CHAPTER VII

SUMMARY AND CONCLUSIONS

Having examined the two sets of data generated in the survey of the plantation and industry owners and managers and the plantation and industrial workers, we have understood the nature of difficulties and constraints faced by the industry and workers in their day-to-day existence and operation. The factors that affect the working of the rubber plantation and industries and those of the living of the workers have now been discussed and understood. The present chapter summarises and capsules the entire thesis and provides for suggestions emanating from the implications of the study.

For many years to come, farm will hold the future in India. Plantations will have a major part in that future. Rubber industry has, without doubt, a significant role in accelerating the pace of growth of the Indian economy. It is an agro-based industry, which depends exclusively on the production of latex in the rubber plantations. As far as Tamil Nadu is concerned, Kanyakumari district enjoys a place of prominence in regard to the supply of latex. Facts show that the State of Tamil Nadu comes next only to Kerala, with regard to the production of latex, in lands 15,000 ha to 25,000 ha and with nearly 50,000 workers (1999).

Summary

History of Rubber. The story of *Hevea Brasiliensis* is essentially the story of rubber. The use of rubber has evidently been well established by the Incas of Peru, the Aztecs of Mexico and the Maya of Central and
South America, even before the discovery of America by Columbus. The early explorers of the new continent recovered protective garments and other coverings, balls for playing games, bottles and syringes. After the voyage, Columbus brought back from Haiti, bouncing balls of rubber with which the natives used to play some primitive games on specially paved courts. Later, Portuguese explorers found Amazonian inhabitants waterproofing their hats, clothes and shoes with rubber latex; and other explorers observed Mexican Indians chewing the hardened latex of guayule shrub.

Not much progress was made during the sixteenth and the seventeenth centuries that are regarded as periods of incubation in the history of rubber. The rubber articles brought back to Europe by Columbus and other explorers remained as curiosities as the knowledge concerning these valuable plant products was rather scanty. Only a few latex yielding plants were known at that time.

The year 1770 is memorable in the history of rubber because an English chemist, Joseph Priestly, reported the ability of the hardened latex (caoutchouc) to erase lead pencil marks on paper and since then it still tips millions of lead pencils. Because of the property of caoutchouc to rub off pencil lines, it came to be known as ‘rubber’. By 1780, a great number of erasers were on sale in London shops.

Rapid progress was made in the nineteenth century and quite a large number of botanical sources of rubber were unearthed. Charles Macintosh, a Scotsman, discovered, in 1823, that rubber could be
dissolved in the solvent naphtha, which offered a new way for producing waterproof articles, such as raincoats.

Factories for the manufacture of rubber articles began to spring up in the principal industrial countries. Solid rubber tyres were first used on road vehicles in 1867. At the beginning of the twentieth century, the world’s supply of natural rubber came almost entirely from Brazil and as such the plant was shipped into England. Later on it came to Malaya, Indonesia and Sri Lanka and then to India.

The Rubber Plantation Industry in South East Asia dates back to 1876. In India, rubber plantations were first started in Kerala State in 1905. Since then many other areas have been brought under rubber cultivation. The World War II provided a stimulus to the synthetic rubber industry. Synthetic rubber equaled natural rubber in world output in the early 1960s and moved ahead of natural rubber thereafter. Despite the competition from synthetic rubber, natural rubber continues to occupy an important place where elasticity, resilience and tackiness are required.

**Rubber Production**

The total area under rubber cultivation during 1997-98 in India was 544,534 ha, with a total production of 583,830 tonnes. Of the traditional region, Kerala state accounted for 85.45 per cent (or 465,282 ha) and Tamil Nadu accounted for 3.4 per cent of the total area of cultivation in the country. In terms of production, the traditional region accounted for 96 per cent of all production in the country (561,110 tonnes out of
583,830 tonnes. While Kerala accounted for 92.9 per cent of the country’s production, Tamil Nadu for just about 3.3 per cent of the country’s production.

