

# CONTRIBUTION BY DIFFERENT AGENCIES IN THE EXPANSION OF AREA UNDER RUBBER PLANTATION IN TRIPURA, INDIA

Raju Debbarma<sup>1</sup> and Dr. S.Purkayastha<sup>2</sup>

<sup>1</sup>Research Scholar, Department of Geography, North-Eastern Hill University, Shillong, Meghalaya, India.

<sup>2</sup>Faculty, Department of Geography, North-Eastern Hill University, Shillong, Meghalaya, India.

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## ABSTRACT

*Tripura ranks second to Kerala in area under rubber plantation in India. Rubber plantation was introduced in Tripura during 1963 to check soil erosion and deforestation, but soon rubber plantation emerged as an important policy intervention to check slash and burn or shifting (jhum) cultivation and win over the jhum cultivators (jhumias) to settle agriculture enhancing their socio-economic development. The government of Tripura along with the Rubber Board and different agencies like Tripura Forest Development and Plantation Corporation Limited (TFDPCL) and Tripura Rehabilitation and Plantation Corporation Limited (TRPCL) are playing an important role in the expansion of area under rubber plantation in the state. This paper highlights on the contribution of different agencies in the expansion and distribution of area under rubber plantation in the state. The data for this paper is mainly secondary derived from various agencies which have been duly acknowledged. Statistical measures have been used to assess the role of the major agencies in the growth and distribution of area under rubber plantation in the state which has also been mapped to show the area of concentration of rubber plantation developed by the different agencies. Further an attempt has been made to compare the contribution of the different agencies in the growth and distribution of area under rubber plantation in Tripura.*

**Keywords:** area under rubber plantation, distribution, different agencies, Tripura.

## Introduction

Tripura, a north eastern state of India holds a strategic location as it is bounded by Bangladesh on three sides; during the colonial phase, Tripura was a native kingdom whose boundary extended to adjoining portion of present Bangladesh. With India independence and formation of East Pakistan, the present state of Tripura was merged with the India union and it experienced much change in its demography as this tribal majority state changed into a non-tribal state due to large scale immigration of Bengali speaking population from adjoining East Pakistan, present Bangladesh. This has marginalised the local tribal population who still practice *jhum* cultivation which leads to deforestation and soil erosion. Consequently efforts have been made by the state government to address this problem of deforestation and soil erosion. Rubber plantation was introduced here during 1963 by the Tripura Forest Department on a trial basis (Vinod et al., 1996) as part of afforestation programme for soil conservation measures in Patichari and Manu ranges of South and North Tripura districts respectively (Bhowmik, 2006; Das, 2014; Viswanathan and Bhowmik, 2014). Success of this trial plantation motivated the Tripura Forest Department for more extensive cultivation of rubber trees, but rubber plantation being a new commercial crop was initially rejected by the local population. However with the rubber trees planted in 1963 maturing in early 1970s, tapping and processing of latex started around 1971-72, the importance and benefits (economic, welfare and ecological) of rubber plantation received its due recognition as the local population realised the commercial significance of such plantation (Bhowmik, 2006; Viswanathan and Bhowmik, 2014). Subsequently, the state government set up agencies i.e. TFDPCL in 1976, TRPCL in 1983 to popularise and expand area under rubber plantation in the state. The Rubber Board in collaboration with the scheduled tribe/caste welfare department of the state government from 1992 onwards encouraged rubber plantation, the state government also encouraged office of the Tripura Tribal Areas Autonomous District Council (TTAADC) from 1892 onwards to popularise rubber plantation. From 1998 onwards, office of the Sub-Divisional Magistrates (SDM)/Block Development Officer (BDO) has also been encouraged to set up rubber plantations in their respective block (Bhowmik, 2006; Joseph et al., 2010; Viswanathan and Bhowmik, 2014). The expansion of rubber plantation in the state has been encouraged with a rationale to uplift the economically and socially marginalised section of population and win over the *jhumias* to settle agriculture through rubber plantation-based rehabilitation programme. The positive coordination among the different agencies in implementing this rehabilitation programme has been a success (Joseph et al., 2010). This programme of rehabilitating the *jhumias* and other landless marginalised section of the population through policy intervention has been conceived and

implemented by the Rubber Board and the state government. This has proved to be an agent of change helping in ushering the much needed socio-economic development of the *jhumias* and the marginalised landless population on one hand and the growth and expansion of area under rubber plantation in the state (Sharma et al., 2014) thereby making Tripura the second largest producer of natural rubber in the country. In this backdrop, this paper attempts to assess the contribution of the different agencies in the expansion and distribution of area under rubber plantation in the state of Tripura.

Materials and Methods

Data source

This paper is based on secondary data which has been collected from the offices of the Rubber Board (Agartala), TFDPCL and TRPCL as these agencies are mainly contributing towards the development of rubber plantation in the state.

Data analysis

The annual growth rate of area under rubber plantation has been computed by ‘arithmetic rate of growth’ and the distribution of rubber plantation developed by the different agencies has been represented by ‘concentration index’ (Hassan, 2005). The formula of concentration index is as follows-  $CI = (P/\overline{P})/(A/\overline{A})$  where,

- CI = Concentration Index
- P = Actual area under rubber plantation of the i<sup>th</sup> district
- $\overline{P}$  = Average area under rubber plantation of the district in the state
- A = Actual area size of the i<sup>th</sup> district
- $\overline{A}$  = Average area size of the district in the state

This has been further mapped by appropriate cartographic technique.

