PROBLEMS AND PROSPECTS OF RUBBER PLANTATION INDUSTRIES IN DAKSHINA KANNADA DISTRICT: A CASE STUDY WITH REFERENCE HARVESTING COST

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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 rubber planters' of Dakshina Kannada district in the study area. The analysis of the findings states that the calculated value of F differed significantly in Harvesting cost between different regions=8.011. 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 Harvesting cost in different regions.

Keywords*: HS, ANOVA, Tukey HSD.*

Introduction:

Rubber, natural or synthetic substance characterized by elasticity, water repellence and electrical resistance. Natural Rubber is obtained from the milky white fluid called latex, found in many plants; synthetic rubbers are produced from unsaturated hydrocarbons. Natural Rubber is nature's most versatile vegetable product. It is the only natural material that is truly elastic, a property that allows it to be soft yet tough. Rubber gently but firmly holds everything together and absorbs bumps and shocks to make our lives so much more comfortable. This special property has made rubber virtually indispensable and products made from rubber, now number in tens of thousands. Natural rubber is a stretchy, flexible and waterproof, hydrocarbon polymer which is derived from latex and drawn by incising into the bark of the rubber tree. It is refined into the usable rubber. The British planters introduced the commercial cultivation of natural rubber. Rubber is a vital product in the life of every human being in the contemporary era. It supports the life of the mass through its diverse benefits. This material has multifarious uses and there are hardly any segments of society, which do not use rubber and rubber based products. In our daily life, we are always involved with products made of rubber. The use of rubber products has made the life of human beings in the modern age more comfortable. Right from the simple eraser to the wheels of the vehicles of all size, airplanes, and space shuttle, use of rubber is made in one form or other. From everyday articles such as rubber bands and shoes to mattresses, tyres and windshield wipers, rubber is so much a part of our lives that we take it for granted and assume that rubber has been with us for a very long time.

Objectives of the study:

The objectives of the study are:

1. To understand the importance, prospects of rubber and its various uses and to study the potentials for rubber based industries 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 in the plantation and processing of natural rubber.
3. To work out the cost of cultivation and revenue in the rubber plantation industry of Dakshina Kannada.

Significance of the study:

Rubber plantation in India is dominated by smallholdings. Although the State of Kerala continued

to dominate in the country's supply of NR, recent years have seen a gradual shift in favour of Non-traditional regions especially some districts of Karnataka and North-Eastern States. Natural rubber is available in good quantity and hence there is a huge scope for setting up of rubber based industries. Rising demand, steep rise in the price of synthetic rubber and reduced supply from some previously dominant rubber-producing countries have contributed to a sharp rising trend of the price of natural rubber over the last decade. The price rise has naturally induced steps for increased production. But unfortunately, in the current year the prices of the natural rubber in India have reduced drastically due to the cheap availability of import rubber. In India, the scope of further area expansion in traditional areas being limited, there has been some effort to extend rubber plantation to non-traditional areas, such as Karnataka, Maharashtra, Goa, Andhra Pradesh in the Southern part and Tripura, Assam and Meghalaya in the North-Eastern part of the country.

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 review of related literature, research work done, and the recent developments on the subject, helps 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.

Mc Fadyen (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 of data. The cost data collected was also analyzed for Mean, Standard Deviation, Standard Error and 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.

Findings:

1) Harvesting Cost

Harvesting cost includes various cost elements such as:

- Cost of latex collection device
- Cost of prevention of rain water mixing with latex
- Labor cost for tapping latex

The first cost component is one time cost, the second cost component is incurred every year before the onset of monsoon and the third cost component is incurred continually every year from the 7th year onwards. The labor cost is the major cost element in the overall harvesting cost.

The main implements used for exploitation of rubber trees are knives, spouts, cup hangers, latex collection cups, collection buckets and scrap buckets. Tapper wages constitute a major component of cost of production of natural rubber. Due to shortage of tappers and the resultant high wages, low frequency tapping systems are favored in most of the regions.

Rain guarding should be done, in order to increase the number of tapping days. Every year, around 80 tapping days are lost due to rains in India. In a normal year, around 25 to 40 tapping days can be gained in the field by rain guarding, depending on the tapping frequency (d/3 or d/2) An ideal tapping system is one which gives highest yields at the lowest tapping cost, satisfactory growth and bark renewal and the lowest incidence of brown bast. After six/seven years for a rubber tree, if the circumference of the rubber tree is around 22 inches or 50 cms, it is considered to be ready for tapping. During the first year, tapping should be done for four months only from November to February. Regular tapping can be carried on from the second year onwards. Daily tapping of a tree leads to lesser yield and shorter life. Efficiency of tapping varies from person to person and is also influenced by sharpness of knife, obstacles in inter-rows and topography of the field, cleaning and replacing cups, age and girth of the tree, time of tapping, clonally differences and frequency of tapping.