In India, the production of natural rubber increased by 3.9 per cent and touched 43,355 tonnes during April 1998, as against 49,705 tonnes during April 1999. On the other hand, there was a decline in the consumption of rubber to the extent of 2.6 per cent in auto-tyre sector and 7.2 per cent in general rubber goods sector. Yet, the consumption during the same month in the previous year was higher by 10 per cent. India exported 152 tonnes of natural rubber during the month. The total stock of 182,160 tonnes of natural rubber held in the country at the end of April 1999 was higher by 78,330 tonnes against the quantity normally required for two months of consumption in the country.

The country produced 4,880 tonnes of synthetic rubber during April 1999 as against 6,169 tonnes in the previous month. The stock at the end of April 1999 was 17,445 tonnes. The consumption of synthetic rubber declined to 156,395 tonnes, a decline by 2.8 per cent during 1998-99. The relative use of rubber marginally tilted in favour of the natural rubber. It was 79:21 during the year as against 78:22 during 1997-98. There are 545 manufacturers in Tamil Nadu (9 per cent of the total manufacturers in the country), consuming 37,129 tonnes of natural rubber, 13,910 tonnes of synthetic rubber and 5,352 tonnes of reclaimed rubber, during 1997-98.
Kanyakumari district has an area of 25,000 ha under rubber, of which nearly 18,000 ha is matured and the rest immatured. The average yield is 1,500 kg per ha, but varies from 900 kg to 4,000 kg per ha. In the last few years, there has been a fall in the demand and as such there has been a 3 per cent fall in rubber cultivation due to fall in prices. Eighty-five percent of the rubber plantations are on small holdings while only 15 per cent are on large holdings. In small holdings, the rubber production average about 1,000 kg per ha.

The large rubber plantations employ as many as 5,000 workers while the small ones employ as much as 45,000. The workers of large plantations are paid a wage of Rs. 65 per day while those of small plantations Rs. 50 per day only. Workers employed on plantations of 5 ha or more are also given a bonus, every year and the bonus is normally a month’s salary. Rubber Board maintains a labour welfare fund, covering benefits such as health, housing, educational subsidies.

Rubber production in Tamil Nadu in 1995-96 turned out to be 2,666 metric tonnes, valued at Rs. 166.6 million. This is the highest in the last few years, both in terms of production and in terms of value. Arasu Rubber Plantation in Nagercoil are on forest lands, on lease from Forest Department, in 4,789.7 ha. The plantation is operated with an authorised capital of Rs. 40 million and a paid-up capital of Rs. 20 million. The production figures for the year 1996-97 amounted to 2,591 tonnes and 1997-98 2,800 tonnes, valued at Rs. 142.9 million and Rs. 146.6 million, respectively. The latest figure for production is 2,800 tonnes, valued at Rs. 142.9 million. In the last two years however revenue and expenditures
have been such that rubber industry has shown a loss of Rs. 5.4 million in 1997-98 and Rs. 6.6 million in 1998-99.

Rubber constitutes the basic raw material for production of all kinds of sophisticated and vital rubber products, without which technological and industrial growth in the country will be totally impossible. Every possible effort is taken by the government to nurture the growth of the rubber industry at all levels. The planners of our country have introduced numerous schemes for systematizing the process of growth in various sectors of this industry. Despite these programmes, the rubber industry is bristled with many a problem, which deserves an analytical study.

As far as Kanyakumari district is concerned, the problems of rubber industry are serious and unique, in several respects. It is with a view to make a scientific and analytical study of these problems, that this study is particularly undertaken.