Study area

Tripura is declared the ‘Second Rubber Capital of India’ next to Kerala by the Rubber Board of India (Viswanathan and Bhowmik, 2014; Directorate of Economic and Statistics Planning Department (DESPD), 2016). Tripura is also the second largest producer of natural rubber in India although it is a non-traditional rubber growing state (Rubber Board, 2016).

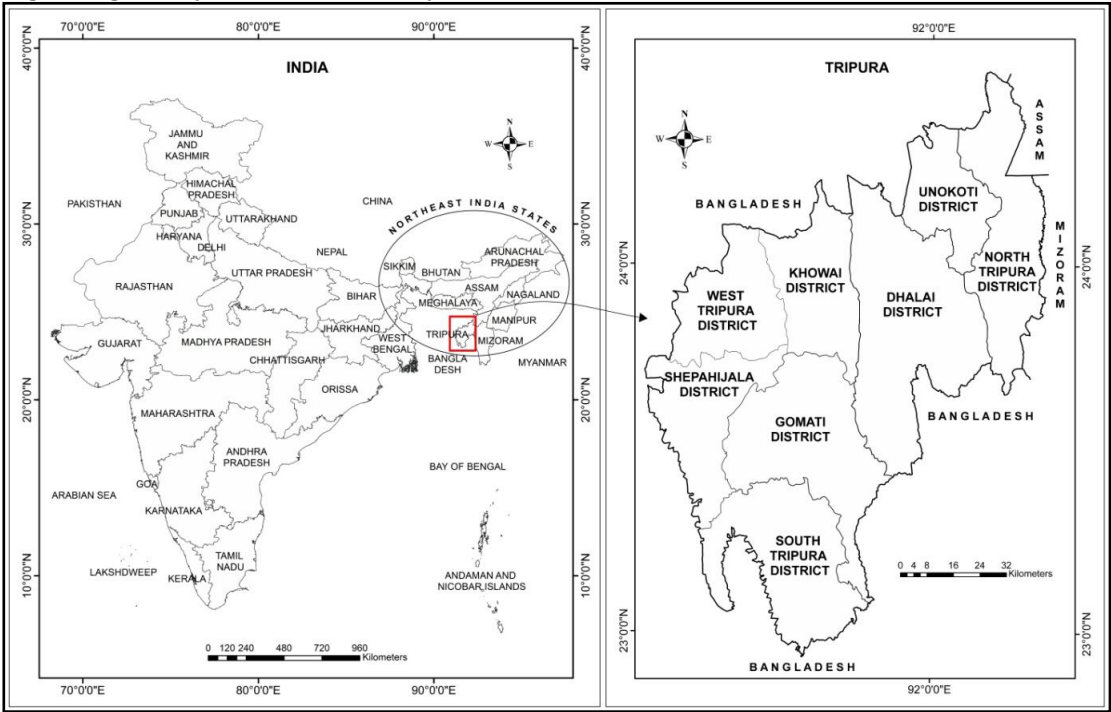


Figure 1: Location map of Tripura.

Contribution of the different agencies in the expansion of area under rubber plantation

The Tripura Forest Department is the pioneering agency which developed 8.28 ha (4.14 ha at Manu areas of Dhalai district and 4.14 ha at Patchari areas of North Tripura district) of rubber plantation in 1963, this increased to 465.73 ha by 1975 (Das, 2014) suggesting a growth rate of 5,524.76 percent. But this rubber plantations was transferred to the TFDPCL (Bhowmik, 2006; Viswanathan and Bhowmik, 2014; TFDPCL,

2016), a public-sector organisation functioning under the administrative control of the Tripura Forest Department (DESPD, 2016).

After 1975, there was a policy change and the expansion of rubber plantation has been initiated by different rubber growing agencies and private organisations and individual entrepreneurs. The main agencies looking after the expansion of rubber plantation in the state are-

#### **TFDPCL**

TFDPCL had initially (1976-77) developed 148 ha of rubber plantation which has increased to 11,624 ha by 2015-16 (appendix 1) suggesting a growth rate of 7,754.05 percent. The area under rubber plantation developed by the TFDPCL started increasing rapidly from its inception till 1989-90, however from 1990 onwards it is increasing but at a slower pace (figure 2). The rapid increase till 1989-90 can be attributed to the restoration of degraded forest land (caused mainly by *jhum* cultivation) through commercial rubber plantation and the implementation of rubber plantation-based rehabilitation programme introduced by the state government for uplifting the economically and socially marginalised sections of the society. Further with maturity of the rubber trees developed by the Tripura Forest Department and TFDPCL, the production of latex and its processing leading to the economic benefits, attracted the rural population to accept this programme. Consequently TFDPCL emerged as the pioneer in successfully implementing the first rubber plantation-based rehabilitation project at Warrangbari village (TFDPCL, 2016). Success of the commercial rubber plantation and rubber plantation-based rehabilitation programme has further encouraged the expansion of area under rubber plantation, generating trust and confidence amongst the poor tribes inhabiting the hills and uplands (Das, 2014) who previously practised *jhum* cultivation.

