Socio Economic Profile of Natural Rubber Farmers in Kottayam District Kerala

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Abstract

Rubber is a coherent elastic solid obtained from latex of a number of tropical trees of which Heveabrasiliensis is the familiar. Rubber is widely used for a variety of purposes, from erasing pencil marks to the manufacturing of tyres and tubes and a large variety of industrial products. The main objective of the study is to examine the socio-economic determinants affecting the income of rubber farmers in Kottayam District, identifying the problems faced by them in rubber production, and exploring ways to improve their livelihoods. The study used empirical analysis and regression model. The study found that unlike other vegetable crops, the farmers could nonot diversifyrom rubber plantation, It is not easy for the farmers on it has very long term crop. Though the maintenance of rubber production to get their minimum income. It is because of the decline demand for natural rubber but the low priced synthetic rubber replaced the natural rubber.

Keywords: Rubber Plantation, Farmers

Introduction

Rubber is a coherent elastic solid obtained from latex of a number of tropical trees of which Heveabrasiliensis is the familiar. The demand for natural rubber in the world was limited in the beginning of last century. The development of the automobile industry made rubber an important raw material of business and commerce. Now rubber is widely used for a variety of purposes, from erasing pencil marks to the manufacturing of tyres and tubes and a large variety of industrial products.

Rubber tree has almost all the attributes of a forest species and it is ecologically beneficial too. This purifies atmosphere through carbon sequestration and improves soil properties through addition of organic matter, keeps the soil cool, enriches fertility, porosity and water intake capacity. The tree has an economic life span of 25-30 years but they may live up to100 years or even more than that. The gestation period of the crop is six years. It will start yielding from the seventh year onwards and the yield gets stabilized four years later.

Review of literature

Leila Husain (2012) while viewing the influencing factors of farm household economic behaviour in an effort to their families. Food security in association with some rubber production activities. The study found that there are some sources of family income, the rubber farm is the main source. Mostly their family income

are higher than their family expenditure. By Allocating all family labours and other resources. The farm house holds can fulfil their primary needs. Especially food security .The economic behaviour of rubber farm households in labor supply, supply, production and consumption are interact each other. In other words one decision will influence another decision.

Dissanayake et al (2016) evaluated farmer awareness on rubber cultivation and production technologies. Through a primary survey. The study identified similar groups from sites in the major rubber growing areas and found that the groups were awareness of immature phase, tapping and processing activities.

Binitha and John Mano Raj (2018) Examined the socio-economic condition of rubber plantation farmers. The study found that socio economic condition of estate labourers remained very substandard with low wages, insanitary employed and living conditions.

Lince Rachel Varghese and Vinitha (2018) aimed at providing an analysis related to yield and economy of the rubber growing farmers of each district of Kerala. The most critical factors that are analysed and found are soil, fertility, meteorological factors. The results of the study showing that in future a rubber knowledge data base can be created or used to predict the crop yield and by considering different economic attributes as constraints. This can be integrated under GIS with climatic and nutrient parameters to derive useful predictive information for the rubber growing farmers.

Lokesh and Mahin (2021) Studies have also highlighted that educational levels among rubber farmers are moderate, with many farmers lacking formal training in advanced rubber cultivation techniques.

Ali and Manoj (2024) analysed Problems of Rubber Cultivators in Kerala: Some Evidence from Ernakulam District. The study reveals that falling price of rubber has affected the life and livelihood of several farmers. The study emphasis the need for reviewing the policy of the government towards rubber sector on an urgent basis.

Objectives of the Study

➢ To study the socio-economic conditions of the rubber producing farmers in the study area.

➢ To probe the process of rubber production in the study area.

➢ To analyse determinants of rubber income of the respondents.

➢ To find out problems of natural rubber farmers in the study area.

➢ To provide rubber polices and suggestion to increase natural rubber production.

Hypotheses

1. The income of rubber in determined by area under rubber cultivation, the total rubber productions, total rubber sheets and total milk produced.

