CHAPTER VII

SUMMARY OF FINDINGS AND SUGGESTIONS

7.1 Introduction

Plantation crops are high value crops of great economic importance and they provide huge employment opportunities. They are commercially significant as these crops contribute significantly to foreign exchange reserves and employment generation. It plays a critical role in the development of the rural and hilly areas and the under developed remote regions in the country. Among these plantation crops, cultivated in India tea, coffee and rubber assume greater importance and rubber plantation exerts a profound influence on the economic and social life of the people.

Rubber cultivation has been traditionally confined to a narrow belt extending from Kanyakumari District of Tamilnadu in the south to Dakshin Kannada and Kodagu District of Karnataka. Kerala and Tamilnadu are considered to be the traditional rubber growing areas of the country and they contribute 84 percentage of the total area of rubber in India. It is heartening to note that Kanyakumari District in Tamilnadu
accounts for 97.78 percent of the total area. The fertile soil, prevailing congenial climate and great enthusiasm of the local planters are the major factors responsible for the development of the rubber plantation in the district.

Though rubber cultivation occupies a significant position, it encounters many problems from the planting stage to the marketing of rubber. Price fluctuation, increasing cost of production, seasonal Changes, low productivity, exploitation by intermediaries and weak marketing system are some of the problems faced by the rubber growers of this district. These factors have called for an indepth study of ‘Production and Marketing of Rubber in Kanyakumari District’ with the specific objectives as stated earlier in Chapter I.

To analyse and interpret both primary and secondary data, appropriate statistical tools, such as Cobb-Douglas production function, Simple regression equation, Co-efficient of variation, Garrett’s Ranking Technique, Project appraisal technique, Shepherd’s formula, Time series analysis using multiplication model, Price spread using concurrent margin method and percentage analysis have been used.

Thus the present chapter is devoted to the summaries of the major findings of the preceding chapters and the recommendation made on the basis of the findings.
7.2 Summary of Findings

Rubber is produced in 22 countries from an estimated planted area of 10135 thousand hectares. Thailand has maintained its top spot in production with 3020 thousand tonnes by the end of 2008 with an average production of 2469.7 thousand tonnes per annum during the study period. Indonesia is the second largest producer and its production gradually increased from 1361 thousand tonnes in 1994 to 2824 thousand tonnes in 2008. The production in Malaysia declined by 112 thousand tonness during the year 1997 because many growers deserted rubber for the production of palm oil which gave more economic returns. Price fall and uneconomic returns were some other factors which lead to the fall in production. However from 2004 onwards, the production started to increase because of the increase in price. The average production during the study period was 1029.5 thousand tonnes per annum.

India is the fourth largest producer producing 880 thousand tonnes by the end of 2008. The average production was 664.3 thousand tonnes during the year. China and Vietnam also have achieved a good growth and their average production was 498.4 thousand tonnes and 346.5 thousand tonnes per annum.

In terms of country-wise share in the world production, Thailand produced 32.1 percent, Indonesia 24.5 percent, Malaysia 13.5 percent, India 8.6 percent and Vietnam 4.5 percent. World rubber
production increased significantly by 11.68 percent per annum during the period under review. Among the main countries in the world Vietnam occupies the highest growth rate with 26.77 percent per annum because of the effective steps taken by the government and the rubber research institute of Vietnam, followed by Indonesia with 12.46 percent and Thailand with 10.91 percent per annum.

During the period under study, the world rubber production experienced a considerable variation of 18.37 percent. Vietnam experienced the highest variation of 45.58 percent followed by Indonesia 26.9 percent and Thailand 20.25 percent.

Global consumption had grown from 5650 thousand tonnes in 1994 to 9550 thousand tonnes in 2008. China maintained its position as the largest consumer accounting for 19.1 percent of the total global consumption, whereas the consumption was 14.1 percent, 10.1 percent, 8.8 percent and 4.9 percent in the U.S.A, Japan, India and Malaysia respectively. Because of booming car sales and spinning demand for tyres, China’s consumption growth rate was the highest with 26.47 percent followed by India with 9.98 percent and Malaysia with 6.17 percent.

