

Rubber Farming, Boon or Bane for the Farmers in Tripura: a Socio-economic Analysis

¹Prabhakar and Prodyut Bhattacharya²

^{1,2}University School of Environment Management, GGSIP University, Dwarka
Sec-16C, New Delhi 110078, India

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ABSTRACT

Tripura, in India's North-Eastern region, has experienced a remarkable increase in the area under rubber (*Hevea brasiliensis*) plantation, making it the country's second-largest producer of rubber by the presence of 1.10 lakh rubber farmers cultivating 77400 ha of the area after Kerela. Its acceptance and spread among tribal smallholders, especially shifting farmers, has given them with an alternative source of income as well as economic stability and livelihood security for "Jhumias". This study aims to analyze the socio-economic impacts and changes with the smallholder's rubber plantation farmers in Tripura. A questionnaire survey was conducted for the study and 160 respondents participated from the districts Gomti and Septhajala which has predominated rubber production. According to the study findings, the bulk of the questioned farmers' principal source of income is from rubber plantations, around 95% of farmers who took the survey had less than 5 acres of the area under rubber plantation. More than 50% of farmers rely on rubber plantations, adding more than 75% to their monthly household income. About 83% of farmers had additional sources of income along with rubber. With the assistance of Tribal Welfare Department, Forest Department, and the implementation of suitable state policies and initiatives, smallholders adopted rubber plantation. Indirectly large-scale rubber plantation in Tripura contributes to the climate commitments of India towards carbon sequestration.

Key words: Socio-Economic Status, Rubber Plantation, Small-Holders, Tribal Farmers, Tripura

Introduction

Rubber farming has spread throughout South-East Asia over the last decade to fulfill the demand of natural rubber (*Hevea brasiliensis*), particularly in growing nations such as China and India (Zeigler *et al.*, 2009). Tripura relies heavily on rubber as a commercial crop and Government of Tripura gets a significant amount of revenue from this cash crop. Kerala and Tripura are two states well-known for their rubber production (Economic Review, 2018-19). The total land under rubber plantation is around 77400 ha which yielded about 9% of total

rubber production of India. Around 1.10 lakhs farmers engaged in rubber plantations which produced about 83701.23 MT of rubber (Department of Industries & Commerce, Govt of Tripura). The primary goal of growing rubber plantation in the North-Eastern states was to wean away from shifting cultivation through the permanent standing crop of Rubber Plantation Scheme (RPS) and offer shifting cultivators with an alternative means of living, as well as to protect degraded forestland (Vongkhameng *et al.*, 2016). After the establishment of the "The Indian Rubber Board" in 1980s, the rubber plantation in the North-Eastern Region (NER) of India has grown tre-

(¹Research Scholar, ²Professor)

mendously, particularly in Tripura, Assam, and Meghalaya, making it the country’s “Hub of Rubber Production” (Vishwanathan and Bhowmik, 2021). State agencies such as the Tripura Forest Development and Plantation Corporation (TFDPC) and the Tripura Rehabilitation Plantation Corporation (TRPC) implemented the beneficiary model which tries to help the tribal beneficiary in setting up the plantation for small farmers. Following the implementation of the Cash Subsidy Scheme, landusepolicy favoring Natural Rubber (NR), establishment of rubber Producer Society for processing and marketing of NR under the initiative of Rubber board and the operation of the accelerated rubber development scheme in the North-East, the overall activities in the state got a significant boost (Bhowmik and Vishwanathan, 2018; Mohanakumar, 2016). Rubber plantations have key linkages with several socioeconomic parameters, as illustrated in Figure 1.

Tripura has predominantly agricultural economy with a high percentage of poverty (16.53%) and a low per capita income of 1,29,995 Indian Rupee (INR)(Economic Review, 2020-21). The long-term dependency on rubber as a single crop may affect the socio-economic conditions and livelihood of the farmers, which may expose them to economic and ecological crisis. Since rubber is almost solely used for industry like Automobile tyres, footwears and tubes, the dynamics of the global market economy have a significant impact on rubber demand and

supply. This implies that rubber prices have boom-and-bust cycles, putting producers at risk of unstable revenue. Smallholders who solely depend on rubber from monocultures are especially vulnerable to price changes (Goh *et al.*, 2016; Andriesse and Tanwattana, 2018).

