



Dimensions of Foreign Trade of Natural Rubber in India

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DECLARATION

This report, “**Dimensions of Foreign Trade of Natural Rubber in India**” is a bonafide work done by me under the supervision of Dr Vijayakumar, Chief, Evaluation Division Kerala State Planning Board, Thiruvananthapuram, and has not been previously formed the basis for award of any degree, diploma, associate-ship, fellowship or other similar title or recognition.

Thiruvananthapuram

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CERTIFICATE

This is to certify that this report, “**Dimensions of Foreign Trade of Natural Rubber in India**” is a record of bonafide work carried out by Jiss Tom Palelil under my supervision. No part of this report has been submitted for the award of any degree or diploma of any university.

Thiruvananthapuram

April 2016

Dr. V. Vijayakumar

DISCLAIMER

The study has been prepared by **Mr. Jiss Tom Palelil**, student of Christ University, Third year BA Economics Honours, as part of his internship programme. The facts and figures in this report is based on primary data collected by the Author through questionnaires from the study area and secondary data collected from various sources. They do not reflect the views or policies of the Kerala State Planning Board.

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ABSTRACT

Natural rubber is one of the most important raw materials of several modern industries, which is produced from the latex derived from the bark of rubber tree. Originated in the Amazon rainforest region, it was later carried to several tropical regions of the world to establish rubber plantations. The spread of rubber cultivation accelerated primarily due to the colonial expansion and growing needs resulting from the massive industrialization in the late 18th century. First commercial rubber plantation in India was established at *Thattekadu*, Kerala in 1902 by the British planters. Since then, the total area of rubber cultivation has been increased steadily and resulted in contributing significantly towards the region's economic growth. Today, India is the fourth largest producer of the natural rubber in the world after Thailand, Indonesia and Vietnam. The country has imported 442130 metric tonnes of natural rubber in FY 2014-15 compared to 360363 metric tonnes in FY 2013-14. However, India has exported only 1002 metric tonnes of natural rubber in FY 2014-15 compared to 5398 metric tonnes of FY 2013-14. Though the total consumption of natural rubber increased due to the demand requirements, our exports are showing a steady decline for the past several years. Kerala, occupying only 1.2% of total area and 2.5% of total population, is the largest producer of natural rubber in India by contributing 94% of total output. It was because of the adaptation of modern technologies, agricultural tools and practises and botanical research and development along with its suitable climate, Kerala was able to achieve this marvellous position. In the above circumstances, this study takes a gander at the present position of nature of rubber production and its foreign trade in the country with special reference to Kerala. The primary purpose of this study is to take a gander at the present condition of rubber cultivation in Kerala, to scrutinize various trade policies and legislations of the government related to natural rubber and finally the influence of foreign trade of natural rubber on Kerala's economy. This research tries to explore (i) International prices of natural rubber and its influence on the domestic

market, (ii) the reasons behind the low domestic prices amid high consumption of natural rubber and growth in the automobile industry, (iii) the level of awareness among the ordinary people, particularly the small scale rubber farmers and rubber dealers, about the factors contributing to the price levels and (iv) the impact of existing policies and agreements over the domestic market and native farmers.

Keywords: Natural Rubber, Foreign Trade, Kerala

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LIST OF ABBREVIATIONS

AFTA	ASEAN Free Trade Agreement
AIRIA	All India Rubber Industries Association
AMUL	Anand Milk Union Limited
ANPRC	Association Of Natural Rubber Producing Countries
APTA	Asia-Pacific Free Trade Agreement
ASEAN	Association Of South-East Asian Nations
ATEP	Asian Trade Expansion Programme
CEPT	Common Effective Preferential Tariff
DEEC	Duty Exemption Entitlement Certificate
DEPS	Duty Entitlement Passbook Scheme
FAO	Food and Agricultural Organization
GATT	General Agreement on Tariffs and Trade
IMF	International Monetary Fund
IRSG	International Rubber Research Group
ISFTA	Indo-Sri Lanka Free Trade Agreement
ISNR	Indian Standard Natural Rubber
MRF	Madras Rubber Factory
RRII	Rubber Research Institute of India
RSS	Ribbed Smoked Sheet
SAPTA	SAARC-Preferential Trade Agreement
SION	Standard Input Output Norms
TSR	Technically Specified Rubber
UNCTD	United Nations Conference on Trade and Development