Co-efficient of variation was also high in China with 46.76 percent followed by India with 18.56 percent and France with 16.07 percent. In the year 2008, there was only a marginal increase in the world
consumption due to world economic crisis and decline in consumption by the automobile industries.

The production of rubber in India registered a significant increase during the period under study. The analysis of production of rubber in India revealed that the production ranged between 4,35,160 tonnes and 8,52,895 tonnes during the study period. The increase in production was mainly due to the better climatic conditions and the expansion of tapped area during the year. During the years 1998-99 to 2002-03, there was only a marginal increase in the production owing to the low price during the past years, the small holders had suspended maintenance and the cultural practices in their holdings and this has affected the production performance of the sector.

In the year 2007-08, the production declined and recorded a negative growth rate of 3.2 percent mainly due to unfavourable weather conditions and abnormal leaf fall.

Among the major rubber growing areas of the state, Kerala holds a near monopoly position in rubber production and contributes 90 percentage of India’s total rubber production. Rubber production in Kerala recorded a minimum of 408311 tonnes in 1993 – 94 and a maximum of 783275 tonnes in 2006-07. Its trend value also signifies the future increase in production.
Tamil Nadu occupies the second place in traditional rubber growing area. The production increased by 9300 tonnes during the study period. The trend value increased from 16058 tonnes to 25046 tonnes in 2007-08 which signified the possibility of further growth in the years to come.

The analysis of rubber production in Kanyakumari District showed that there was generally an increasing trend during the period understudy. It increased with the maximum of 11.69 percent in 1995-96 and minimum of 0.15 percent in 2001-02. In the year 2007-08 there was a negative growth rate of .83 percent mainly due to unfavourable climatic conditions.

The analysis of share of the Kanyakumari District to India and Tamilnadu revealed that an average of 3.15 percent of rubber production in India and 97.48 percent of rubber production in Tamilnadu was carried out by this district. In the year 2007-08 even though the overall production decreased by 27550 tonnes, the production in Tamilnadu had a marginal decrease of only 200 tonnes. Among this the share of Kanyakumari District was 195 tonnes. The decrease in the production was mainly due to the adverse climatic conditions and the non adoption of better agro management practices.

The analysis of compound growth rate revealed that the growth rate of the rubber production in India was 10.66 percent. Among
the traditional rubber growing states, Kerala recorded the highest growth rate with 10.209 percent and Tamilnadu with 7.87 percent. Compound growth rate in the study area was 8.143 percent during the period under review. Coefficient of variation was high in Kerala with 19.04 percent and there was also a considerable variation in the study area with 14.93 percent.

The analysis of the area under rubber cultivation in India has revealed that there was gradual increase from 508420 hectares in 1993-94 to 635400 tonnes in 2007-08. The trend also showed the increasing trend which signifies the possibilities of the future growth. The share of area under the small holding sector surpassed that of the estates and its contribution was 89 percent of the total area by the end of 2007-08. Kerala account for 470827 hectares in the analysis of state-wise area under rubber cultivation in India in the year 2007-08. The trend value also increased from 433509 hectares to 508145 hectares during the period under review. Widespread prevalence of root wilt disease of coconut in Central Kerala and relatively remunerative price for rubber during the period fuelled the process of crop shift in favour of rubber.