Most of the previous studies were focused on qualitative account of rubber plantation. Considerable research has been conducted in selected districts of Tripura i.e., Gomti and Sephaiala, on the socioeconomics of rubber labours(Chouhan and Bhowmik (2017); Bhowmik and Chouhan (2013); Bhowmik and Vishwanathan (2015); Chaudhary and Sarkar (2021); Chouhan *et al.*, 2019). Hence, a more representative socioeconomic study of smallholder rubber farming was needed. The study aims to analyze the current contribution of the rubber economy for small landholders. Specifically, we examine a) the current socioeconomics condition of rubber farmers and b) the contribution of rubber plantation to the monthly income of farmers.

Materials and Methods

Study area

Tripura is a small state with a geographical area of 10,486 km² in India’s Northern-Eastern Region, lying between 22° 56’ and 24° 32’ N latitude and 90° 09’ and 92° 20’ E longitude. The state is hilly, with elevations ranging from 15 to 940 meters above mean sea level. The state boasts a diverse floral and faunal

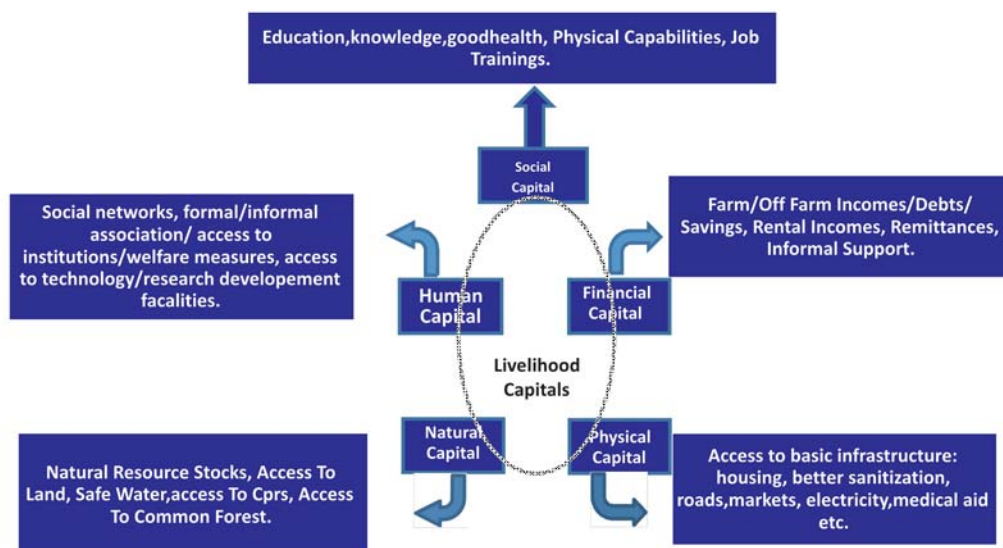


Fig. 1. Linkages between livelihood capitals and rubber plantation

variety, with a total forest cover of 7722 km² and the forest cover has increased in the past years, due to the large rubber plantation area (FSI 2021). Tripura is one of six scheduled states, and two districts, Sephaujla and Gomti, were chosen for the study, as indicated in Figure 2.

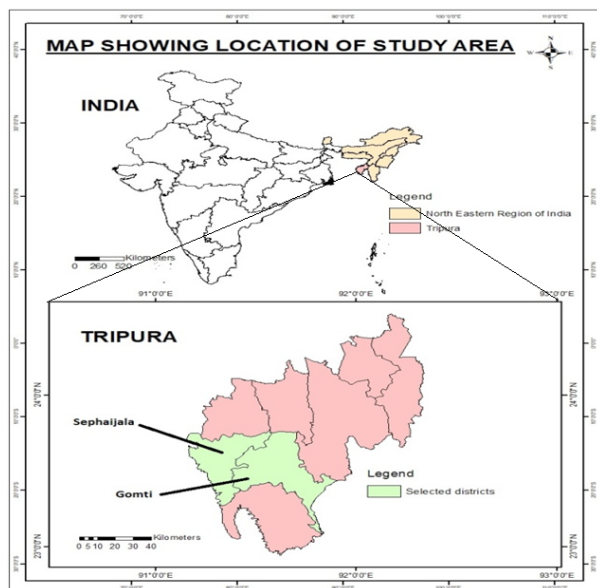


Fig. 2. Study area map showing sampled districts.

