THINK INDIA JOURNAL

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Rubber Production and Marketing with emphasis on the small scale growers and the Rubber Producer's Societies (RPSs): A literature Review

Stephen Mathew

Assistant Professor

Department Of Commerce, St Stephens College

Uzhavoor, Kerala

This article presents an account of various researches conducted in areas relating to rubber cultivation, processing, production and marketing with emphasis on the small scale growers and the RPSs.

Rubber industry in India has been studied extensively: Studies on rubber cultivation by small growers, marketing of rubber produced by them and the RPS functioning has been enquired into by different researchers from time to time. As the present study aims at extending available knowledge on the area through the study, accounts of related studies are presented under two categories: 1. Studies pertaining to general aspects of rubber production, processing and marketing. 2. Studies focusing on the functioning of RPS and the small scale rubber farmers.

Studies pertaining to general aspects of rubber cultivation, production, processing and marketing

Aziz, Abdul, and Kadir, S. A. (2014) examined the research achievements, challenges and future directions for R & D in the rubber growing countries. They held that the predominant role of the rubber smallholders in the NR industry combined with declining interest of the plantation sector posed new challenges to the public sector R & D institutes in ensuring the continued viability of the industry. According to them, the mechanism of transferring research findings effectively to the small holders and encouraging the development of the small and medium scale industries (SMI) involved in rubber products manufacturing need improvement.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Beliczky, Louis, S. and Fajen, John (1982) stated in the Encyclopedia of Occupational Health and Safety that controlling the environmental and health issues in the rubber industry can be done, but it will not come easy or be free. The cost associated with controlling environmental and health problems must be added to the cost of rubber products. They found that most of the epidemiological studies of cancer in rubber workers have not been based on reliable industrial hygiene data.

Budiman, A. F. S. (2013) examined the global price trend of Natural Rubber. According to him the price of NR was one of the most significant issues of the global rubber industry and trade, as NR became more of a social commodity affecting the livelihood of over 35 million small holders worldwide. He held that the most important period for price forecasting is the medium-term, ranging from two to five years ahead, as this is generally the time-scale on which business investment decisions are made. He anticipated imminent shortage of NR supply in the near future, medium – and long-term trend of NR prices were quite favorable but still hard to secure due to great uncertainties of the world situation in the years ahead, which could influence the demand side to a great extent.

Chandy, B., *et. al* (2010) presented a paper contextualizing the long-term trends in the real values of price, farm income and wages in Kerala's natural rubber sector in the era of market uncertainty. The analysis revealed that despite the pivotal role of the rate of growth in productivity in sustaining the tempo of growth in farm income during the 28 year period under review, the outcome during the post-reforms phase had been influenced more by the trends in unstable prices. The emergence of unstable prices as the major determinant of farm income in the post reforms phase poses serious policy challenges to the rubber plantation sector in the state.

Deepthi, S. (2014) analyzed the evolution and the performance of selected RPS involved in marketing of latex/sheets and assessed the impact of marketing NR through these RPS. The study was carried out in the Kollam district where the RPS has not attained the same level of growth as in other parts of the state. An exploratory and analytical study compiling both quantitative and qualitative methods have been employed. The results of the study indicated that marketing/group processing through RPS helped in improving the quality of the produce and also could limit exploitation of cultivation by middlemen to a great extent. The stages of

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

exploitation by middlemen in the marketing channel was also assessed and the gross revenue to the growers as a result of their participation in the RPS activities quantified.

Ganesh, S. P. (2012) examined the state of Natural Rubber industry for a period of 55 years. According to him the rubber industry recorded growth and prosperity through modernization, a level of modernization no other major agricultural crop has achieved in India. Basically, the statutory protection given to Natural Rubber has made the growth possible.

Geevergees, P.V., *et. al* (2013) narrated the following as the advantages of group processing and marketing management system: (a) revival of inactive Rubber Producers' Societies through extension support (b) sharing of resources available with the farmers and between Rubber Producers' Societies (c) switching over strategy for production of different types of rubber as per market demand (d) improvement in bargaining capacity, and quality improvement through collective processing and strict supervision. The challenges facing the rubber plantations particularly the small growers could be addressed through the group approach manifest in the RPSs. The consortium of Rubber Producers' Societies and marketing companies in the co-operative sector now under operation in some regions of the traditional rubber growing tract of Kerala had proved their worth in this context.

George, *et. al* (2010) found that the rubber industry linked business men stocking natural rubber in their go-downs, to control the price of rubber in the market to their advantage : buying and importing rubber at cheap price and keeping away from market during peak production season were reported as the usual cartel strategies to exploit the small scale rubber cultivators.

George, Tharian, K. (2014) listed the major achievements of the Economics Division of Rubber Research Institute of India such as building up a comprehensive database, analytical inputs on yield performance of major planting materials, rubber products manufacturing industry, foreign trade in rubber and rubber products, rubber wood and honey etc.

Gopalakrishnan, C. (2011) reported that India attained the position of third large Natural Rubber producing country and the fourth largest Natural Rubber consuming country. He estimated production at 630,000 tonnes that was consumed domestically.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Joby, Joseph and George, K.T. (2016) conducted a study entitled 'India's Trade Liberalisation Initiatives and Trends in Balance of Trade under the Regional Trade Agreements: The Case of Rubber and Rubber Products'. According to them the aggregate level analysis of India's external trade during the 17-year period highlights the following aspects: a sharp increase in the growth rate in the value of imports and a steep fall in the rate of growth in the value of exports during the post-reforms phase which are not only serious issues of policy concern but also requiring the need for detailed disaggregate level analysis on the performance of the major product groups.

John, K. K. (2002) stated that the RPS did some commendable job for stabilizing the price of natural rubber, especially at times of price slide by helping the growers to stock their produce till the price improves. Through stocking, supply of rubber could be regulated in accordance with the demand and price by blocking the immediate entry of natural rubber into the market. The study suggested that the Rubber Board and Government should provide funds for the construction of go-downs to RPS.

Joseph, K. J, and Kumar, Ajith, C. E. (2016) conducted a study on the cost and returns of natural rubber production in Kerala. This study revealed that, given the ongoing crisis in India's natural rubber sector, which performed remarkably well in the past, there had been demand for intervention of the state from natural rubber growers. For policy intervention reliable data on cost and returns of natural rubber production were required, which were not available. The operational cost per acre of rubber was found to be Rs 37936 in Kottayam and the corresponding cost per Kg of rubber was Rs 91. However, the total cost per acre in the state was estimated at Rs. 48424; the cost per Kg of rubber produced was calculated to be Rs 117.

They also projected different economic cost scenarios by taking into account, returns from inter crop, subsidy received, potential income from the sale of rubber wood and finally the interest on the value of land used for cultivation. The estimated ratio of returns to cost was found to be greater than one in more than one district. Yet, the estimated net operating income per acre was only Rs 16732. The net total income from an acre was estimated to be much lower, at Rs 5685 in Kottayam. At the going market price, the recorded net operating income and net total income for those with holding size below two hectares and depending entirely on rubber cultivation for their livelihood was computed to be below the benchmark income for poverty line. They also

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

revealed that in the current context, the need to ensure remunerative prices along with measures that contribute to cost minimization, higher yield and improving output quality by revamping the R&D, extension, training and developmental activities of the Rubber Board with a new orientation cannot be over emphasized.