CHAPTER I

INTRODUCTION

1. Introduction

Natural rubber is the agricultural output produced from the latex which is extracted from the outer bark of *Hevea brasiliensis*, a tropical tree whose origins can be traced back to the Amazon forests of Brazil. Rubber grows well in the regions with moderate rainfall, abundant humidity, low wind, moist soil and wet climatic conditions throughout the year. Though there are several new hybrid varieties developed with the help of biogenetics to adapt with the dry climatic conditions of the country, most of the widely cultivated rubber species are still allergic to dry climate and heavy rainfall, which is a characteristic feature of several parts of the country. It is because of this same reason why rubber is produced in the few pockets of the country like Kerala, Tamil Nadu, West Bengal and the North Eastern Sister States.

1.1 Natural Rubber: A Historical Perspective

The earliest references to the natural rubber occurs in the travelogues of Christopher Columbus who reported to have seen the Red Indians of the American coast playing with bouncing balls that are obtained from the juices of the trees. However for nearly 200 years after this mentioning about rubber, no one took the burden to study more about this tree and its latex. Since colonialization was the first priority of the Spanish inquisitors, they barely allocated time and resources for botanical exploration and scientific examinations. As most of the Spanish invaders along with the accompanying officials from the royal court devoted their time to loot the gold and resources out of the region, the natural resources including the rubber was kept untouched for several decades. This tree was identified for the first time by *Charles De La Condamins* in the year 1751, who named it as '*Caotchouc*'. This word was derived from the native language of Incan civilization, which meant 'Weeping Tree' as they considered the white liquid flowing out of the tree as the tears of nature. Later, a botanical team was sent to the Amazon region to collect the seeds of the rubber tree. According to the historical studies of

Smith and WouterZant (1995), this team was under the supervision of Sir Henry Wickham and started their voyage in the year 1857. Legend says that the British expedition stole nearly 70,000 rubber seeds from the Spanish colonies without the permission and knowledge of the latter and later these seeds were transported to numerous British colonies in South Asian like Ceylon, Malaya, Burma, Philippine etc. This expedition was funded by the London office of East India Company. Various historical accounts also throws light over the involvement of Sir Joseph Dalton Hooker, a prominent botanist of those days, who used some of those seeds to further develop improved varieties of the natural rubber. Nearly half of the widely used rubber varieties today were developed at Royal Botanical Gardens, Kew. Though there are several hundreds of varieties of rubber trees, the most widely used variant of rubber plant for commercial purposes today is *Hevea brasiliensis* and its genetic hybrids.

1.2 Commercial Expansion of Natural Rubber

Towards the end of the 18th century most parts of the present-day Western Europe, particularly the British Empire, experienced massive industrialization. Factories came up and a huge amount of workforce was shifted from the primary sector jobs to secondary and tertiary sector jobs. This massive shift in the basic structure of the economy was also accompanied by growing demand for raw materials which were crucial for the industrial production and output. Along with raw materials like steel, coal, cotton etc. rubber too became an important component for production in several industries ranging from automobiles to arms and ammunitions.

This was also a period which saw a lot of innovations in pure and material sciences. Several solvents and chemical compounds were discovered and these inventions in turn accelerated the use of materials like natural rubber. For instance, the discovery of the process of ‘Vulcanization’ by Charles Goodyear in 1836 is a milestone in the timeline of natural rubber. The process of vulcanization improved the quality of the rubber by adding certain amount of