The total population of the district 'Gomti' is 4,41,538, having an area of 1522.8 Km² and the percentage of Scheduled Caste and Scheduled Tribes is 16.85% and 42.7%, respectively. On the other side, the total population of the district 'Sephaujla' is 5,42,731, having an area of 1043.04 Km², and percentage of Scheduled Caste and Scheduled Tribes is 17.99% and 26.5%, respectively as shown in Table 1.

Table 1. Brief profile of study areas

Characteristics	Gomti district	Sephaujla district
Total Population	441538	542731
Area	1522.8 km ²	1043.04 km ²
% SC	16.85 %	17.99%
% ST	42.7%	26.05%
Nos. of Villages	173	169
Total Forest Area	1012.623 km ²	251.34 km ²

Source: Tripura State Portal (GoI)

Sampling design

This study contributes both descriptive and analytical information to understand the overall status of smallholders. Data for this study were sourced from

a primary source using a questionnaire survey which was administered to 160 rubber smallholder farmers for the study. Multi-stage sampling technique was adopted for this study. The first stage was the purposive selection of two districts Gomti and Sephaujla of the state and two blocks from each district namely Matabari, Killa, Boxanagar, and Jampuijala, where rubber production is predominant. The second stage was the selection of two villages from each block, using the simple random sampling method that gave a total of 8 villages namely Laxmipati, kwaimura, Sukhmohanbari, Nutandhanbari, Adampur, Jamutilla, Laytancherra and Goliraibari. Finally, 20 farmers from each village and total 160 farmers were selected using the simple random sampling method from the list of rubber farmers of the Tripura rehabilitation plantation corporation (TRPC) and Tripura Forest development and plantation corporation limited (TFDPC) rubber centers.

Results and Discussion

In the present analysis of socio-economic conditions, there are differences in the various livelihood capitals, particularly natural and social capital was high in comparison with the human and financial capital. The assets include property, the kind of house, household goods, facilities offered, and land sizes are all examples of wealth. The percentage technique was used for analysis.

The "socioeconomic condition" refers to the factors that might influence an individual's or family's social standing. It is a relationship between an individual's and a family's income, education, wealth, location of residence, and work position. This research includes both sources of income and monthly family income.

Income and socioeconomic condition

One of the socioeconomic elements which is considered 'income' is farm output round the year in their farm unit pre and post farming rubber trees in their farmland. The amount and quality of rubber latex/sheet produced determines the money received from rubber trees. Figure 4, 5 & 6 shows the results of a percentage analysis of income from rubber plantation and other sources of income.

About 31.8 % of families earn 'less than 10,000' Indian Rupee (INR) per month, 46.25% and 12.50% earn between 20000-30000 by 13.13% earn 'between

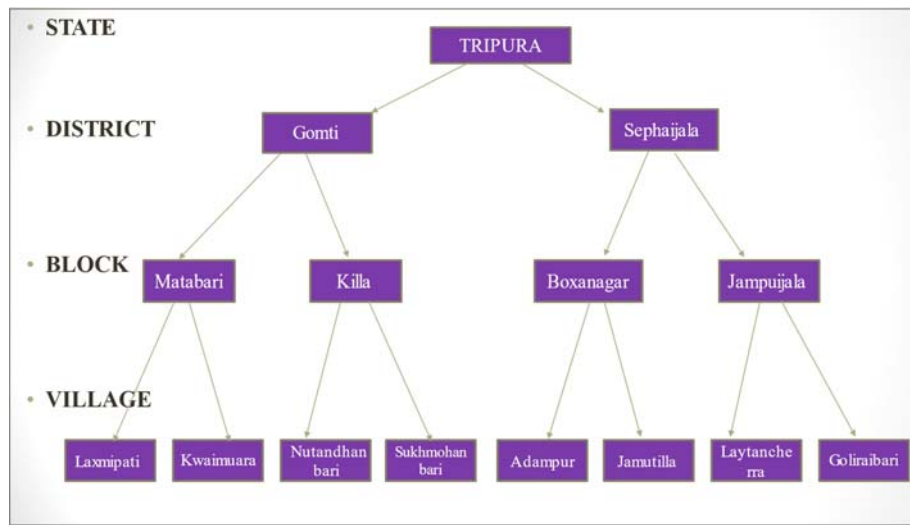


Fig. 3. Sampling design for the selection of study sites

20,000-30,000 INR per month and 8.75 % earn more than 30,000 INR per month (Fig. 4). The reality of small holders draws the result (Fig. 5) that 83% (133 out of 160) of households have additional sources of income from agricultural, dairy farming and MGNREGA whereas, with 17% of households do not have secondary sources of income.