Joseph, Mathew, C. (2012) reported that the rubber sheet processing continued to be labour intensive, time consuming and requiring more infrastructure in the age old way without out any modernization. The invention of new coagulation time with horizontal partition and design trolley smoke house were reported to be important steps in the mechanization of the rubber sheet processing by achieving the goals of quality improvement, cost reduction and drudgery relief. The new devices also ensure the efficient utilization of time, labour and space which are actually limiting factors in rubber sheet processing of small rubber farmers.

Kumar, Krishna, A. K. (2009), held that the Rubber Producers' Society was a valuable asset attempting at the reformation of the small-scale rubber growers. Though small farmers having an average of less than half a hector of rubber-cultivated land in possession produce 87 per cent of the total rubber produced in India, they got less than the market price. The main reasons for this were the shortage of basic facilities and unorganized small scale cultivators. Only the Rubber Producers' Societies could make the technological and scientific knowledge available to the farmers, distribute agricultural implements to them and make available other facilities that they need.

The Rubber Producers' Societies in the villages need to be strengthened by providing required professional support through appropriate agencies. The study suggested that the Rubber Board and the government should take special effort to increase the financial assistance given to the small rubber growers and strengthen rubber marketing societies and the Rubber Producers' Societies.

Kuriakose, K. K. (1995) stated that the formation of the Rubber Producers' Societies in each village for daily collection of latex and scrap rubber, facilitates the full utilization of the production capacity of the processing factories run by the marketing societies. The Rubber

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Producers' Societies in the villages need to be strengthened by providing required professional and financial support through appropriate agencies to help the small growers.

The difference in price realized by the growers in the RPS compared to non members were found statistically significant. Quantification of the impact of the RPS on adoption of cultural practices and organizational development was carried out. The role of RPS in capacity building at the grass roots level also was elucidated.

Kurian, Thomas, K and Panickar, A.O.N. (2014) described the genesis and development of Indian Rubber Plantation Industry. The early and post independence development of both rubber plantation and rubber manufacturing industry were very vividly narrated.

The role played by the Rubber Board, the development agency created under the Statute, with its contributions in research and development, strong extension support, imaginative and liberal but judiciously distributed financial aids and an organizational system which has built up capability to identify, even anticipate, problems and design measures to effectively combat those have resulted in the accelerated growth of the rubber industry.

Lalithakumari, E. and Jacob, Jom (2010) outlined some components of the rubber industry. They identified the Production Sector, Imports and Exports, Price, Types of Rubber and the availability of rubber in the world scenario as the major components of the industry. According to them Indian Rubber Industry after passing through many vicissitudes attained a fairly significant position in the global arena with its size and different structural parameters.

Mani, K. P. (2011) observed that Kerala has the virtual monopoly in the production of rubber in the country. According to him, the crucial question is whether the excess supplies of rubber in relation to consumption "within State" will attract sufficient margins permanently.

Menon, Mukundan, P. (2002) described the past, recorded the present and predicted the future situations of Natural Rubber in India. Menon outlined the history of the rubber tree and the growth and development of rubber plantation industry in the country. He also examined how the overall development and prosperity of the industry had been achieved, what factors had played crucial roles in the process and what the foreseeable future can be considered to hold for natural rubber in India.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Planning Commission (2008) in its Kerala Development Report considered rubber as an agricultural commodity to be protected against dumping by major foreign producers of rubber. The difference between the domestic and international rubber prices and its implications for the domestic producers were also visualized by the commission.

Sebastian, Prince, *et al* (2104) presented a paper containing an evaluation of the various training programs for the small holdings sector conducted by the Rubber Board, such as training for small growers (both off and on campus), seminars, group meetings, annual campaign meetings etc. The study was confined to the traditional region.

A comparison between growers who have attended seminars/group meetings and other training programmes with growers without such training was also made. The trained group showed a productivity increase of 13.7% in comparison with the non-trained ones.

55% of the growers in the trained category were found producing good quality RSS rubber where as only 18% in the untrained category produced such sheets. Optimum tapping depth was observed in the case of 92% of experimental holdings where trained tappers were engaged against 73% in the control holdings. Over 85% of holdings owned by the trained growers were categorized in the higher productivity range.

Thenankal, Peter (2016) studied the diffusion and adoption of modern advanced technology in rubber cultivation which have played a crucial role in enhancing productivity and the volume of natural rubber production in Kerala. The basic requirement for the steady progress of the rubber industry, of which the small holding sector is an important and integral part, is to bring into existence a consistent marketing and organizational setup. Then only, the growers would get a profitable and steady price for the rubber they produce.

The required organizational and institutional structure should be provided by the Central and State Governments especially to the small holders to achieve these objectives. Only in such a situation, the small growers could be expected to accept and utilize the achievements of scientific studies and researches and new technologies in the production and processing of natural rubber.

Usharani, S. (2013) studied the performance of some Rubber Producers' Societies and quantified the impact of marketing of Natural Rubber though Rubber Producers' Societies. The

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

objective of the study were (i) to analyze the performance of selected Rubber Producers' Societies in Thiruvanthapuram District; (ii) to assess the impact of marketing of Natural Rubber through selected Rubber Producers' Societies as latex/sheets; and (iii) to assess how far marketing has helped the organizational development of these Rubber Producers' Societies. It was evident from the study that group processing and marketing of Natural Rubber through Rubber Producers' Societies could ensure quality upgradation in the small holder sector, which could wipe off the 'thekkan' grade gradually. Besides, the small scale farmers exploitation by middle men in the chain of marketing at the village level was eliminated by the RPSs.

Varghes, Leelamma, *et al* (2014) explained the process of latex collection and its pre-processing procedures. They discussed the procedure of latex collection in detail, including field coagulam, its transportation and the pre-processing of latex. The scientific procedures outlined by them help the RPS to evolve suitable methods and procedures to preserve and protect the latex collected.

Varghese, Sunny, *et. al* (2014) studied Natural Rubber processing in India which was oriented towards catering to the domestic industry. The produce was largely Ribbed Smoked Sheets (RSS). 70% of the processed form of rubber in India was Ribbed Smoked Sheets which was dissimilar to the global pattern. Traditionally, Ribbed Smocked Sheets have been processed in the individual smallholdings, where facilities for scientific processing are inadequate. This implied that bulk of the rubber processed was adopting unscientific practices. Processing in individual holdings has several disadvantages as it leads to production of low quality sheets, lacking homogeneity, resulting in higher unit cost, lower return and drudgery for the small holder's family and the workers. The environmental issues related to the disposal of effluent were also reported to be posing problems.

Studies on the small scale rubber farmers and the functioning of RPSs

Abraham, K. K. (1990) found that the reason for the failure of the Rubber Marketing Co-operative societies as the absence of roots for them in the villages where farmers live, cultivate and produce rubber. The Rubber Producers' Societies run by farmers at the village level made

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

the co-operative movement strong and beneficial by providing the necessary roots and foundation.

Ahamed, Rasheed, Mohamed., and Haz, Tuan. (2013) pointed at the importance of giving training to workers for better productivity. Untrained workers according to them caused low productivity.

Antony, A. V., *et. al* (2014) studied the practices adopted in holdings with high productivity levels and compared them with holdings with relatively low productivity to identify gaps. Significant correlation was obtained for practices adopted even during immature phase, such as soil conservation measures, ground cover management, use of fertilizers and plant protection measures. Wide variation in the adoption of technology has been noticed between regions. Age of farmers, extension support, retention of excess non rubber trees, etc. also have contributed to lower productivity.