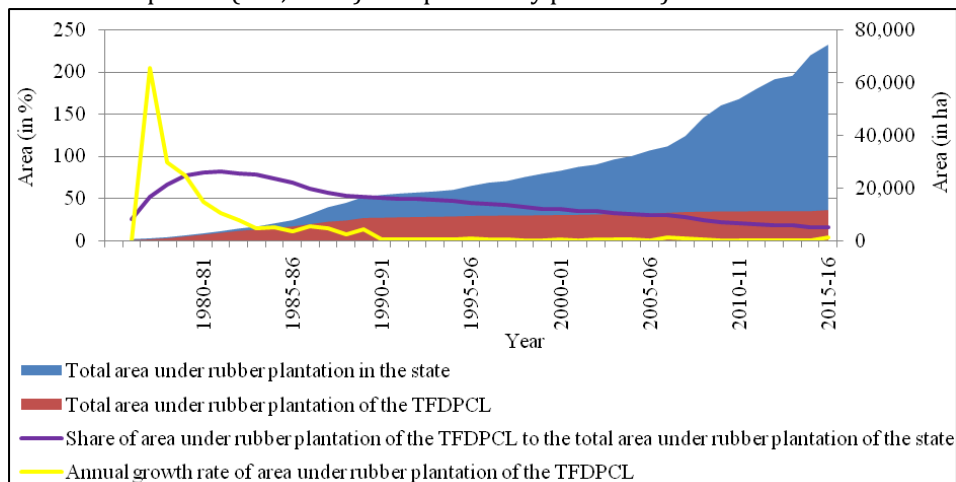


Figure 2: Share and growth rate of the area under rubber plantation developed by the TFDPCL (1976-77 to 2015-16).

As depicted in figure 2 the share of area under rubber plantation developed by the TFDPCL started increasing from 1976-77 reaching its peak during 1981-82 when the share was as high as 82.12 percent (appendix 1). After 1982 the share started declining and the lowest share is noticed during 2015-16 with only 15.64 percent (appendix 1). The share of area under rubber plantation developed by this agency suggest a declining trend as private owners, TRPCL and Rubber Board have come up bringing more area under rubber plantation in the state. From 1976-77 to 2015-16, the average share of area under rubber plantation developed by the TFDPCL to the total area under rubber plantation in the state is 44.35 percent. The growth rate of area under rubber plantation developed by the TFDPCL indicates a declining and fluctuating trend where one peak is noticed during the initial year of 1977-78 i.e. 204.73 percent which falls below 100 percent in the next year (1978-79) and from 1990-91 to 2015-16 the area under rubber plantation has been increasing with an average annual growth rate of below 4 percent (figure 2 and appendix 1). The average growth rate from 1976-77 to 2015-16 is 15.32 percent.

#### **TRPCL**

TRPCL had initially (1984-85) developed 75 ha of rubber plantation which has increased to 9,154 ha by 2015-16 (appendix 2) suggesting a growth rate of 12,105.33 percent. The area under rubber plantation developed by the TRPCL has been continuously increasing from its inception till 1989-90, however from 1990 onwards it has been increasing steadily (figure 3). This continuous increase in area under rubber plantation is due to the support from the state government for extending the area under rubber plantation

through rubber plantation-based economic rehabilitation programme addressing the upliftment of the economically and socially marginalised sections of the society as well as the acceptance of this rehabilitation programme by the poor ST population of the state; in fact the main objective of the TRPCL is to economically rehabilitate the *jhumias*, landless and small farmers mainly belonging to ST population inhabiting rural areas through rubber plantation (TRPCL, 2016).

As depicted in figure 3 the share of area under rubber plantation developed by the TRPCL shows a significant increasing trend from 1984-85 which continues till 1989-90. After 1990, the share suggest an increasing trend but at a slower pace. From 1995-96 to 1998-99, the share of area under rubber plantation developed by this agency indicates a fluctuating trend. After 1999, the share started increasing significantly reaching its maximum share (17 percent) during 2006-07 (appendix 2). After 2007, the share suggests a declining trend each successive year till 2015-16. The TRPCL has maintained above 10 percent share of the area under rubber plantation from 1988-89 to 2015-16 (appendix 2). However in the recent years the share has been declining as other public agencies as well private sector and number of individual entrepreneurs have emerged playing a pivotal role in bringing more area under rubber plantation in the state. The average share of area under rubber plantation developed by the TRPCL to the total area under rubber plantation of the state (1984-85 to 2015-16) is 13.19 percent.