While majority of rubber farmers have secondary source of income, it could be assessed (Fig. 6) that about 90.23 % earn from MGNREGA scheme, 9.77% of respondents are rubber tappers, 7.52% earn from NTFP collection, 4.51 % farmers earn from agricultural activities, 4.51% earn from dairy farming, 6% do local level business, 3.76% are shop owners, 3.76 % are government employees, 1.5 % earn from house help. It has been noticed that a large number of individuals use MGNREGA as a supplementary source of income because it gives a guarantee of 100 days of labor under a central government plan. According to Bhowmik *et al.* (2018), tribal households owing to their limited access to land ownership are more dependent on the state initiatives and MGNREGA.

In reference to rubber cultivation, 55 % were those households in which income from rubber contributes 75-100% to their monthly income, 26.25% were having 50-75% rubber-based income contribution to their total monthly income, while 10.63% of households were having 25-50% rubber income contribution to their total monthly income, and 8.13% of households were those, whose income from rubber contributes 0-25% of their total monthly income. A

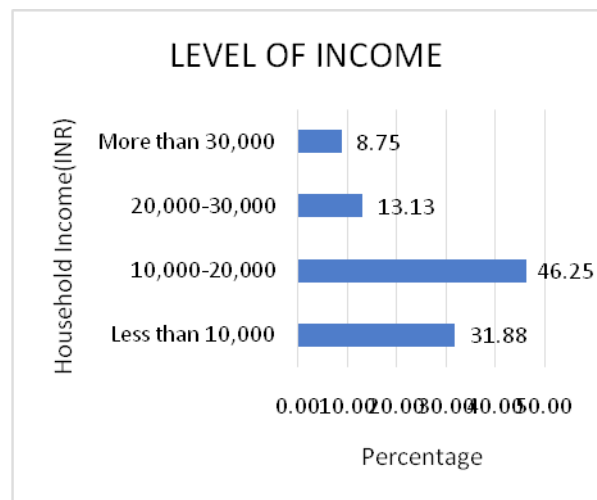


Fig. 4. Level of income (%)

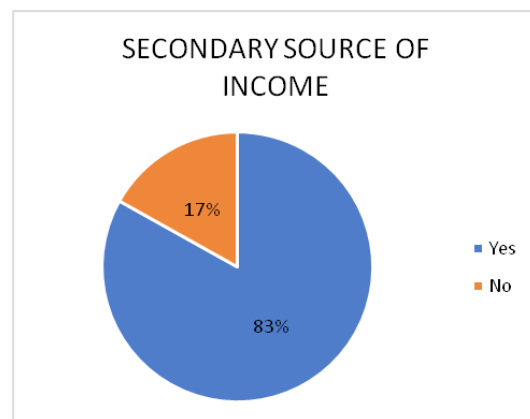


Fig. 5. Status of secondary source of income(%)

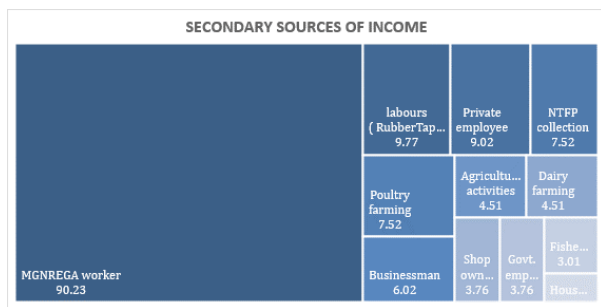


Fig. 6. Different types of secondary sources of income

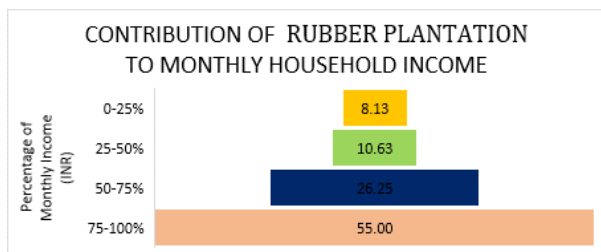


Fig. 7. Contribution of monthly household income from rubber plantation

significant majority (55%) of farmers rely on rubber plantation for a major part of their monthly income. As most farmers have limited land holdings, the majority of respondents get a range of income of 10,000-20,000 INR per month from rubber plantation. The ratio of rubber tree plantations of small holders is lower than that of farmers with large land holdings. Typically, 250 trees are planted on one acre of land, generating around 15,000 INR per month; if the number of trees are more, they can earn higher income, that is necessitating the cultivation of rubber in more areas. According to Kromkratoke and Suwanmaneepong (2017) the production of rubber is dependent on the total cultivation area and the number of rubber tapping trees.