Antony, K. P. and Hegden, Raveendranatha, M. L. (2012) reiterated the importance of effective extension delivery system with the help of RPS. The RPS is capable to handle the complexities of the development and its allied activities, besides technology transfer.

They suggested that the farmer's clusters (RPS) shall act as change agents by acting as service providers. This can be achieved through RPSs only by locating, identifying and storing the locally available skilled and unskilled workers. The selected workers can be grouped under the banner of SHG under each RPS. These groups shall be given periodic training on specific / technical methods by the RPS. The group activity will generate positive impact in the farming community promoting a healthy competition to improve their efficiency both in technical aspects and augment net income which will ultimately improve their socio economic status.

Anuja, A.R. *et al*. (2012) found the Indian rubber plantation sector dominated by small holdings, which account for almost 93 per cent of the total rubber production in the country. Small rubber growers were found to suffer from problems like low productivity, poor quality of processing and weak marketing system.

The prevalence of smallholdings makes the sector vulnerable to fluctuations in price, exploitation by middlemen, etc. To overcome the problems of small rubber growers, the

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

formation of cooperatives called Rubber Producers' Societies (RPSs) was suggested. The study assessed the role of RPSs in providing services for input delivery, processing and marketing of natural rubber in Kerala. The study has revealed that RPS members have a lower cost of production and better price realization for their product compared to non-members. Group processing and community smoke house facility helped in production of good quality rubber sheets.

Key services provided by RPSs have been identified using factor analysis technique under five major categories, *viz.* marketing, financial, efficiency, infrastructural and social factors. The study focused on the rubber growers of Kerala, specifically the small rubber growers who were the members of the Rubber Producer Societies (RPSs). The RPSs were effective in transferring new technologies generated by the Rubber Board. These Societies provided good quality inputs at a subsidized rate utilizing the financial support from the Rubber Board.

The study noted a significant difference in the costs on input, processing and marketing between RPS beneficiaries and non-beneficiaries. Marketing channels have been identified for rubber farmers who are members of RPSs. It is reported that Rubber Producer Societies ensured better prices and were more efficient since exploitation by the middlemen is nil or comparatively low.

Group processing facilities are quite effective in improving the quality and uniformity of rubber sheets and in reducing individual farmers' drudgery. Community smoke houses provided by RPSs reduce the cost of building individual smokehouses. The various services have been grouped under five major categories, viz. marketing, financial, efficiency, infrastructural and social factors. Production of uniform export quality sheets through combined efforts would help the producer-farmers to fetch better prices. An integral approach aided by the RPSs would be beneficial to the stakeholders as it will promote closer interaction among them and foster better understanding of mutual strengths and weaknesses.

Balakrishnan, Arsha (2013) held that there should be strong efforts to stabilize the price in case of rubber, which is subject to monthly variations. According to her both assured price and stabilized price are equally important.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Even in the case of RPS members, monthly price fluctuation is a problem. In order to motivate the farmers in retaining their membership and to promote new farmers to take membership assurance of a stabilized price is important. There should be a strong price stabilization policy.

Since 80 per cent of the sheet rubber produced by the Group Processing Centre of the RPS is of the highest quality (RSS 1 grade) there should be measures to make use of the full export potential of the crop which will result in a greater price realization by the member farmers. RPSs should widen its operational area and should create awareness among the farmers to take membership in RPS. There should be more tangible benefits to the members of Rubber Producers' Society from the Rubber Board in order to promote farmers to take membership in RPS.

Balakrishnan, K. K. (2012) indicated that many RPSs promote apiculture as a subsidiary income generation source. Through apiculture, there was a constant increase in the production of honey and corresponding total income over years. The scheme has generated additional employment and income to the marginal rubber growers. So, this strategy can be adopted in every rubber plantation where RPS is active.

Banerjee, P. K. (1997) proposed that the condition of Rubber Producers Societies could be improved if the latest technology was used in this field. By using the scientific methods the growth level could be enhanced.

Barlow, Colin (1978) found the small holders being ignorant of the latest methods and techniques to improve productivity, better processing techniques and effective marketing strategies. They remain disorganised and economically backward.

The Centre for Development Studies (2015), in its technical report on innovation and development of natural rubber, pointed out that the formation of RPSs was due to the responsiveness of the system to the challenges confronted especially by the small holders who dominate the system. It was observed that certain regions that responded intensively towards forming RPS also turns out to be the regions wherein defunct RPS are concentrated.

While more detailed enquiries are called for towards locating the factors behind the observed trend, based on the feedback from the focus group discussions and interactions with the farmers,

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

it could be inferred that RPS seems to have not adapted itself to the changing context and that we have today a kind of dualistic system. While a small proportion of the farmers are actively involved in RPS a large majority are out of the ambit of RPSs.

Most of the growers who are out of the RPSs are having other sources of income and many appear to be "absentee growers". The inertia of RPS to change is evident from the fact that the bylaws of RPS have not been subjected to any change over the years.

Hence, there is the need to revisit the relevance of RPS in the current form. In the organizational innovation that evolved (RPS) market had a very limited role and that there is evidence to suggest that market based systems are being evolved (private consultants) and they might create serious challenges to the extension system that has been evolved over time. Hence, there appears to be the need for bringing these actors into the innovation system sooner than later along with appropriate changes in RPS to make them more relevant to the current realities.

Cyriac, P. C (1986) found the small holders are ignorant of the latest technologies and therefore, they suffered a lot for improving the productivity. Their technology ignorance added on to their losses.

Deepthi, S. (2014) analysed the performance of selected RPS in Kollam district, Kerala involved in marketing of latex/sheets and the impact on marketing NR through these RPSs. The research also aimed at delineating the evolution of these societies into self reliant and viable units in the field. The RPSs in the district had not attained the same level of growth as in other districts of the state. An exploratory and analytical study was carried out employing quantitative and qualitative techniques. The results indicated that marketing/group processing through RPS helped in improving the quality and also could limit exploitation of farmers by middlemen to a great extent. The stages of exploitation by middlemen in the marketing channel was assessed and the gross revenue to the growers as a result of their participation in the RPS activities quantified. Difference in the price realized by members in the RPS and non members were found to be statistically significant.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Deshpande, S. H. (1985) considered a small scale cultivator as a farmer who operates below the subsistence level. In other words, his net farm business income, i.e. Gross income minus paid out cost, does not leave him any margin for saving.

Dhanakumar,V. G., (2012) developed a comprehensive framework and module to address conceptual and methodological issues related to grass root institutions, value creation and sustainability for rubber business operation of RPS. The study sounded on the need to bridge the gap between poor performing and better performing RPSs. There is a greater need to identify the critical factors and evolve mechanisms to overcome the shortcomings. The study also suggested many capacity building programmes for the officials. According to the study, institutionalizing RPS for value creation, understanding quality performance management factors for officials both by RPS members and extension functionaries remain the mechanism of success for India's RPS.

Geevergees, P.V., *et. al* (2013) listed the following outcome due to RPS functioning *viz.* (a) revival of inactive Rubber Producers' Societies through extension support (b) sharing of resources available with the farmers and between Rubber Producers' Societies (c) switching over strategy for production of different types of rubber as per market demand (d) improvement in bargaining capacity, and quality improvement through collective approach in processing and strict supervision. The challenges facing the rubber plantations particularly the small growers can be addressed through group approach. The consortium of Rubber Producers' Societies and marketing companies in the co-operative sector now under operation in some regions of the traditional rubber growing tract of Kerala had proved their worth in this context.