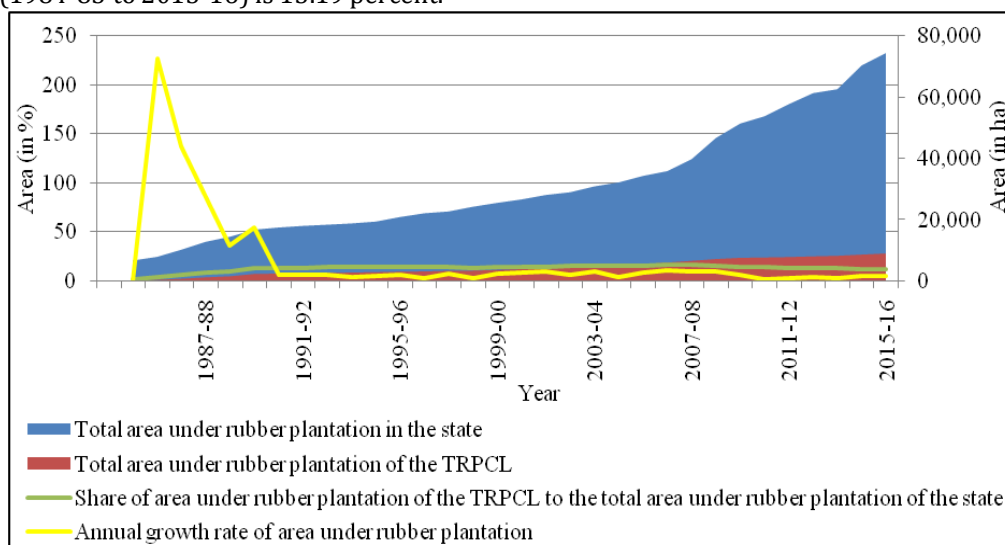


Figure 3: Share and growth rate of the area under rubber plantation developed by the TRPCL (1984-85 to 2015-16).

Figure 3 indicates that the growth rate of area under rubber plantation developed by the TRPCL is declining with fluctuating trend. The highest growth rate was noticed during 1985-86 (226.67 %) while the lowest growth rate has been observed during 2010-11 i.e. 1.65 percent (appendix 2). From 1990-91 onwards the growth rate is below 10 percent except during 2006-07 i.e. 10.61 percent (appendix 2). The average growth rate from 1984-85 to 2015-16 is 22.04 percent.

### Rubber Board

Rubber Board had developed 122 ha of rubber plantation during 1992-93 and 3,775 ha by 2015-16 (appendix 3) suggesting a growth rate of 2,994.26 percent. As observed from appendix 3, there has not been much change in the area under rubber plantation developed by the Rubber Board from 2010-11. Figure 4 indicates that there has been a significant increase in the area under rubber plantation from 1992-93 till 1998-99. After 1999, the area under rubber plantation has been increasing at a slower pace. The Rubber Board looks into the implementation of the rubber plantation-based rehabilitation programme through Block Plantation Scheme (BPS)/Tripura Block Plantation Project (TBPP) addressing mainly the poor ST and SC households inhabiting the rural areas of the state. It also focuses on the reforestation of denuded forests through rubber plantation scheme (Rubber Board, 2016), this has resulted to the continuous increase in the area under rubber plantation developed by the Rubber Board in the state. It must be mentioned that the Rubber Board has played a significant role in the expansion of rubber plantation area in the state through BPS/TBPP (from 1992) in collaboration with the Tribal Welfare Department, government of Tripura, which is supported by the World Bank to promote economic upliftment of the ST *jhumia* families through rubber plantation (Bhowmik, 2006; Viswanathan and Bhowmik, 2014).

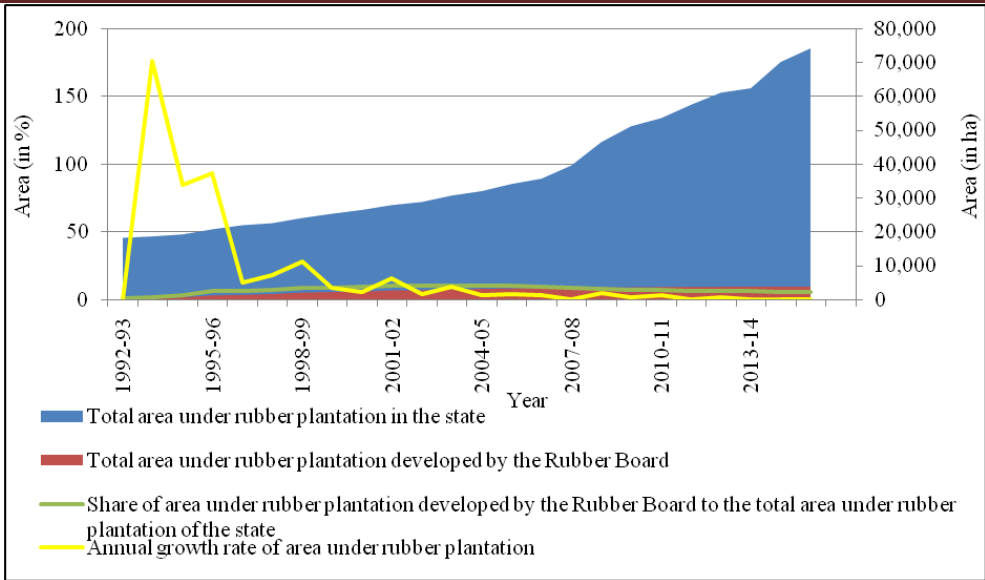


Figure 4: Share and growth rate of the area under rubber plantation developed by the Rubber Board (1992- 93 to 2015-16).