lead into it. This process helped in reducing the reaction time of the rubber compound against heat, thus reducing the reactivity and further increasing the durability of the rubber when used in the production of various commodities. This also gave rubber the nickname, 'fireproof gum'. Similarly, the invention of Pneumatic-type tyres that we use today by John Boyd Dunlop in the year 1888 was another breakthrough in the history of natural rubber and its commercial use. In 1840's, another Englishman named Thomas Hancock created a mastication machine to mix, blend and soften the rubber properly to use it in the production of various goods. This machine simplified the production process which earlier used to take several weeks and in certain cases, months. As time passed, the utilities of the natural rubber also increased as a result of further research and development in the area. In the following years, most of the Western countries were engaged in wars and conflicts. Soon after the first decade of the twentieth century, most of the world came under the political tensions. While the whole Europe was pulled into WWI, the Asian and African nations fought tremendously for freedom and independence from imperialism. The same time, Latin America also experienced military juntas and political pressure from Western powers, leading to the political instability and further military tensions.

The industrialization and early globalization which happened parallel to these developments also created a large demand for goods and commodities made completely or partially from natural rubber. This further elevated the demand for natural rubber as it was an important component in several war-related commodities like battery boxes, boots, tyres, rubber gloves, hot air balloons etc. as well a material used in parts or full of various big machines and equipments.

1.3 British Imperialism and Amazonian Rubber Boom

The period 1879 to 1920 is often termed as the period of Amazonian Rubber Boom due to the fact that rubber cultivation expanded tremendously during this period of time and later it even

spread to other parts of the world as well. Colonization was one of the major contributing factor to the identification of the natural rubber and its commercial use followed by this rapid expansion of rubber plantations across the tropical regions of the world.

As mentioned before, the 18th century industrialization and the accompanying growth created a huge demand for industrial raw materials to boost the production. In order to meet the growing demand, colonial powers like Great Britain often used its colonies for the uninterrupted, regular supply of raw materials. Rubber, being a crucial component of several manufactured goods, was thus introduced in several British colonies. This was primarily because of two reasons: Firstly the regions like Brazil, Panama, and Argentina etc. where the rubber tree grew naturally were not under the direct control of Britain. Thus, Britain had to depend upon its rival forces including the Spaniards for the supply of the rubber. Secondly, there was a scope for the expansion of rubber cultivation within the English colonies. Britain and East India Company occupied several tropical regions like Ceylon, Philippines, North-East Frontier Province, and Southern India etc. which were suitable for the rubber cultivation.

1.4 Natural Rubber in India

Recognizing the needs and requirements of the industries and factories operated across the English islands, there were several attempts from the part of the British government under the auspices of East India Company to introduce rubber plantations in the dominions under its control. Following this mission, Sir Henry Wickham in the year 1876 conducted a successful expedition to Amazon River basins to collect the seeds of rubber tree. He was able to preserve them well till his ship reached Ceylon. Later, they were transferred to *Nilambur* in Malappuram district in Kerala as the East India Company owned sizeable amount of land and estate holdings

there. In the year 1902, the *Periyar Syndicate*¹ was formed by the colonial administrators which in turn led to the establishment of first commercial rubber plantation in India at a place called *Thatttekadu*². Initially, the native people were not allowed to engage in rubber farming. However, this restriction was removed in 1920's and this further accelerated the geographical expansion of rubber cultivation. The formation of 'Malankara Rubber and Produce Company' in 1910 and various other cooperative societies following this model in Kerala increased the rubber production and made it commercially viable and economically profitable.

1.5 Government Approach Towards Rubber Sector After Independence

The colonial administration always encouraged the rubber cultivation due to its commercial importance and this trend was followed by the governments which came after independence too. Rubber Act of 1947 was an important milestone in the history of natural rubber cultivation in India. This act laid down several regulations and laws which governs the rubber cultivation and its trade today. Later in the year 1954, an amendment³ was made to this act to incorporate the provisions seeking the establishment of 'Indian Rubber Board' headquartered at Kottayam. Along with these developments, the natural rubber sector expanded further fuelled by the growing domestic and international demand along with inadequate supply. Several interventions from the part of various governments as well as the Rubber Board helped in

¹Periyar Syndicate was an informal organization formed exclusively by the Englishmen for encouraging the cultivation of Rubber. Rather than a formal organization, it often acted as an informal association to protect the colonial interests.