George, Daniel (1993) conducted a study on the financial problems of small rubber cultivators of Punalur region. Ignorance of small growers to adopt scientific processing of latex, absence of proper training to tappers, un-trained tappers damaging rubber trees and producing low yield together with the crude methods of grading of sheets helping rubber dealers to exploit the small rubber holder were identified as the important problems of small scale cultivators there.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

George, M. C. (2000) stated that rubber marketing could be brought under the control of the small growers, if the Rubber Producers' Societies carry out latex collection, processing and storing at the village.

Gopinath, M. N. *et. al* (2012) studied the critical factors limiting the performance of RPSs. RPSs have to deal with sector-specific constraints like technological asymmetry, limited capital assets, social capital etc to thrive in the development process. These constraints, thus, are both internal by design and external due to their social milieu. As a matter of fact the development initiatives vary with individual RPS even in a given institutional framework and support. The study found that the RPS movements have contributed remarkable levels of progress in the rubber sector of India. The five major reasons *viz* collective leadership, social capital management, profit and nonprofit conflicts, community involvement for development participation, thrust and motivation factors independently or in combination have profound impact on the performance of RPSs. The study suggested that RPS have to work as an intermediary, bridging the market forces and the common members and a reversible supply chain has to be established.

Gowda, Giridhara, K. and Mayya, Sureshramana, (2016) studied the problems and prospects of rubber plantation industries in Dakshina Kannada District. The analysis of the findings indicated that there is significant difference in the cost of cultivation and yielding cost in different regions.

Guptha, V. K., and Gaikwad, V.R. (1986) found that distance between the producers and manufacturers caused tremendous suffering to small holders. So, there should be some mechanism to sort out this problem for the development of the industry.

Guptha, V.K. (2013) stated that the most striking feature of the agriculture of South-East Asian countries is the very small farm size and that over the years, the percentage of small farmers has been increasing. In Malaysia rubber small holder is legally defined as the owner of a parcel of agricultural land of 100 acres (40.49 hectares) or less where approved crops are grown. Rubber is the first such approved tree crop. In Sri Lanka it is only 10 acres (4.05 hectares). In Thailand small holders who account for more than 90 per cent of the latex production dominate the rubber production scenario. There are only very few estates in Thailand.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Jacob, George (1990) estimated that small holders share was 82 per cent of the total Rubber area in India. Their share in the total natural rubber production was 79 per cent. Therefore, the prospects of the rubber plantation industry depend heavily on the progress and prosperity of the small holders. So effective steps should be taken to improve the prospects of the small holders and their rubber cultivation. For this urgent steps must be taken to achieve higher efficiency in production, processing and marketing in the smallholder sector.

Jacob, K. K. (1993), observed the development of co-operative marketing societies and the Rubber Producers' Societies, was indispensable for the welfare and well being of the small rubber growers.

John, K. K. (2002) held that the RPS can stabilize the price of natural rubber, especially at a time of price slide by helping the growers to stock their produce till the price increases. By providing safe and sufficient godown facilities, the RPS can help the growers to defer the sale of their produce till the prices improve. Through godown facilities, supply of rubber could be regulated in accordance with the demand and price by blocking the immediate entry of natural rubber into the market. According to him the Rubber Board and Government should provide funds for the construction of godowns to RPS.

Johnson, V. J. (2001) found that testing soil and leaf was very poor among the small rubber growers of Kerala. Model Rubber Producers' Societies functioned as training centres for the small rubber growers. They made technical information available at the Rubber Cultivation Research Centres reach the farmers and helped them to acquire the technical knowledge needed for the production of RSSI sheets.

Jose, Jojo., and Nair, Ramesh, B. (2012) studied the role of women in the functioning of RPSs with emphasis on women empowerment and gender issues. The study revealed that women have a major role in the functioning of RPS. 93% workforce of Group Processing Centers comprises of women. The activities of RPS fetch income to women uplifting their socio economic status and empowering them. It is reported that 52% of woman labours contribute 10 to 30 % of family income, 19% contribute less than 10% of family income and 20% contribute more than 30% of family income. The rest 1% is the sole bread winner of the family.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Service provided by women workers help growers to avoid drudgery, save time, and to achieve a cleaner environment.

Joseph, Kuruvila and Rajeev, K. P. (2012) studied the role of RPS in skill upgradation of tappers which indicated a significant improvement after the training given by various RPSs in the usage of templates, half spiral tapping, maintaining correct slope, correct tapping depth and also optimum usage of bark (21 to 23 cm). The other positive aspects were the adoption of productivity enhancement methods and quality upgradation of produce. The training was found useful to improve rain guarding upto 24%, panel protection upto 63% and cleanliness of utensils upto 78%. The yield per tap was found to increase significantly in the post training period.

Kanipally, George., (2000) found that main problems faced by the small rubber growers included the distance between the producers and the manufactures as well as the exploitation of small scale farmers by middlemen.

Kumar, Anil, B. and Jessy, M. D. (2014) analyzed the pattern of inter cropping in the small holdings and its impact on rubber cultivation and the socio economic empowerment of small growers through it. The study indicated that inter cropping helped in increasing the income level of farmers. Banana was identified as the most popular inter-crop. Region-wise difference in the choice of crops was also reported. The study discussed the profitability of various inter crops, besides analyzing the impact of the inter crops on growth of rubber under different agro-climatic conditions.

Kumar, Krishna, A. K. (1999) analysed the impact of various schemes implemented by the Rubber Board qualitatively and quantitatively leading to higher productivity and higher income levels. An assessment of impact of Rubber producers' Societies in the small holding sector was also made in relation to its role in acting as a conduit for transfer of technology. Though there were 2,000 RPS the level of performance among them vary significantly: some perform exceptionally well; others are relatively weak.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

A constraint analysis of the factors leading to the varying level of performance of the various RPS across the state was also made. 70 percent of the RPS could maintain the same level of productivity. A factor analysis for the various indicators identified as contributing factors to the level of performance of the RPS have also been presented.

The research also narrated the initiatives of the Board involving farmer resource persons and implementing women and tribal development projects in the rubber sector. Experience in promoting consortium of RPS for processing and marketing also were highlighted.

Kumari, Santha, K. (1993), analyzed the impact of the Rubber Producers' Societies on their members with special reference to Pathanamthitta District. The researcher concluded that if the shortfalls are rectified they can play a key role in the future development of the Rubber plantation industry in our country.

Kumari, Santha, K. and Pillai, B. V. (2009) analysed the role of rubber producers' societies (RPSs) in the dissemination of technical know-how among small rubber growers. In order to analyse the impact of the RPS scheme of imparting technical know-how on small rubber growers, six variables were examined: (1) dependence on RPSs to get technical know-how; (2) participation in training programmes; (3) effectiveness of the training programmes; (4) practical application of know-how acquired from training; (5) improvement in productivity; and (6) reduction in cost of production. The member growers fared well in all these variables compared to non-members. The investigators specifically emphasized that RPSs have a significant positive impact in imparting technical know-how on the small rubber growers. RPSs are effective in providing technical know-how to improve the yielding capacity and reducing the cost of production of smallholder rubber growers.

Kuriakose, K. K. (1995) stated that the formation of the Rubber Producers' Societies in each village for daily collection of latex and scrap rubber, facilitated the full utilization of the production capacity of the processing factories run by the marketing societies. The Rubber Producers' Societies in the villages needed to be strengthened by providing required professional support through appropriate agencies. The study suggested that the Rubber Board and the

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

government should take special care to increase the financial assistance given to the small rubber growers and strengthen rubber marketing societies and the Rubber Producers' Societies.