Figure 4 indicates a significant increase in the share of area under rubber plantation developed by the Rubber Board which started functioning from 1992-93, this continued till 1998-99 and reached its peak during 2003-04 but after 2004, the share started declining continuously. This declining share in the recent years may be attributed to the fact that the private sectors and individual entrepreneurs have emerged, playing a significant role in bringing more area under rubber plantation in the state. The average share of area under rubber plantation developed by the Rubber Board to the total rubber plantation area in the state (1992-93 to 2015-16) is only 7.03 percent.

The growth rate of area under rubber plantation developed by the Rubber Board indicates a declining and fluctuating trend (figure 4). The highest growth rate is noticed during 1993-94 (176.23 %) while the lowest growth rate is observed during 2012-13 i.e.1.34 percent (appendix 3). The average growth rate from 1992-93 to 2015-16 is 20.72 percent.

**District wise distribution and concentration of the area under rubber plantation developed by the TFDPCL, TRPCL and Rubber Board**

Tripura consist of eight districts, but the present paper takes into account the previous four districts viz. North Tripura, Dhalai, West Tripura and South Tripura districts as the new districts viz. Unokoti, Khowai, Sepahijala and Gomati have been carved from the previous three districts (North Tripura, West Tripura and South Tripura districts) for better administration. The administrative boundary of Dhalai district has not undergone any changes. Data pertaining to area under rubber plantation is available only for the previous four districts hence the distribution and concentration of rubber plantation developed by the different agencies has been analysed and mapped for the previous four districts.

TFDPCL has developed rubber plantation in three districts and the distributional pattern suggest that it has the highest presence in North Tripura district (29.49 %) having a CI value of 0.95, followed by South Tripura district (22.94 %) having a CI value of 1.14 while West Tripura district has the least (9.80 %) having a CI value of 0.81 (table 1 and figure 5). TFDPCL has not yet developed rubber plantation in Dhalai district although it is in this district that the first rubber plantation was introduced.

TRPCL has developed rubber plantation in all the four districts and the distributional pattern suggest that it has the highest presence in Dhalai district (39.39 %) having a CI value of 0.76, followed by North Tripura district (16.89 %) having a CI value of 0.93 while West Tripura and South Tripura districts (10.22 % and 9.48 % respectively) having a CI value of 1.44 and 0.81 respectively.

Rubber Board has developed rubber plantation in three districts and has the highest presence in West Tripura district (8.30 %) having a CI value of 2.04, followed by South Tripura and North Tripura districts with 2.91 percent and 2.27 percent and CI value of 0.43 and 0.22 respectively. Rubber Board has not developed any rubber plantation in Dhalai district (table 1).



Thus it is observed that rubber plantation in the state is not equally distributed over space as South Tripura and West Tripura districts have the highest concentration of area under rubber plantation.

Table 1: District wise distribution and share of the area under rubber plantation developed by the TFDPC, TRPCL and Rubber Board in Tripura (2014-15)

| District      | * Area under rubber plantation (in ha) in the state | ** Area under rubber plantation (in ha) of the TFDPC | Share (in %) | *** Area under rubber plantation (in ha) of the TRPCL | Share (in %) | *Area under rubber plantation (in ha) of the Rubber Board | Share (in %) |
|---------------|---|--|--------------|---|--------------|---|--------------|
| North Tripura | 9,365   | 2,762  | 29.49        | 1,582   | 16.89        | 213   | 2.27         |
| Dhalai        | 3,874   | -----  | -----        | 1,526   | 39.39        | -----   | -----        |
| West Tripura  | 35,317  | 3,462  | 9.80         | 3,610   | 10.22        | 2,930   | 8.30         |
| South Tripura | 21,740  | 4,987  | 22.94        | 2,062   | 9.48         | 632   | 2.91         |

Source: \* Rubber Board, 2016; \*\* TFDPC, 2016; \*\*\* TRPCL, 2016.

