (24.49)	342.06 (2.95)	8402.38 (72.56)	11580.27 (100.00)
3	TTAADC	2719 (100.00)	...	...	2719 (100.00)
4	SDM/BDO	1185 (100.00)	...	...	1185 (100.00)
5	TRPC	6574 (100.00)	...	...	6574 (100.00)
6	Total	16564.26 (64.81)	591.63 (2.31)	8402.38 (32.88)	25558.27 (100.00)

Source: Rubber Board, 2009; GOT, 2009a

Figures in parentheses indicate category- wise shares.

total area increased to 81.96 per cent during the year 2008-09 (Rubber Board, 2009; GOT, 2009a). In spite of the steady progress achieved in NR cultivation factors such as lack of awareness of the benefits of rubber cultivation, problems associated with the land tenure system, issues related to the supply of planting materials, socio-political disturbances and inadequate flow of institutional finance as well as availability of trained manpower continued as major constraints (Rubber Board, 1997). The institutional interventions required to address these issues assumed the role of a comprehensive group approach. It was at this juncture that the Rubber Board in collaboration with State Government of Tripura implemented the BPS in 1992.

Conceptually, the objectives and mode of implementation of the scheme are more comprehensive than the other state sponsored schemes for two important reasons: (i) a collaborative project of the Rubber Board and State Government of Tripura with the former assuming the lead role by coordinating the financial and extension support; and (ii) close monitoring of all activities from the acquisition of land for planting to marketing of the crop. Despite the completion of the three phases of the scheme in 2007 and the launching of the fourth phase no systematic attempt has been made to assess the socio-economic impact of the scheme from the angle of the beneficiaries, implementing agencies and the policymakers. The studies on NR cultivation in the state was focused on the comparative advantages vis-à-vis shifting cultivation (Bhattacharya, 1992; Rajeevan and Majumdar, 2005),

relevance of institutional support measures adopted in the region (Joseph, 1986; Hajra and Potty, 1986; Cyriac, 1986; Krishnakumar and Meenatoor, 2000; Pal and Dey, 2000) and the implications on the indigenous farm livelihood systems (Viswanathan and George, 2006). The present assessment assumes importance not only for streamlining the relevant follow-up action in the state but also to draw valuable guidelines for initiating the scheme in other NE states with limited progress in the rehabilitation of ESMGs through the expansion of NR cultivation. This proposition is validated by the vast potential of suitable land identified for NR cultivation in the region. Therefore, an assessment of the socio-economic impact of the BPS on the targeted groups is expected to provide a platform for consensual approaches towards comprehensive institutional interventions.

## Objectives

- (i) to understand the socio- economic profile of the households covered under the BPS;
- (ii) to estimate, analyse, and compare 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) which represent growers from the mainstream<sup>6</sup>;
- (iii) to estimate the assets and liabilities of the households under the three categories; and
- (iv) to draw inferences for compatible policy initiatives from a regional perspective.

## Methodology

As the main objective of the study is to assess the socio-economic impact of the BPS the required primary data were collected through a sample survey based on a detailed pre-tested questionnaire. The survey was initiated and completed during the year 2008. The study considered all the 47 functional BPUs for the analysis. However, sample households from only nine BPUs and two GPUs were selected for the field survey. The selection of sample households attached to BPUs and GPUs were based on the geographical distribution of area under NR cultivation and the beneficiaries. The households under the GPUs represent general category of population which is outside the ambit of the BPS. Based on the region-wise distribution of BPUs and area, households located in West Tripura were given more representation compared to other regions<sup>7</sup>. Table 3 shows the region-wise distribution of the coverage.

The sample units were selected based on a selective random sampling method. For a comparative assessment of the income impact of the BPS, data from 271 households with

Table 3. Region-wise distribution of sample households

No.	Name of BPU/GPU	District	Number of households covered
1.	Laxmandepha	West Tripura	53
2.	Kariyamura II	West Tripura	58
3.	RS Para	West Tripura	42
4.	Khamberbari	West Tripura	22
5.	Rambabu Para	West Tripura	46
6.	PS Para	West Tripura	45
7.	Kamalasagar	West Tripura	40
8.	Janmabhumi	West Tripura	49
9.	Dariabagma	South Tripura	56
10.	Rani	South Tripura	40
11.	Rajarshi	South Tripura	29
	Total		480

mature area, 131 households with immature area under the nine BPUs and 78 households under two GPUs were gathered. Altogether, 480 households were covered. The total area covered for the study was 842.52ha consisting of 498.39ha and 198.59ha under BPUs with mature and immature NR holdings respectively and 145.54ha of mature area under the GPUs. The secondary information gathered from Rubber Board, the Tribal Welfare Department and other concerned agencies were supplemented by the qualitative information gathered from the representatives of the BPUs and GPUs. The comprehensive data gathered from these sources were subjected to a comparative analysis in order to understand the socio-economic impact of the BPS.

### The concept of BPS

In 1992, the BPS was introduced in Tripura with three different BPUs having a total area of 113.99 ha (Rubber Board, 1992; 2007). It closely resembled the rubber based settlement programmes of Federal Land Development Authority (FELDA) in Malaysia and similar rubber based rehabilitation projects in Kerala and Tripura<sup>8</sup>. The BPS in Tripura was formulated as a rubber based settlement programme aimed to provide a big push for expansion of area under NR cultivation beyond the traditional rubber growing regions of India to meet the growing consumption requirements of the domestic market. Under the

BPS, a compact land (block) owned by SC/ST households is identified and the plantation is raised by engaging family labour as wage earners. The important criteria for raising a BPU are: (i) minimum extent of land available in each colony shall be around 50 ha.; (ii) the land shall be in contiguous plots; (iii) the tribal beneficiaries who own land should hand over the land to the Rubber Board for a period of seven years; (iv) assurance from beneficiaries for the engagement of family labour during the immature phase; (v) the beneficiary should have the clear title to the land; (vi) the extent of land ranges from around 1 ha to 2 ha per beneficiary household; (vii) formation of Rubber Producers' Society (RPS)<sup>9</sup> after reaching maturity; (viii) retention of the plantation by the Rubber Board for two more years after opening the trees for stabilizing harvesting, processing and marketing procedures before handing over the plots back to the beneficiaries; (ix) the financial expenditure will be borne by the Rubber Board, State Government of Tripura and also the beneficiaries in the form of family labour (Rubber Board, 1992; 1997; 2005)<sup>10</sup>. The compulsory engagement of family labour as wage earners ensures employment and income to the beneficiary households during the immature phase. Though 53 units under the BPS were established till 2007, only 47 units were functional covering a total area of 3018.01 ha. with 2621 beneficiary households. Table 4 shows the region-wise status of BPS in Tripura.