² According to tradition, Thatttekadu was chosen due to its proximity to Cochin port as well as due to a special request from the then ruling dynasty of Cochin Princely State.

³ Till 1954, the sector was directly under the control of Ministry of Agriculture. However, this was inefficient, particularly with research and subsidy disbursement, leading to the formation of Rubber Board.

increasing the productivity of this sector.

Natural Rubber production in the State of Kerala have been through several ups and downs. Though blessed with good weather conditions and environment, Kerala often faced the disadvantage of growing population pressure in its agricultural sector and rubber is no exception. Many farmers often express how difficult is for them to find and procure new piece of land for rubber cultivation either under rent or through purchase. Most of the land area are being converted into commercial plots due to the high volatility in the rubber prices over the short period of time. Even in the long run, natural rubber is subject to market instabilities. This can be observed in the prices over the period of time. For instance, rubber prices in 2001 was ₹32.09 /Kg which increased tremendously to ₹102.34/Kg on 2007 December. This trend further helped the prices to reach an all-time high of ₹242.77/Kg in 2011 February. Government also succeeded in rolling out several new policies meant for the welfare of the rubber farmers as well as the development of natural rubber sector and allied industries. Such policies, though criticized for their inefficient management, has helped in increasing the competency of the rubber sector when it comes to the international trade and interaction.

Largely because of these efforts, the total rubber production in the country increased from 23730 MT in 1956 to 446313 MT in 2015. A sum total of ₹28.27 Cr was spent in 1990 for the promotion of Indian natural rubber whereas it increased to ₹162.23 Cr in the year 2015. Though the production expanded over the course of time, the geographical distribution of rubber is still static in nature, implying that the rubber production is concentrated in few States and regions of the country. Thus today, there exists a 'Rubber Belt' comprising of few rubber producing districts of Kerala. Even today, Kerala contributes around 92% of total natural rubber production of the country.

1.6 Statement of Problem

Today, India's economy is shifting from the primary sector to secondary and tertiary sectors. The country is now largely becoming dependent on these two sectors for employment generation and further economic growth. Thus, it has become very crucial for the country to maintain enough natural resources and raw materials required for the smooth functioning of these two sectors. Among the industries coming under the primary sector, automobile industry occupies an important position in the economy and rubber forms one of the most important raw material consumed largely by the auto mobile industry.

Looking at the case of Kerala, the State is known for its unique model of development. In most economies around the world, the economy grew through the stages were each of the three sectors dominated and this progression was in the form of economy dominated by agricultural sector followed by industrialization and manufacturing and finally the service sector. Almost all developing nations across the world has a stronger service sector whereas underdeveloped and developing nations still draw their economic resources primarily from agriculture or industries. However, in the case of Kerala, the Kerala model Development is unique for its transition from primary sector to service sector directly without touching a phase of industrialization. Though this makes the model unique, it must also be noted that the State has several small-scale industries scattered across the region and thus the economic picture of 'Gods Own Country' is different and must be treated as a special case during an economic analysis.

The State of Kerala accounts for approximately 92-94% of total natural rubber production in the country although it just occupies 1.2% of total area and 2.5% of total population of India. Natural Rubber is an important component within the economy which can influence and determine the financial prosperity of the region. According to the report of

International Rubber Study Group (2009), there is a strong correlation between the consumption pattern of people in the rubber cultivating areas and the fluctuations in rubber prices. It is also worth mentioning that more than one-third of the households depends upon the rubber directly or indirectly as a source of income. This shows how much the State's economy relies upon the rubber production and how any change to this equilibrium can cause serious negative implications on the region's economic wellbeing. This also points to the fact that how crucial are the trade policies and other regulations with regards to natural rubber and its foreign trade, as this sector is a significant contributor to the national revenue earnings of India in general and Kerala in Particular. Thus, the research problem can be stated as:

To analyze the growth achieved by the producers and farmers in the production of natural rubber over the course of time due to the adaptation of advanced technology and modern farming techniques; to take a gander at the foreign trade of natural rubber and its impact, both positive and negative, on Kerala's economy; to critically evaluate existing trade policies and regulation within the legal framework of the country and scrutinize various promotional measures and programmes taken by the government for the production and exports of natural rubber.