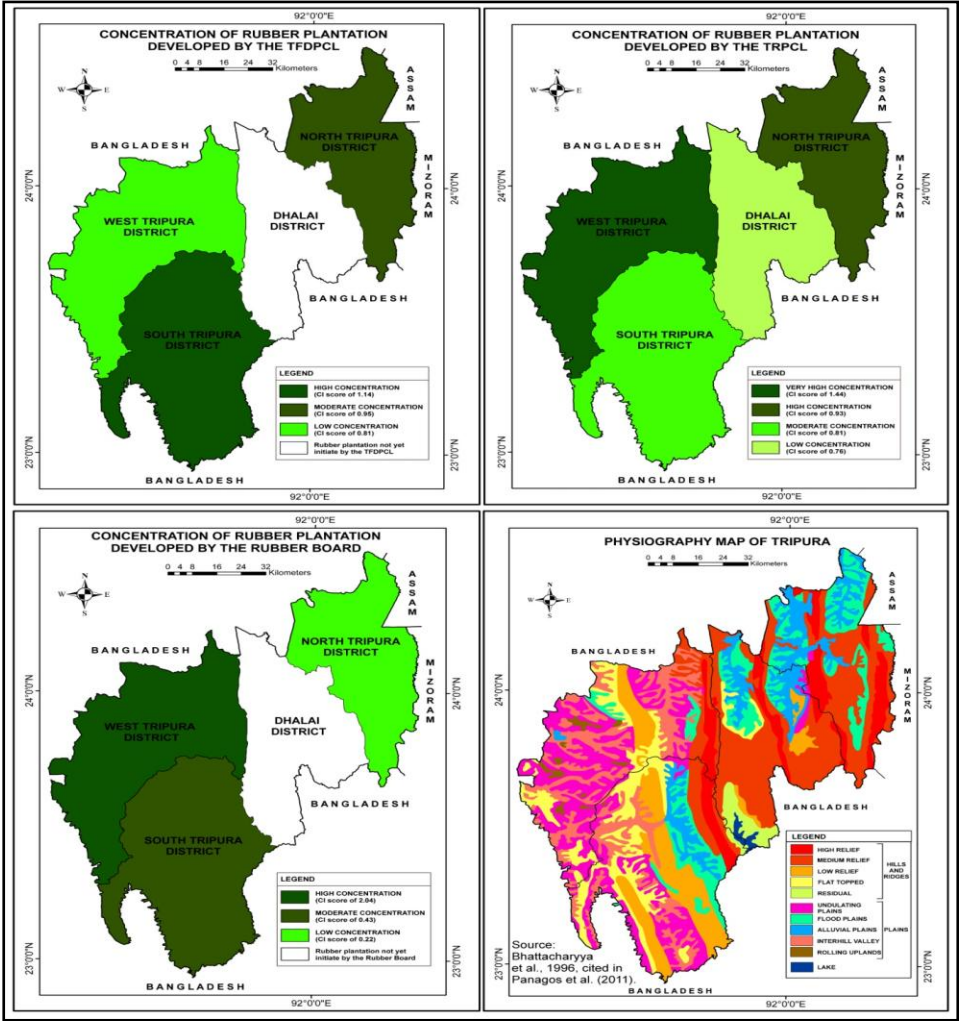


Figure 5: Concentration of rubber plantation of the different agencies and physiography map of Tripura.

Factors contributing to the unequal distribution of rubber plantation

All the three agencies (TFDPC, TRPCL and Rubber Board) have developed maximum area under rubber plantation in West Tripura and South Tripura districts (table 1) and this may be attributed to the availability of favourable land ideal for rubber plantation here as these districts are mostly covered with undulating hills comprising of small uplands locally termed as *tillas* and the slope of the *tillas* are easily drained ideal

for rubber plantation. Bhattacharyya, et al., (1998) highlights that the suitable areas for rubber plantation in Tripura are mostly characterised by undulating plains and uplands having less than 15 percent slope. They also mentioned that in steep slope greater than 30-50 percent (although severely limiting rubber plantation) rubber plantation can be established only with proper conservation methods, consequently these agencies have set up rubber plantation in steep slopes here with contour bunds management. Raj et al. (2012) states that the undulating terrain of South and West Tripura districts comprising of low to medium/gentle slope are considered suitable for rubber plantation consequently this two districts of Tripura has the maximum concentration of rubber plantation in the state. The physiographic map (figure 5) also suggests the same.

North Tripura and Dhalai districts have the least area under rubber plantation as these districts are mostly covered by hilly terrain with forested tracks where rubber plantation is not encouraged (Mohanakumar, 2014). In fact the Ministry of Environment of Government of India in 2005 has totally banned setting up of rubber plantation in forested lands i.e. mainly reserved forest areas (Mohanakumar, 2013). Bhattacharyya et al. (1998) also states that rubber plantation face severe limitation in areas having high relief with steep slope and also low valleys (as they are not well drained) prone to water stagnation which causes severe limitation for the growth of rubber trees. Consequently topographic limitation restricts the share of the area under rubber plantation in these two districts hence both North Tripura and Dhalai districts has the least concentration of area under rubber plantation.

### Conclusion

The area under rubber plantation developed by the three agencies has been increasing continuously, however in the recent years though increasing but at a declining growth rate with fluctuating trend. This may be attributed to the emerging role of private sector and individual entrepreneurs who are at present playing a significant part in developing rubber plantation in the state as it is a profitable venture bringing in good business. Among the different agencies, TFDPCCL has developed maximum area under rubber plantation (11,624 ha) followed by TRPCL (9,154 ha) and Rubber Board (3,775 ha). Till 2015-16, TFDPCCL has contributed 15.64 percent of the area under rubber plantation to the total area under rubber plantation in the state; TRPCL has contributed to the development of 12.31 percent of the area under rubber plantation while the Rubber Board has contributed to the development of 5.08 percent of the total area under rubber plantation in the state. TRPCL has developed rubber plantation in all the four districts of the state (North Tripura, Dhalai, West Tripura and South Tripura districts) while both the TFDPCCL and Rubber Board have developed rubber plantation only in three districts (North Tripura, West Tripura and South Tripura) and are totally absent in Dhalai district. Rubber plantation developed by these three agencies has been increasing continuously where large tracks of wastelands (scrubland, denuded lands, land with grass/shrubs) and fallow lands has been converted to rubber plantation. The degraded forest areas caused due to *jhum* cultivation have been afforested through rubber plantation-based rehabilitation programme. Consequently these three agencies have contributed much towards the development of rubber plantation in the non-traditional rubber growing state of Tripura and the rubber plantation sector has brought in economic dynamism for more than 57,000 households as well as to the state's economy (DESPD, 2015; Bhowmik and Viswanathan, 2015).

