CHAPTER 3

REVIEW OF LITERATURE

Many scholars have examined the importance of plantation crops in general and in the agricultural sector of Kerala and its impact and consequences. Compared to many other crops a large volume of literature is available on rubber. Below an attempt is made to review the available literature.

**Plantation Crops**

Plantation crops constitute a major portion of the total cropped area in Kerala. In Kerala plantation crops are of early origin. The present situation of plantation crops reached in India after a series of transition. Lovath Heather (1953)\(^1\) reviewed the transition of plantations crops in India during late 1800s and early 1900s. The first plantation crop which was developed and exported from south India was coffee. It appears that coffee was exported from South India as early as 1659 when the Dutch East India Company ordered consignment on a trial.

Langley W.K.M. (1954)\(^2\) made a comparative study about the development of coffee and tea in India. The area where tea was first

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developed in Kerala was Wayanadu and Peermade. Many of the British companies which developed tea plantations in India had first entered Coffee trading and cultivation. The record of Parry and Company shows that as far back as 1823 they were trading in Mysore coffee. This led to their involvement in the planting of coffee in the Kalpetta district and by 1850 they were well established in the Wayanad coffee plantations. Their subsequent turn over to tea and finally the sale of their tea properties to the Harrisons and Crosfield is a more recent history.

As international commodities there is international significance for plantation crops. Greaves I (1959)\textsuperscript{3} analysed the significance of plantation sector in the world economy. Historically and economically plantation system is international in character. Because of this character, the plantation crops have been associated with most political and international development of modern times, mercantilism and free trade; slavery and independence, capitalism and imperialism ........

The plantation crops have played a crucial role in the development of tropical economies. Wickiser V.D. (1958)\textsuperscript{4} evaluated

\textsuperscript{3} Greaves I, Plantations in World Economy, in Plantations of the New World (Washington 1959)

the significance of plantation crops in tropical underdeveloped
countries. Plantation agriculture has been generally ignored in the
rapidly expanding literature on underdeveloped agriculture. To a
large extent this expresses a view that plantation agriculture is
efficient and modern; It is particularly suited to bring previously
isolated areas into the modern world economy. The large scale
plantation units make possible economies of operation by the use of
labour saving machinery.

The development of plantation crops in the world is closely
related with colonialism. Mark Blang (1961)\textsuperscript{5} made a study about the
relationship between the two. Historically, plantations were the
product of colonialism. The British colonial expansion in Asia during
the early part of the 19\textsuperscript{th} century took the form of investments in the
colonies where raw materials and labour were cheap. At the same
time the rate of profit for re-investments in Britain was declining. It
was this quest to maximise profits which brought coffee, tea and
rubber plantations to countries like India and Ceylon. Even today it
has been estimated that the rate of return for foreign investments in
Asia is around 33 per cent, whereas the rate of return is less than 8
per cent.

\textsuperscript{5} Mark Blang \textit{Economic Imperialism Revisited} The Yale Review 1961.
Jones W.O. (1968)\textsuperscript{6} analysed the significance of plantation crops over other crops. A plantation is an economic unit producing agricultural commodities for sale and employing a relatively large number of unskilled labourers whose activities are closely supervised. Plantations usually employ all round the year crew of some size. They usually specialise in the production of only one or two marketable products. They differ from other kinds of farms in the way in which the other factors of production, primarily management and labour are combined.

Several economic and political factors are responsible for the development of plantation crops in Kerala. Best Lloyd (1968)\textsuperscript{7} analysed the historical evolution of rubber plantation in the world. Plantation agriculture is the outgrowth of the political colonisation of the tropical areas by the metropolitan countries of Europe. The colonisation activities of the metropolitan countries took two general forms (a) Colonies of Settlement and (b) Colonies of exploitation. Temperate areas which had been colonised by Europe- viz. the United States, Canada, New Zealand etc. involved the movement of people. On the other hand in the colonies of exploitation the metropolitan interest was primarily in production and trade (Caribbean Islands and


\textsuperscript{7} Best Lloyd, ‘Outlines of a model of pure Plantation economy,’ in; Social and Economic Studies, (Kingston September, 1968) p.37.
South East Asia). In these tropical colonies, capital and enterprise moved from the metro pole to produce 'Colonies of exploitation.' Thus the areas developed as 'Colonies of settlement' and the pattern of agriculture that emerged were significantly different from the tropical colonies. And the plantation was the best institution suited to metropolitan needs in countries of exploitation.