The Problem. Rubber industry in Kanyakumari district as a problem of research needs no elaborate discussion on the reasons for it. For although the district accounts for more than 90 per cent of latex production in the State of Tamil Nadu, the industries in operation are not producing useful rubber products such as automobile tyres, rubber bushes or numerous other industrial accessories as expected from such an industry. The trend in rubber production disproves the basic principles governing the localization of industries.
The Objectives of the study are four-fold and they are:

1. To understand the nature and extent of rubber plantations and subject data pertaining to growth and development to a statistical investigation of the potentials of latex supply in Kanyakumari district;

2. To explore the possibilities for opening up new avenues for the rubber industry in Kanyakumari district, given an understanding of the extent of cultivation and volume of production over the years;

3. To identify and examine the factors hampering the growth of industries manufacturing rubber products in Kanyakumari district so that they may be corrected or manipulated for economic change; and

4. To determine ways and means to get over these problems and put the rubber industry on rail in the years ahead.

The Research Design. The study is based on both primary and secondary data collection. The primary data are collected using schedules of questions, pre-tested, and reformulated for the purpose of interviews with (a) industrial workers, and (b) industrialists or industry managers. The sample chosen could only be small, as there are only a small number of workers in a small number of industries. The sample size is 125 for industrial workers and 18 for industry managers or industrialists. In most cases, the industry owners were not available for interview and so only industry managers could be contacted and interviewed.

The study has called for use of simple statistical techniques, which could help with the explanation of the industry and the production of raw materials (latex) for the industry. They could also provide for different
perspectives on the nature of the subject of study. The techniques used are the multiple and stepwise regression schemes. Other exploratory techniques, such as frequency and percentage analysis, would be used mostly to study the potentials of growth for the rubber industry in Kanyakumari district and to portray the genesis of some of the deep-rooted problems of the industry. The study would be used to find out the ways and means by which the rubber industry in Kanyakumari district can resolve its technical and institutional problems and emerge as the promising and prominent industry in the district:

a. A historic study of the rubber plantations and the growth of latex production in the district ever since the State reorganisation in 1956;

b. A diagnostic study of the basic factors hampering the growth of industries manufacturing rubber products; and

c. A study of the rubber industry in the district, in the absence of measures fostering the growth of the industries manufacturing rubber products in the district.

The primary data were collected using the random sampling technique, in which every willing industrial worker was interviewed. Their number was kept to the minimum so that the industrial workers from some select units in select locations could be interviewed. The secondary data on the other hand were collected from standard research journals, research monographs and periodicals and publications of the
Rubber Board of India, as these are the only reliable sources of information.

The study required the use of the following and useful statistical techniques. They could be stated as follows:

a. A trend analysis of the growth of the rubber plantations and latex production in the district; and

b. The fitting of an econometric model of relationships, namely, multiple regression scheme.

The study has accomplished the following:

a. The ways and means by which Kanyakumari district could be rendered a centre for manufacturing of the major rubber products.

b. Further growth of rubber plantations and the consequent growth of latex production in the district.

c. The path of progress for the rubber industry not only in Kanyakumari district but in the region as well in the years ahead.

The Structure of the Thesis. The thesis has been organised in seven chapters. The first chapter has introduced the problem of study and the procedures followed in the analysis of data and interpretation.
The second chapter has provided an overview of relevant literature and it recounts the historical events relating to the growth and development of rubber and rubber industry in the world and India. The third chapter has provided a description of the study area, in all its geographical, social and economic characteristics, with a view to providing a background for the understanding of the plantation crops in general and rubber in particular. The fourth chapter has examined the rubber and rubber industry in India and Tamil Nadu and has given the trends in rubber production and rubber products in the State and the country. A historical account of rubber and rubber industry is also provided in this chapter.