Human Capital

Education is one of the most important variables that have a direct impact on people’s socioeconomic status as human capital. In terms of literacy rate, Tripura placed third after Kerala and Mizoram in 2011, with 87.22 % literacy. The literacy rate in the district of Gomti is 84.35 %, with a total of 3,25,854 literates, of which 1,76,776 were male and 1,49,078 were female, whereas the literacy rate in the district of Sepahijala is 84.78 %, with a total of 3,69,344 literates, of which 1,94,993 were male and 1,64,351 were female (Census, 2011). Figure 8. illustrates how the

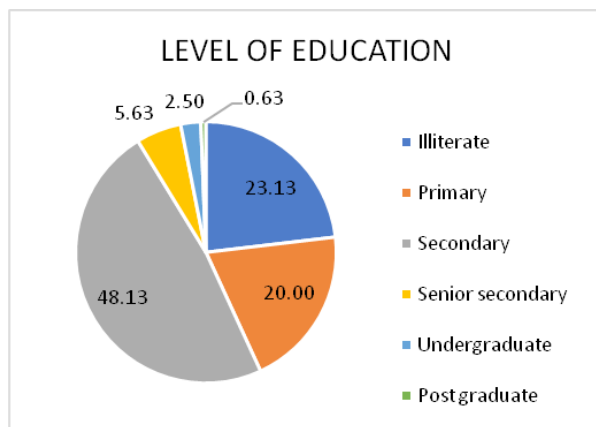


Fig. 8. level of Education

respondents were classified depending on their greatest degree of education using percentage analysis.

Nearly half of the respondents (48.13%) had secondary education. Only 2.5% of respondents had an undergraduate degree, and around 23.13% of respondents were illiterate. Education needs to be considered as a constraint for better access to information and awareness in nontraditional rubber growing areas. From Fig. 9, it could be assessed that about 30.63 % of respondents received rubber cultivation/tapping instructions from various organizations, whereas 69.38 percent did not receive any training. The respondents had received training from organizations like Rubber board and TFDPC in the past, which has provided them with significant knowledge and skills. Such training usually lasts from 1 to 90 days and local participants attend it for a better understanding of growing, tapping and storage practices in rubber plantation clusters.

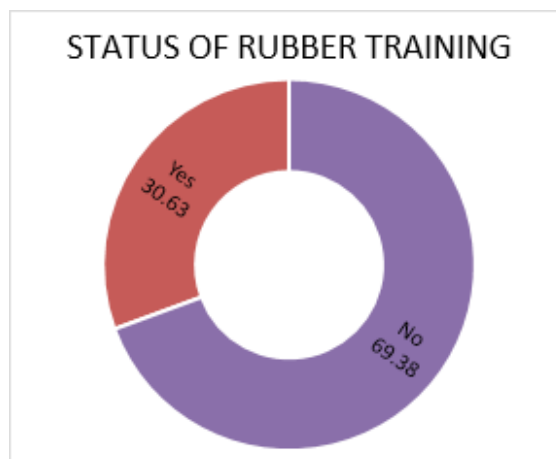


Fig. 9. Status of Rubber training

Living condition and Socio-economic condition.

Living condition pertains to the circumstances and resources available to a person to live and that can directly affect their socio-economic condition. The following figures analyze living circumstances such as ownership of a house, kind of dwelling, household possession, prevalent facilities, possession of land, and type of land in this study.

Around 47.5% of the respondents live in a 'kutcha house', 33.75% of the respondents live in the 'pucca' house and 18.75% of the respondents live in a 'semi-pucca' house (Fig. 10). In reference to household possession, about 80% of the respondents possess TV, 1.88% respondents possess telephone, 33.75% of the respondents possess two-wheeler, 98.75% of the respondents possess mobile phone, 94.38% of the respondents possess gas stove and about 7.5% of the respondent possess radio (Fig. 11). Because farmers are out on the rubber plantation fields for long periods of time and require mobile phones to communicate with family members and

other workers, majority of respondents own mobile phones, and have gas stoves in their houses, either self-financed or provided through the Central government scheme 'The Pradhan Mantri Ujjwala Yojana.' The number of respondents that had two-wheelers were mainly used for the collection of rubber latex from plantation sites to collection centers or to their house. Study shows that households that were involved in the rubber plantation had financial capabilities to buy expensive household possessions (Nath *et al.*, 2013).