Although the cost of agricultural land in Kerala is high, the land for the cultivation of Tea, coffee and cardamom are cheap. This is one of the major reasons for the development of plantation crops in Kerala. Chaudhari M.R. (1978)\(^8\) analysed the growth of tea industry with special reference to price of land labour in India. The low price of land and labour in India played a pivotal role in the growth of Indian Tea Industry. Originally tea plantations were made in areas which were unsuitable for the cultivation of other crops and where land was cheap. In fact there was no question of tea competing for land with other crops in the jungle infested areas in North-East India and the hill slopes of South India. Land for this plantation crop was available at cheap price and so extensive cultivation was resorted to instead of intensive cultivation.

In India majority of families consume tea and coffee. Hence the population growth will be followed by increase in the consumption

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\(^8\) Chaudhari M.R. The Tea Industry in India (Calcutta, 1978) P.29.
of tea and coffee. Sib Ranjan Misra (1986)\(^9\) conducted a study about the consumption of tea in India. India’s domestic consumption of tea has been rising steadily at a rate faster than any other tea producing countries in the world. It has already surpassed United Kingdom as the largest tea consumer in terms of volume.

A tea plantation relies heavily on the presence of large supply of permanent resident labour. In South India tea plantations field labour on an average constitutes about 90 per cent of the total labour force and the rest 10 per cent is employed in the tea factories. Beefork L George (1972)\(^10\) made a comprehensive study about the social institutions in underdeveloped countries. In surveying the third world situation today, we can identify certain types of agricultural systems which reflect different economic, social and political conditions. Here we find the plantation system, the peasant system, the tribal system, and the feudal system and the state controlled system, all represent different institutional environments.

Dawood Nawaz (1980)\(^11\) reviewed the tea plantations in British colonies. A striking case among the colonies of exploitation is the


Asian Tea industry which was developed during the early part of the 19th century. The abolition of slavery by the British legislature during this period resulted in the planters turning to the tropical regions of Asia where the system of indentured labour had an advantage over the old slave system, where the labour is merely contracted for wage, and had to live only on his wage, whereas the old slave had to be housed and looked after. Capitalists' inexorable hunger for raw materials and markets made this development necessary, not the adventurer's desire to unravel the mysteries of the east, as some would have it.

The opening up of tea plantations in the tropical regions of Asia during the middle of the 19th century brought about the integration of these areas into the periphery of the British economic system. The British colonies changed the existing system of internal production and they linked these areas with the external situation, thus making it possible for the external factors to become operative through internal factors. This colonial transition was a direct result of the development of the forces of Capital accumulation in Britain and Europe. George Tharian K (1982)\(^\text{12}\) made an elaborate study about the tea plantations in South India. The Indian Tea Industry in general and the South Indian Tea Industry in particular are passing

\(^{12}\)George Tharian K: The Economics of Tea Plantations in South India, School of Management Studies, University of Cochin 1982.
through a serious crisis. The major cause of the crisis is the cost escalation and declining or stagnant prices. Consequently the attempt of the individual producer to improve his output levels to keep up with the cost increases have been aborted by the declining or stagnant prices and further increasing costs. The present situation does not permit sufficient cash accruals and thereby blocks plough back of funds for the growth of the industry. The present crisis assumes more importance when we consider the relatively declining auction prices and the stiff competition from the newly emerged rival producers whose cost of production is comparatively low.

Syed M. Ahammed, M. Ansari & Faridul Islam (2004) analysed the trends in the price of coffee and concluded that long term structural policies aimed at expanding export earnings through increasing export volumes and export diversification will be more helpful to the coffee exporting countries than short term stabilisation measures.

Rubber Plantations

Rubber trees grow and yield best in equable climate of tropical equatorial regions lying between 10 degree north and south latitudes. In India 50 per cent of the total planted area comes within these

ideal locations. The remaining areas experience rather inhospitable conditions to varying degrees.