Majumdar, Arunabha, *et. al* (2012) found that one of the major factors behind the success of rubber plantation development in Tripura was the formation of RPS and its strong linkage with rubber growers. The study revealed that 16% of rubber growers were directly inspired from RPS and 40.67% indirectly by seeing neighbours success who initiated rubber planting due to the association with RPS. Productivity is usually less. This is attributed to close spacing, defective tapping, shortage of good tapping materials and skill of tappers. Clonal disadvantage wintering and ignorance. According to the study quality of rubber carries least relevance in these regions. This is much attributed to shortage of processing inputs, ambitious intentions and a vibrant, proactive market. All the respondents in their study expressed their whole hearted satisfaction over their endeavour of raising rubber plantation and support received from RPS and Rubber Board.

Mathai, Boban (2012) noticed that RPSs were undertaking various charity works as part of their social responsibility since their inception, even though the primary objective was to provide support for plantation development and marketing. Fogging against mosquitoes was undertaken by 10% RPS, medical camps were organized by 83%, measures to prevent communicable diseases were taken by 16% and financial assistance for treatment was given by 10% RPSs. The study indicated that some RPSs organized these activities with financial contribution ranging upto 100% in many cases.

Mathew, N. J. (1991), opined that any planning for the development of the rubber plantation industry should concentrate on the modernization of the small rubber holding sector.

Mathew, Peter (1996) studied the relationship of scientific literacy of the small rubber growers with their training and education and found that the different types of training given to the small rubber growers were inadequate for obtaining maximum yield from their holding.

Ministry of Commerce and Industry (2008) reported that the target was to set up 500 Rubber Producer's Societies (RPSs) during X Plan period. But the rubber Board miserably failed in the

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

mission and could set up only 72 RPSs. The report required the Board to accelerate formation of RPSs and provide them necessary support and assistance.

Nair, Chandrasenan, J. *et. al* (2012) observed that small growers have greatly benefited as they get premium price for their produce in right time due to the intervention of RPSs. Early dissemination of technical knowledge at the grass root level, availability of assured quality planting materials and easy access to market are the advantages of RPS.

Nair, Madavankutty, P.M. (1997) described the functions of the RPS. The Rubber Producers' Societies were organised at the village level functioning in the democratic way. They also played a key role in fostering better relationship between the Rubber Board and the growers.

Narayanan, P. K. (1989) suggested that the transfer of appropriate technology on a seasonal basis to the small scale cultivators in an intelligent manner, coupled with timely delivery of quality inputs and equipment at cheaper rates would help maximize production and productivity of rubber from small holdings. It is due to this reason the Rubber Board is promoting the group approach among rural smallholdings at the village level for timely transfer of technology and delivery of inputs.

Rajasekharan, P. and Haridasan, L. (1992) conducted a study covering 480 small rubber growers in Kottayam district and came to the conclusion that only if the small growers are given adequate training their income from cultivation will increase.

Rajeevan, B., *et. al* (2012) indicated that the formation of RPS hastened the infrastructure build-up, institutional development, education level improvement etc and consequently opened up exposure avenues leading to their attitudinal change which has also helped to control the insurgency that prevailed in the tribal pockets, to certain extent.

Rao, V. K. (2010) observed that the Rubber Board had adopted a group approach in its extension program about 35 years ago, but a real participatory extension approach was initiated only during the last 5 years. For the rubber sector to survive its problems, considerable strengthening of the small holding sector was required. Participatory extension with a focus on institution building at grass roots level could be the best means to achieve it at a faster rate.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Sebastian, Joseph (2012) indicated that the Janatha Model Rubber Producers' Society at Aimcombu in Kottayam District was instrumental in the overall development of the rubber farming community there. According to him the sustainability of small and marginal farmers could be ensured if other Rubber Producers' Societies follow this example.

Sebastian, Joshi. (1999) was of the view that the rubber grower got all the benefits he was eligible to have, except the processing expenses by getting latex processed at the society. The Rubber Producers' Societies made available better price for the products and unified the farmers to face crises. According to Sebastian, the Rubber Producers' Society was acting as a catalyst of social change by uplifting weaker sections including women in the area of its operation.

Sebastian, Prince., *et. al.* (2014) evaluated the various training programs for the small holdings sector conducted by the Rubber Board, such as training for small growers (both off and on campus), seminars, group meetings, annual campaign meetings etc. The study was carried out in the traditional region of rubber cultivation in India.

A comparison of smallholdings, of trained and non-trained small growers indicated that plantations managed by growers who had attended seminars/group meeting etc. showed a productivity increase at 13.7% when compared to the control holdings. 55% of the growers in the trained category were producing quality Ribbed Smocked Sheets while only 18% in the untrained category were producing quality sheets. Optimum tapping depth was observed in the case of 92% holdings where trained tappers were engaged against the 73% in the control holdings. Over 85% of holdings owned by the trained growers were categorized in the higher productivity range.

Shanmugavadivu, N. and Kavitha, K.R. (2015) found that, the state of Kerala dominated by small rubber growers is the largest producer (90%) of natural rubber. Therefore small rubber producers are main contributors of natural rubber to the Indian rubber industry.

The small holding producers faced several problems like poor quality, low productivity, weak marketing system, lack of skilled labours etc. They suggested that the Government and Rubber Board should initiate more steps to protect small rubber producers.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Sobhalekshmi, C. (2012) conducted a study of 83 RPS in Muvattupuzha Region in Ernakulam District to assess their performance. The study revealed very wide variations among the RPS in their performance. Many critical factors for the poor performance of the RPS were located and a number of strategies were evolved to overcome the shortcomings. It is the duty of the government to identify the various problems and constraints which normally affect the growth of these co-operatives and to initiate timely action to put the co-operatives in the right path for sustained growth and progress.

Thomas, Jasmine. and Kumar, Ajith, K. (2012) indicated the significance of labour bank/activity groups associated with the RPSs. According to the study, the activity groups are very crucial in strengthening RPS. The small growers are fascinated to complete plantation maintenance work such as prophylactic spraying, fertilizer application, disease management, rain guarding, etc. in time, through the service of labour bank. Small growers are usually constrained to skip many cultural works either due to unavailability of appropriate chemicals or skilled persons to undertake the work. Further, the stake holders are privileged to pay reasonable and affordable wages for the prompt execution of work from labour bank.

According to the study, women empowerment is an indirect benefit achieved through the labour bank. It is proved to be the right choice to manage the threat of labour scarcity in small grower sectors. The effective management of RPS over the activities of labour bank is very important to ensure well disciplined and prompt service in plantations. This work force is a real boon in small holding sector especially to the absentee owners who can entrust their RPS for the above services.

Ushadevi, T. U. (1999) studied the technology adoption in rubber smallholdings in Kerala and found that the Rubber Producers' Societies helped a lot in the diffusion of technology among the small rubber growers. However, the technology package adopted by the estates was more advanced than that of the small growers. The researcher held that the future of rubber economy in India and Kerala depends on performance of the small holding sector.

Varghes, Leelamma, *et. al.* (2014) narrated the process of latex collection and its pre-processing procedures. They presented the procedure of latex collection in detail, including field coagulam,

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

its transportation and the pre-processing of latex. The scientific procedures outlined by them would help the RPS to evolve suitable methods and procedures to preserve and protect the latex collected.