**Table 4. Region-wise status of BPS in Tripura**

Districts	No. of BPUs	Total area (ha.)	Beneficiary households (No.)	Average size of rubber area under beneficiary households (ha.)
West Tripura	36	2320.08	1982	1.17
South Tripura	09	603.73	551	1.10
North Tripura	02	94.20	88	1.07
Total	47	3018.01	2621	1.15

Source: Rubber Board, 2007

Among the four districts, block planting units are functioning in West Tripura, South Tripura and North Tripura with the notable exception of Dhalai for geographical constraints. The distribution of the BPUs is highly skewed (77 per cent of the number of units and area as well as 76 per cent of the beneficiaries) in favour of West Tripura. Apparently, the observed pattern is mainly on account of the proximity to the intervening institutions. Another important aspect of BPUs is the community and phase-wise distribution. Table 5 provides the details.

Table 5. Community and phase-wise distribution of BPUs in Tripura

Phase	No. of BPUs of STs	No. of BPUs of SCs	Total No. of BPUs	Total area (ha.)	Beneficiary households (No.)	Average size of holding (ha.)
Mature	26	5*	31	2169.11	1922	1.13
Immature	16	...	16	848.9	699	1.21
Total	42	5	47	3018.01	2621	1.15

\*One among the five units includes both STs and SCs

Source: Rubber Board, 2007

Table 5 reinforces the highly focused feature of the BPS as 89 per cent of the BPUs is exclusively earmarked for the benefit of scheduled tribes. Among the beneficiary households, the share of the community is 91 per cent. The phase-wise distribution shows the prominence of the mature area under the scheme with the potential demonstration effect to the prospective regions within the state and other states in the region.

## SECTION II

# SOCIO-ECONOMIC PROFILE OF THE HOUSEHOLDS

The socio-economic characteristics of the NE communities are different from the rest of the country in three important respects: (i) a relatively higher share of ESMGs in the composition of the total population; (ii) tradition bound customs and practices with important implications for land tenures and mode of economic activities; and (iii) laggardness in the integration with the mainstream development process. Moreover, the unique geographical features of the region are considered to be a major handicap in realizing the perceived goals<sup>11</sup>. Table 6 shows a comparatively higher share of ESMGs in the NE region compared to the All India pattern.

Table 6. **Category-wise composition of NE population in 2001 (%)**

States	ST	SC	Others
Arunachal Pradesh	64.2	0.6	35.2
Assam	12.4	6.9	80.7
Manipur	32.3	2.6	65.1
Meghalaya	85.9	0.5	13.6
Mizoram	94.5	0.0	5.5
Nagaland	89.1	0.0	10.9
Tripura	31.1	17.4	51.6
Total	26.9	6.4	66.7
All India	8.2	16.2	75.6

Source: GOT, 2010

Barring Assam and Manipur, the combined share of ST and SC population is higher in the other five states. The share is more than 94 per cent in Mizoram, 89 per cent in Nagaland and 86 per cent in Meghalaya. In Tripura, the share is more than 48 per cent. The ST population of Tripura is unevenly distributed. For instance, while the share of ST population is 25 per



cent each in West Tripura and North Tripura, it is 38 per cent and 54 per cent in South Tripura and Dhalai respectively (GOT, 2010). However, the population density (persons/sq.km) was more in West Tripura (511) followed by North Tripura (282), South Tripura (251) and Dhalai (131) in 2001 (GOT, 2007). The uneven distribution of ST population and density of population across the four districts of the state indicate a comparatively lower density of population in areas where the ST population is concentrated. It is in this broad demographic background of the state that the salient aspects of the sample households are examined.

### **Family composition, literacy and occupational status**

For the sake of comparative analysis, information were gathered from sample households with mature and immature rubber plantations under the BPU (BPU-mature and BPU-immature) as well as from the households under the GPU. Table 7 shows the distribution of sample households by size of families across the three groups.

**Table 7. Distribution of households by size of families**

Size of families (Nos.)	BPU-mature (%)	BPU-immature (%)	GPU (%)
Below 3	6.32	6.82	3.90
3 - 5	71.38	77.27	59.74
6 - 7	15.61	12.12	33.76
8 and above	6.69	3.79	2.60
Total	100.00	100.00	100.00

The combined average family size of a BPU household is 4.5 (both mature and immature BPUs) compared to 5.2 in the GPUs. The average family size of sample households is 4.6. Table 7 shows that more than 77 per cent of the households in BPUs are in the size class of below five whereas more than 36 per cent of the households under GPUs are in the size class of above six. Hence, the BPU households are relatively more oriented towards nucleus families compared to the larger families under the GPUs. Among the three groups, the immature BPUs had larger share of smaller size families with less than five members (more than 84%). Another important demographic feature is the age-wise distribution of population under the sample households which is indicative of the employment and income earning potential of the three groups. Table 8 shows the details.

Table 8. Age-wise distribution of population (%)

Category/ Age-group		0-14	15-24	25-59	Above 59	Total
BPU-mature	Male	22.58	20.12	46.70	10.60	100.00
	Female	22.03	21.68	46.15	10.14	100.00
	All	22.32	20.85	46.44	10.38	100.00
BPU-immature	Male	23.53	24.18	43.79	8.50	100.00
	Female	23.74	24.51	44.75	7.00	100.00
	All	23.62	24.33	44.23	7.82	100.00
GPU	Male	16.18	11.76	61.76	10.29	100.00
	Female	22.40	20.83	43.75	13.02	100.00
	All	19.19	16.16	53.03	11.62	100.00

Though the working age of the population can be considered as 15 to 59 (Shukla and Agarwal, 1986) the present classification incorporating the age-group of 15-24 was with the objective of evolving a comprehensive understanding on the educational as well as economic profile of the households. Accordingly, population in the age-group of 15-24 was presumed to be the potential student population pursuing higher studies under the local conditions and the age-group of 25-59 was considered as the economically active category of work force. The age-group of above 59 is the economically inactive dependent segment of the population. To a certain extent, this classification adopted the norms followed in the human development report (GOT, 2007). Table 8 reveals that the relative share of younger age-groups is higher in the BPU (43.17% and 47.95% respectively) than in the GPUs (35.35%). The observed difference is indicative of higher employment and income earning potential of the BPU. Another important distinction is that while the gender composition across all the age-groups is comparable in the BPU, it shows marked variations in the case of GPUs. Finally, the share of economically active age-group is the highest in the GPUs (53.03%) which underlines higher current income earning opportunities of this group compared to the BPU. The share of population above the age of 59 years is also the highest in the GPUs (11.62%). The age-wise gender composition of the households is summarized in Table 9.