The fifth chapter is one of the two analytical chapters. In this chapter, the data collected from the plantation owners and managers have been in the description of their characteristics. The analysis is simple and is about 18 plantations/factories in frequency and percentage forms. The sixth chapter is about the characteristics of plantation and factory workers. The data gathered from 125 workers consisting of field and factory workers, plantation workers and watchmen have been analysed in frequency and percentage terms and subsets of data are subjected to multivariate regression methods to bring out their characteristics and relationships. The seventh chapter is the present chapter, which summarises the entire thesis and gives the conclusions of the study in a nutshell. The implications of the findings and conclusions are also given in this chapter, with a note on the studies which could be taken to further the understanding of the rubber and rubber industry.
Findings and Conclusions of the Study

1. In South India, the plantations are located mostly in areas with a prolonged dry season and severe southwest monsoon. There is a large variation between the winter and the summer temperatures. Rubber plantation thrives best in deep well-drained loamy soils. The soils to the rubber plantation of South India are however red lateritic or clayey loams. The soils are generally deep and well drained. They are fairly rich in nitrogen, but poor in mineral constituents.

2. Rubber is a long duration tree crop and stays on the ground for several years. The economic life of the rubber tree is 30 to 35 years. A newly opened jungle is considered to be the most suitable for rubber cultivation.

3. The average yield of latex per hectare in India from unselected ordinary seedlings is 375 kg. The yield from bud grafted trees, of approved clones and from clonal seedlings of approved percentage, is twice as much or more and has now been obtained with improved planting materials in India.

4. Though the plantation industry and the Rubber Board are against synthetic rubbers, it would be like putting back the clock of progress, if India did not produce synthetic rubber. In the new millennium, all types of synthetic rubber would be manufactured in India: SBR, PBR, NBR, EVA, EPDM, CPE, BU tyre and VP latex.
At present, synthetic rubbers like silicone, viton, and hyplaon, which are highly specialized and used in relatively smaller quantities, are imported. The total consumption of synthetic rubber in 1997–98 is 168,215 tonnes and it is expected to reach 196,210 tonnes during 2000 A.D.

5. There are tremendous prospects for the rubber industry if the natural rubber plantation industry does not worry about synthetic rubbers, for the industry’s envisaged growth rate of 10 per cent would lead to higher consumption equally of natural rubber as well as synthetic rubber. Synthetic rubber has thus far been assigned only a supplementary role and it has played this role well without any threat to natural rubber.

6. Traditionally, rubber has been grown mainly in the State of Kerala and Kanyakumari district of Tamil Nadu. Other States and Union Territories with areas suitable for adoption, because production in the traditional areas was inadequate to meet the increasing demand in the country, were brought in to increase production of rubber. Such States and the Union territories are Karnataka, Tripura, Assam, Meghalaya, Mizoram, Manipur, Goa, Maharashtra and Orissa. There are potential areas in the states of Andhra Pradesh, Madhya Pradesh and West Bengal for growing rubber.

7. India is now the fourth largest producer of natural rubber in the world, next to Malaysia, Indonesia and Thailand. However, India’s share of world production is only around 6 per cent. With regard to productivity, India has attained a remarkable position of being the
second (944 kg /ha) among the leading rubber countries: Malaysia (1,232 kg / ha), Thailand (776 kg/ha), China (733 kg/ha), Sri Lanka (732 kg/ha) and Indonesia (661 kg /ha).

8. Growth of rubber plantations in India has been in leap and bounds. As of now, there are over 400,000 ha planted with rubber. Kerala accounts for 87 per cent of the area. The rest of the area is shared by Tamil Nadu (4 per cent), Tripura (3 per cent) and other States and Union Territories (7 per cent). The rubber consumption in the country has risen from 23,000 tonnes in 1951 to over 500,000 tonnes in 1995. India has 38 tyre units, over 300 medium scale units and about 5,000 small scale units, besides several hundreds of tiny units, all of which manufacture over 30,000 rubber products, ranging from tiny teats and balloons to aero tyres and parts for aircrafts and spacecrafts. They also cater to the needs of all the three wings of defense – Army, Navy and the Air Force.

9. Tyre industry produced 7.8 million tyres in 1980 and it has reached 17.4 million tyres and 12.6 million tubes in 1990-91. It was estimated that, by 1994-1995, there would be a demand for about 29 million tyres for domestic and export markets.