2. The total production of rubber is determined by the total area owned applications of fertilizer, number of trees and expenditure of farming

Methodology

The present study is based on primary data. The primary data required for the study have been collected from the selected respondents of Chirakkadavu village, Kanjirapally Taluk, Kottayam district, Kerala which was the highest natural rubber producing village in the district. About 120 households were selected from this village and the farmers were classified in to 3 categories by the farm size. Marginal farmers, small farmers and medium farmers. This study based empirical analysis and the researcher made the analysis with tool. A part from simple tabular statements like averages and percentages, Multiple Linear Regression model was used to test the hypothesis. Further this chapter outlines the collection of primary data and detailed methodology of the adopted in this study.
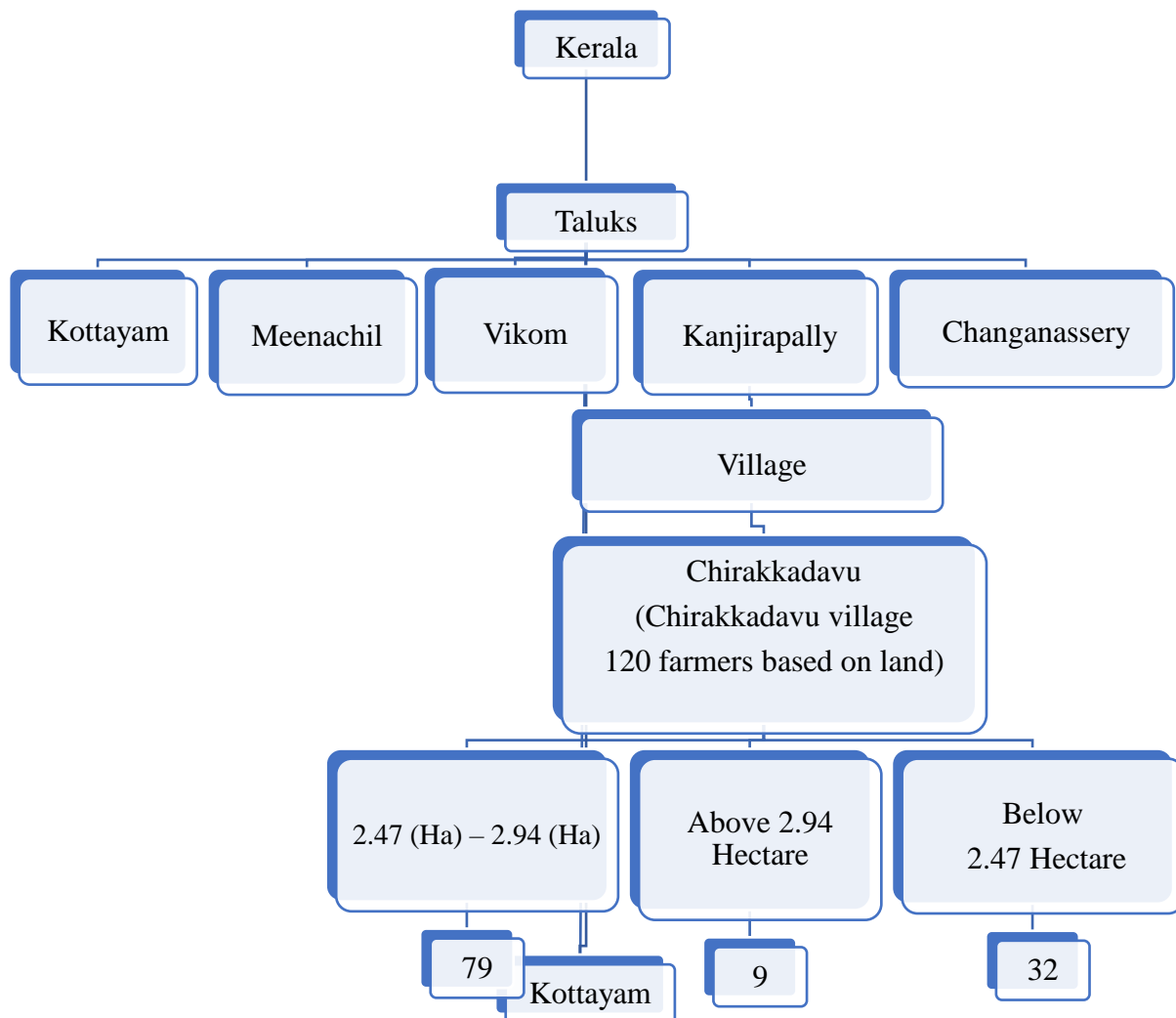
Result and Discussion