1.7 Objectives of the Study

- To make an overall examination of the progress made in the cultivation and production of natural rubber in India over the course of time with special reference to Kerala State.
- To enumerate the existing condition of the natural rubber sector.
- To assess various measures and initiatives taken by the government to promote the cultivation and export of natural rubber and to find their viability.
- To offer policy suggestions for the promotion of production and exports of rubber.

1.8 Methodology and Data Collection

The study primarily aims at an analysis of the existing policy framework which dictates the natural rubber sector in the country. Since the attempt is made through the perspective of political economy, the study will be both quantitative and qualitative in nature.

The proposal for the research project was submitted on the month of January 2016 for the approval from Kerala State Planning Board Evaluation Division Chief Dr. Vijayakumar. After several rounds of meetings and consultations, the project proposal was approved with certain crucial suggestions put forward by the Chief. A research schedule along with a questionnaire proposal was submitted to the Chief for prior approval. Once the questionnaire was accepted with minor changes, it was later used for conducting a pilot study on the proposed sample population from the surrounding areas of Kottayam. The underlying idea was that the pilot study would help in achieving a clear understating of the sample population and how the questions must be asked to extract the precise information. Following the pilot study, the questionnaire and interview schedule were further edited to make it adaptive to the requirements of the cognitive abilities of the individuals who might be participating in the research project.

Later, a full-fledged survey of the sample population was carried out in the following months for the requirement of the research project. This was also supported by a parallel survey of secondary data, using the resources available at the Central Library, located at the Pattom office of Kerala State Planning Board. The works referred to includes the offline resources available at the central library as well as the online databases to which the Planning Board network has access to. Throughout the course of this research project, Dr V Vijayakumar was there with all forms of guidance and clarified the methodological issues of the research project.

1.8.1 Sources of Data

The research was conducted with data samples collected from both primary as well as secondary sources. In order to understand the overall progress made by the natural rubber industry in the country, data from secondary sources was relied primarily.

1.9.1.1 Primary Data

Primary data was used for the understanding the overall condition of the natural rubber sector from the perspective of farmers and other people closely tied to the natural rubber. This study also attempted a thorough analysis of various such trade policies of Government of India and will look at how these policies are viewed by the sample population from their perspective. For this purpose, a questionnaire was distributed among the people to record their responses. Personal interviews with experts was also used to get a clearer picture of the overall response. The study also used inputs from prominent industrialists, rubber dealers and farmers who are aware of various such foreign trade policies of Government of India. This will include the personal interviews, questionnaires and surveys to be conducted among the group of rubber cultivators, local and small scale rubber dealers, exporters, government officials and scholars who are familiar with the topic.

With the help of the information derived from various sources including industrialists, researchers, administrative officials, exporters, farmers and local businessmen, this study tries to conclude with some suggestions in the form of possible future trade policies which are viable and can protect the interests of the domestic market.

1.9.1.2 Secondary Data

Sources of secondary data mainly includes the past annual reports of Rubber Board of India, International Rubber Study Group (IRSG), Rubber Research Institute of India (RRII), located in Kottayam, various books and articles published which gives an account of history of Modern

Kerala and its agricultural practices etc. In order to enumerate the foreign trade policies of India regarding the natural rubber, this study made use of the statistical resources of various central and State agencies and organizations including the Ministry of Commerce and Industries, Ministry of External Affairs and Kerala Agricultural Department.

1.8.2 Sampling Design and Data Collection

Since the natural rubber sector has a good network of cooperatives, primary data collection was fulfilled by distributing questionnaires/survey forms through cooperative societies and farmers clubs. A fixed number of forms were distributed to each cooperative society and a request was made to the office bearers to distribute the questionnaire among the interested members of the cooperative. Since the distribution was limited to members, it essentially implies that the questionnaire was filled by the farmers. Non-Random Sampling method was followed and a target of 75+ responses was kept. In some cases, a localized version of the same questionnaire was distributed for those who weren't comfortable with the English version. A pilot survey of 23 respondents was conducted during December 2015. The final data was collected starting from April 2016 till October 2016, for a period of six months.