Bauer (1948) made a comprehensive study on rubber. The growth of the industry, distribution of area under rubber, establishment of international rubber regulation, plantation labours and prospects of the industry in the world are the main areas of his study. Lin So Ching (1968) conducted a survey on the production of 470 small holdings in Malaysia, selected as containing either high or low yielding planting material on the basis of yield data recorded at group processing centres. This survey supplements previous works on similar holdings to establish yields, revenues, inputs and other costs as a basis for forward planning.

Technological improvement will act as an impetus to rubber cultivation. Rogers and Shoemaker (1971) observed that knowledge of improved technology might act as a strong motivation for its adoption among farmers. Rubber Research Institute of Malaysia (1975) evaluated the performance of different clones in Malaysia. Among the clones in the pipeline, RRIM 703, gave the

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highest yield of 1975 Kg/hectare over the first eight years of tapping. The other clones worthy of special interest are RRIM 712, PB 235, PB 255, and PB 260 with yields of more than 1600 Kg. per hectare over the first three to four years of tapping. To assist the industry in carrying out the planting of high yielding material, the supply of planting materials of the recommended clones was intensified.

Stifel (1975) made an effort to study the efficiency of sheet rubber marketing system in Thailand in the framework of the structure-Conduct-performance model from the field of industrial organisation. This study shows that the Government can make competition more workable by measures to increase the producers' bargaining strength, to improve the efficiency of the capital market, to encourage standardisation of the quality of produce, and by continuing to push feeder roads into the rubber producing areas to increase the size of effective markets.

Grace (1977) realised that wind and storm adversely affect rubber cultivation. The damage caused varies with the age of the tree and the nature of wind. Morphological and anatomical deformations

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are reported to be usually associated with high wind velocities. One of the notable features of trees in windy areas is the deformation of their canopies leading to an asymmetrical architecture in which the branches appear to be swept to the leeward side.

Jose Thomas (1979)\textsuperscript{19} made a study about the economics of rubber plantations in Kerala. After discussing the importance and growth of the industry, various development schemes are explained. The role of Rubber Board and Rubber Marketing Societies in the development of the industry is examined. The demand - supply position of natural rubber industry and cost of production was studied. The profit shares of the estate sector and the small holding sector were compared by using the break even chart. The major conclusion of the study was that the estates enjoy higher rate of profit than small holdings. Further conclusions of the study are

i) Wide fluctuations in the price of natural rubber adversely affect long term supply due to difficulties in making healthy long term plan for future production.

ii) Marginal improvement in production is higher in small holdings.

iii) The Break Even Point of NR in the estate sector increased from 410 Kgs. in 1965-66 to 631 Kgs. in 1974-75. The profit share

\textsuperscript{19} Jose Thomas (1979)(Dr) - The Economics of Rubber Plantation Industry in Kerala. Ph.D. thesis submitted to Cochin University of Science and Technology (Unpublished) .
remained more or less the same during the period in the estate sector. The Break Even Point in the small holdings are 325 Kgs. and 474 Kgs. during this period. But the share of profit decreased.

Kanbur and Morrie (1980)\textsuperscript{20} made an effort to study the measurement of cycles of natural rubber prices. The principal thrust of the study was to analyse the short term fluctuations in natural rubber prices prevailing in the important markets of the world. The study reveals the existence of cycles of 30 months.

Barlow (1980)\textsuperscript{21} published one of the most important books on rubber. In this book he gives historical, technological, social, political and economic aspects of Malaysian rubber plantation industry. The ultimate goal of the development of the industry is perceived in this book as the maximisation of the social value product, this being defined in broad terms which includes an equitable distribution of gains amongst all members of society. Technological aspects of production and processing and the development of synthetic rubbers are analysed. The structure of marketing channels between producers and consumers and the organisational arrangements on patterns of resource allocation are also examined.


Dowling (1980)\textsuperscript{22} made a study of the measurement of cycles of the prices of natural rubber. The main thrust of the study was to analyse the short-run fluctuations of natural rubber prices prevailing in the important rubber markets of the world. The study revealed the existence of cycles of 30 months.