Here presents the socio, demographic, economic characteristics the Natural Rubber Farmers in Kottayam district of Kerala

Table 1: Socio demographic factors

S.NO	Factors	No. of Respondents	Percentage
1	Age of the Respondents		
	Young (Less than 35)	2	1.67
	Middle (35 to 60)	112	93.33
	Old (Above 60)	6	5.00
	Total	120	100
	Gender of the respondents		
2	Male	120	100
	Female	0	0.00
	Total	120	100
	Family type of the respondents		
3	Joint	36	30.00
	Nuclear	84	70.00
	Total	120	100
	Community wise of the respondents		
4	FC	114	95.00
	OBC	6	5.00
	Total	120	100
5	Educational Qualification of the Respondents		
	Primary	3	2.50

	Secondary	8	6.67
	Graduate	70	58.33
	Technical	26	21.67
	Others	13	10.83
	Total	120	100
5	Religion of the respondent		
	Hindu	27	22.50
	Muslim	2	1.67
	Christian	91	75.83
	Total	120	100

Source: computed

Note: figures in parentheses are percentages to the total

Table 1 represents the socio economic factors of the respondents. Age wise classification of the respondents is the level of age has been divided in to young (<35) middle (35-60) and old (>60). In total 93 per cent of the respondents belonged to middle age group, which was followed by old age group (3.81%) and the share of young age group (2.54%) among the farm size was somewhat higher (99.37%) in small farm size than marginal and medium farm size. Sex wise classification of the respondents is total the respondents were male. Religion wise classification of the respondents is explained that majority of the respondents were belonged to Christian (75.83%) which was followed by Hindu (22.50%) and Muslim (1.67%). Among the farm size also the same picture could be seen. However, a few Muslims were also found in marginal and small farmers. Community wise classification in total 95 per cent of the respondents belonged to forward cast category, which was followed by OBC (5%). In farm wise analysis forward cast was found high among and no OBC was found among small and medium farmers. The level of education has been categorized in to, primary, secondary graduate technical and others. In total, 58.33 per cent of the respondents were graduates, 21.67 per cent of the respondents were studied up to technical and other education level was 10.83 per cent. In case of level of farm sizes graduate dominated other levels of education and its share was somewhat high in the category of medium farm size.

Table 2 Distribution of Asset Value of the Respondents

Sl.no	Value(in Rs)	Farm size			Total
		Marginal	Small	Medium	
1	Below 2000000	80 (97.56)	88 (55.70)	0 (00.0)	168 (53.33)
2	2000000- 4000000	2 (2.44)	69 (43.67)	68 (90.67)	139 (44.13)
3	4000000-6000000	0 (0.00)	1 (0.63)	6 (8.00)	7 (2.22)
4	Above 6000000	0 (0.00)	0 (0.00)	1 (1.33)	1 (0.32)
Total		82.00 (100.00)	158 (100.00)	75.00 (100.00)	315.00 (100.00)

Source: computed

Note: figures in parentheses are percentages to the total

The distribution of asset value among the surveyed farm size sectors marginal, small and medium is given in table 2. The value of assets of the respondents has been grouped in to 4 categories i.e.; below 2000000 Rs 2000000 to 4000000, Rs 4000000 to 6000000, and above 6000000. In total more than 71.67 per cent of the respondent's asset value lied in below Rs 50000000 were followed by 50000000 to 100000000 (26.67%) only 0.83 per cent of the respondents were included in 100000000 to 150000000 and above 150000000 categories. Among the farm sizes, most of the farmers of all categories had their assets worth between Rs 50000000.