10. The non-tyre industry produces high technology and sophisticated industrial products. The small-scale sector accounts for over 50 per cent of production of rubber goods in the non-tyre sector. According to the rubber consumption, the automotive tyre sector is the single largest sector, accounting for about 46 per cent consumption of natural and synthetic rubbers. It is followed by
bicycle tyres and tubes (13 per cent), footwear (11 per cent), belts and hoses (8 per cent), and foam products (4 per cent). All other remaining rubber products put together account for the rest.

11. In Tamil Nadu, rubber goods are manufactured both in the organized and the small-scale sector. There are about 13 centres in the organized sector and about 60 to 70 small scale units manufacturing products like tyres, tubes, belts and reclaimed rubber, whereas the small scale sector manufactures products like rubber balls, washers, tread rubber, and rubber sheets. The number of licensed manufacturers during 1985-86 in Tamil Nadu was 253 and in 1998 it was 480 units. In Tamil Nadu, a few units like the Madras Rubber Factory, Dunlop, and Sri Chakra Tyres are manufacturing tyres and tubes.

12. It is a proud fact that rubber of standard variety is available from Kalkulam and Vilavancode taluks of Kanyakumari district. The average yield per hectare is 1500 kg. A maximum yield of 4,000 kg,ha is found in Kalial Village. The average yield is around 1000 kg / ha. Rubber industry is capable of earning good foreign exchange and thereby enhancing the living conditions of the people of the district. In rubber plantations, the workers could earn an income more than they could from the organized sector. Women in large number earn their livelihood from rubber plantations and rubber industries and have become self-dependent.
The Rubber Estates

13. Two of the 18 rubber estates sampled do not employ any labour, whereas 7 of them employ one labourer each, 6 of them 2 each and one each as many as 3, 4 and 12 labourers in the estates. The reason for no labourer being employed could be attributed to recent establishment of rubber plantations and the plantations not requiring labourers to take care nor tap the trees. Eleven of the estates do not have any supervisors while 7 of them employ one supervisor each. Thirteen of the estates have estate workers employed whereas the rest employ 1, 2, 3, 4 and 7 labourers, respectively.

14. Production and Value of Latex. Estates under 4 of the estate owners and managers do not harvest any latex as yet while others collect between 300 kg and 1,200 kg. Five of them report a production of less than 400 kg while rest of them more than 400 kg. The value of production is very low in the case of one plantation, while in others the range is very high: between Rs. 2,000 and Rs. 100,000.

15. Initial Investment and Annual Costs of Plantations. Inconsistency is seen in the underwriting or overstating of initial investments. The range of initial investments is Rs. 2,000 to as much as Rs. 600,000. Two each of the managers report of Rs. 25,000, Rs. 65,000 and Rs. 100,000 as initial investments made in their farms. It is obvious that in some cases this investment also
includes the cost of establishing the rubber plantation from the scratch. Similarly, they report also a yearly expenditure of Rs. 2,000 to Rs. 110,000. Four of the estate owners/managers indicate to an annual expense of more than Rs. 100,000; 2 of them between Rs. 75,000 and Rs. 100,000 and rest less than Rs. 30,000. One estate spends as little as Rs. 2,000 as well.

16. **Production and Value of Production in Estates.** The production levels for the latest year (1998-99) have shown a great range, from 400 kg to as much as 2,000 kg of latex. Most rubber estates (10) have very small levels of production and therefore small value of production. The value of production for the latest year ranges from Rs. 1,300 to Rs. 50,000. Only a few of the estates showed consistent levels of production over the last five years, whereas others showed varying levels. Production in 1994-95 was as low as 45 kg in at least one estate and it was 1,100 in another, and six others producing anywhere in between. The value of production reported by eight estate managers is from Rs. 400 to Rs. 26,000.