It can be concluded that the role of Rubber Board in the development of the area under rubber plantation in the state is marginal when compared to the TFDPCCL and TRPCL. The three mentioned agencies have not only played a significant role in developing the area under rubber plantation but have also brought to the limelight the profit and business associated with rubber plantation, thereby encouraging private sector and individuals to emerge as entrepreneurs having their own rubber plantations, this in turn has resulted to further expansion of rubber plantation making Tripura the second largest area under rubber plantation and producer of natural rubber in the country.

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### Appendix - 1

Share and growth rate of the area under rubber plantation developed by the TFDPC  
(1976-77 to 2015-16)

| Year    | * Total area under rubber plantation (in ha) in the state | ** Total area under rubber plantation (in ha) of the TFDPC | Share (in %) | Annual growth rate (in %) |
|---------|---|--|--------------|---------------------------|
| 1976-77 | 574   | 148  | 25.78        | 0.00                      |
| 1977-78 | 878   | 451  | 51.37        | 204.73                    |
| 1978-79 | 1,306   | 867  | 66.39        | 92.24                     |
| 1979-80 | 1,989   | 1,534  | 77.12        | 76.93                     |
| 1980-81 | 2,746   | 2,232  | 81.28        | 45.50                     |
| 1981-82 | 3,590   | 2,948  | 82.12        | 32.08                     |
| 1982-83 | 4,578   | 3,673  | 80.23        | 24.59                     |
| 1983-84 | 5,338   | 4,190  | 78.49        | 14.08                     |
| 1984-85 | 6,545   | 4,825  | 73.72        | 15.16                     |
| 1985-86 | 7,742   | 5,361  | 69.25        | 11.11                     |
| 1986-87 | 10,085  | 6,265  | 62.12        | 16.86                     |
| 1987-88 | 12,670  | 7,169  | 56.58        | 14.43                     |



|         |        |        |       |       |
|---------|--------|--------|-------|-------|
| 1988-89 | 14,326 | 7,646  | 53.37 | 6.65  |
| 1989-90 | 16,620 | 8,620  | 51.87 | 12.74 |
| 1990-91 | 17,320 | 8,709  | 50.28 | 1.03  |
| 1991-92 | 17,860 | 8,840  | 49.50 | 1.50  |
| 1992-93 | 18,250 | 8,971  | 49.16 | 1.48  |
| 1993-94 | 18,670 | 9,059  | 48.52 | 0.98  |
| 1994-95 | 19,252 | 9,158  | 47.57 | 1.09  |
| 1995-96 | 20,761 | 9,390  | 45.23 | 2.53  |
| 1996-97 | 21,982 | 9,479  | 43.12 | 0.95  |
| 1997-98 | 22,582 | 9,537  | 42.23 | 0.61  |
| 1998-99 | 24,120 | 9,566  | 39.66 | 0.30  |
| 1999-00 | 25,380 | 9,614  | 37.88 | 0.50  |
| 2000-01 | 26,495 | 9,757  | 36.83 | 1.49  |
| 2001-02 | 27,947 | 9,787  | 35.02 | 0.31  |
| 2002-03 | 28,853 | 9,929  | 34.41 | 1.45  |
| 2003-04 | 30,770 | 10,093 | 32.80 | 1.65  |
| 2004-05 | 32,065 | 10,192 | 31.79 | 0.98  |
| 2005-06 | 34,189 | 10,214 | 29.88 | 0.22  |
| 2006-07 | 35,760 | 10,594 | 29.63 | 3.72  |
| 2007-08 | 39,670 | 10,877 | 27.42 | 2.67  |
| 2008-09 | 46,588 | 11,040 | 23.70 | 1.50  |
| 2009-10 | 51,292 | 11,083 | 21.61 | 0.39  |
| 2010-11 | 53,669 | 11,134 | 20.75 | 0.46  |
| 2011-12 | 57,621 | 11,181 | 19.40 | 0.42  |
| 2012-13 | 61,231 | 11,201 | 18.29 | 0.18  |
| 2013-14 | 62,529 | 11,203 | 17.92 | 0.02  |
| 2014-15 | 70,296 | 11,211 | 15.95 | 0.07  |
| 2015-16 | 74,335 | 11,624 | 15.64 | 3.68  |

Source: \*Centre for Development Studies; \*Rubber Board, 2016; \*\*TFDPCL, 2016 (Share and growth rate computed by the researcher).