Table 3 Annual Income of the Respondents

Sl.no	Values in Rs	Farm Size			Total
		Marginal	Small	Medium	
1	Below 100000	28 (87.50)	7 (77.78)	55 (69.62)	90 (75.00)
2	100000 to 200000	2 (6.25)	0 (0.00)	8 (10.13)	10 (8.33)
3	200000 to 300000	0 (0.00)	1 (11.11)	4 (5.06)	5 (4.17)

4	300000 to 400000	0 (0.00)	0 (0.00)	5 (6.33)	5 (4.17)
5	400000 to 500000	1 (3.13)	0 (0.00)	1 (1.27)	2 (1.67)
6	Above 500000	1 (3.13)	1 (11.11)	6 (7.59)	8 (6.67)
	Total	32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)

Source: computed

Note: figures in parentheses are percentages to the total

Distribution of income of the respondents is given in table 3. The distribution has been classified in to six categories viz; below 100000 to above 500000.with an equal interval of Rs 100000. It is seen from the table 75 per cent of the respondents were earned below Rs100000. which was followed by Rs 100000 to 200000 (8.33%). In farm wise analysis also a vast majority of the farmer's income was below one lakh per annum. However a minimum portion of the respondents also earned above Rs 500000

Table 4 Total Land Area Classification of the Respondents

Sl.No	Total Area of Land Holding	Farm size			Total
		Marginal	Small	Medium	
1	Below 2.5acre	43 (52.44)	23 (14.56)	14 (18.67)	80 (25.40)
2	2.5-3 acre	21 (25.61)	45 (28.48)	8 (10.67)	74 (23.49)
3	3-3.5 acre	4 (4.88)	53 (33.54)	7 (9.33)	64 (20.32)
4	Above 3.5 acres	14 (17.07)	37 (23.42)	46 (61.33)	97 (30.79)
	Total	32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)

Source: computed

Note: figures in parentheses are percentages to the total

The total area of land holding of the respondents shows on table 4. The total area of land holding of the respondents was categorized in to 7. Below 2 acres, 2 to2.5 acres, 2.5 to 3 acres, 3to 3.5 acres, 3.5 to 4 acres, 4

to 4.5 acres, 4.5 to 5 acres, and above 5 acres. In total 25 per cent of the respondents hold less than 2 acres of land. This was followed by 2.5 to 3 acres (23.33%) and above 5 acre (15.83%). In farm wise analysis 93.75 per cent of the marginal farmers had below 2 acres land, which was minimum when compared to other farmers.

Table 5 Area under Rubber Cultivation of the Respondents

Sl.no	Area under cultivation	Farm Size			Total
		Marginal	**Small**	**Medium**	
1	Below 1acre	1 (3.13)	0 (0.00)	0 (0.00)	1 (0.83)
2	1-2 acre	28 (87.50)	1 (11.11)	1 (1.27)	30 (25.00)
3	2-3 acre	3 (9.38)	8 (88.89)	24 (30.38)	35 (29.17)
4	3-4 acre	0 (0.00)	0 (0.00)	20 (25.32)	20 (16.67)
5	4-5 acre	0 (0.00)	0 (0.00)	21 (26.58)	21 (17.50)
6	Above 5 acre	0 (0.00)	0 (0.00)	13 (16.46)	13 (10.83)
	Total	32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)

Source: computed
Note: figures in parentheses are percentages to the total

   Table 5 explains the area under rubber cultivation by the respondents. It clearly seen from the table that more than 29.17 per cent of the respondents were cultivating rubber under 2 to 3 acres. Which was followed by 1 to 2 acres (25%) and 17.50per cent of the respondents were farming rubber in 4 to 5 acres. Only 10.83 per cent of the respondents were cultivated rubber farming under above 5 acres. Among the farm, based on their holdings they extended their rubber cultivation.