Most of the respondents (89.38%) have possession on land which could be assessed from the fig. 12, out of them 88.13% respondents have 'less than 5 acres' land (Fig. 13), 9.38 % of the respondents have '5 to 10 acre' land and 0.63% of respondents have 10 to 15 acres of land. Almost 96 % of respondents (Fig. 13) have less than 5-acre land in rubber plantation, 3 % of respondents have 5 to 10 acre land in rubber plantation and 1 % of respondents have 10

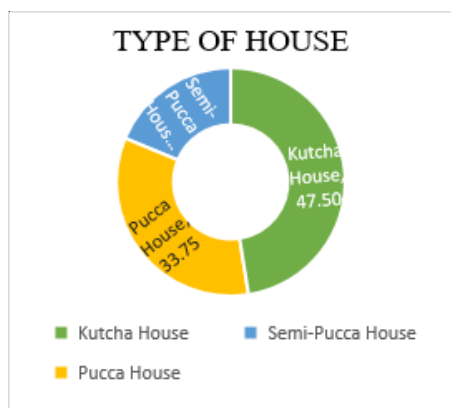


Fig. 10. Different type of houses of rubber farmers

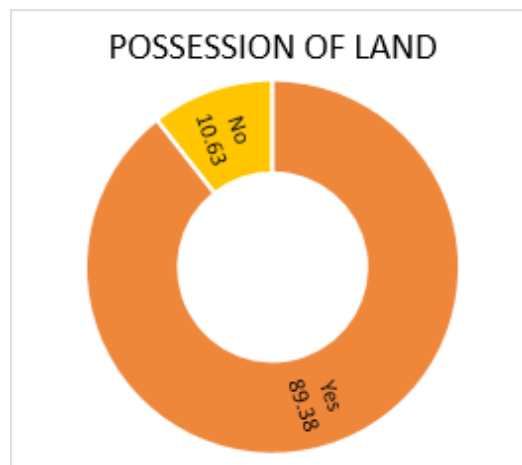


Fig. 12. Status of possession of land

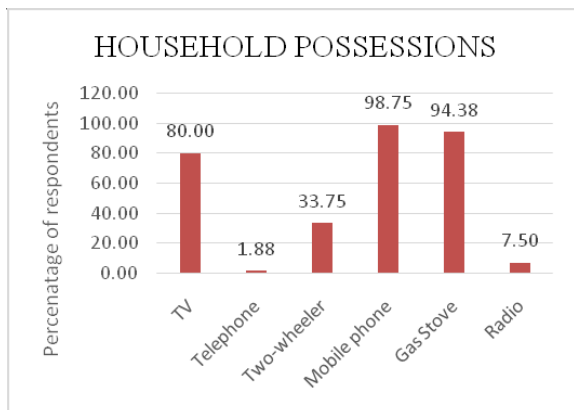


Fig. 11. Indicators of wellbeing among the rubber farmers

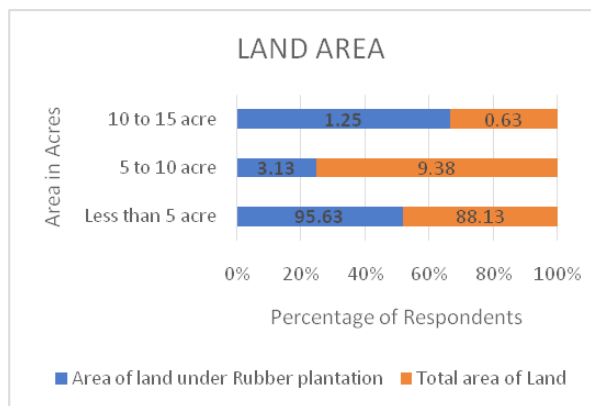


Fig. 13. Distribution of extents of different lands

to 15 acre land for rubber plantation. According to Fox *et al.* 2013; Penot *et al.* 2019 the top rubber producing countries, natural rubber is largely produced on small holdings constituting around 88% in India. According to Kromkratoke and Suwanmaneepong (2017) the production of rubber is dependent on the total cultivation area and the number of rubber tapping trees. The majority of respondents owned property totaling less than 5 acres and utilized it mostly for rubber production and agriculture. It is also stated by Khosla and Bhattacharya (2020), in their study that most of the land owned by the villagers is used for rubber plantation.

