Problems and prospects of rubber plantation industries in Dakshina Kannada district: " A case study with reference to yield"

Dr. Sukhesh P.

Govt., First Grade College for women's Puttur

Puttur TQ, Dakshina Kannada District

Karnataka

India.

Abstract

This study reports is the findings from a survey of rubber planters' of Dakshina Kannada district of Karnataka. A questionnaire was administered to 50 each rubber planters' in different Taluks of Dakshina Kannada district in the study area. The analysis of the above variables shows that there is significant diffence in the yield between the regions 1,2,3 and 4. The same difference can also be found in the holdings of the same region. From the satisfactory point of view Sullia (Region 2) and Belthangady (Region 3) are good in all respects of rubber production; but from the economy point of view Bantwal region (Region 4) is good. But from the agro-climatic point of view Bantwal region is not preferred.

Keywords: HS, ANOVA, Tukey HSD.

Introduction

The rubber industry has grown to become one of the most important industries in the world, involving literally millions. By virtue of its essential role in all modern forms of transportation, it can be said that rubber 'drives the wheel of the world economy'. The farmers who toil in the fields to grow and tap rubber, the scientists who find better ways to grow and use rubber, and the suppliers, transporters, dealers, processors, manufacturers and others who help to transform the 'tears' of a tree into thousands of useful products. The beneficiaries of this product extend from the growers of Natural Rubber to the ultimate consumer and during the flow of the product, value is being added continually

Three major categories of rubber are in use today, namely- *natural rubber, synthetic rubber and reclaimed rubber*. Natural rubber is produced from the sap of rubber tree, which grows primarily in South East Asian countries. Synthetic rubber is artificial rubber, made from raw materials such as butadiene, styrene, isoprene, chloroprene, isobutylene, acrylonitrile, ethylene and propylene. Reclaimed rubber is made from the treatment of ground vulcanized scrap of rubber tyres, tubes and miscellaneous waste rubber articles, through the

application of heat and chemical agents. This is followed by intense mechanical working, which gives regenerated rubber almost original plasticity. Natural rubber accounts for about 42.2% of the overall global production of rubber in the world during 2011-12.

Objectives of the study;

The objectives of the study are:

1. To understand the importance, prospects of rubber industries in terms of yield in Dakshina Kannada.
2. To ascertain the problems of natural rubber plantation industry in Dakshina Kannada and to suggest the measures to overcome various problems

Significance of the study;

Rubber industry is a versatile industry and has its applicability in every facet of human life. Despite this, the industry is not free from problems and defects. These problems will have their significant adverse effects on the whole process of rubber plantation industry. In order to manage these kinds of complexities of problems and to assess the dynamic prospects of rubber, there are several works by different authors describing their views on the area. In the current globalised context, the prospects of the Indian rubber industry would depend on the trends in the global rubber industry and regional-specific factors.

Review of Literature:

The core of the present investigation is on the topic 'Problems and Prospects of Rubber Plantation Industries in Dakshina Kannada District: An integrated approach'. There are a number of books and articles, which have been written by various scholars, dealing with the history of rubber cultivation, requirement for rubber cultivation, small-scale rubber growers, and Rubber Producers' Societies. All these articles, books or related literatures are specially related to the Kerala, being the major rubber producing state. The reviews of related literature, research work done, and the recent developments on the subject, help the researcher to develop a conceptual framework of the present study. Different studies have been conducted by institutional agencies and individuals to review the various aspects of Rubber Plantation Industry at regional, state and national levels. As far as possible, the chronological order has been maintained in the review of literature to present it in an organized and systematic way.

Brown (1998) and Neilson (1998) detail many of the cost factors in plantation establishment, including capital costs, pre-planting, operational costs, project overheads and the varying costs of land. It is clear that the cost of establishing and managing industrial plantations depend on the cost of labour, the availability of land, the availability of infrastructure and specialized equipment, the physical and climatic conditions of the site, and the political and economic climate of the country. Establishment costs in developing countries are likely to be significantly lower than in developed countries, reflecting the lower cost of labour. Economies of scale also

have an impact on the cost of establishment and management; large unfragmented blocks are cheaper to establish and manage than smaller parcels of land.