Pushpadas and Karthikakutty Amma (1980)\textsuperscript{23} point out that for optimum growth and yield, rubber requires an evenly distributed rainfall of 2000-3000 MM in an year. In areas where rainfall is much less, it was found that the tree becomes stunted in growth with crooked stem and lesser number of branches. The growth of tree is retarded in regions during drought season. Temperature is one among the key environmental factors influencing plant growth. Monthly mean temperature of 21 C.to 35 C. without wide variations is found suitable for the growth of rubber. A humid atmosphere throughout the year without much variation is found to be ideal for successful cultivation of rubber. The relative humidity varies from about 70 per cent in January to 95 per cent in August in many of the rubber growing regions in India. The growth of rubber has been

\textsuperscript{22} Dowling(1980) \textit{The Supply Response of Rubber in Thailand. } Discussion Paper 58. Thamsat University.

found satisfactory up to 450 Metres above sea level. At higher elevations temperature becomes unfavourable for proper growth. In an experiment conducted at West Java Experiment Station to compare the performance of Hevea at two locations 515M and 250M above mean sea level, it was found that there was considerable retardation of growth at high elevations. The yield of rubber is highly related to the number of rubber cultivated per hectare. In India the Rubber Board recommends a maximum population of 500 plants /ha.

Tausar (1984) conducted a comprehensive study of the world rubber market structure and price stabilisation. The main theme of the study was the estimation of an econometric model of the world natural rubber and synthetic rubber market to explain natural rubber overtime. This study developed a model of the world rubber market with explicit treatment of the synthetic rubber industry and oil price, the latter being a key variable about which there is great uncertainty and worry. The study also analysed the implications of rubber market stabilisation along the lines of international natural rubber agreement. The study emphasised the need for stockpiling policy so that consumers will not be faced with unforeseen shortages.

Ciciliamma Thomas(1984)\textsuperscript{25} studied the structural changes and profitability of the rubber plantation industry. She analysed the changes in rubber area compared to other cash crops. A major reason for the changes in the area under rubber cultivation was the proliferation of a large number of small holdings. Supply response of natural rubber was studied using a single distributed lag model which hardly considers the characteristics of a perennial crop like rubber. It was found that the price of competing crops had a greater influence on the changes in area and output than the lagged prices. The profitability of rubber cultivation among small holders are analysed from a single village in Meenachil taluk where yield/ha is highest in Kerala. Therefore the conclusion cannot represent the general situation in Kerala.

Chew (1984)\textsuperscript{26} estimated the rate of technological change in Chinese small rubber holdings in Peninsular Malaysia under the framework of Cobb-Douglas production function. It was specified and fitted to two sets of cross sectional data collected in 1963-64 and 1978-79. The study concluded that the technological changes in the


Chinese rubber small holdings are capital augmenting type. The estimated rate of profit was about 1.2 per cent per annum.

James (1985) analysed the role of subsidies in rubber cultivation. The analysis was on various schemes of the Rubber Board to enhance the production of natural rubber in India. The study aimed at the evaluation of rubber board subsidies on the basis of distributive justice and research development. The conclusion of the study was that equity consideration was not at all the intended objective in the case of rubber subsidies. In the case of research development of the rubber board, a restructuring may be made with a broad social science perspective.

George Tharian (1986) conducted a survey on the international commodity agreements with special reference to natural rubber. He observed that natural rubber price exhibits a higher degree of instability in the international market and this exposes the fragility of the framework where commodity agreements are operating.

Though there are different clones used for rubber cultivation RRII 105 is the most widely used variety. Saraswatiamma, George and

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Panikar (1987) in an estate trial with 10 clones including RRII 105 and other 9 popular clones, found that RRII 105 had the highest yield but susceptible to brown bast (15 per cent) under $1/2 S$ and $d/2$ tapping system. RRII 105 was reported to be a sturdy tree with tall straight trunk and with good branching habit. In general the RRII 105 showed a higher degree of tolerance to abnormal leaf fall and moderate resistance to odium and high susceptibility to panic disease.