With reference to Fig. 14, about 60% of respondents have 'Khas' type of land (government land but has been occupied by the indigenous community for a long time), 15 % of respondents have 'patta' land (legal right provide by the government to the owner of the land), 11.25% of respondents have 'jyot' land (agricultural), 3.13% of respondents have land on 'rent/lease'.

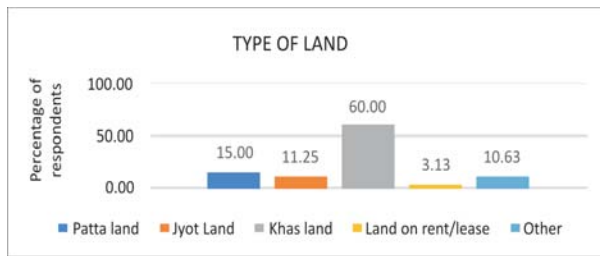


Fig. 14. Different type of land among the rubber farmers

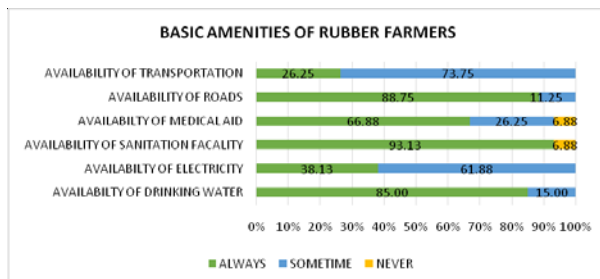


Fig. 15. Status of basic amenities of rubber farmers

With reference to Fig. 15, about 85% of respondents believe that drinking water is 'always' accessible, about 61.8% of respondents have the opinion that electricity not available always, 93.13% of the respondent's opinion that sanitation facility is 'always' available, 66.88% of the respondents have the opinion that medical aid is 'always' available, 88.75% of the respondent's opinion that access to

roads are 'always' available, while 73.75 % of respondents have the opinion that availability transportation is 'sometimes'. As these regions begin to grow, essential facilities like drinking water, power, road access, and sanitization are upgraded and made available to all village inhabitants.

Conclusion and Recommendations

There is no doubt, rubber plantation initiatives have provided a significant boost for the small farmers in the past decade. There are several factors that are responsible for good returns from rubber plantation in reference to two tribal dominated districts Sipahijala and Gomti. The forest cover of Tripura state has shown positive change due to past two decades of new rubber plantations, which has also grown to dominate the rural economy of both the districts. As the majority of farmers are smallholders, not having very good knowledge on market conditions, NGOs, Forest Development Corporation, Rural Development Department and Tribal Welfare Department should assist local farmers and give them training for improved cultivation/tapping, storage practices and supply change management. Limited education of rubber farmers is recognized as a restriction for the rubber growers. Some prospects of growing horticulture (pineapple), agroforestry, and medicinal plants crop in rubber plantation fields may provide better earning support. Further study can be done on the long-term evaluation of economic assessment and sustainability of smallholder rubber farmers.

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Declaration of interest statement

I hereby declare that the disclosed information is correct and that no other situation of real, potential or apparent conflict of interest is known to me.

Ethics approval

Ethics approval was not sought as all participants provided oral informed consent prior to enrollment in the study and participation was voluntary. In addition, the respondent's anonymity and confidentiality were kept.