Kulkarni (1999) analyzed the challenges and opportunities of Indian Rubber Industry in the wake of liberalization and globalization. He stressed the need for import of natural rubber when domestic supply falls short of demand. He suggested measures such as support of the government, technically qualified manpower, expanding internal market and access to raw materials for expansion of Rubber industry in India. In his study, he clearly draws the picture of present global rubber scenario together with Indian and South East Asian rubber scenarios. He is of opinion that Rubber Industry in India has maintained a prolific growth rate with the support of easy access to major raw materials, rapidly expanding internal market, adequate government support and technically qualified and experienced man power. He concluded that the rate of growth of production in natural rubber would remain subdued with no prospect of growth in non-traditional areas of rubber production in India. He also stressed that the import of NR will become inevitable if domestic supply falls short of the demand.

McFadyen (1944) in his report analyzed that to tide over the price crisis due to economic depression (1929-33), a majority of the rubber producing countries including India entered into IRRA in 1934. The IRRA envisaged that further expansion of rubber in participating countries can be controlled by assigning export quotas and strictly restricting replanting and new planting. But this restriction was nullified since 1942 as a result of the conquest of Malaya and other South East Asian colonies by Japan during the second World War (1939-45) and only India and Ceylon remained as the sources of natural rubber for British and allied countries.

Methodology:

Various tools such percentages, tables, bar diagrams, pie charts, graphs, etc. were used to analyze the review data. The cost data collected was also analyzed for mean, standard deviation, Standard Error, Analysis of Variance between groups and within groups, Post Hoc Test for multiple comparison and Tukey Post Hoc Test. The comparison of the cost of cultivation under each element is made region-wise and holding-wise. The comparison of cost is made on cost per ha/acre basis. The results of the observations, interviews, and the respondents' views were categorized and presented according to the topics in a systematic way. Findings from the analysis are used to arrive at recommendations, implications and conclusions. Which are given in the last chapter of the thesis.

Data collection is from both primary and secondary sources. A sample design is a definite plan for obtaining a sample from a given population. For collecting primary data, separate sample surveys were conducted among Growers, KFDC, RPS, Rubber Co-operative Societies and Dealers. The study is mainly focused on Dakshina Kannada District as it enjoys the status of non-traditional area for the production and marketing of NR in this part of India. In the Karnataka state itself, there is a regional concentration in NR plantation with 70% of the

area in D K District.. Fifty cultivators from each taluk, i.e. Puttur, Sullia, Belthangady and Bantwala were chosen under non-probability sampling method for field study. Thus a total of 200 growers were selected from four taluks in DK District for the sample survey. Five of the largest and oldest rubber estates in DK District i.e. Kadamakal estate, Thomson estate and Neriya estate, Ganesh Rubber Estate and Sampige Kolli Estate have been selected as a sample for collecting primary data required from estate holders.

In order to collect the required primary data from the rubber growers another field survey has been conducted. For the primary source of data, based on the holding area size, the holdings are classified as marginal holdings (0- 2 acres), small holdings (2 – 5 acres), medium holdings (5- 10 acres), and large holdings (above 10 acres). The entire population (growers) is divided into mutually exclusive and exhaustive strata and then a stratified random sample is selected within each strata or subgroups. For the study purpose, Puttur, Sullia, Belthangady and Bantwala taluks of D.K. District are classified as region R1, R2, R3 and R4 respectively. The sample size of 50 is taken from each region and among this, 20 are marginal, 15 are small, 10 are medium and 5 are large holdings (total-200).