Michael (1989) analysed the economics of rubber plantations owned by small growers. The study was about the rubber growers in Meenachil Taluk in Kottayam district. Here a comparative study was made with respect to the profitability of rubber plantation with Cocoa and Coconut plantation. The study reveals that rubber is the most profit making cultivation in Meenachil taluk. In economic terms while rubber growers get a profit of Rs.2962/- per hectare, Cocoa and

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Coconut growers suffer a loss of Rs.659/- per hectare and Rs.4860/- per hectare respectively in Meenachil taluk (1984 prices).

Joseph Kochikudy (1990)\textsuperscript{31} analysed the performance of rubber plantations in Kerala. The study was based on secondary data from Rubber Board and official publications. Here the area, production and productivity of natural rubber from 1956-57 to 1985-86 was analysed. The study reveals that rubber has replaced large areas covered by Coconut and Tapioca. When there is such a substitution of an annual crop by a perennial crop or a perennial crop by another perennial crop, there will be an apparent decline in output due to long gestation period. This is only a temporary phenomenon and not an agricultural doom.

Jacob (1990)\textsuperscript{32} also had opined that the rubber marketing and related activities are all the more important because the bulk of the produce comes from a vast number of small farmers owning less than one hectare of rubber area. The peculiarity of rubber plantation industry has also brought in its wake many complex and complicated problems in marketing. Small holders account for 82 per cent of the total area in the country. Their share in the total natural rubber


production is 79 per cent. These are bound to increase substantially in the coming years.

Raju (1990) analysed the economics of rubber based industry in Kerala. The study was based on the primary data from rubber product manufacturing units and secondary data from annual survey of industries, Kerala State Planning Board, Rubber Board etc. The conclusion of the study is that although number of units and consumption of rubber has increased considerably, productivity in the rubber based industry showed a declining trend over the years. Rubber based industrial units are facing a large number of problems such as under utilisation of capacity, power shortage, problems in marketing etc. These anomalies can be removed only with the assistance and co-operation of the Government, Rubber Board, financial institutions and trade union leadership.

Abraham (1991) analysed the performance of different clones of rubber in Pathanamthitta district and found that RRII 105 was the highest yielder (1528 Kg./ha) followed by RRIM 600 (1194 Kg./ha) in the district. The higher yield is due to the interaction between the

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clones and the agro-climatic situations of that area coupled with high intensity of tapping. He revealed that the incidence of brown bust in RRII 105 and RRIM 600 is 5 per cent and 6 per cent respectively. Though RRII 105 was highly tolerant to phytophora, RRIM 600 had severe incidence (40 percent). The incidence of pink disease in RRII 105 was 15 per cent whereas it is little low in RRIM 600 (10 per cent). The study also reported that the odium attack was comparatively low for both clones in that area. Wind damage of RRII 105 was to the tune of 7 percent followed by RRIM 600 with 5 per cent.

Omman Zachariah (1992)\textsuperscript{35} analysed the economics of rubber wood industry in Kerala. The study was based on primary data from rubber wood manufacturers, and secondary data from rubber board and forest research institute. The study reveals that rubber wood industry has a very great potential. This can be attained by coordinating the activities of individual units and institutions, by conducting the research in perfecting the method of treatment, popularising the product and by controlling the cost of inputs within reasonable limits.

\textsuperscript{35} Omman Zachariah-(1992) \textit{The Economics of Rubber Wood Industry in Kerala}. M.Phil thesis submitted to Cochin University (Unpublished).
In view of the poor price prospects and scarcities of land and labour in the future, Krisanasap (1993) predicted that the annual rate of rubber new planting will decline substantially from 16,000/ha in 1993 to 10,000/- hectares in 1994. The decline will continue further until the stabilisation rate of 6,000/ha is attained from 1998.

The world investment report (1993) of UNCTAD speaks of the emergence of an integrated global system of Production. In the past multinational companies transferred particular activities to locations with cost advantages. They are now slowly moving to a system where all the activities of the firm are being undertaken in different locations depending on respective advantages.

Joseph and Haridasan (1993) in a study revealed that 84 per cent of the area under their study was planted with the clone RR11 105.

Cyriac (1994) evaluated the consequences of GATT accord and concluded that" The General Agreements on Tariff and Trade

36 Krisanasap(1993)-Natural Rubber Production Possibilities and capacities for Thailand. Rubber Research Institute, Department of Agriculture, Thailand.