Appendix - 2  
Share and growth rate of the area under rubber plantation developed by the TRPCL  
(1984-85 to 2015-16)

| Year    | *Total area under rubber plantation (in ha) in the state | **Total area under rubber plantation (in ha) of the TRPCL | Share (in %) | Annual growth rate (in %) |
|---------|--|---|--------------|---------------------------|
| 1984-85 | 6,545  | 75  | 1.15         | 0.00                      |
| 1985-86 | 7,742  | 245   | 3.16         | 226.67                    |
| 1986-87 | 10,085   | 580   | 5.75         | 136.73                    |
| 1987-88 | 12,670   | 1,072   | 8.46         | 84.83                     |
| 1988-89 | 14,326   | 1,449   | 10.11        | 35.17                     |
| 1989-90 | 16,620   | 2,236   | 13.45        | 54.31                     |
| 1990-91 | 17,320   | 2,352   | 13.58        | 5.19                      |
| 1991-92 | 17,860   | 2,476   | 13.86        | 5.27                      |
| 1992-93 | 18,250   | 2,608   | 14.29        | 5.33                      |
| 1993-94 | 18,670   | 2,711   | 14.52        | 3.95                      |

|         |        |       |       |       |
|---------|--------|-------|-------|-------|
| 1994-95 | 19,252 | 2,851 | 14.81 | 5.16  |
| 1995-96 | 20,761 | 3,000 | 14.45 | 5.23  |
| 1996-97 | 21,982 | 3,084 | 14.03 | 2.8   |
| 1997-98 | 22,582 | 3,299 | 14.61 | 6.97  |
| 1998-99 | 24,120 | 3,358 | 13.92 | 1.79  |
| 1999-00 | 25,380 | 3,585 | 14.13 | 6.76  |
| 2000-01 | 26,495 | 3,870 | 14.61 | 7.95  |
| 2001-02 | 27,947 | 4,237 | 15.16 | 9.48  |
| 2002-03 | 28,853 | 4,505 | 15.61 | 6.32  |
| 2003-04 | 30,770 | 4,905 | 15.94 | 8.88  |
| 2004-05 | 32,065 | 5,095 | 15.89 | 3.87  |
| 2005-06 | 34,189 | 5,496 | 16.08 | 7.87  |
| 2006-07 | 35,760 | 6,079 | 17.00 | 10.61 |
| 2007-08 | 39,670 | 6,668 | 16.81 | 9.69  |
| 2008-09 | 46,588 | 7,278 | 15.62 | 9.15  |
| 2009-10 | 51,292 | 7,689 | 14.99 | 5.65  |
| 2010-11 | 53,669 | 7,816 | 14.56 | 1.65  |
| 2011-12 | 57,621 | 7,952 | 13.80 | 1.74  |
| 2012-13 | 61,231 | 8,186 | 13.37 | 2.94  |
| 2013-14 | 62,529 | 8,372 | 13.39 | 2.27  |
| 2014-15 | 70,296 | 8,780 | 12.49 | 4.87  |
| 2015-16 | 74,335 | 9,154 | 12.31 | 4.26  |

Source: \*Centre for Development Studies; \*Rubber Board, 2016; \*\*TRPCL, 2016 (Share and growth rate computed by the researcher).

### Appendix - 3

Share and growth rate of the area under rubber plantation developed by the Rubber Board  
(1992-93 to 2015-16)

| Year    | *Total area under rubber plantation (in ha) in the state | **Total area under rubber plantation (in ha) developed by the Rubber Board | Share (in %) | Annual growth rate (in %) |
|---------|--|--|--------------|---------------------------|
| 1992-93 | 18,250   | 122  | 0.67         | 0.00                      |
| 1993-94 | 18,670   | 337  | 1.81         | 176.23                    |
| 1994-95 | 19,252   | 623  | 3.24         | 84.87                     |
| 1995-96 | 20,761   | 1,204  | 5.80         | 93.26                     |
| 1996-97 | 21,982   | 1,356  | 6.17         | 12.62                     |
| 1997-98 | 22,582   | 1,602  | 7.09         | 18.14                     |
| 1998-99 | 24,120   | 2,049  | 8.50         | 27.90                     |
| 1999-00 | 25,380   | 2,220  | 8.75         | 8.35                      |
| 2000-01 | 26,495   | 2,346  | 8.85         | 5.68                      |
| 2001-02 | 27,947   | 2,710  | 9.70         | 15.52                     |
| 2002-03 | 28,853   | 2,806  | 9.73         | 3.54                      |
| 2003-04 | 30,770   | 3,073  | 9.99         | 9.52                      |
| 2004-05 | 32,065   | 3,176  | 9.90         | 3.35                      |
| 2005-06 | 34,189   | 3,301  | 9.66         | 3.94                      |
| 2006-07 | 35,760   | 3,402  | 9.51         | 3.06                      |
| 2007-08 | 39,670   | 3,402  | 8.58         | 0.00                      |
| 2008-09 | 46,588   | 3,564  | 7.65         | 4.76                      |

|         |        |       |      |      |
|---------|--------|-------|------|------|
| 2009-10 | 51,292 | 3,620 | 7.06 | 1.57 |
| 2010-11 | 53,669 | 3,725 | 6.94 | 2.90 |
| 2011-12 | 57,621 | 3,725 | 6.46 | 0.00 |
| 2012-13 | 61,231 | 3,775 | 6.17 | 1.34 |
| 2013-14 | 62,529 | 3,775 | 6.04 | 0.00 |
| 2014-15 | 70,296 | 3,775 | 5.37 | 0.00 |
| 2015-16 | 74,335 | 3,775 | 5.08 | 0.00 |

Source: \*Centre for Development Studies; \*Rubber Board, 2016; \*\*Rubber Board, 2016 (Share and growth rate computed by the researcher).