It is evident from Table 9 that the share of males in all the age-groups was higher in the BPU whereas the share of females dominated all the age-groups except 25-59 in the GPUs. However, the share of males in the total population was 53.1 per cent. The lower share of female population in the BPU compared to the GPU except in the age group of 25-59

Table 9. Age- wise gender composition of population (%)

Category/ Age-group		0-14	15-24	25-59	Above 59	Total
BPU-mature	Male	53.85	51.37	53.52	54.33	53.23
	Female	46.15	48.63	46.48	45.67	46.77
	All	100.00	100.00	100.00	100.00	100.00
BPU-immature	Male	54.14	54.01	53.82	59.09	54.35
	Female	45.86	45.99	46.18	40.91	45.65
	All	100.00	100.00	100.00	100.00	100.00
GPU	Male	43.42	37.50	60.00	45.65	51.52
	Female	56.58	62.50	40.00	54.35	48.48
	All	100.00	100.00	100.00	100.00	100.00

requires further explanation. The lower proportion of females to the males in tribal areas is mainly attributed to: the higher infant mortality rates due to insufficient attention and care after birth, a relatively higher proportion of deaths among females at the time of puberty due to functional derangements, burden of bearing children at an early age and also more work load on them in the hilly areas of the region (Agarwal, 1987; Shukla and Agarwal, 1986). These issues are accentuated by the lower level of awareness, aversion for modern medical facilities and inadequacies of infrastructural as well as healthcare facilities in the rural areas. The distribution of income earners also showed a contrasting picture among the sample households. Table 10 provides the details.

Table 10 highlights the disparities in the gender and age-wise distribution of income earners among the three groups. Among the three age groups and three categories of households the male dominance as income earners is evident. It is more explicit in the case of all age-groups under the GPUs. The share of males in the GPUs was more than 95 per cent followed by mature BPUs (77.53%) among the income earners. In the economically active age-group (25-59), the highest share of female income earners was observed in the households under the immature BPUs. The higher share of female income earners in the immature BPUs is mainly to supplement deficiencies in the household income.

In sum, the four important demographic aspects having a strong bearing on the sample households are: (i) the larger family size and a higher concentration of income earners in the economically active group in the case of households under the GPUs; (ii) the lower proportion

Table 10. Gender and age-wise composition of income earners (%)

Category/ Age-group		0-14	15-24	25-59	Above 59	Total
BPU-mature	Male	0.00	79.66	77.39	73.91	77.53
	Female	0.00	20.34	22.61	26.09	22.47
	All	0.00	100.00	100.00	100.00	100.00
BPU-immature	Male	0.00	79.07	71.68	88.89	74.36
	Female	0.00	20.93	28.32	11.11	25.64
	All	0.00	100.00	100.00	100.00	100.00
GPU	Male	0.00	80.00	96.63	100.00	95.19
	Female	0.00	20.00	3.37	0.00	4.81
	All	0.00	100.00	100.00	100.00	100.00

of female population in the BPU households; (iii) the higher employment and income earning potential of the BPUs given the higher share of younger generation; and (iv) the dominance of males as income earners in the households under mature BPUs (77.53%), immature BPUs (74.36%) and GPUs (95.19%).

## Literacy level

The level of literacy is one of the critical constituents of the human development index. It is widely recognized that the technical capabilities embodied in a population have a strong bearing on the quality of human capital. The quality of human capital in any given society is an explicit indicator of the development potential as defined by the capabilities to utilize the resource endowments and material production base. In comparison to the national literacy rate of 65.38 per cent, the state's achievement in literacy rate (73.66 %) is remarkable (GOT, 2010). However, there are notable regional and gender differences in the literacy rate of the state. The rural-urban (89% and 70%) and the male-female (81% and 65%) differences in literacy rate of the state indicate serious deficiencies in the development process. To a large extent, the gender differences in literacy rate at the state level are reflected among the sample households across the three groups (Table 11).

Table 11 highlights comparatively higher differences in the gender-wise literacy rate in the BPUs than the state average and the GPUs. The mature BPUs have the highest literacy rate followed by GPUs and immature BPUs. However, these broad observations mask

Table 11. Gender-wise literacy rate (aged 7 and above)

Sex	BPU-mature	BPU-immature	GPU
	(%)	(%)	(%)
Male	84.76	77.63	79.14
Female	61.40	59.77	63.84
All	74.04	69.29	71.70

educational aspects at various stages. Hence, it is imperative to focus on the disaggregate level analysis of education among the sample households in the backdrop of the trends observed at the state level. The Seventh All India School Education Survey showed that 84.42 per cent of the rural habitations in the state have primary school within 1 km (ibid) compared to 86.96 per cent at the national level (Pajankar and Pajankar, 2010). The dropout rate in the state was the highest in high school stage (61.08%) followed by the elementary stage (21.42 %) and primary stage (11.60 %) during the year 2006-07 (GOT, 2008; 2008a). Table 12 shows the disaggregate level details of education among the sample households at five different stages.