The area under rubber production in Tamilnadu also showed an increasing trend ranging from 17691 hectares to 19292 hectares. Kanyakumari District accounts for 97 percent of the area under rubber cultivation in Tamilnadu. The area is in a steady increase when compared to the other major crops. In this district rubber is extensively cultivated in
The three taluks of the district namely Thovalai, Kalkulam and Vilavancode. The analysis of the area under rubber cultivation revealed that there was a gradual upward movement from 16855 hectares to 18979 hectares during the period under review. There was only a marginal increase in the area during the period from 1998-2002 because of the prolonged sluggishness in the rubber market people hesitate to cultivate rubber. However as a result of attractive price, the subsidy scheme for new planting and replanting and favourable market supported the area expansion during 2005-07. In the year 2007-08, there was only a marginal increase in the area of 173 hectares because of the unfavourable climatic conditions.

The compound growth rate of the total area was 3.24 percent per annum and the tapped area was 5.164 percent per annum in the analysis of trend and magnitude of variability of area under rubber in India. Among the traditional rubber producing states Kerala occupied the highest growth rate of 2.67 percent in the total area and 4.32 percent in the tapped area. The growth rate was low in the study area. It was only 1.479 percent in the total area and 3.276 percent in the tapped area. The variation in Kanyakumari District was 3.18 percent in the total area and 6.322 percent in the tapped area.

The analysis of the productivity of rubber in India revealed that it increased from 1285 kg/hect to 1799 kg/hect in 2007-08. the average productivity in Kerala was 1631/kg/hec and in Tamilnadu it was 1509
kg/hect, and 1504 kg/hect in Kanyakumari district. The trend values also showed the increasing trend. The increase in productivity was mainly due to the favourable climatic conditions and the use of hybrid varieties of clones. In the year 2007-08, the productivity decreased as a result of erratic monsoon and abnormal leaf fall.

The analysis of compound growth rate of productivity signified 5.23 percent growth per annum in India. The growth rate in the study area was 4.713 percent per annum. The analysis of coefficient variation revealed that Kerala experienced a considerable variable of 11.03 percent among the main producing states. The co-efficient of variation in the study area was 9.62 percent.

The cost of production of rubber on an average was Rs.63.32 per kilogram for the small holdings and 57.59 per kg for the estates of which the total operational and maintenance cost constituted 60.06 percent for the small holdings and 51.99 percent for the estates and the fixed cost constituted 39.94 percent and 48.01 percent for the small holdings and the estates.

The cost of labour was the major component in the total variable cost. 41.75 percent and 35.26 percent of the total variable cost were accounted for by labour alone in the small holdings and the estates followed by the processing cost with 7.99 percent and 7.41 percent. In the total fixed cost, the rental value of the land formed part of 18.57 percent
and 19.36 percent for the small holdings and the estates and the annual share of the net establishment cost was 15.88 percent and 16.45 percent. Therefore any step taken to improve the efficiency of the labour and processing cost would result in the reduction of the cost of production.

The analysis of unit cost of production and productivity shows that yield per tree was worked out to 4.29 kg for the small holdings and 4.88 kg for the estates. Cost of production was Rs.63.32 per kilogram for the small holdings and 57.59 / kg for the estates. The profitability analysis revealed that the net profit ratio was 33.41 percent for the small holdings and 40.69 percent for the estates.

The cost and the return analysis revealed that the cultivation of rubber was profitable both for the small holdings and the estates. To ascertain the scope for further increase in the net return per acre the resource use efficiency was analyzed. The Cobb-Douglas type production function is fitted to evaluate the resource productivity and the returns to scale in rubber cultivation.

The relationship between the yield of rubber and the independent variable in the smallholdings indicated that every one percent increase in the level of investment in resources namely fertilizer, labour, experience and processing cost, yield could be increased by 0.294, 0.071, 0.093 and 0.314 percent from its mean level.
As regards the independent variable in the estates, four explanatory variables were responsible for 85.7 percent of the output of rubber. The co-efficient of fertilizer, labour, experience and processing cost were statistically significant and indicate that one percent increase in these variable may lead to 0.217, 0.315, 0.067 and 0.291 percent increase in gross returns. Among the significant variables labour had a great influence on the yield of rubber cultivation in the case of the estates.