Findings in terms of yield

The yield per tree will gradually increase by about 10% from the 7th year to 10th year every yer. From 10th year to 15th year the increase in yield will be 15% per year. From 15th to 20th year, yield is almost steady. From 20th year onwards the yield decreases by 4%. The yield per hectare may be bit less (about 20 per cent) during the initial period, the difference between d/2 and d/3 systems will be narrowed in course of time and there will be an ultimate saving in the cost under d/3 system and increase in net profit, as the latex got under d/3 system has comparatively more rubber content and it has also reduced the risk of tapping panel dryness. The study in the surveyed area has revealed that yield from the block where tapping is over by 7 O'clock is 15% more than the block where tapping is over by 11 O'clock

Bark consumption under different tapping system

Tapping frequency	No. of tapps/ year		Yield per tree/yr (Kg)	Bark consumption layer/tapping	Total bark consumption in a year
	With weekly off	Without weekly off			
d/2	156	182	5	1.5mm	22-23cm
d/3	104	121	5.4	1.75mm	17-18cm
d/4	78	91	5.9	2.00mm	14-16cm
d/6	52	60	6.50	2.5mm	12-14cm

From the above table 6.49, it is concluded that d/6 type of tapping is yielding more and it is also a solution for the tapper shortage. A tapper can cover six blocks in a week. For optimum yield, bark consumption per year as shown in table 6.9 has to be ensured under various frequencies. However, removal of bark shaving thicker than the recommended does not increase yield, but results only in wastage of bark. On the other hand lower consumption than recommended can cause reduction in yield. Similarly, too thin bark shaving under LET tend to reduce crop. One panel can be tapped for 7 years under d/3, 8 years under d/4 and the duration can be increased further 10 years under weekly tapping. LET combined with CUT, economic life can be increased to 40 to 50 years from the current 25 years, provided sufficient stand exists and considerable increase in timber quantity.

Thus instead of the current two hectare per tapper, one tapper can cover three, four, six or seven hectares per week depending on the nature of Low Frequency Tapping adopted. Adoption of LFT is the immediate solution for the current tapper shortage in the district. When tapping is done by the grower himself, weekly tapping with rain guard would be most appropriate as the effort will be minimal without compromise on production. The success of LFT depends on regularity in tapping under the opted frequency, stimulant application as per the schedule of the frequency and clone, leak proof rain guard (throughout the year), bark consumption stipulated for the given frequency, good quality tapping etc.

Exhibits Mean and Standard Deviation of Yield/acre of four Taluks

Report					
Yield					
Place	N	Mean	Std. Deviation	Minimum	Maximum
Puttur	50	3570.5000	120.61987	3410.00	3900.00
Sullia	50	3718.0800	124.77078	3570.00	4053.00
Belthangady	50	3662.2600	125.45734	3470.00	3960.00
Bantwala	50	3310.5000	114.41123	3137.00	3615.00
Total	200	3565.3350	197.63710	3137.00	4053.00

Source: Survey data

As per table No 6.50 , it is evident that the yield in Sullia Taluk is much higher when compared to other regions of study area as mean and standard deviation is higher (3718.0800±124.77078) and in Bantwala Taluk is much low while comparing mean and standard deviation (3310.5000±114.41123). So Sullia region is most preferable to Putter, Balthangdy and Bantwala Taluks in respect yield per acre..

Exhibits ANOVA to Yield/acre of four Taluks

ANOVA					
Yield					
	Sum of Squares	df.	Mean Square	F	Sig.
Between Groups	4884652.255	3	1628217.418	110.488	.000
Within Groups	2888372.300	196	14736.593		
Total	7773024.555	199			
Source: Survey data					

The calculated value of F for difference in Yield between different regions=110.488. The table value of F at 5% level of significance is 5.14. The calculated value is more than the table value and hence the null hypothesis is rejected which leads us to conclude that there is significant difference in the yield in different regions due to agro-climatic and other reasons.