The five age-groups of student population given in Table 12 correspond to students at the primary, upper primary, high school, higher secondary and graduation and above levels. The highest share of student population is observed in the case of immature BPU (66.38%) followed by mature BPU (63.27%) and GPU (61.48%). The gender differences at various

Table 12. Composition of student population (%)

Age group	BPU-mature			BPU-immature			GPU		
	Male	Female	All	Male	Female	All	Male	Female	All
5-9	73.47	70.45	72.04	78.26	80.00	79.07	90.91	91.67	91.30
10-12	97.44	100.00	98.65	100.00	93.75	96.55	100.00	100.00	100.00
13-15	90.70	94.59	92.50	100.00	90.91	95.35	100.00	91.67	94.44
16-17	83.33	88.24	85.11	64.29	100.00	79.17	75.00	80.00	77.78
18-24	37.80	20.00	28.25	30.77	39.02	34.41	47.37	16.13	28.00
Total	68.31	57.89	63.27	62.60	70.64	66.38	71.43	54.79	61.48

stages of education among the three groups showed disparate trends and in the highest age-group (category presumed to pursue higher education) the male supremacy was evident in the cases of both mature BPUs and GPUs. However, it is a misnomer to conclude that the share of students in this age-group is pursuing higher education. In fact, only 3.95 per cent, 3.23 per cent and 6.0 per cent respectively of the students in this age-group in mature and immature BPUs and GPUs are actually engaged in graduate programmes and above. Therefore, a major share of students in this age-group has been pursuing education at the higher secondary level or below in spite of the higher age profile. Better awareness, access to the available facilities and income might have contributed to the higher share of students pursuing graduate programmes and above in the GPUs than in the BPUs.

### Land use pattern

As mentioned earlier, the net area sown in the state is only 24.31 per cent of the total geographical area. The average size of operational holding in the state has been declining over the years and it is smaller than the average size of a rubber holding<sup>12</sup>. The higher size of the rubber holding is mainly due to its concentration in the sparsely populated hilly areas. But the pressure of population on tillage land in the region is also growing (Agarwal, 1987). Despite a less than nine per cent share of BPUs in the total area under NR cultivation in the state the annual average growth rate has been significantly higher than the growth rates achieved elsewhere during the 15 year period from 1992-93 to 2006-07<sup>13</sup>. In the process of growth, there has been a systematic shift from the traditional multi-cropping subsistence agriculture to a highly commercialized mono crop cultivation of NR. Notwithstanding the shift towards NR, the share of area under other crops in BPUs is higher than the GPUs.

Table 13 provides the average size of holding and area under NR and other crops in the BPUs and GPUs

The average size of area under NR by sample households is the largest in the GPUs (1.72ha) compared to mature BPUs (1.44ha) and immature BPUs (0.95ha). The smallest average size of holding under immature BPUs is an indicator of growing interest among the

**Table 13. Average size of holding and crop-wise distribution of area (ha.)**

Category		BPU-mature	BPU-immature	GPU
Rubber	Mature	1.34	Nil	1.33
	Immature	0.10	0.95	0.39
	Total	1.44	0.95	1.72
Other crops		0.40	0.55	0.17
Total		1.84	1.50	1.89

ESMGs for rubber cultivation. However, the highest share of NR in the total area under cultivation was observed in the case of GPUs (91%) followed by mature BPUs (78%) and immature BPUs (67%). This differential pattern is indicative of a higher degree of mono cropping of NR in the GPUs compared to the gradual shift in the BPUs from the traditional subsistence agriculture. The size-wise distribution of NR holdings among the households also revealed the growing importance of the crop. Table 14 provides the details.

**Table 14. Size-wise distribution of NR holdings among the households (%)**

Size class (ha)	BPU-mature	BPU-immature	GPU
Less than 1	13.57	26.20	11.34
1 - 3	77.41	68.15	56.11
Above 3	9.02	5.65	32.55
Total	100.00	100.00	100.00

It is evident from Table 14 that more than 86 per cent households in the mature BPUs, 73 per cent in the immature BPUs and 88 per cent in the GPUs have a size above one hectare. It is more explicit in the case of the GPUs as 32.55 per cent of the households possess an area above three hectares. From an analytical angle, the three important aspects of the land use pattern are: (i) steady increase in area under NR; (ii) a growing detachment from the traditional subsistence agriculture among the targeted groups; and (iii) a larger average size of the holdings compared to the traditional NR growing regions in the country and operational holdings in Tripura. Functionally, the three important outcomes of the changes in land use pattern favouring NR cultivation have been the prominence attained by settled modes of cultivation compared to the shifting cultivation among the ESGMs, growing monetization of the economy and substantial increase in the land value leading to the emergence of land as an important investment option. In-built provisions of state's land legislation rules prohibit sale of tribal land to non-tribals. Hence, the benefits derived from the value appreciation of tribal land remain within the system. The resultant constraints in asset management and income diversification efforts demand comprehensive policy approaches from a long-term policy angle.

## SECTION III

# FAMILY BUDGETING

### Household income

The estimated household income is the sum of income from all sources during the year 2008. Table 15 compares the annual average income of households under the three groups. The income profile of households under the immature BPUs is considered as a proxy for targeted groups without income from NR whereas the households under the GPUs are representatives of rubber growers from the general stream not covered by the BPS.

Table 15. Sources of annual average household income (Rs.)

	BPU-mature	BPU-immature	GPU
Rubber	65136 (65.68)	...	118308 (74.79)
Employment	25824 (26.04)	35844 (76.55)	22560 (14.26)
Others	8208 (8.28)	10980 (23.45)	17328 (10.95)
Total	99168 (100.00)	46824 (100.00)	158196 (100.00)

Figures in parentheses indicate respective shares (%)

First of all, an annual income difference of Rs. 52344 (112%) was observed between households with and without income from rubber (mature and immature BPUs). However, the highest annual household income of Rs.158196 was observed in the GPUs. The income difference between the GPUs and mature BPUs is Rs.59028 (60%). The composition of household income revealed that almost 75 per cent income of the GPUs was derived from NR compared to only 66 per cent in the mature BPUs. Moreover, the absolute and relative shares of income from other sources in the GPUs was higher than the mature BPUs. Therefore, it is plausible to surmise that a comparatively higher income of the GPUs could be due to



larger size of holdings (Tables 13&14) and marketing strategies pursued by the individual growers. However, higher density of plant population and younger age profile of the trees under GPUs are important sources of higher rubber yield and income<sup>14</sup>. Moreover, the higher share of other sources of income underline better diversified options of income for GPU households other than NR and employment. The other sources of income included income from other crops and trading/business activities. The main source of income for the immature BPU households is employment opportunities provided within the blocks during the immature phase of rubber plantations.

Another important aspect of the household income is its relationship with the size of the families. Table 16 provides the details.