1.8.3 Analytical Tools

The collected data is analyzed with the help of simple analytical tools like percentage, rate of growth, averages etc. in the case of primary data. They are then converted into graphical representations in the form of charts and graphs for better understanding.

1.9 Limitations of the Study

The research faced certain difficulties and limitations while collecting the data required for analysis and further interpretation. This was because of the following reasons:

- Though the respondents are all well aware of the research problem, often they were not able to answer the questions to the expected level as the responses were within their cognitive limitations or influenced by the mood at the time of answering questions.
- Since the sampling technique used is non-probability sampling method, this can, in turn, lead to the sample possibly not reflecting the views of the concerned population studied for the purpose of the research.
- The study also faced difficulties in extracting secondary data as a good share of those data is not available in public domain and often came up with huge fees/ subscription charges.
- There was also delays in acquiring data from Rubber Board and at one point, even RTI was filed to get the required data from the authorities.

1.10 Further Scope and Possible Extensions

Since this study is primarily focusing on the foreign trade and its impact, there is a scope for further studies in the areas related to financial sources available for rubber farmers, level of technology acquisition and use in the sector, influence of foreign remittances and rubber production patterns, paradox of growing level of unemployment and parallel phenomenon of labour shortage in the rubber sector etc.

CHAPTER II

Review of Literature

2. Review of the Literature

The natural rubber production and its foreign trade is a topic of great relevance as it plays a significant role in the economy of the State as well as the manufacturing sector of the whole country. However, very few researches have been conducted in the area, international trade of natural rubber and its implications on the State's economy. Additionally, the areas of the studies conducted so far have been confined mostly to the production techniques and domestic economy and few researchers have been attempted to approach the issue from the perspective of political economy. This section provides a brief overview of all relevant literatures and studies conducted by various scholars and academicians on the relevant areas related to the topic.

2.1 Studies on Historical Aspects and Emergence of Natural Rubber

There have been several studies, qualitative in nature, which looked at the historic aspects of the natural rubber cultivation in the country and how it became the source of income and livelihood for a large share of population. A Plantation Inquiry Commission, appointed by the Government of India in the year 1956 produced a comprehensive report which looked into the emergence of rubber cultivation in the country, its growth over decades and various other (Menon, Madhav 1956). Similarly, Harp (2015) traced the history of natural rubber, its expansion from Amazon River basin to other parts of the world and the initial foreign trade and economic importance. He also takes a gander at how colonialism paved way to the expansion of commercial rubber plantations and large scale massive production of natural rubber. Dijkman (1980) made an attempt to trace the history of arrival and the historical expansion of natural rubber cultivation in the Eastern hemisphere, particularly in South-East Asia. In his book 'Hevea: Thirty Years of Research in the Far East', the history and timeline of all major incidents in the past of natural rubber cultivation is explained from the critical perspective and

tried to understand who actually benefitted from the expansion of the rubber cultivation in the Asian colonies; whether it was the Imperial powers or the natives. Raju (2014) traced the history of rubber based industries in Kerala and how they evolved over the course of time from small scale units run by individuals to large scale production houses with exports to other countries as well.

2.2 Studies about Production Process and Plantations

A huge amount of available literature on natural rubber sector also deals with the technology and methods used in the production process of the natural rubber as well as the management of rubber plantations. Both the aspects, production process and plantations, are essential topics within the scope of a study related to natural rubber.

Ajith Kumar (1994) conducted a research on the changes in various technological tools and methods related to the plantation industry of the country and how it enabled the producers to attain the maximum level of output from the existing resources and area under cultivation. This study examined whether instability in the production of natural rubber is reduced by technological change and it also estimated the rate of diffusion of high yielding planting materials in the estate sector and the small holding sector. Thomas (1979) conducted a detailed study on the dynamics behind the rubber plantations spread across the State of Kerala and how they play a crucial role in the regions' economic wellbeing from the perspective of an economist. This study threw light on several aspects of rubber plantations and the way in which they sustained. Ushadevi (1999) conducted an intensive study on the history of rubber cultivation and its adaptation of modern technologies and farming techniques. It also looked at how these changes created a huge jump in the entire production process and how various government policies and subsidies promoted this technological advancement. This study correlates the growth in production with technological change in the industry. Rajesh (2005)

studied about the economic aspects of rubber-based industries in Kerala. This study further looked into the resource utilization of rubber industries, their productive capacity and productivity levels and the resulting growth from trade and exports.