Exhibits Post Hoc test to Yield /acre of four Taluks

Multiple Comparisons

Dependent Variable: Yield

Tukey HSD

(I) place	(J) Place	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Puttur	Sullia	-147.58000*	24.27887	.000	-210.4916	-84.6684
	Belthangady	-91.76000*	24.27887	.001	-154.6716	-28.8484
	Bantwala	260.00000*	24.27887	.000	197.0884	322.9116
Sullia	Puttur	147.58000*	24.27887	.000	84.6684	210.4916
	Belthangady	55.82000	24.27887	.102	-7.0916	118.7316
	Bantwala	407.58000*	24.27887	.000	344.6684	470.4916
Belthangady	Puttur	91.76000*	24.27887	.001	28.8484	154.6716
	Sullia	-55.82000	24.27887	.102	-118.7316	7.0916
	Bantwala	351.76000*	24.27887	.000	288.8484	414.6716
Bantwala	Puttur	-260.00000*	24.27887	.000	-322.9116	-197.0884
	Sullia	-407.58000*	24.27887	.000	-470.4916	-344.6684
	Belthangady	-351.76000*	24.27887	.000	-414.6716	-288.8484

*. The mean difference is significant at the 0.05 level.

Source: Survey data

Post Hoc Tests Shows that there is significance difference in the amount of responses (0.05 level). So it is concluded that Bantwala Taluk is not suitable one when compared to the yield per acre of other regions.

Exhibits Harmonic Mean to Compare Yield /acre of four Taluks

Yield				
Tukey HSD[a]				
Place	N	Subset for alpha = 0.05		
		1	2	3
Bantwala	50	3310.5000		
Puttur	50		3570.5000	
Belthangady	50			3662.2600
Sullia	50			3718.0800
Sig.	1.000	1.000	.102	
Means for groups in homogeneous subsets are displayed.				
a. Uses Harmonic Mean Sample Size = 50.000.				
Source: Survey data				

The Tukey Post Hoc test indicates that Yield in Sullia Taluk differed significantly from Bantwala, Puttur and Belthangady Taluks ($p < .05$). So this indicates that Sullia Taluk is highly preferable than Bantwala Taluk with respect yield obtained from the mature plantations.

CONCLUSION

Rubber Plantation Industry is an important agro-based employment oriented industry in India. The industry is associated with the cultivation of rubber plants, processing and marketing of rubber products. Dakshina Kannada district ranks first among the districts in Karnataka in terms of both the area under cultivation and production of rubber. It could be seen that rubber plantation is highly labour intensive, providing employment to one person for every 2 hectares. Sullia and Belthangady taluks' economy depends on the rubber plantations to a significant extent. Rubber was introduced in Karnataka by the Karnataka Forest Department in 1961 at Sampaje area as a rehabilitation project for Srilankan repatriates, which proved to be successful.

The calculated value of F for difference in Yield between different regions=110.488. The table value of F at 5% level of significance is 5.14. The calculated value is more than the table value and hence the null

hypothesis is rejected which leads us to conclude that there is significant difference in the yield in different regions due to agro-climatic and other reasons

It is the need of the hour to understand the ground realities of various problems faced by the Indian Rubber Plantation Industry, during its cultural activities, harvesting, processing and marketing activities. The protective environment of NR sector has been transformed into a new protection-free liberalized NR economy. Liberalization and globalization policies of the Government have paved the way for international competition in the domestic market together with the opening of new marketing avenues abroad. The Rubber growers, dealers and entrepreneurs have got ample opportunities to advance in their areas due to this eco friendly rubber plantation industry. DK district has been well connected by all types of transportation facilities. By adopting the recommended suggestions, it is hoped that a long term planning of rubber plantation industry can be formulated based upon re-structuring of RPS, introduction of rubber exchange and futures trading, development of export marketing and the application of NR for new uses. Evolution of such a strategy will help the Indian rubber market to protect it from the adverse impacts of Structural Adjustment Programme initiated in the1990s. It will also help to add new vigour and vitality to the Indian rubber market in the present millennium to be the kingpin of the international rubber market in the liberalised world.

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