17. The industrial units producing centrifuged rubber report the value of products as being Rs. 1,300 to Rs. 50,000. At least three of them produce for less than Rs. 5,000; nine of them for Rs. 10,000 to Rs. 30,000 and only one of them for Rs. 50,000. Four of them produce for a value less than Rs. 5,000; 7 of them for value ranging between Rs. 10,000 and Rs. 18,000; and 2 of them for more than Rs. 25,000. Other rubber products produced have a value of production of Rs. 1,300 to Rs. 37,500.
18. Revealed perceptions about estates are that the expenditures on cultivation have increased tremendously (2 managers); and that there has been a great fall in prices of rubber in the market. Inputs have become costly over the years (3 of them) and production has grown at very slow rate (4). For improving returns from the production of rubber, there is need to fix a minimum protected price (5) and the government must take efforts at it. Six of the estate managers are already planning for rotation of crops and one each has no plan for any change, wants to change the system of production and renovate the factory for the future.

Rubber Factories

19. Market Value and Sale of Products. On an average, 7 companies produce about 100 kg of rubber bands every week and 200 kg of rubber sheets per week. The rubber bands are valued at Rs. 55 per kg while the rubber sheets at Rs. 86 per kg. Sakthi Rubber Products, for example, produces 500 kg/year and the products, because of the local markets, are valued at Rs. 40 per kg. The entire production is however sold at Nagercoil. Vivek Rubber Products sells its products in the north of India and also in the southern states, including Tamil Nadu.

20. Revealed Perceptions of Current Status of Factories. Modern machinery in King Rubber Factory makes possible production at lower costs. There is fashion that determines the new products. There is a continuous labour problem. It is not insurmountable.
There is therefore a setback to production, as both King Rubber Factory and Sakthi Rubber Products vouch for it. Although there are about 20 rubber industrial units, only 12 are fully operative and even they are constrained by problems they face day-to-day. Imported rubber is competitive in prices such that local products have low value in the market. As for elastic thread producers, as seen from the responses of Vivek Rubber Products, poor quality of latex is the current and serious problem leading to heavy loss.

21. **Expectations.** The factory owners/managers suggest several steps for fulfilling their expectations of higher production with higher returns. They would appreciate credits at low interest rates, steps towards ameliorating power shortages, and, most important, fair prices for rubber and rubber products. It would be helpful if the government procures the products and sells them at higher, supportive prices. According to the manager of Sakthi Rubber Products, sales tax should not be levied on rubber products and with the import of rubber products from foreign countries there is no upward trend in the production. Competition is high.

22. **Some Examples.** Comerin Rubber Products has shown a total investment of Rs. 2.248 million over the five years, fetching a total value of production of Rs. 6.792 million. Value added is Rs. 3.744 million, which is very good for a factory employing 26 workers, including the executive and 2 middle level employees. The capital / value of production ratio is 0.33 and the capital / value added ratio is 0.60. On both the counts, the Comerin Rubber products fares
better although the performance has to be improved over the years to have much smaller K/VP and K/VA ratios.

23. Sakthi Rubber Products has shown higher value of production (Rs. 657,000) and higher value added (Rs. 404,000) with a total costs of Rs. 312,000 over the last five years (1994-95 to 1998-99). The performance is however poorer than that of Comerin Rubber Products as the K/VP ratio is 0.62 and K/VA ratio is 0.77. King Rubber Factory has incurred a total cost of Rs. 2.19 million, which fetched over the five years a total value of production of Rs. 2.23 million. The value added for the five years Rs. 2.19 million, which is equal to the costs incurred in the factory. King Rubber Factory is not doing as well as it should and in a few years the operation will have to be folded with such poor performances.

24. Gnanam Latex, Thadikarankonam, is another factory with a poor performance. The total costs is Rs. 947,000 while the value of production is Rs. 1.52 million. The value added is Rs. 573,000 for the last five years. The K/VP ratio is 0.62 and the K/VA ratio is 1.65.