2.3 Supply-Side, Marketing and Distribution

There have been a handful of studies conducted on the rubber producing societies in the country. Sumithran (2010), Thomas (2004) and John (2002) carried out comprehensive research on the natural rubber market in the country and how the marketing of the commodity is achieved through the help of rubber cooperatives in the State. While Sumithran focused largely on the cooperative societies, the other two studies were looking at the marketing mechanism of natural rubber and the general factors that influence the same in the economy as a whole. Particularly, the study conducted by John focuses on the natural rubber industry during the post-liberalization period and how the international trade creates problems in the domestic market. It also looks at the role of synthetic rubber in determining the prices of natural rubber.

2.4 Foreign Trade of Natural Rubber and Rubber Related Policies

Cherian (2006) looked at the natural rubbers' role in the scenario of expansion of world capitalist economy and underlying dynamics. This study also comprehensively looked at the changes in the foreign trade policies of various governments in India over the course of time and how these policies affected the country's domestic market of natural rubber and the people sustaining with its production. Similarly, Mathews (2012) conducted a study on the foreign trade of natural rubber with a special case study on Kerala. It primarily focused upon various trade policies and promotional activities from the part of the government and looked at how these measures along with growing domestic consumption affected the international trade of natural rubber produced in Kerala, which accounts for more than 90% of total national output

of rubber. George and Chandrashekhar (2014) published a research article which took a gander at the recent trends and developments in growth in the production of natural rubber and associated industries amid the global financial slowdown and stiff competition from synthetic rubber and cheap oil prices. Muthamma (1994) analyzed the production and marketing of natural rubber in India and the network for marketing the natural rubber across the world. It also looked at how the synthetic rubber and various other rubber producing countries created intensive competition to the natural rubber output of the country.

2.5 Research Gap and Relevance of the Study

Though there have been a sizeable amount of researches and analytical studies conducted on the foreign trade and its influence on the domestic market, most of them have been done prior to the 2008 crisis and the 2011 oil price boom. Similarly, most of the above studies as well as others merely tried to estimate the quantitative aspect of the natural rubber and its foreign trade partially or completely. Most of these studies failed in recognizing the policy aspects, which is qualitative in nature and majority of them lacks policy suggestions accommodating the influence of trade agreements and oil price fluctuations. Thus, these areas, untouched by the literature reviewed so far, will form the area of research for this study.

CHAPTER III

NATURAL RUBBER: CULTIVATION, PRODUCTION & CONSUMPTION

3. Natural Rubber: Cultivation, Production and Consumption

Identifying the commercial significance and the possible economic returns that could be yielded by the cultivation of natural rubber, government directly and through Rubber Board have been encouraging the farmers to increase the gross production of natural rubber in the country. Unlike several other crops which could be produced even without modern technology, the natural rubber cultivation and production requires some form of skill and basic techniques, without which the production will be nearly impossible.

3.1 Cultivation of Natural Rubber

Today rubber is traded across the world markets as it dominates several economies partially or fully due to its commercial and industrial significance. *Hevea brasiliensis* can be grown in areas with similar climatic conditions to the Amazon rain forests, which efficiently restricts production to regions 15 to 20 levels latitude north or south of the equator. However, it must be also noted that there are several new hybrids that are adaptive for even more dry regions.

It takes five to eight years for a rubber tree to mature to the girth at which it may be tapped and its commercial lifespan varies between 20 to 30 years. At the end of its lifespan, rubber wood offers a worthwhile by-product as a medium density tropical hardwood, which can be used for furnishing and other purposes.