Varghese, Sunny, *et. al.* (2014) held that the Natural Rubber processing in India had been oriented towards catering to the domestic industry, which was relying on Ribbed Smoked Sheets (RSS). 70% of the processed rubber in India was Ribbed Smoked Sheets which was against the global pattern.

Traditionally, Ribbed Smocked Sheets were processed in individual smallholdings, without any scientific processing facilities. Processing in individual holdings has several disadvantages as it leads to production of low quality sheets, lacking homogeneity, resulting in higher unit cost, lower return and drudgery for the small holders family and the workers. The environmental issues related to the disposal of effluent were also reported to be posing problems.

Varma, K. S. (1988) highlighted the role of the Rubber Producers' Societies as a nucleus for dissemination of information and distribution of inputs to the members. The RPS channelized and expedited the distribution of financial and technical assistance from the Rubber Board and the government by group action. They improved the quality and price of the rubber produced by members by helping them to follow proper agricultural practices, better processing, product manufacturing and group marketing.

Yield in small holdings was remaining lower than that of the professionally managed large estates. In the light of this the Rubber Board felt it necessary to promote group approach among rural smallholdings at the village level for timely transfer of technology and delivery of inputs.

Viswanathan, P.K. (2008) conducted a Comparative Economic Analysis on Emerging Smallholder Rubber Farming Systems in India and Thailand. This paper provides a comparative perspective on the performance of smallholder rubber farm livelihood systems based on case studies of two regions in India and Thailand. The analysis of the emerging farming systems in the two countries' rubber farms revealed that the rubber monocrop system is viable, provided prices remain remunerative and primary markets efficient.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Findings further indicated the dominant contribution of rubber production to the gross household income of the rubber growers in the integrated farming systems. Nevertheless, from a sustainable livelihoods perspective, the socio-economic significance of the rubber integrated farming systems assumes greater prominence, given the fact that small producers are highly vulnerable to market uncertainties.

It has been found that rubber integrated livelihood systems provide the smallholders with ample capability for resilience during crises and ensure a sustained flow of income. The study demonstrates the need to promote and scale up rubber integrated farm livelihood systems in the smallholder-dominated rubber producing countries in the Asian region.

The paper also recommended enhancing the capabilities of the smallholders by strengthening their access to the five forms of capital that sustain their livelihood

The foregoing survey indicates that the plight of the small scale rubber cultivators due to

1. The low market price of rubber
2. Middlemen exploitation of the produced rubber at selling points
3. Absence of grass roots level marketing facilities
4. Absence of quality enhancement training for latex processing
5. Non use of technology from planting to processing
6. Shortage of agricultural machinery to replace costly labour
7. Absence of various accessories for rubber cultivation and processing
8. Absence of go-downs for stocking rubber at times of low prices in the market.
9. Non existence of ready cash payments or cash advances for stocking rubber.
10. Individual involvement in planting, processing and product selling by unorganized farmers, need to be tackled to sustain the small scale rubber cultivators in their task of cultivation and production. The fact that the small scale farmers constitute 80% of the rubber producers in the country implies that until the problems of these farmers are

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

solved the future of the rubber industry in India is not going to be bright in the days to come. If no timely steps are taken the cultivators will be forced to switch over to other cash crops.

It is evident from the survey that many studies have been carried out in relation to RPS functioning in different regions and localities in India. These RPSs covered in the studies have been formed to cater to the needs of rubber cultivators residing in specific areas. In a comparison of 2000 RPSs across the state, Krishnakumar (2000) reported varying level of performance – some were found performing exceptionally well, others relatively weak. This variation may be because of geographical and environmental variables affecting their performance or due to the socio economic, educational background and personality traits of the RPS stake holders of specific localities. Similarly, M. V. Antony *et al*. (2005) reported wide variation in adoption of technology among RPS members belonging to different RPSs located in different regions. Besides, most of the findings of the cited studies have the limitation of study period specificity, as the affective variables of rubber plantation, latex processing and product selling are dependent on factors that undergo change from time to time. So, findings of the previous studies may be taken to be limited to the corresponding periods of study.

In short, studies indicate that the performance, problems and prospects of RPS are dependent on the locations / areas in which they are functioning and the human parameters involved in them which might promote or retard their functioning. Moreover, no study till date has been carried out on the functioning of the RPSs covering the state of Kerala.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

Bibliography :

1. Abdulla, T.M. (1967). ***Report of the Rubber Smallholding Economic Enquiry Committee***. Publication Division, Govt. of India, New Delhi.

2. Abraham, K.K. (1990). ***Rubber Producers' Societies*: *Rubber Enna Kalpadenu***. Kottayam: Rubber Board.

3. Ahamed, Rasheed, Mohamed., and Haz, Tuan. (1983). *Structural Changes in Malaysian Small Holder Sector*. ***Proceedings of the International Marketing Conference***.

4. Antony, A. V., Gopinath, M. N. and Mathew, T.V. (2014). *Productivity rating in small holdings – An analysis on best practices*. Paper presented in 9th ANRPC Seminar, Association of Natural Rubber Producing Countries. Kochi.

5. Antony, K. P. and Hegden, Raveendranatha, M. L. (2012). *RPS as Service Providers*, ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept., Rubber Board, Kottayam, p. 94-99.

6. Anuja, A.R., Amit Kar., Mathur, V.C. and Jha, G.K. (2012). '*Input Delivery, processing and marketing of Natural Rubber: The role of Producers Co-operative in Kerala*", ***Agricultural Economics Research Review***, Vol. 25. pp 379-386.

7. Aziz, Abdul. (2014). "*R & D: past Contributions and Future Challenges*", Paper presented in 9th ANRPC Seminar, Association of Natural Rubber Producing Countries. Kochi.

8. Balakrishnan, Arsha. (2013). *Economic Impact of Rubber Producers' Societies (RPSs) on Rubber Farmers in Kerala*, University of Agricultural Sciences, Bangalore.

9. Balakrishnan, K. K. (2012). *Apiculture – A promising ancillary income generation activity – A case study*, Rubber Board. ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept. , Rubber Board, Kottayam p. 99-104

10. Banerjee, P.K. (1997). A*gricultural Economy: Financing Small Farmers* New Delhi: Chethana.

11. Barlow, C. and O.S. (1978). *On Some Biases in the Generation of Technologies by Rubber Research Institutes*, ***Journal of the RRI of Sri Lanka***. Vol. 54.

12. Barlow, Colin. (2011). *The Natural Rubber Industry*. New York: Oxford University Press.

13. Beliczky, Louis, S. and Fajen, John. (1982). *Encyclopedia of Occupational Health and Safety*, 4th Edition, Chapter 80 – ***Rubber Industry***. VOL.: 28.

14. Budiman, A. F. S., (2013). *The global price trend of Natural Rubber* , Rubber Planters Conference, India, Rubber Research Institute of India, Kottayam.

15. Centre for Development Studies. (2015). *Organizational Innovation in Natural Rubber: The Case of Rubber Producers Societies*., Technical Report · January 2015 Centre for Development Studies (CDS), Kerala(India), pp. 41-64.

16. Chandy, B., Tharian, George, K., and Raj, S. (2010). *Trends in farm income and wages in the era of market uncertainty: An exploratory analysis of natural rubber sector in Kerala*. NRPPD Discussion Paper 5, Centre for Development Studies, Thiruvananthapuram.