(GATT) and liberalisation of the economy will have no impact on the rubber industry if the industries maintain a very high quality for their products”.

Other than climatic factors the role of government has been significant in rubber plantation industry. In this aspect George, Haridasan and Sreekumar(1994) realised that factors such as exemption from land ceiling legislation and promotional schemes of the Government etc. promoted the small growers to cultivate rubber extensively.

Thilakarathna (1994) analysed the effect of liberalisation of Sri Lankan economy on rubber. According to him the liberalisation of economic policies adopted in Sri Lanka since 1977 has led to a surge of activities in the rubber products arena. Industries exporting value added locally available raw materials, rubber products in particular, were identified as an area suited for foreign investment and afforded pioneer status. Yet the overall progress made in the rubber products manufacturing sector till 1989 had been rather slow. For

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instance local consumption in 1989 constituted less than 20 percent of total rubber production.

However, local consumption has increased rapidly since 1989. The consumption of dry rubber, latex and total rubber have increased by 22 per cent, 92 per cent, and 37 per cent respectively during 1989-1992.

Ajithkumar (1994)\textsuperscript{41} conducted an econometric study of the impact of the technological changes in the rubber plantation industry of Kerala. The study included gestation period, productive life, yield profile, weather conditions and the quality of planting materials. The study shows that in estates where bud grafts are used as planting material, the elasticity of output with respect to tree index, fertilizers and other inputs expenses are lower than the elasticity for estates using clonal seedlings. The size of the estates does not significantly affect the yield per hectare. The technological change experienced during the last four decades (1954-1994) has a very positive impact on the rubber plantation industry in Kerala.

Hanumantha Rao (1994)\textsuperscript{42} in an analysis of liberalisation and agriculture argues that raising the productivity of resources through better allocation between different crops and regions and adoption of improved technologies is a major objective of liberalisation. Export orientation would provide incentives for the regional specialisation of crops and use of new technologies in production, processing, and marketing. However, a high priority is needed for soil and moisture conservation in rain fed areas to facilitate the adoption of new methods there. If agricultural growth is not to be constrained by the domestic demand but should indeed contribute to raising the overall economic growth, then agricultural growth need to be stepped up for exports by diversifying the areas, he suggests. According to him agriculture can serve as the biggest safety net in the process of adjustment not only by softening the rigour of inflation but also by providing new avenues of productive employment.

Lalithambika (1994)\textsuperscript{43} analysed the production and consumption of natural rubber from 1980-81 to 1993-94 and projected that there will be an internal deficit between 2000 and 2010. Hence World Bank aided project to enhance the production of natural rubber is needed.

\textsuperscript{42} Hanumantharao, C.H. (1994) \textit{Liberalisation and Agriculture}, Yojana, August 1994, New Delhi
Mohankumar and Babu (1994) made a study of the production and consumption pattern of natural rubber and synthetic rubber in India. The data used were the production, consumption and import of natural rubber and synthetic rubber from 1988-89 to 1992-93. The conclusion of the study was by 2000, the synthetic rubber industry would determine the price of natural rubber in India. The data used were the production, expansion more of both special purpose and general purpose synthetic rubber and thus meet the entire requirement of new rubber in the country.

Sekhar (1994) evaluated the scope of natural rubber and remarked that natural rubber is becoming an essential commodity for almost all the industry. Without an adequate supply of natural rubber, the wheels of world industry will come to a grinding halt. There is virtually no commodity that occupies such an equally strong and irreplaceable and use requirement position. So, natural rubber has a bright future. With globalisation of manufacturing and trade and the seat of elastomer consumption growth located in Asia, rubber producing countries are not at the mercy of the so called industrial nations.


Tiyo (1995)\textsuperscript{46} reviewed the natural rubber market in India. The review was on the basis of data of monthly prices of natural rubber from 1991 to 1995. The main conclusion of the review was, imported natural rubber is going to be the main culprit in depressing the domestic market in 1995.