Therefore it may be concluded from the analysis that among the significant variables, processing cost, fertilizer and the experience were found to be important resource for the small holdings and human labour, processing cost and fertilizer were found to be the important resources for the estates. The analysis also revealed that the sum of production elasticities for the small holdings and the estates were 1.08 and 1.17 which indicates an increasing return to scale.

The analysis of resource use efficiency revealed that in the case of the small holdings the ratio of the marginal value product to the factor cost were 0.24, 5.49 and 5.89 respectively for labour, fertilizer and processing cost. The ratio in case of estates were 1.48, 5.21 and 7.31. It reveals that every rupee additionally spent on these variable would increase the output.

Thus it may be inferred from the analysis that the input namely fertilizer and processing cost for small holdings and labour,
fertilizer and the processing cost for the estates were under utilized in rubber cultivation in the study area. As the ratio of the marginal value to the factor cost was more than the unity, there is wide scope for increasing the use of the respective input in rubber cultivation under the small holdings and the estates to maximize their returns.

The study on capital productivity showed that the pay back period was 10.02 years for the holdings and 9.34 years for the estates. The cutoff year at 10 percent cost of capital is 10 years. Since the pay back period was less than the cutoff year in case of the estates and equal incase of the small holdings the investment in rubber cultivation was viable for both the small holdings and the estates in the study area.

The result of the benefit cost ratio indicated that every one rupee invested in rubber cultivation would benefit the small holdings by Rs. 1.64 and the estates by Rs.1.92. The net present value of rubber cultivation was Rs.1,68,499.37 for the small holdings and Rs.235707.41 for the estates at 10 percent discount rate. Since net present value is positive and large it is inferred that the capacity to generate more wealth is large.

The analysis revealed that the rubber cultivation in the study area fetched 20 percent and 22 percent internal rate of return for the small holdings and the estates. The result of the capital productivity analysis
justified the economic viability of the investment in rubber cultivation. It is economically viable one under the small holdings and estates.

Garrett’s Ranking Technique was applied to identify the constraints in rubber cultivation and it was found that the lack of skilled labour, the climatic changes and the high labour cost were the major hurdles for both the holdings and the estates in rubber cultivation in the study area.

In the study area, the entire quantities of rubber sheet produced were marketed because it was consumed by the industrial consumers only and the growers do not retain it for any other purpose. So the marketable surplus was 100 percent.

The analysis of storing habits among the sample growers showed that the small holders stored 56 percent and the estate holders stored 68.38 percent of their marketable surplus with the anticipation of the remunerative price later.

The study on market structure, the marketing efficiency and the price spread revealed that the intermediaries played a vital role in rubber marketing in Kanyakumari District. It was identified that the village trader, wholesalers, commission agents, co-operative societies were the intermediaries engaged. The share of the co-operative societies in the marketing continues to be negligible in the study area. So the most common marketing channel identified in rubber marketing in Kanyakumari
District to distribute the produce from producer to ultimate consumer is shown below.

Channel I
Producer → Village Traders → Wholesalers → Industrial Consumers

Channel II
Producer → Wholesalers → Industrial Consumers

Both the village traders and the wholesalers transacted 96.68 percent of the marketed surplus of the small holdings and 94.20 percent of the estates, where the commission agents, the co-operative stores and the Industrial consumers formed only 1.25 percent, 1 percent and 1.07 percent respectively for the small holdings and 1.35 percent, 3.21 percent and 1.24 percent for the estates.

Thus it is inferred from the analysis that the major portion of the marketed surplus of small holdings were disposed through the village traders and the estates disposed through the wholesalers. Easy contact and spot payment were the major reasons for choosing the particular intermediaries.

The analysis of the cost incurred by the producers in the marketing of rubber revealed that the average marketing cost was Rs.155 per 100kg. It also showed that the cost was low (Rs.132 per 100kg) in channel I. When compared with the marketing cost of channel II, Channel I
was found to be cheaper because there was lesser expenses incurred on transportation.