Table 6 Labour Utilization for the Rubber cultivation

Sl.No	Particular	Farm size			Total
		Marginal	**Small**	**Medium**	
1	Irrigation owns	15 (46.88)	3 (33.33)	5 (6.33)	23 (19.17)
2	Hired	7 (21.88)	4 (44.44)	74 (93.67)	85 (70.83)
3	Weeding own	10 (31.25)	1 (11.11)	0 (0.00)	11 (9.17)
4	Hired	32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)
5	Fertilizer owns	22 (68.75)	3 (33.33)	6 (7.59)	31 (25.83)
6	Hired	5 (15.63)	6 (66.67)	70 (88.61)	81 (67.50)
7	Pesticides	32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)
8	Tapping own	25 (78.13)	5 (55.56)	5 (6.33)	35 (29.17)
9	Hired	7 (21.88)	4 (44.44)	74 (93.67)	85 (70.83)
10	Collection of latex own	30 (93.75)	6 (66.67)	15 (18.99)	51 (42.50)
11	Hired	3 (9.38)	4 (44.44)	66 (83.54)	73 (60.83)
12	Rolling machine own	8 (25.00)	1 (11.11)	3 (3.80)	12 (10.00)
13	Hired	1 (3.13)	1 (11.11)	8 (10.13)	10 (8.33)

14	Sheet making own	8 (25.00)	1 (11.11)	4 (5.06)	13 (10.83)
15	Hired	1 (3.13)	1 (11.11)	7 (8.86)	9 (7.50)
16	Heating smoke own	9 (28.13)	2 (22.22)	10 (12.66)	21 (17.50)
17	Hired	0 (0.00)	0 (0.00)	2 (2.53)	2 (1.67)
	Total	32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)

Source: computed

Note: figures in parentheses are percentages to the total

Table 6 depicts the utilization of labours to cultivate rubber in their farms. Labourers may be of Hired labours and Owned labours. The process of rubber making involved labour distributions of the respondents grouped in to nine categories. Viz; irrigation, weeding, fertilizer, pesticides, tapping, collection of latex, rolling machine, sheet making, heating and smoke. Most of the respondents using hired labourers for rubber cultivation. Hired labours were mostly used in to weeding (100%) irrigation (70.83%), tapping (70.83%), fertilizer (67.50%) and collection of latex (60.83%). Owned labours were more engaged in heating (17.50%), rolling machine (10%), and sheet making (10.83%).

Table 7 Establishment cost of Rubber among the Famers

Sl no	Values in Rs	Farm Size			Total
		Marginal	**Small**	**Medium**	
1	Below100000	7 (21.88)	1 (11.11)	0 (0.00)	8 (6.67)
2	100000-150000	23 (71.88)	0 (0.00)	1 (1.27)	24 (20.00)
3	150000-200000	1 (3.13)	8 (88.89)	5 (6.33)	14 (11.67)
4	200000-250000	1 (3.13)	0 (0.00)	20 (25.32)	21 (17.50)
5		0	0	16	16

	250000-300000	(0.00)	(0.00)	(20.25)	(13.33)
6	300000-350000	0 (0.00)	0 (0.00)	12 (15.19)	12 (10.00)
7	350000-400000	0 (0.00)	0 (0.00)	11 (13.92)	11 (9.17)
8	Above 400000	0 (0.00)	0 (0.00)	14 (17.72)	14 (11.67)
	Total	32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)

Source: computed

Note: figures in parentheses are percentages to the total

Table 7 represents the establishment cost of the rubber plantation by the respondents. The establishment cost has been classified in to 8 categories viz; Rs Below100000,Rs100000to 150000,Rs150000-200000,Rs200000 to 250000,Rs 250000 to 300000 Rs 300000 to 350000, Rs 350000 to 400000 and Rs Above 400000. In total, 20 percent of the respondents were spent in between Rs100000 and 150000, which was followed by Rs 200000 to 250000(17.50%) and Rs 250000 to 300000 (13.33%). In farm size analysis establishment cost of rubber was high for the medium farmers when compared to small and marginal farmers.