Usha Devi (1995)\textsuperscript{47} assessed the technology adoption made by small rubber growers. The data used for the study was from 100 samples selected from Vellilappilly village of Kottayam district and secondary data from Rubber Board publications. According to the study, the development of technology makes a positive change in the area, production and productivity of rubber and hence the economic well being of the people in rubber growing areas. Rubber Board should make necessary arrangements to educate the small rubber growers regarding the advancement in technology related to processing and marketing of natural rubber.

Stephan Analil (1995)\textsuperscript{48} analysed the performance of rubber marketing societies on the basis of quality up gradation, market

\textsuperscript{46} Tiyo -(1995) \textit{Natural Rubber Market Set to Decline}. Rubber Asia July – August Cochin 1995.


\textsuperscript{48} Stephan Analil (Dr)(1995) \textit{Role of Rubber Marketing Societies in the New Economic Order}. Paper presented in National
coverage and structural modifications. The conclusion is that the share of co-operative rubber marketing societies in the total rubber trade is comparatively low (less than 10 per cent). The societies are to be turned into vibrant business units, with full support of the farming community. Co-operatives should be capable of facing the future challenges posed by the new liberalised economic environment, and reap opportunities for the welfare of the nation and the rubber economy as a whole and the small growers in particular.

Jacob Mani Mannothra (1995)\(^49\) assessed the impact of new technologies on rubber production. He analysed the quality of tapping and stated that a host of new technologies are emerging from the world of rubber research which promises cost effective quantum jumps in the yield within a short period. A time bound action programme need to be developed for farm research and implementation of appropriate techniques.

Tong Kok Hung (1995)\(^50\) analysed the scope of rubber wood manufacturing industry with special emphasis to Malaysia. The analysis reveals that the rubber wood industry requires further


investment for upgrading of products, utilisation of new technology
for automation and product diversification. Above all there is a need
to venture into new markets as there seems to be an over
dependence on a few major ones. He predicted that the demand
for rubber wood will increase significantly as there is still ample
room for further investment particularly in the furniture sector.

Kuriakose (1995)\textsuperscript{51} made a study about the marketing channels
of natural rubber with special emphasis on co-operative marketing in
Kerala. The study was on the basis of secondary data and survey
conducted from among 1500 samples selected from Kottayam and
Pathanamthitta districts. The study shows that co-operative rubber
marketing in Kerala covers only less than 20 per cent of the
marketing of natural rubber. The domination of private dealers is
due to giving advance during off season and the facility to settle
value of rubber at any time and spot payment if required. The
weaknesses of rubber marketing societies can be avoided by
providing timely finance from apex institutions, by making efficient
accountable management, by avoiding political interference and
observing the co-operative principles.

\textsuperscript{51} Kuriakose K.K. (1995) \textit{A Study of the Marketing Channels of
Natural Rubber with special Reference to Co-operative Marketing
Studies- Cochin University of Science and Technology
(unpublished).
Chakravarthy (1996)\textsuperscript{52} evaluated the innovative trends in the rubber blends. The evaluation was on the basis of fuel efficiency, tyre performance and the properties of rubber. According to him efforts are on for the development of and production of natural rubber based blends to combine existing polymers to exploit their different, but complementary properties.

Zia Qureshi (1996)\textsuperscript{53} while analysing the opportunities and challenges of globalisation on the basis of capital inflows to developing countries from 1991-94 concluded that the increasing integration of developing countries into the global economy represents a major, perhaps the most important opportunity for raising the welfare of both developing and industrial countries over a long term. The article is based on World Bank report -Global economic prospects of the developing countries.

In 1949, 68 per cent of the area under rubber was owned by estates of 20 hectares and above. But now the situation has changed. At present (2003) small growers constitute 99.9 per cent of the rubber growers and 85 per cent of the area under rubber.


Kerala State Planning Board (1997)\textsuperscript{54} analysed the performance of various plantation crops in Kerala. According to the review, among the plantation crops, rubber is the largest with respect to the coverage of area. Out of total area of 5.23 lakh hectares under cultivation in the country, 4.49 lakh hectares are in Kerala. The production and consumption of natural rubber is increasing in the country. From the review of the production of plantation crops from 1990-91 to 1996-97, rubber is the only plantation crop in Kerala which is showing an increasing trend.