The harvesting cost gradually decreases from marginal holding to large holding. It is observed that labor cost in holding considerably less as they employ regular labourers on a monthly salary basis whereas marginal holders hire temporary labourers which definitely cost higher. In majority cases, tapping charge is calculated on per tree basis. In some places the grower himself/family member does the tapping activity. In such cases also his labour cost is estimated and the cost value is taken.

Table-1: Exhibits Mean and Standard Deviation of harvesting cost of four Taluks

Report					
Harvesting cost					
Place	**N**	**Mean**	**Std. Deviation**	**Minimum**	**Maximum**
Puttur	50	26013.2200	949.83471	24195.00	27225.00
Sullia	50	26378.6000	792.85550	24905.00	27292.00
Belthangady	50	25769.4200	948.89308	24173.00	26860.00
Bantwala	50	25513.9400	975.71745	23460.00	26420.00
Total	**200**	**25918.7950**	**967.06065**	**23460.00**	**27292.00**

As per table No -1 it is evident that the Cost of harvesting in Sullia TQ is much higher when compared to other regions of study area as mean and standard deviation is higher (26378.6000±792.85550) and in Bantwala TQ is much low while comparing mean and standard deviation (25513.9400.± 975.71745). So Bantwala region is most preferable to Putter, Sullia and Belthangdy Taluks for new plantation.

Table 2: Exhibits ANOVA to Compare Harvesting cost

ANOVA					
Harvesting cost					
	Sum of Squares	**df.**	**Mean Square**	**F**	**Sig.**
Between Groups	20327859.015	3	6775953.005	8.011	.000
Within Groups	165778193.580	196	845807.110		
Total	**186106052.595**	**199**			

The calculated value of F differed significantly in Harvesting cost between different regions=8.011. 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 Harvesting cost in different regions.

Table 3: Exhibits Post Hoc test to Compare Harvesting cost

Multiple Comparisons						
Dependent Variable: Harvesting Cost Tukey HSD						
(I) place	**(J) place**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**	**95% Confidence Interval**	
					Lower Bound	**Upper Bound**
Puttur	Sullia	-365.38000	183.93554	.197	-841.9952	111.2352
	Belthangady	243.80000	183.93554	.548	-232.8152	720.4152
	Bantwala	499.28000*	183.93554	.036	22.6648	975.8952
Sullia	Puttur	365.38000	183.93554	.197	-111.2352	841.9952
	Belthangady	609.18000*	183.93554	.006	132.5648	1085.7952
	Bantwala	864.66000*	183.93554	.000	388.0448	1341.2752
Belthangady	Puttur	-243.80000	183.93554	.548	-720.4152	232.8152
	Sullia	-609.18000*	183.93554	.006	-1085.7952	-132.5648
	Bantwala	255.48000	183.93554	.508	-221.1352	732.0952
Bantwala	Puttur	-499.28000*	183.93554	.036	-975.8952	-22.6648
	Sullia	-864.66000*	183.93554	.000	-1341.2752	-388.0448
	Belthangady	-255.48000	183.93554	.508	-732.0952	221.1352
*. 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, Belthangady and Puttur regions is most suitable one when compared other regions.

Table -4: **Exhibits Harmonic Mean to Compare cost of Harvesting of four Taluks**

Harvesting				
Tukey HSD[a]				
Place	N	Subset for alpha = 0.05		
		1	2	3
Bantwala	50	25513.9400		
Belthangady	50	25769.4200	25769.4200	
Puttur	50		26013.2200	26013.2200
Sullia	50			26378.6000
Sig.	.508	.548	.197	
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 Cost of Harvesting Sullia taluk differed significantly from Bantwala taluk ($p < .05$). So this indicates that Bantwala and Belthangady taluk is highly preferable than Puttur and Sullia taluk.

Conclusion:

The research work is initiated to ascertain and analyze the problems and prospects of natural rubber plantation industry in Dakshina Kannada and to suggest the measures to overcome various problems. Dakshina Kannada being the largest rubber producing District in South India among non-traditional areas is selected for the study, has the advantage of promoting rubber based industries. Rubber industry has not grown adequately despite the existence of large rubber plantations in the District. There is immense scope for development of rubber based industries in this region.

The analysis of the above nine variables shows that there is significant difference in the cost of cultivation 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.

Therefore cultural practices should be followed very carefully, taking the references from the background study of similar habitats and environment for introducing a plantation crop. However, there will remain some problem always but these can easily be solved. As a potential important multipurpose plantation crop, there must have some sort of regulations under which industrial development, land utilization and allotment for plantation, management, employment, wages and benefits, health and safety, discipline, product standardization, commodity market, import and export price control, dealers' licensing, research and development, technical training, statistics and publication etc., should immediately be programmed and materialized. 'Follow up' measures i.e. statistical evaluation, technology upgrading and future plan for development, should be kept active.

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