17. Cyriac, P. C (1986). *Gramathalathil Rubberkarshakanu oru Uthpadakasngam.* Deepika 22 Oct. 2011: 4.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

18. Cyriac, P.C. (2013). *The Prowess and Development of Rubber Smallholders in India*. Country Report. Proceedings of the Sixth Seminar of ANRPC Palambang (Indonesia): ANRPC.

19. Deepthi, S., (2014). "*Marketing strategies for NR and RPS*". Paper presented in 9th ANRPC Seminar, Association of Natural Rubber Producing Countries. Kochi.

20. Deshpande, S.H. (1985). *Problems of Co-operative Farming*. New Delhi: Himalaya.

21. Development Report. (2011). Government of India, Academic Foundation, New Delhi.

22. Dhanakumar,V. G. (2012). *Institutionalization – A study on India's RPS as value creation in the sector*, ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept. , Rubber Board, Kottayam , p. 144-150.

23. Dominic, Cherian, (2011), ***Rubber Krishi*** , Kottayam: Sahithya Pravarthaka Sahkarana Sangam,

24. ***Economic Survey 2011-12*** .(2012). Ministry of Finance, Govt. of India, New Delhi.

25. ***Farm Guide 2012***. (2012). Farm Information Bureau, Department of Agriculture, Govt. of Kerala Thiruvananthapuram.

26. Fernado, P.J. (2011). *Are Small Holders Withering away in Sri Lanka*, Rubber Asia, June: 15.

27. Ford, J.K., MacCallum, R.C. and Tait, M. (1986). *The application of exploratory factor analysis in applied psychology: A critical review and analysis*. Personnel Psychology, B(2): 291- 314.

28. Ganesh, S. P. (2012). *Tracing the Development of Natural Rubber* . ***Rubber***, Rubber Research Institute of India, Rubber Board, Kottayam.

29. Gangadharan, Unni, R. and George, Jacob, (2010) *Rubber Small Holdings in lndia* Report of the Sample Survey. Kottayam: Rubber Board.

30. Geevergees, P.V. , Mathews, James, T. and Achuthankutty, P. (2013). *Impact of processing and marketing of Natural Rubber through Rubber Producers' Societies*, Rubber Planters' Conference, India, Rubber Research Institute of India, Kottayam.

31. George, K. (2014). *Rubber Based Industrialization of Kerala*. Economics and Political Weekly. Feb: 104-117 .

32. George, Daniel. (1993). *A Study on the Financial Problems of Small Rubber Cultivators with Reference to Punalur Region*, M.Phil Dissertation, University of Kerala, 29.

33. George, Jacob, S. (1990), *Rubber Marketing and Small Growers*, ***Rubber*** , May: 59.

34. George, Kanippally. (2010). *Samkadikkuka Saktharavuka*, ***Rubber Mithram*** April: 51.

35. George, M.C. (2000). *The Example Shown by Kakkattoor*, ***Rubber Mithram*** April: 55.

36. Gopalakrishnan, C. (2011). *Predominance of Spices and Plantation Crops in Kerala*, Implications of WTA on Kerala's Agriculture. Kerala Economy: Trends during the post reform period (Edited K. Rajan) Serials Publications, New Delhi.

37. Gopinath, M. N. *et. al* . (2012). *Critical factors limiting the Performance of RPSs*, ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept., Rubber Board, Kottayam, p. 135-143.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

38. Gowda, Giridhara, K. and Mayya, Sureshramana. (2016). *Problems and Prospects of Rubber Plantation Industries in Dakshina Kannada District: A Case Study With Reference Harvesting Cost*, ***Indian Journal of Commerce & Management Studies.***

39. Guptha, V.K. and Guikward, V.R. (1986). ***Guide to Management of Small Farmers Co-operatives*** , New Delhi: Concept.

40. Harman, H. (1967). *Modern Factor Analysis*, University of Chicago Press, Chicago, pp. 197-435. Vol. 25.

41. Hotelling, H. (1933). *Analysis of complex statistical variables into principal component*. ***Journal of Educative Psychology***, 24 (2): 489-520.

42. ***Indian Rubber Statistics***, Vol. 38, 2017

43. Jacob, K.K. (1993). *A Study on the Working of Kaduthuruthy Co-Operative Rubber Marketing and Processing Society Ltd.*, M.Phil. Dissertation, University of Kerala.

44. Joby, Joseph and George, K.T. (2016). *India's Trade Liberalisation Initiatives and Trends in Balance of Trade under the Regional Trade Agreements: The Case of Rubber and Rubber Products*, paper presented in Third INDIALICS International Conference on Innovation and Sustainable Development, 16-18.

45. John, K.K. (2002). *A Study on the Impact of Economic Liberalization and Globalization on the Marketing of Rubber in India.* Ph D Thesis, Mahatma Gandhi University.

46. Johnson, V.J.(2001). *Elanadu Rubber Producers' Societies*, ***Rubber Mithram*** June 2001 : 23.

47. Jose, Jojo., and Nair, Ramesh, B. (2012). *RPS for Woman Empowerment*, ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept. , Rubber Board, Kottayam. p. 119-121.

48. Joseph, K. J, and Kumar, Ajith, C. E. (2016). *Cost And Returns of Natural Rubber Production In Kerala*.

49. Joseph, Kuruvila and Rajeev, K. P. (2012). *RPS are Rural Training Centers for Skill upgradation of Tappers*, ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept., Rubber Board, Kottayam , p. 122-128.

50. Joseph, Mathew, C. (2012). *Labour friendly innovations in GPC,* ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept., Rubber Board, Kottayam, p. 88-93

51. Kaiser, H. F. (1958). *The varimax criterion for analytical rotation in factor analysis*. Psychometrika, 23(2): 187- 200.

52. Kanipally, George., (2000). *Samkadikkuka Saktharakua.* ***Rubber Mithram,*** 51

53. Krishnakumar, A.K. (2011). *Illithodu Sangam.* ***Rubber Mithram***. Sept: 16-20.

54. Kumar, Anil, D and Jessy, M. D.,(2014). *Intercropping in immature rubber plantations Indian experience*, Paper presented in the Ninth ANRPC seminar on Progress and Development of Rubber Small Holders, Association of Natural Rubber Producing Countries ,Cochin.

55. Kumar, Krishna, A.K. & Dhanakumar, V.G. (2010). *An assessment of Rubber Producers' Societies, Self help., Groups of small growers in the rubber plantation sector in India*, Paper presented in Indian National Planters' Conference, Kuala Lumpur.

56. Kumari, Santha, K. and Pillai, B. V. (1993). *Role of rubber producers' cooperatives in imparting technical know-how among the small rubber farmers in Kerala*. Journal article : ***Indian Cooperative Review*** Vol.47 No.1 pp.55-62 ref.8

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

57. Kuriakose, K.K. (1995). *A :Study of the Marketing Channels of Natural Rubber with Special Reference? to Co-operative Marketing in Kerala*, PhD Thesis, Cochin University of Science and Technology,: 174.

58. Kurian, Thomas, K. and Panickar, A.O.N. (2014). *Indian Rubber Plantation Industry: Genesis and Development of Natural Rubber*, Rubber Research Institute of India, Rubber Board, Kottayam.

59. Lalithakumari and Jom, Jacob. (2000). *Natural Rubber In India: An Overview*; Rubber Research Institute of India, Kottayam

60. Leelamma, Varghese, (2014). *Crop collection and pre-processing -Natural Rubber*, Research Institute of India, Rubber Board, Kottayam.