Devinder Sharma (1998)\textsuperscript{55} analysed food and trade policy in the light of globalisation and remarked that India's food self sufficiency is being sacrificed at the altar of globalisation and non-proliferation with the government agreeing to accept the intellectual property regime and frontload agriculture in the phase out programmes of trade barriers that protected the gains of green revolution against an influx of cheap and highly subsidised grain, the survival of the Country's 400 million farmers is now at stake.

\textsuperscript{54} \textit{Economic Review} (1997) Kerala State Planning Board, Thiruvananthapuram

Cyriac (1998)\textsuperscript{56} stated that as in Malaysia and in other major rubber producing countries, a sizeable portion of natural rubber in India was processed into latex concentrates and the availability of Ribbed Smoked Sheets (RSS) came down.

Maurice Cain (1997)\textsuperscript{57} Secretary General of International Rubber Study group, U.K. in the seminar on `Outlook of Indian Rubber Industry-Trends and Challenges' predicted a shift in the pattern of domestic rubber consumption in India from its reliance on natural rubber to achieve a position more in line with the world pattern in favour of predominantly synthetic rubber. To him the demand for rubber will nevertheless continue to increase as population growth and economic growth continue. Both natural rubber and synthetic rubber will face supply problems in the medium term. However, the synthetic rubber sector will be able to match the increase in supply with that in demand because it is based on a relatively small number of national and multinational companies.

Phani Deka (1999)\textsuperscript{58} searched the scope of rubber based industries in India. The analysis was based on the consumption of


\textsuperscript{58} Phani Deka (Dr.) (1999) Industrial Development. (Rubber Asia Nov-Dec 1999 Cochin)
rubber goods manufacturing industries in India in 1992. According to him there are no rubber based industry in North Eastern states of India except a few latex processing units in Tripura. Therefore, there is good scope for rubber based industries in the region.

Sundar(2000)\textsuperscript{59} while assessing the effects of devaluation stated that the rubber growers are convinced that the Rubber Board, or the Commerce Ministry or their own associations are not prepared to meet the emerging WTO challenges. All that the planters wanted to know from the government was a convincing list of actions taken or proposed to be taken to ensure that their fate was safe.

Tony Prasetiantono (2000)\textsuperscript{60} evaluated the performance of world rubber industry in 2000. He felt that due to better economic performance and the world wide trend, it will be a good opportunity for the rubber industry to grow faster than that in the previous periods. Whether there is another Asian crisis or not, companies or industries need to gear up for global competition by boosting efficiency, quality and customer service.


Jiang Jusheng and Zhou Zhongyu (2000)\textsuperscript{61} assessed the prospects of natural rubber in China. Using simulation method they predicted that the consumption of natural rubber in China in 2030 will be 189.43 million tonnes. According to them it is necessary to reform the management system of the Chinese state farms and reduce a large number of non-production staff to decrease production cost, strengthen economic vitality to enhance the competition ability of natural rubber. Private rubber plantations expand swiftly and the activity of planters in planting rubber continues to rise in contrast to what is happening in state farms.

Joseph Sunny (2003)\textsuperscript{62} made a study about the real estate and housing finance in Kerala. The study reveals a trend of increased use of agricultural land for non-agricultural purposes in all parts of the state. The increasing pressure on land for housing, increasing population, escalation of land prices, scarcity of suitable house plots etc. have necessitated the use of land hitherto used for agricultural purposes to non-agricultural purposes. But this trend is not reflected in rubber plantations which show a constant increasing trend with respect to area under cultivation.


\textsuperscript{62} Joseph Sunny (2003) \textit{Flow of Credit to commerce and trade in Kerala – A study of Real Estate and Housing Finance in Kerala.} Ph.D thesis submitted to M.G. University, Kottayam,(Unpublished)
As mentioned in the beginning of the review of literature, many scholars have examined and discussed the various dimensions of rubber plantations. But the reviews made it clear that majority of them are centring on the technology of rubber plantations and associated issues. Only a few studies cover the economics or marketing dimensions, that too, they discuss only the conventional dimensions and not the appropriation of surplus income. Hence a study examining the impact and implications of globalisation on rubber economy is quite relevant.