**Table 16. Family size and average annual income of households (Rs.)**

Family size	BPU-mature	BPU-immature	GPU
Below 3	66288 (6.32)	24060 (6.82)	259824 (3.90)
3-5	87408 (71.38)	44220 (77.27)	154704 (59.74)
6-7	125112 (15.61)	61680 (12.12)	150828 (33.76)
8 and above	195156 (6.69)	93564 (3.79)	181500 (2.60)
Total	99168 (100.00)	46824 (100.00)	158196 (100.00)

Figures in parentheses indicate relative shares of different size-groups

In both groups of BPUs, the highest household income was observed in the case of families with more than eight members. In fact, the annual income of mature BPU households in this group was higher than the income of their counterparts in the GPUs. But the highest annual income of Rs.259824 was recorded by the GPUs in the smallest size group (less than three). It was 33.11 per cent higher than the highest income realized by the mature BPUs. Therefore, the association of higher income with larger size of family observed in the BPUs was not evident in the GPUs. The higher average annual income among the larger households in the tribal areas was mainly due to the multiple sources of income from livestock and employment other than the income from NR. The larger households generally living in a large courtyard and in many cases, rubber acreage also will be larger (Bhattacharya, 1992).

The age-wise distribution of income earners among the three groups indicated a highly skewed pattern in the GPUs followed by the mature BPUs and immature BPUs (Table 17). The classification followed represent four age groups viz., age of schooling (below 15), the age of higher education (15-24), the economically active age-group (25-59) and the old age-group of above 59.

Table 17. **Age-wise composition of income earners (%)**

Age group	BPU-mature	BPU-immature	GPU
Less than 15	0.00	0.00	0.00
15-24	16.16	18.38	9.62
25-59	77.54	73.93	85.58
Above 59	6.30	7.69	4.81
Total	100.00	100.00	100.00

The virtual absence of income earners in the youngest age-group of less than 15 among the three groups is indicative of the importance given to education up to the secondary level rather than child labour. The higher share (85.58%) of economically active group in the GPUs is an important contributory factor for the higher household income reported during the period under study (Table 15). Both mature (77.54%) and immature (73.93%) BPUs also had the highest shares of income earners in the economically active age-group. The GPUs has the lowest share (9.62%) of income earners in the 15-24 age-group compared to both groups of BPUs.

The differences in annual household income, sources of income and composition of income earners among the three groups warrant an analysis of the distribution of various income groups among the sample households. Accordingly, the sample households were classified into five annual income groups, viz., up to Rs.12000, Rs.12001-36000, Rs.36001-60000, Rs.60001-120000 and above Rs.120000. Table 18 shows the distribution of households by annual income.

In mature BPUs and the GPUs the share of households earning an annual income of more than Rs.60000 is 68.4 per cent and 98.7 per cent respectively compared to 25.76 per cent in the immature BPUs. However, more than 68 per cent of the GPU households were earning an annual income of more than Rs.120000 compared to 30.48 per cent in the mature BPUs. The comparative income earning capabilities of the GPU households are reinforced by the earlier observations such as larger size of rubber holdings, largest share of income earners in the economically active age-group and higher diversified sources of income (Tables 15&16). This proposition is underscored by the virtual absence of GPU households in the

Table 18. **Distribution of households by annual income (%)**

Annual income (Rs.)	BPU-mature	BPU-immature	GPU
Up to Rs. 12000	0.37	1.52	0.00
Rs. 12001- Rs. 36000	6.69	44.70	0.00
Rs. 36001- Rs. 60000	24.54	28.03	1.30
Rs. 60001-Rs. 120000	37.92	21.21	29.87
Above Rs. 120000	30.48	4.55	68.83
Total	100.00	100.00	100.00

income groups with an annual income of less than Rs.36000. Conversely, the annual income of more than 46 per cent of the households in the immature BPUs was less than Rs.36000.

Table 19 shows different income group-wise average annual income among the three groups.

Table 19. **Group-wise average annual income (Rs.)**

Income groups (Rs.)	BPU-mature	BPU-immature	GPU
Below Rs. 12000	9996	9060	...
Rs. 12001- Rs. 36000	26952	23988	...
Rs. 36001- Rs. 60000	47532	46332	60000
Rs. 60001-Rs. 120000	90108	79260	90480
Above Rs. 120000	168948	135744	189420
Total	99168	46824	158184

The income profile of GPU households revealed the comparative edge over the average income of their counterparts under both groups of BPUs. Functionally, the extent of differences in annual income with and without income from NR under the BPS is illustrated by the average earnings of the majority of the households. While more than 74 per cent households under the immature BPUs had only an annual income of Rs.32115, 68 per cent households under the mature BPUs earned Rs. 125239. The comparative advantages of GPU households are evidenced not only by the largest share in the highest income group (Table 18) but also from the highest average income among all the income groups.

## Household expenditure

The analysis of household income highlighted significant differences within the BPS sector and between the BPU and GPU households. The results were indicative of the earnings from NR cultivation as well as the comparative advantages of GPU households vis-à-vis the BPU households. In order to capture the implications of the income differences, an attempt was made to assess the total value and composition of the consumption expenditure. Table 20 shows the value and composition of consumption expenditure among the three groups.

The value and composition of annual consumption expenditure of both mature and immature BPU households are comparable. The difference in the expenditure of both groups was only 9.71 per cent and the major sources of expenses were food, healthcare, education and clothing. Apparently, consumption expenditure had been guided essentially by the extent of availability of own sources of food articles and customs and conventions. The higher

**Table 20. Total value and composition of annual consumption expenditure (Rs.)**

Item	BPU-mature	BPU-immature	GPU
Food	28584 (61.46)	27852 (65.69)	53280 (46.57)
Clothing	3432 (7.38)	2412 (5.69)	9396 (8.21)
Pan and alcohol	2532 (5.44)	2352 (5.55)	3492 (3.05)
Consumer durables	1536 (3.30)	600 (1.42)	4332 (3.79)
Healthcare	3444 (7.40)	2988 (7.05)	7572 (6.62)
Education	3360 (7.22)	3876 (9.14)	7584 (6.63)
Electricity	996 (2.14)	900 (2.12)	4116 (3.60)
Others	2628 (5.65)	1416 (3.34)	24624 (21.52)
Total	46512 (100.00)	42396 (100.00)	114396 (100.00)

Figures in parentheses indicate respective shares

allocation of funds for education and healthcare facilities was mainly due to higher dependence on private tuition and absence of adequate public medical facilities in the rural areas. The expenses on pan and alcohol expenditure also accounted for more than 5 per cent of annual expenditure of households under both groups. But the explicit difference in the consumption expenditure between the mature BPU and GPU sectors deserves attention. The difference in the total annual consumption expenditure was 146 per cent compared to 60 per cent difference in the income between the two groups. Though food accounted for the largest share of expenditure in both mature BPU and GPU households the relative values and shares varied significantly. Moreover, expenses under 'others' formed the second largest category of expenditure in the GPU households. The constituent items of expenditure in 'others' included expenses for pooja celebrations, visiting relatives and travel. The wider gap in the consumption expenditure compared to income between the two groups is reflective of better awareness and access to facilities by the non-tribal communities integrated more into the mainstream society.