The study further analysed the cost incurred by small holders and estate holders. The total cost incurred by the small holders was Rs.167/100kg and for estate holders Rs.143/100kg. The cost incurred by estate holders was less because of less transport cost and loading and unloading. Thus in both the type of growers the transport cost, the loading and unloading and the rejection loss ranked first, second and third in the marketing cost.

The marketing cost incurred by the village trader was Rs.145/100kg. The transportation cost and loading and unloading cost constituted 68.97 percent of the total marketing cost.

The marketing cost incurred by the wholesaler was Rs.593/100kg. Since all the wholesalers are registered dealers of rubber board they have to pay tax. So tax constituted the major share accounting for 48.90 percent of the total marketing cost followed by the transport cost with 28.67 percent.

The price spread analysis in the study area revealed that the producer’s share in the price paid by the consumer was about 90.51 percent in channel I and 92.59 percent in channel II. It implied that there is not much difference in the net price received by the producers. Whatever may be the type of channel he choose to market his produce. Channel II was
best from the producers point of view as it had the low price spread of Rs.967/100kg because of less marketing cost and high producer’s price.

The result of marketing efficiency computed by Shepherd’s Formula also confirmed that channel II was the most efficient channel in rubber marketing in Kanyakumari District, as the marketing efficiency in channel II was better than channel I because of the lesser marketing cost.

The behaviour of price was studied by analysis of variation due to seasonal, cyclical, irregular and trend components. The price of rubber depends upon the demand and supply in the international market.

The secular trend analysis of prices at the Kottayam market over the years showed that there was a significant increase in the price of rubber. The annual average price per 100kg increased at the rate of Rs.312.38 per annum.

The result of cyclical variation indicated that there were recurrent up down movement around the secular trend level. The coefficient of irregular variation was 16.95 percent and the irregular indices of price ranged from 0.78 to 1.37. The irregular variation in price may be due to the change in the consumption of automobile industries, variation in crude oil price and the like.

Analysis of seasonal variation of rubber price during a short period exhibited that low prices prevailed in the month of January and February due to the increase in the supply during the winter season and the
post harvest glut in the market and the storing habit of producers. The highest price index prevailed between April-July due to decrease in the production in summer season especially during the month of February, March & April. Tapping rest was also given during this period.

Analysis of the most crucial problems faced by the sample growers in the marketing of rubber with the help of Garrett’s Ranking Technique showed that frequent price fluctuation of rubber prices ranked first followed by the changes in the policy of the government and the inadequate storage facilities. The delay in payment was found to be the least important problem.

7.3 Recommendations

1. Superior quality and hybrid varieties of planting material suitable for diverse agroclimate must be made available to rubber growers through recognized nurseries at subsidized rates. The improved and hybrid varieties must be pest resistant and draught tolerant to achieve the maximum level of productivity.

2. Scientific methods of improved crop management techniques may be imparted to the growers to increase productivity by periodical ‘growers meet’ organized by the government organizations and the extension agencies for effecting improvement in the operation of cultivation. Awareness through training, seminars, workshops and
distribution of pamphlets and publicity through mass media like T.V. and newspaper would help to improve quality at reduced cost.

3. To reduce unit cost of production and increase the net income per unit of area, it is suggested to employ the strategies of discriminatory application of fertilizers and plant protecting chemicals, giving tapping rest during rainy season for rubber trees with low potential and adoption of stimulation based on low frequent tapping system. Low frequency tapping has also proved to be effective in maintaining yield level with reduction in labour input.

4. Shortage of skilled tappers hit the rubber plantation hard in the study area. So it is suggested to give short term incentive training in scientific tapping and crop processing through Rubber board and register their names in the Rubber Board and the co-operative Societies. They should publish a list of approved and trained list of tappers in different parts of the district. So the growers can easily access and utilize the trained tappers.