References

- Andriessse, E. and Tanwattana, P. 2018. Coping with the end of the commodities boom: rubber smallholders in Southern Thailand oscillating between near-poverty and middleclass status. *Journal of Development Society* 34(1):77–102. <https://doi.org/10.1177/0169796X17752420>
- Bhowmik, I., Bose, P., Goswami, S. and Chouhan, P. 2018. MGNREGA and Inclusive Development: A Case Study in Tripura, Northeast India, "India Studies in Business and Economics, In: Bhattarai M., Viswanathan PK., Rudra N., Mishra & Bantilan C. (ed.). *Employment Guarantee Programme and Dynamics of Rural Transformation in India*. Springer, chapter 0, pages 225-242.
- Bhowmik, I. and Viswanathan, P. K. 2015. *Emerging labour relations in the small rubber plantations of Tripura*. NRPPD Discussion Paper 47. Trivandrum: Centre for Development Studies. 33p.
- Bhowmik, I. and Viswanathan, PK. 2018. North East India's Tryst with Rubber-A Saga of Missing Innovation.
- Bhowmik, I. and Chouhan, P. 2013. An Inquiry into the Employment Status, Income and Assets of Rubber Tappers working in the large estates of Tripura. *Labour and Development*. 20(2): 104-129..
- Census of India. 2011. Office of the Registrar General & Census Commissioner. New Delhi. Available at <http://censusindia.gov.in/> last assessed on 21/06/2021, 3.30 pm.
- Chaudhury, S. K. and Sarkar, S. 2021. Health conditions of women rubber tappers in Tripura: A case study. *Economic, Environment & Conservation*. pp. 31-34.
- Chouhan, P. and Bhowmik, I. 2017. Labour market conditions of natural rubber plantations in Tripura: an Inquiry. *Social Change and Development*, 14, 55-69.
- Chouhan, P., Kuki, V. and Bhowmik, I. 2019. A study on the emerging labour relations in the rubber plantations of Tripura. *Indian Journal of Economic Development*. 7(4): 1-14.
- Department of Industries & Commerce, Govt of Tripura. 2023. (<https://industries.tripura.gov.in/>) Last accessed on 15/02/2023.
- Economic review of Tripura. 2019. Agartala: Directorate of Economics & Statistics Planning (Statistics) Department, Government of Tripura. https://ecostat.tripura.gov.in/Eco_Review_2018-19.pdf.
- Economic review of Tripura 2021. Agartala: Directorate of Economics and Statistics Planning (Statistics) Department, Government of Tripura. https://ecostat.tripura.gov.in/sites/default/files/FINAL%20ECONOMIC%20REVIEW_0.pdf.
- Fox, J. and Castella, J.C. 2013. Expansion of rubber (*Hevea brasiliensis*) in Mainland Southeast Asia: what are the prospects for smallholders? *Journal of Peasant Studies*. 40(1): 155–170. <https://doi.org/10.1080/03066150.2012.750605>
- Goh, H.H., Tan, K.L., Khor, C.Y. and Ng, S.L. 2016. Volatility and market risk of rubber price in Malaysia: pre-and post-global financial crisis. *Journal of Quant Economics* 14(2): 323–344. <https://doi.org/10.1007/s40953-016-0037-4>
- India State of Forest Report. 2021. *Forest Survey of India. Ministry of Environment Forest and Climate Change*. pp:59.
- Khosla, A. and Bhattacharya, P. 2020. Review of Various Initiatives for Tribal Development in Tripura within the purview of Forest Rights Act, 2006. *International Journal of Research in Social Science*. 10(08).
- Kromkratoke, W. and Suwanmaneepong, S. 2017. Socio-economic Characteristics of Rubber Farmer in Drought Area in Sa Kaeo Province, Thailand. *International Journal of Agriculture. Technology*. 13(7.2): 1947-1957.
- Mohanakumar, S. 2016. Political Economy of Natural Rubber Cultivation in Tripura. *Social Scientist*, 44(11/12): 59-76.
- Nath, T. K., Inoue, M. and De Zoysa, M. 2013. Small-scale rubber planting for enhancement of people's livelihoods: A comparative study in three South Asian Countries. *Society & Natural Resources*. 26(9): 1066-1081.
- Penot, E., Ilangang, S. N. V., Asgnari, A. and Dinas, P. 2019. Rubber Agroforestry systems in Kalimantan, Indonesia. Which changes from 1994 to 2019? Report of the mission undertaken in October 2019 with support from the Forests, Trees and Agroforestry research program (FTA) of the CGIAR. Montpellier: CIRAD. <https://agritrop.cirad.fr/597296/>
- Tripura State Portal. 2022. Official portal of government of Tripura. (<https://tripura.gov.in>). Last accessed on 11/12/2022.
- Viswanathan, P. and Bhowmik, I. 2021. Compatibility of institutional architecture for rubber plantation development in North East India from a comparative perspective of Kerala. Kerala: Centre for Development Studies.
- Vongkhamheng, C., Zhou, J., Beckline, M. and Phimmachanh, S. 2016. Socio-economic and ecological impact analysis of rubber cultivation in Southeast Asia. *Open Access Library Journal*. 3(1): 1-11.
- Ziegler, AD., Fox, JM. and Xu, J. 2009. The rubber juggernaut. *Science*. 324(5930): 1024-1025.