## **Savings and assets**

The extent of monetization, access to organized banking sector, rate of savings and trends in the value and pattern of asset accumulation are crucial indicators in the stages of development of an economy. Hence, an attempt was made to estimate the value of savings and assets among the sample households. Table 21 shows the estimated average value of savings and assets.

A relatively higher difference in savings and assets (72.87 %) between the two groups of BPUs was observed compared to the differences in annual consumption expenditure (9.71%). To a large extent, the income impact of the BPS was reflected more in the differences in savings and assets than in the consumption expenditure of the targeted groups. The magnitude of the difference would have been higher had there been access to reliable data on land purchases by the households under mature BPUs. Livestock, which had been an integral component of *Jhumia* culture, was accorded only least priority in households under mature BPUs. It was also observed that the appetite to purchase modern consumer durables including household utensils, mobile phones and vehicles are common among the households attached to mature BPUs.

As observed in the cases of annual income and consumption expenditure the GPU households had reported the highest value of savings and assets which was 153 per cent higher than the value of mature BPU households. However, the composition of the value of savings and assets among the three groups was dominated by housing. The other major avenues of savings and asset accumulation were deposits, consumer durables and ornaments. The popularity of deposits among the BPU households with the organized

Table 21. Average annual value of savings and assets (Rs.)

Item	BPU-mature	BPU-immature	GPU
Deposits	11398 (15.71)	3442 (8.20)	23454 (12.80)
Ornaments	7894 (10.88)	8206 (19.55)	29727 (16.22)
Insurance	435 (0.60)	977 (2.33)	12547 (6.85)
Housing	37344 (51.48)	20424 (48.67)	70130 (38.26)
Livestock	5168 (7.12)	4652 (11.09)	9182 (5.01)
Consumer durables	10307 (14.21)	4265 (10.16)	38238 (20.86)
Total	72546 (100.00)	41966 (100.00)	183278 (100.00)

Figures in parentheses are respective shares

banking sector is mainly due to the persuasion of the institutional agencies to popularise the concept of savings.

## Indebtedness

The extent of indebtedness among the sample households and the sources of borrowings are summarised in Table 22.

Among the three groups, the value of annual debts was also higher for the GPU households. However, the most striking feature was that more than 81 per cent of the debts of households under the three groups were borrowed from the banks. The role of moneylenders was minimal and friends and relatives were the second important source of borrowings. The debts expressed as a proportion of the income was only 3.11 per cent, 3.31 per cent and 14.95 per cent of the annual income of the mature, immature and GPU households respectively. Conceptually, the extent of indebtedness was expected to be the highest among the immature BPU households which has been primarily dependent on the wages. However, the comparable extent of debts as a proportion of income of BPU households indicate the pivotal role of tribal customs and traditions rather than

Table 22. Sources and average value of debts (Rs.)

Item	BPU-mature	BPU-immature	GPU
Traders	...	55.76 (3.60)	1589.49 (6.72)
Friends and relatives	393.94 (12.76)	117.10 (7.56)	1086.47 (4.59)
Societies	98.48 (3.19)	...	436.36 (1.84)
Bank	2518.94 (81.60)	1375.46 (88.84)	20532.47 (86.81)
Money lenders	75.76 (2.45)	...	...
Others	...	...	7.79 (0.03)
Total	3087.12 (100.00)	1548.32 (100.00)	23652.58 (100.00)

Figures in parentheses indicate respective shares

rational behavior in the decision making process. The higher proportion of debts of GPU households is mainly on account of the World Bank loan provided to raise the income levels during the immature phase of NR through concerned agencies of the State Government.

## SECTION IV

# THE BPS AND ITS IMPACT

A realistic assessment of the BPS shall contain an analysis of its two important dimensions, viz., the endogenous aspects of the scheme pertaining to the benefits realized by the targeted groups/households and the exogenous dimensions related to the achievements of the larger socio-economic objectives which are the perceived impact on the regional economy. More precisely, the endogenous aspects of the scheme consisted of providing a sustainable income basis to the targeted groups through a settled mode of cultivation whereas the exogenous dimensions are concerned with the resultant changes leading to improvements in the quality of life of the ESMGs and their integration into the mainstream development process. The assessment has to be contextualized in the backdrop of the inherited socio-economic background of the tribal communities, practices associated with shifting cultivation and the social unrest witnessed in the state during the 1980s and 1990s. Hence, the process of transition from the shifting cultivation and vestiges of the ethnic conflict has been challenging. Moreover, there are different views on the introduction of a new crop into a traditional society. The introduction of new crop in to an underprivileged traditional community showed the difficulties involved in the production process and appeared to have delivered less prosperity to adopters than initially promised (Carletto et al, 2008). However, rubber cultivation among the shifting cultivators in Indonesia revealed that rubber has not only complemented swidden agriculture but also provided good economic opportunity for the farmers (Penot, 2004).

The BPS in Tripura has been instrumental in evolving a settled mode of cultivation and led to significant improvement in the income profile of the beneficiary households. Unlike the wage employment schemes entangled with the consumption linkages the BPS has the potential multiplier effects as it has been conferring ownership rights of a mature plantation with a guaranteed sustainable source of income. The three important aspects of the process of change under the BPS have been an equitable distribution of land, clear title and control over land and an assured income from land. These changes have been crucial in the process of transformation from a primitive society. Moreover, there has been a shift from the earlier ideal family concept of *Nokhong-Katar* (extended family) to the *Nokhong-Kosu* (nucleus family). The decline of the extended family system has deprived the *Jhumias* of their co-operative spirits and ventures (Bhattacharya, 1992). Despite a higher annual income (112%) of the households under the mature BPU than immature BPU the income impact was reflected



more in the differences in savings and assets (72.87%) than in the consumption expenditure (9.71%). The comparable consumption expenditure vis-à-vis the income differences between the two groups underlines the pivotal role of traditional customs and conventions of tribal communities in determining the pattern of household consumption expenditure. However, the higher differences in the consumption expenditure between households under GPUs and mature BPUs (146%) compared to differences in the income (60%) is reflective of better awareness and access to facilities by the non-tribal communities integrated more into the mainstream society.