5. Tapping is an activity that can be taken up by female labourers also. So it is suggested to use more number of women tappers. Wage rate is also low for women tappers. Proper training can be imparted to them through tappers training school or through Rubber Board.
6. Rubber growers are to be motivated to form a growers association in micro level and to meet periodically to discuss the issues relating to rubber cultivation.

7. The producer’s organization in the major rubber producing areas are to be strengthened further with technical and financial assistance to set up latex collection and sheet processing facilities with environment friendly effluent treatment system on a cost sharing basis.

8. Introducing rain guards is the only available solution to avoid rain interferences on tapping and productivity of labour. Although rainguards are being used extensively in the estate sectors, the awareness is very poor among small holdings. Effective awareness programmes and demonstration plots will help in improving the adoption of rainguards.

9. Small holders in the study have insufficient knowledge of making quality rubber sheet and are short of equipment and supplies and they lack bargaining power. They produce low quality rubber sheet and receive unfair prices for the rubber sheet. So this problem can be solved through the establishment of group processing and marketing at the village and district level.

10. Consolidation of the position of Indian rubber in the international market and aiming at competition in the world market have emerged as the most important challenges. This can be achieved only by the use of quality improving techniques. Growers must be educated about
quality control from the field level onwards. Quality will command good demand in the international market and fetch attractive prices.

11. Warehouses must be established in the production centres, so that the growers can stock their produce to sell it at attractive prices at the appropriate time.

12. Grading and processing facilities may be provided at the production centre, so that the rubber growers would get the right price for their produce.

13. Marketing activities of the co-operative societies must be strengthened in the study area. Co-operative societies should develop a direct link between the wholesalers, retailers, processors, and exporters. So the marketing cost incurred by the growers for lengthy channels can be reduced and they would get fair prices for their produce. The Government must provide financial assistance to the societies for their efficient functioning.

14. Liberal financial assistance should made available to the growers as crop loans and development loans through commercial banks or co-operative societies. At the time of necessity pledge loan system can also be adopted through co-operative societies.

15. The Rubber Board shall appropriately advise the government of India to formulate import and export policies to sustain the international price parity in rubber. This will be helpful to both the producing sector and
the consuming sector to synergize their activities for a prosperous industry.
Assured price to rubber will encourage the prospective growers to continue
rubber cultivation and undertake the same on a large scale.

16. The Rubber Research Institute of India should utilize its
capable resources to explore more new uses of rubber. (ie) non-
conventional application of rubber. These measures would help further
strengthen the long term growth and viability of the rubber industry.

7.4 Conclusion

Rubber industry in India has passed through many
vicissitudes and attained a fairly significant position in the global arena.
Currently India has attained the position of the fourth largest producer in
the world by sharing 8.92 percent of the global output and the fourth
largest consumer with 8.7 percent share in the global consumption.
Important factors which influenced the dynamic growth were captive
domestic market and relatively remunerative price enjoyed by the crop
during the study period. The study revealed that the major factors affecting
the viability of rubber producers were in a steady increase in cost the of
production, the instability of price and the shortage of skilled labour. As
the production sector is dominated by the smallholdings, a group approach
towards value addition seems to be an important policy option rather than
isolated individual efforts to maximize the returns. The emerging scenario
of liberalization and growing market integration underline the need to
revolutionize the processing and marketing scene to accommodate in its main stream the changing consumer requirement and producer capability. The future development strategy should be drawn against the perspective of quickly changing structural pattern of the industry, with importance being shifted to the small growers.

**Scope for Future Researchers**

On the basis of the present investigation the following topics are found relevant for further studies.

1) The impact of rubber plantation on the development of hilly and rural areas of Kanyakumari district.

2) Comparative study of socio economic conditions of workers in the small holdings and the estates.

3) Human resource management in rubber plantation

4) Marketing of rubber products in India.