Table 8 Production of Natural Rubber of the Respondents

Sl.no	Values(litters)	Farm Size			Total
		Marginal	Small	Medium	
1	Below 20	19 (59.38)	1 (11.11)	1 (1.27)	21 (17.50)
2	20-40	12 (37.50)	8 (88.89)	5 (6.33)	25 (20.83)
3	40-60	1 (3.13)	0 (0.00)	29 (36.71)	30 (25.00)
4	60-80	0 (0.00)	0 (0.00)	23 (29.11)	23 (19.17)
5	80-100	0 (0.00)	0 (0.00)	8 (10.13)	8 (6.67)
6	Above 100	0 (0.00)	0 (0.00)	13 (16.46)	13 (10.83)
	Total	32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)

Source: computed

Note: figures in parentheses are percentages to the total

Table 8 shows the production of natural rubber of the respondents. The production show as in litters. It has been categorized in to six. That is below 20, 20 to 40, 40 to 60, 60 to 80, 80 to 100, and above 100. In total 25 per cent of the respondents were get 40 to 60 litters of the natural rubber, which followed by 20 to 40 litter (20.83%), 60 to 80 litters (19.17%) and below 20 litters (17.50%). Only 10.83 per cent of the farmers have get above 100 litters of the natural rubber.

Table 9 Selling Point of the Natural Rubber of the Respondents

Sl.No	Selling point	Farm Size			Total
		Marginal	**Small**	**Medium**	
1	Private dealer	2 (6.25)	0 (0.00)	6 (7.59)	8 (6.67)
2	RPS/Board companies	30 (93.75)	9 (100.00)	72 (91.14)	111 (92.50)
3	Collection depot of private processor	0 (0.00)	0 (0.00)	1 (1.27)	1 (0.83)
	Total	32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)

Source: computed
Note: figures in parentheses are percentages to the total

In table 9 shows the selling point of the natural rubber of the respondents. It has been categorized in to 3 private dealer, RPS/ board companies and Collection depot of private processor. In total 92.50 per cent of the respondents were selling to the RPS/board companies. And remaining respondents are selling to the private dealer and collection depot od private processor.

Table 10 Income from Rubber Cultivation of the Respondents

Sl no	Values in Rs	Farm Size			Total
		Marginal	**Small**	**Medium**	
1	Below30000	9 (28.13)	1 (11.11)	1 (1.27)	11 (9.17)
2	30000-60000	16 (50.00)	0 (0.00)	2 (2.53)	18 (15.00)
3	60000-90000	6 (18.75)	8 (88.89)	8 (10.13)	22 (18.33)

4	90000-120000	1 (3.13)	0 (0.00)	27 (34.18)	28 (23.33)
5	120000-150000	0 (0.00)	0 (0.00)	17 (21.52)	17 (14.17)
6	150000-180000	0 (0.00)	0 (0.00)	4 (5.06)	4 (3.33)
7	180000-210000	0 (0.00)	0 (0.00)	8 (10.13)	8 (6.67)
8	Above 210000	0 (0.00)	0 (0.00)	12 (15.19)	12 (10.00)
	Total	32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)

Source: computed

Note: figures in parentheses are percentages to the total

Table 10 shows the income from the natural rubber by the respondents. It is clearly seen that the 23.33 per cent of the respondents were earned in between Rs 90000 to 120000, which was followed by Rs 60000 to 90000(18.33%) Rs 30000 to 60000(15%) and Rs120000to 150000(14.17%). Only 10 per cent of the farmers were earning in above Rs 210000. Farm size wise analysis showed that more than 88 per cent were small farmers earned in between Rs 60000 to 90000 and one half of the marginal farmers income was in between 30,000 and 60,000.