25. The cost-benefit profiles indicate that there are some industries, which perform well while others are not. The primary reason for poor performance is the price of products produced, no matter whether it is latex and other products such as the rubber bands, gloves and other essential products. Competition from Kerala and imports from other countries such as Malaysia and Thailand are
suffocating the industries. It has been observed that out of 30 factories in the state, only 4 or 5 are able to survive the onslaught of external and internal forces. Something has to be done quickly and in short term, if rubber industry has to thrive and sustain itself and the workers depending on it.

Rubber Plantation and Factory Workers

26. Workers with experience can do better than the inexperienced. Out of a total of 125 workers surveyed, only 51 (40.8 per cent) workers had previous experience before joining the present job whereas the rest had no experience whatever. The government plantation gives priority to experience in the process of recruitment of workers to the estates.

27. Skilled and Unskilled Workers. Tappers are skilled workers. Field workers, factory workers and watchmen are brought under the category of unskilled workers. According to our survey, 11.2 per cent of the workers are field workers, 27.2 per cent of them factory workers, and 2.4 per cent of them are watchmen. They are all unskilled. Of the workers, 59.2 per cent of them are tappers, and therefore are skilled.

28. The skilled workers constitute 52.50 per cent and 47.50 per cent, respectively in government rubber plantations. Migration of the rubber plantation workers is mostly due to economic factors, geographical, physical and political factors as well.
29. **Problems.** The rubber plantation workers in Kanyakumari district are faced with the two major problems. There are excesses in indebtedness. There is also addiction to intoxicants. These two problems have considerably restrained the growth of the material prosperity of the rubber plantation workers in Kanyakumari district.

30. Out of the 51 respondents who expressed that they had previous experience, 49.02 per cent were in the government rubber plantations and 21.6 per cent were in private ones.

31. **Working Hours.** The workers are engaged in 5 to 9 hours of work per day. A majority of 64 per cent is employed for 8 hours a day, while 16.8 per cent are employed for 7 hours a day; 12.8 per cent engaged in work for 6 hours a day; 4.0 per cent for 5 hours a day; and 2.4 per cent for 9 hours a day. The average hours of work per day is 7.93, with a standard deviation of 6.12 and high variation among the workers (cv = 0.779).

32. **Indebtedness.** About 82 per cent of the workers are in debt, and those in government rubber plantations (42 per cent) are in greater debts than those in the private employment. The amount of borrowing varies from worker to worker. It is from Rs 5,000 to as much as Rs 25,000.
33. The chief source of borrowing for the workers is the moneylender (48.98 per cent). The rate of interest charged by the moneylenders on loans varies from 36 per cent to 120 per cent per annum, depending upon the purpose of borrowal, the type of security offered and the duration of loan. Banks generally charge 11-18 per cent interest.

34. **Income and Expenditures.** Little more than a third of the workers (34.4 per cent) have a household income of less than Rs. 1,000 per month; 16 per cent of them between Rs. 1,001 and Rs. 1,500; about a third (31.2 per cent) between Rs. 1,501 and Rs. 2,000; and 17.6 per cent of Rs. 2,001 and Rs. 2,500. A miniscule 0.8 per cent have a monthly income of Rs. 2,501 to Rs. 3,000. Thus, most of them have an average of Rs. 1,477 per month among them. Standard deviation for household income is 742 while coefficient of variation showing smaller variations among the workers' households is 0.503.

35. **Food Expenditures.** For the workers, food forms the most important expenditure. A little more than a fourth of the households (26.4 per cent) spends less than Rs. 300 per month; 15.2 per cent between Rs. 300 and Rs. 900; 19.2 per cent between Rs. 900 and Rs. 1,100; 31.2 per cent between Rs. 1,100 and Rs. 1,300; and 8 per cent more than Rs. 1,300 per month.

36. **Savings and Indebtedness.** Two-thirds of the workers have shown that they are in the habit of saving. Savings can be as little as Re. 1
and as much as Rs. 100 per month. Nearly a third (32.8 per cent) of the workers has shown savings of Rs. 10 or less per month; 12.8 per cent between Rs. 11 and Rs. 20 per month; 4.8 per cent between Rs. 21 and Rs. 30 per month and less than 1.0 per cent more than Rs. 30 per month.