61. Majumdar, Arunabha., Sen, Shyamal., and Nair, Chandrasenan, J. (2012). *Influence of RPS in the growth and performance of NR Sector in Tripura*, , ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept., Rubber Board, Kottayam, p. 59-65

62. Mani, K.P. (2011). *Cropping pattern in Kerala – Spatial inter temporal Analysis.* ***Kerala Economy: Trends during the post reform period*** (Edited K. Rajan) Serials Publications , New Delhi.

63. Mathai, Boban. (2012). *Charity face of RPSs* , ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept., Rubber Board, Kottayam, p. 129-134.

64. Mathew, N.J. (1991). *Rubber Plantation: Taking it to Non-Traditional Areas*. Survey of Indian Agriculture , Madras: The Hindu.

65. Mathew, Peter. (1996). *Relationship of scientific literacy at small scale Rubber growers with their training and Education*, PhD Thesis, Kerala University: 32.

66. Menon, Mukudan P. (2002). *Natural Rubber in India: Past, Present and Future. Proceedings of Rubber Planters Conference*. Kottayam: The Rubber Research Institute of India.

67. Mohandas, M. (2011). *Implications of WTA on Kerala's Agriculture*, Kerala Economy: Trends during the post reform period (Edited K. Rajan) Serials Publications, New Delhi.

68. Nagabhushanam, T. D. J. and Hiremath, K. C. (1990). *Performance of the MARFED*, Karnataka-Factor analysis approach. Indian Journal of Agricultural Economics, 45(4): 477-485.

69. Nair, Chandrasenan, J., Mukundan, K., Rakshit, A. S and Seena, S. M. (2012). *Grow in Groups – Strengthening of RPS and RPS Sector Companies*, ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept. , Rubber Board, Kottayam. p. 144-150.

70. Nair, Madavankutty, P.M. (1997). *Suvarnasangam Awarddanam*. Rubber Dec.: 5.

71. Nair, Narayanan, P.N. (2012). *Vicharavichi*, Rubber, Nov.: 1 j6.

72. Narayanan, P.K. (1997). *Rubber Producers' Societies: Agents of Change*, ***Rubber Board Bulletin*** Vol. 25.

73. National Institute of Agricultural Extension Management, (2012). *Report of Consultancy Study on RPS*, MANAGE, Bangalore.

74. Olappamanna.(2013). *Karshakane Rubberum Kaividathirikkuvan*. ***Karshakashri*** , Nov.: 5.

75. Omkar , S. Kanwar, (2011). *Kerala Rubber Growers See a Silver Lining*, ***Business Line*** 5 June: 4.

76. Planning Commission (2008), *Agriculture- Rubber Kerala.*

77. Plantation Enquiry Committee Report .(1956). Ministry of Commerce, Govt. of India, New Delhi.

78. Rajasekharan, P. and L. Haridasan. (1992). *Diffusion and Adoption of Innovations in Rubber Small Holdings*, Indian Journal of Natural Rubber Research 5.1-2: 188.

79. Rajeevan, B., Goswamy, P. C. and Majumdar, Arunabha (2012), *Role of RPS in the socio economic development of North East India – A Critical analysis*., ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept. , Rubber Board, Kottayam p. 111-118.

80. Rao, V.K. (2010). *Strides of Rubber industry in Kerala* , ***Rubber*** , Rubber Board Publication, Kottayam.

81. ***Rubber Board Bulletin***. (2011). Rubber Board, Kottayam, Kerala.

82. ***Rubber Board Statistics***. (2010). Rubber Board, Govt. of India, Kottayam, retrieved on 3.03.2012 from *http://rubberboard.org.in/rubberstaticsdisplaypage.asp*

83. ***Rubber Statistical Bulletin***.(2017). Volumen 72, No. 1-3, July.

84. Samuel, T.K. (2012). *Rubber Karshakarude Randu Nirdeshamgal****, Rubber Mithram*** Jan.: 21.

85. Santhakumari, K. (2013). *The Impact of Rubber Producers' Societies on their Members with Special Reference to Pathanamthitta District*, M.Phil. Dissertation, University of Kerala,: 78.

86. Sebastian, Joshi, (1999). *Puliyanathinu Parayanullathu*, ***Rubber Mithram*** Nov. 13.

87. Sebastian, Joseph. (2012). *Sustaining small holder agricultural through Rubber Producers' Societies*, Rubber Planters' Conference , India, Rubber Research Institute of India, Kottayam.

88. Sebastian, K.D. (2010), *Productivity in Small Holdings and Big Estates*, ***Rubber***, April: 27.

89. Sebastian, Prince. and Ramesh, B. (2014). *Human Resources Development in Small holding Sector in India*, paper presented in 9th ANRPC Seminar, Association of Natural Rubber Producing Countries. Kochi.

90. Sekhar, B. C. (2011). *Plans and Strategies for the Development of Small Holdings.* 3rd Seminar of the Association of Natural Rubber Producing Countries, Kulalampur.

91. Shanmugavadivu, N. and Kavitha, K.R. (2015). *A Study on the Problems of Small Rubber Growers with Special Reference to Kodanchery Panchayath, Kozhikode District* AEIJMR – Vol 3 – Issue 10 – October 2015 ISSN - 2348 – 6724.

92. Sobhalakshmi, C, (2012). *Strategies for identifying problems of RPS and measures to overcome*, Study Report presented to Rubber Board, Kottayam.

93. The Rubber Board. (2012). ***Indian Rubber Statistics***, Volume 33, (Kottayam: Rubber Board,)

94. The Rubber Board. (2013). ***Indian Rubber Statistics***, Volume 34, (Kottayam: Rubber Board,)

95. The Rubber Board. (2014). ***Indian Rubber Statistics***, Volume 35, (Kottayam: Rubber Board,)

96. The Rubber Board. (2015). ***Indian Rubber Statistics***, Volume 36, (Kottayam: Rubber Board,)

97. Thenankal, Peter. (2016). *A Study on Futures Trading in Commodities With Special Reference to Rubber*.

98. Thomas, Jasmine. and Kumar, Ajith, K. (2012). *Labour Banks under RPS, - Rubber Board,* ***Natural Rubber Revolution through RPS – 25 years in Retrospect***, Rubber Production Dept., Rubber Board, Kottayam , p. 105-110.

99. Usha Devi, T.U. (1999). *Travails of Rubber Industry in Kerala*". ***Rubber Asia***. Aug.: 98-102.

100. Usharani S. (2013). *A preliminary study on the impact of marketing natural rubber through Rubber Producers' Societies*, Rubber Planters' Conference, India, Rubber Research Institute of India, Kottayam.

ISSN: 0971-1260

Vol-22-Issue-16-August-2019

101. Varghes, Leelamma, Nair, Radhakrishnan, N. and Kumaran, M. G. (2014)

102. Varghese, Sunny, Claramma, P.V. and. Geethakutty, P.S. (2006). *Impact of group processing centres on marketing with a focus on socioeconomic development*, Paper presented in the Ninth ANRPC seminar on Progress and Development of Rubber Small Holders, Association of Natural Rubber Producing Countries, Cochin.

103. Varma, K.S. (1988). *Rubber Producers' Societies: An Appraisal*, ***Rubber Board Bulletin.*** Vo1.24

104. Viswanathan, P.K. (2008). *Emerging Smallholder Rubber Farming Systems in India and Thailand: A Comparative Economic Analysis*, Asian Journal of Agriculture and Development, Vol. 5, No.2.