The pattern of investment and utilization of the surplus generated is an important indicator of the prospective avenues of growth leading to gradual integration of the targeted groups with the development process of the region. Although reliable evidences were not available, investing in land for NR cultivation as individuals and groups has been receiving more attention of households under the mature BPUs. The investment options other than purchase of land and buildings or deposits have been constrained by a variety of factors such as inadequate infrastructural facilities and quality of human capital. In sum, the extent of awareness about the available and potential income diversification opportunities and options as well as skills possessed by the manpower to tap the same were inadequate among the beneficiary households. Nonetheless, the keen interest shown for education up to the age of 17 (high school level) is a positive signal towards the empowerment of the targeted groups. The comparatively better literacy among younger generation in the BPUs shows an attitudinal change towards modern education. The idea of education among tribals is mostly governed by economic returns and educational opportunities (Shah, 2005) whereas the dropout in schools may be either due to the socio-cultural environment of their families/societies or due to inadequate educational institutions. The progress in the higher education of population above the age of 17 is disappointing as only 3.95 per cent of the population in this group in the mature BPU households has been pursuing their higher education. Therefore, the income impact of the BPS on the build-up of human capital and the empowerment of the beneficiaries had been confined to acquisition of basic literacy without any notable linkage effects. This observation is in sharp contrast to the experience of Kerala where the surplus generated from the NR sector has been systematically channelised by the pioneering planters for the formal and professional education of their children (George, 1999; 2005).

The impact of the BPS in the context of the regional economy included the catalytic role in the integration of the tribal communities with the regional and national level development programmes, interactive relationships with the organized banking sector, facilitating the growth of local level infrastructures such as roads, transportation and communication facilities and participatory role in community based organizations like RPS. Another important outcome has been the mobilization of family labour as wage labour to the BPUs

and RPS attached to the same. The main destination of the surplus generated from the BPS segment is land which led to a steady appreciation of the value of tribal land. As the transfer of tribal land to a non-tribal is legally restricted the benefits of value appreciation of land accrue to the households within the community. Another important outcome is the growth of a trading network to cater to the consumption requirements of the beneficiary households. In spite of the observed changes and improvements in the profile of the tribal economy there is an explicit vacuum of linkage effects in the BPS from the angle of the regional economy. The missing link is the absence of potential stimuli to generate growth impulses to capitalize the income impact of the BPS. In this regard, the role of human capital is of critical importance in harnessing the inherent advantages and outcomes of the BPS from a long-term policy perspective.



## SECTION V

# CONCLUSIONS AND POLICY IMPLICATIONS

The BPS has been successful in fulfilling the two perceived objectives, viz., the expansion of area under NR cultivation and improvements in the income profile of the ESMGs, judged by the progress under the three completed phases and the fourth phase in progress. During the past 15 years (1992-07) covering the three phases of its operation, the BPS has led to an explicit shift from the conventional shifting cultivation to settled mode of NR cultivation. In the process of change, the BPS has ensured an equitable distribution and control over land with an assured income to the beneficiary households. Also, there had been a gradual transformation in the social organization of the community favouring the nucleus family concept. To a certain extent, the community approach contained in the planting operations and group marketing had been helpful in retaining the traditional cooperative spirit among the beneficiary households. In this connection, two potential operational level issues deserve attention: (i) the demarcation of individual holdings within a block; and (ii) methods of income sharing. The contiguous land under majority of the blocks is not clearly demarcated for individual holdings. Similarly, the income from NR is also shared either on the basis of area under possession or on an equal basis irrespective of the production from individual holdings. The prevailing system of arrangements bears the potential for future disputes over individual holdings as well as income sharing in the context of the gradual shift towards nucleus families.

In a comparative sense, the experience of income diversification programmes initiated by FELDA in Malaysia offer valuable inputs for exploring the utilization of the income potential of the BPU. The FELDA approach is essentially an attempt to enable the members of the community to maximize the returns from NR and to find alternative sources of income. The multiple sources of income prompted the existing growers to continue rubber cultivation (Massard, 1988). In effect, the FELDA has been successful in germinating the linkages and exploiting the same for sustainable NR cultivation. Conversely, the income impact of BPS has been limited to savings and accumulation of assets (in the form of investments in land, buildings and ornaments) and the consumption linkages. The linkage effects of the BPS on the regional economy were negligible and therefore, the main source of income of the beneficiaries remained to be NR. The extent of awareness and skills possessed by the beneficiaries are major deterrents in effectively utilizing the income potential of the BPS. Despite the marked improvements in the literacy level of the beneficiaries the approaches of the community are primarily governed by tradition bound

customs and conventions. In essence, the quality of human capital available with the beneficiary households is not only compatible with attempts to diversify the sources of income but also incapable of generating linkages from a regional perspective. The limitations imposed by the capabilities of the stakeholders, absence of infrastructural facilities and sustainable avenues of investment in the region pre-empted the potential linkage effects. In this connection, the human development experience and the resultant linkages generated in Kottayam district in Kerala (the largest rubber growing district in the country) deserves attention. It was observed that better educational attainments led to overall economic well being of all sections of society which is reflected in consumer expenditure, asset holdings and living standards compared to rest of the state (CDS, 2009). Therefore, though the BPS had been successful as an NR based rehabilitation project its linkage effects on the regional economy had been seriously constrained by the nature of human capital, the availability of infrastructural facilities and access to the same.

The two critical components required for the effective utilization of the income impact of the BPS are imparting skills through technical/ professional education and providing access to infrastructural facilities related to higher education, healthcare, communication and transport. Any realistic attempt to launch development projects to fulfill such facilities shall make an assessment of the available facilities and the extent of access to the same. It is also essential to identify the gaps in the existing projects and linkages to potential projects for the diversification of the sources of income of the targeted groups. The study indicated the inadequacies and higher costs of education and healthcare for the beneficiary households. From a policy perspective, potential linkage effects of higher household income from BPS depend on the removal of these infrastructural impediments. In the long-run, only such comprehensive approaches addressing multifaceted issues of the ESMGs can facilitate diversification of the sources of income.