37. There are debts with a range of between Rs. 1,000 and Rs. 150,000. While nearly a fifth of them report little or no debts, 1.6 per cent has less than Rs. 1,000 as debts. The workers have shown varying levels of indebtedness, with 7.4 per cent between Rs. 1,000 and Rs. 3,000; 11.2 per cent between Rs. 3,000 and Rs. 5,000; 2.4 per cent between Rs. 5,000 and Rs. 9,000; and 20.8 per cent between Rs. 9,000 and Rs. 11,000. A very small proportion (1.6 per cent) of them report an indebtedness of between Rs. 11,000 and Rs. 13,000. More than a third (36 per cent) report having an indebtedness of more than Rs. 15,000. Among the workers, 4 per cent have shown very high levels of indebtedness, with more than Rs. 32,000 to as much as Rs. 150,000.

Cost-Benefit of Rubber Industry

The cost-benefit profiles for the four rubber factories indicate that there are some industries, which perform well while others are not. The primary reason for poor performance is the price of products produced, no matter whether it is latex and other products such as the rubber bands, gloves and other essential products. Competition from Kerala and imports from other countries such as Malaysia and Thailand are suffocating the
industries. It has been observed that out of 30 factories in the state, only 4 or 5 are able to survive the onslaught of external and internal forces. Something has to be done quickly and in short term, if rubber industry has to thrive and sustain itself and the workers depending on it.

Suggestions for Improvement

1. Production from existing plantations can be enhanced significantly through adoption of discriminatory fertiliser application based on soil and leaf analyses, systematic plant production, efficient crop exploitation through improved methods of tapping, rain-guarding rubber trees for enabling tapping during rainy season and chemical stimulation of yield.

2. Subsidies may be allowed for chemicals, especially fertilisers, at higher levels as the currently available subsidies are very low and ineffective.

3. A steady and remunerative price for rubber and rubber products is essential for the sustained development of the rubber plantation and industry. While import is curbed, the price of rubber and rubber products must be fixed in a way that fetches the producers adequate income. Support price should be such that the planters do not face problems of low price nor a glut of rubber in the market. Conversely, export of rubber and rubber products can be encouraged with incentives for better performance.
4. The watchword for rubber and rubber industry is improvement in productivity as a most pressing demand. As it is rapidly getting tougher to stay on in business, the industrial enterprise must be dynamic and should keep constant improvement.

5. Industrial links with foreign companies and foreign collaborative efforts can greatly enhance the production, efficiency and quality of the rubber products. Such collaborations may be considered also in the case of rubber plantations, with a view to improving export of rubber to other countries.

6. The workers suffer from want of employment during off and rainy season and as such their standard of living is always low, necessitating searches for alternative employment. But alternative employment is not available for plantation workers. This aspect must be further studied and solutions found for (a) identifying alternative or substitute activities including small-scale and self-help projects, (b) human capacity building and training, and (c) assistance for setting up alternative industrial/substitute activities.

Suggestions for Further Research

The study has given rise to a number of suggestions, three most important of which are given below:

1. In the light of the present study, there is need for a comprehensive study of the economics rubber plantations and rubber industries, most importantly on the nature, magnitude and extent of their
economic well-being, as all of them seem to be suffering from either a glut or low support prices.

2. It follows from the above that the regional input-output analysis in regard to rubber, primarily natural, synthetic and reclaimed, may be attempted so that the mechanisms that trigger off progress in such a vital industry as that of the rubber industry. Additionally, rubber products industries may be examined and their prospects analysed in the light of the world buoyancy, supply and demand mechanisms and price variations.

3. There is need for not only a comprehensive and elaborate survey of the plantation and industrial workers in rubber and rubber industry, but also to develop an management information system for the workers alone. Studies with special focuses on socio-economic welfare may be attempted as well.