Table 11 Details of the Subsidy availed and Purpose by the Respondents

Sl. No	SUBSIDY	Farm size			Total
		Marginal	Small	Medium	
1	No	14 (43.75)	1 (11.11)	30 (37.97)	45 (37.50)
2	Subsidy available	18 (56.25)	8 (88.89)	49 (62.03)	75 (62.50)
3	Marketing	18 (56.25)	8 (88.89)	49 (62.03)	75 (62.50)

Total		32 (100.00)	9 (100.00)	79 (100.00)	120 (100.00)

Source: computed

Note: figures in parentheses are percentages to the total

Table 11 shows the details subsidy of availed and purpose by the respondents. In all 62.50 per cent of the respondents were availed subsidy and 37.50 per cent of the respondents were not availed subsidy. The nature of subsidy shows that more than 60 per cent of the respondents were getting subsidy for marketing.

Table 12 Determinants of Rubber Production – Multiple Linear Regression Model

Sl. No	Model	Standardized Coefficients Beta	t	Sig.
1	(Constant)		-.051	.959
2	Land under rubber	-.554	-2.799	.006
3	Total area of land owned in acres	.425	5.374	.000
4	Applying fertilizer	-.007	-.407	.685
5	no. of trees	1.126	5.778	.000
6	Years of Farming experience	-.033	-1.712	.090
	F	631.367		
	R	.982		
	R^2	.965		

To predict the determination of rubber production among the respondents the researcher applied a multiple linear regression model. The hypothesis read as the total production of rubber is determined by land under rubber cultivation, total area of land owned in acres, applying fertilizer, number of rubber trees and years of rubber farming experiences. The F value 631.37 was significant at 1 per cent level denotes that the constructed model was good enough to predict the result of multiple linear regression model as follows the R^2 was 0.965. stated that the all the significant variables together determined the total rubber production by 96 per cent. Among stated variables, land under rubber cultivate and experience had F negative significant value represented that there was a negative relationship between total land under cultivate and total rubber production. The total

area owned and number of trees alone positively associated and difference the total rubber production. Applicant of fertilizer had no effect on the total rubber production as it was not significant even at 10 per cent. Thus the hypothesis stated above was proved.

Table 13 Determinants of Rubber Income- Multiple Linear Regression Model

Sl.no	Variables	Standardized Coefficients	t	Sig.
		Beta		
1	(Constant)		-1.318	.190
2	PDN LTRS	.228	1.596	.113
3	Total sheets	-.024	-.694	.489
4	Land under rubber	.703	4.925	.000
	F	233.539		
	R	.926		
	R^2	.858		

To predict the determinants of rubber income the researcher applied a multiple linear regression model. Total rubber income was the predictant and under rubber were the predictors production litters, total sheets, and under rubber. The F value .233.54 was significant at 1 per cent level stated that the constant model was good. The R^2 value was 0.858 represents 85 per cent of the significant variable stated above area under rubber cultivation. Above was significant at 1 per cent level determined a income from the rubber cultivation. The other variable was not significant. Hence the hypothesis is partially validated.

CONCLUSION AND SUGGESTIONS

Natural rubber plays an important rate in Kerala economy earning a reasonable state domestic (SDP). Though the production and consumption of natural rubber has been on an increasing scenario, the price of natural rubber and the income of the natural rubber producing farmers have been decreasing. Unlike other vegetable crops, the farmers could not diversify from rubber plantation, it is not easy for the farmers on it has very long-term crop. Though the maintenance of rubber production to get their minimum income. It is because of the decline demand for natural rubber but the low priced synthetic rubber replaced the natural rubber. Hence, the Government of Kerala has to interference in the marketing and provides the minimum support price for the natural rubber producers. Which may improve the present economic condition of the farmers

SUGGESTIONS

1. Synthetic rubber is the cheapest alternative of natural rubber so the import of synthetic rubber has to be reduced.

2. Many of the farmers were not maintaining the rubber forms properly as it hectare less income but proper maintenance of rubber form many increase the production and increase the income too.

3. The implements used for pesticides sprayer was costly, even if they fit the cost was around Rs.5000 per day, So the sprayer machine has to be provided to the farmer at a subsidiated rate.

4. Though the rubber sheets fetch more income to the farmers most of the format selling it is the form of latex, due to the period (about 50 days). So a collective rubber sheet production maybe interviewer among the farmers to reduce the cost of production.

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