In the short-run, close monitoring and supervision by the Rubber Board are essential for two important reasons: (i) the beneficiary households are yet to fully assimilate the prescribed agro-management practices; and (ii) the RPSs attached to mature BPU require the inputs and guidance of the Board. Meanwhile, the RPSs with surplus funds may diversify the activities and moot short-term training programmes for the youth. There is a growing potential for self employment in various skill oriented programmes. Therefore, it will be worthwhile to launch/organise short-term industrial training courses so as to impart skills and to empower the unemployed/ underemployed youth. The concerned agencies of the state government may initiate such programmes along with improvements in the infrastructural facilities. The potential linkage effects of rehabilitation programmes like BPS can be tapped only with such comprehensive approaches as underlined by the observations emerging from the study.

## Notes

1. The composition of main workers (who have 183 or more days of employment) in the state showed that 50.91 per cent is constituted by cultivators and agricultural labourers as summarized in Table A-1.

Table A-1. **Classification of main workers in Tripura (2001)**

Category	Share (%)
Cultivator	26.88
Agricultural labour	24.03
Manufacturing, processing, servicing etc.	2.90
Other workers	46.19
Total	100.00

Source: GOT, 2009

2. Rail connectivity to Agartala through Silchar and Lumding in Assam became operational in the year 2008. The state is better connected through air with the rest of the country.
3. There are 19 sub-tribes among the ST population of the State with different cultural identities. The tribes are:(i) Tripuri (ii) Reang (iii) Jamatia (iv) Chakma (v) Lusai (vi) Mog (vii) Garo (viii) Kuki (ix) Chaimal (x) Uchai (xi) Halam (xii)Khasia (xiii) Bhutia (xiv) Kunda (xv) Orang (xvi) Lepcha (xvii)Santal (xviii) Bhil (xix) Noatia.
4. Tripura is the only state in the NE region where the tribal majority has been reduced to a minority due to the massive influx of migrants from Bangladesh. The ethnic conflict in the state is thus directly relatable to the land question (Subramanian, 2000).
5. The major constituent segments of the dominant tertiary sector are the community, social and personal services of the government (53.55%) followed by trade, hotel and restaurant (27.55%).
6. A comprehensive scheme for group processing in Tripura was initiated only in 2002. The beneficiaries of the scheme included peasants from all communities. The institutional support to the Group Processing Centres is confined to financial assistance and technical support to establish processing facilities other than the subsidy for planting. The community-wise composition of households under Group Processing Centres covered in the present study is given in Table A-2.

Table A-2. **Community-wise composition of households covered (%)**

Community	Share in total households covered (%)
OBC	44.00
General	41.00
SC	12.00
ST	3.00
Total	100.00

7. More than 42 per cent of the total area under NR in the state and 77 per cent of the area under the 47 BPU is concentrated in West Tripura as is evident from Table A-3.

Table A-3. District and BPU- wise area under NR during 2006-07

Districts	Total area (ha)	BPU area (ha)
West Tripura	15177.55	2320.08
South Tripura	12421.45	603.73
North Tripura	8161	94.20
Total	35760	3018.01

Source: Rubber Board, 2007

8. Federal Land Development Authority (FELDA) in Malaysia was established in 1956 to promote and execute land settlement schemes for the small farmers. It has three divisions, viz., (i) the smallholding division (managing the development activities in all schemes of the settlers), (ii) the plantations division and (iii) the manufacturing and trading division. The last two divisions operate on a commercial basis and provide services to support activities of the smallholding division (Chandy, 2006). In Kerala, the tribal rehabilitation project was initiated during the year 1988 in Thiruvananthapuram district in collaboration with Government of Kerala. Around 1864 ha of rubber plantations were raised in the state in two phases. Prior to the launching of the BPS in Tripura, rehabilitation projects were initiated by TFDPC in 1976 and TRPC in 1983.
9. The RPS is a voluntary association of small rubber growers promoted by the Rubber Board in 1986-87. It was conceived to provide necessary institutional framework for the adoption of scientific cultural practices and promotion of group processing and marketing with least government interference (George, 1992).
10. Table A-4. Estimated development costs and shares during different phases (Rs. /ha)

Contributing agency	Phase I (1992-96)	Phase II (1997-01)	Phase III (2002-07)
Rubber Board	32223 (56.00)	31711 (40.00)	40000 (50.00)
Government of Tripura	25000 (44.00)	43500 (54.00)	32000 (40.00)
Beneficiaries	...	4519 (6.00)	8000 (10.00)
Total	57223 (100.00)	79730 (100.00)	80000 (100.00)

Source: Rubber Board (1992; 1997; 2005)

Figures in parentheses indicate respective shares in the total cost

11. Major part of the NE region is hilly and majority of the people were practicing shifting cultivation. The share of hilly land is about 90 per cent in Arunachal Pradesh, 96 per cent in Meghalaya, 95 per cent in Nagaland, 91 per cent in Manipur, 99 per cent in Mizoram and 60 per cent in Tripura whereas in Assam 81 per cent is plain land (Shukla and Agarwal,1986; Agarwal,1987).
12. Average size of operational holdings in the state has declined from 1.25 ha. in 1976-77 to 0.60 ha in 1995-96 (GOT, 2010). The average size of rubber holding among the sample households was 1.35ha during 2008.
13. **Table A-5. Trends in area under NR cultivation in Tripura (ha.)**

Year	BPU	Non-BPU	Tripura	All India
1992-93	114	18136	18250	499374
1993-94	385	18399	18670	508420
1994-95	574	19063	19252	515547
1995-96	975	20360	20761	524075
1996-97	1127	21830	21982	533246
1997-98	1369	22339	22582	544534
1998-99	1794	23949	24120	553041
1999-00	1965	25221	25380	558584
2000-01	2124	26128	26495	562670
2001-02	2491	27837	27947	566555
2002-03	2601	28739	28853	569667
2003-04	2715	30568	30770	575980
2004-05	2918	31943	32065	584090
2005-06	3039	33985	34189	597610
2006-07	3243	34603	37846	615200
Annual average growth rate (%)	34.77	4.74	5.37	1.50

Source: Rubber Board (2000; 2007; 2008)

14. During the year 2008, the average density of tapped area under GPUs was higher than the BPUs as area under the latter was severely affected by cyclone. The impact was more evident in BPUs such as Dariabagma and Rani. Further, more than 83 per cent of area under GPUs was under the age-group of 1-4 years of tapping.





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