Rubber saplings are usually produced from the germination of the rubber seeds or through the process of tissue culture. Germination involves the traditional means of production in which the seeds are picked up from the plantations daily and treated with nutritious chemicals for faster sprouting. The seeds are then kept in the river-bed sandy soil which is moist but not wet. The seeds will soon start developing stem modules and leaflets and the selection of the better progeny is done after 21 days of sowing.

Another common method for the production of natural rubber plants is true the means

of tissue culturing. Though the early research in tissue culturing of natural rubber dates back to early days of World War II, it became a comprehensive and effective area of study after 1968 when the Rubber Research Institute was formally inducted into operation under Rubber Board.

Tissue culturing is the process by which the natural rubber sapling will be produced from the specially created nutritious medium by extracting the plant embryo or cell pack and inserting it in the specially prepared medium. The beneficial feature of tissue culture is that it will help the botanist to produce plants of superior quality and desired features. Once the plant sapling is formed through the culture, it is transferred into a greenhouse setup for further treatment. Later, the healthy plants are selected and disbursed for commercial use. Though it is widely used for research purposes, it has yet to achieve popularity among the private rubber nurseries as well as in the commercial production of natural rubber plants.

3.2 Climatic Conditions Favoring Growth

Rubber trees require specific climatic conditions for its growth and climatic conditions plays a substantial role in determining the productivity as well. Rubber is best grown in the regions where there is a rainfall of 2500 to 4000 mm annually distributed across 100-130 days of the year. Humidity factor should be around 80% for optimal performance and the desired temperature range is between 23°C to 27°C and the tree can only tolerate a maximum of 30°C temperature. Though the tree is intolerant to temperature, it requires sunlight throughout the day, at least for six hours to maintain the levels of latex production. Strong currents of wind are also not appreciable as it can even lead to the absolute damage of the tree as well as tremendous fall in the latex produced.

3.3 Tapping of Rubber and Extraction of Latex

The rubber is extracted in the form of latex, a white, milky fluid which is held in cells which can be observed within the interior layers of the bark of the timber, using a process referred to as 'tapping', which involves paring away a thin slice of bark without harming the growing layer in a sequence of half-spiral cuts, often on alternate days, using a particular knife. Once the tree completes six to seven years of growth, the bark of the tree will be marked using the knife at scientifically determined lengths. The bark will be then removed slightly on a daily basis to extract the latex. The most preferable time for getting the optimal amount of latex is the early morning, particularly between 4:30 am and 6:30 am. The latex then oozes from the cut and flows right into a collecting cup for a period of a few hours or extra unless it starts evolving to coagulated form and ceases the liquid nature.

After collection of the latex, which at this stage is set to a liquid with 70% water content, will be taken to a processing unit, the place where it is usually sieved to cast off extraneous subject and suspended particles, blended, coagulated, rolled into sheets and then dried in 'smokehouses' to provide 'Ribbed Smoked Sheets' (RSS). However, after coagulation, alternatively it could be washed, shredded and granulated under controlled conditions before being dried in deep-bed driers to form a 'block' rubber known as Technically Specified Rubber (TSR). Whichever process is used, the rubber is then pressed into bales and wrapped into polythene baggage for dispatch. Alternatively, a small share of traditional rubber is also processed and offered as latex concentrate; water is removed by centrifuging, creaming or evaporation to give a product containing around 60% rubber.

As natural rubber can only be produced in few parts of the world with specific geographic features, it is the foreign trade of natural rubber that meets the requirements of various non-rubber producing manufacturing countries from across the world. Thus, any attempt to take a close gander at the natural rubber production, its foreign trade and their impact on the economy

can be achieved with its full result only by analyzing the Indian scenario as well as the global scenario of natural rubber.

3.4 Global Scenario

The major invention in using natural rubber for commercial purposes was the invention of eraser from natural rubber. It was Joseph Priestley and Edward Nairn who invented the use of rubber as eraser. In those days as the paper was very costly, this utility of rubber soon became popular. Following this trend, several scientists invented numerous uses of natural rubber.

Though the rubber production was costlier before 1900s, it became cheaper as the production of natural rubber shifted from the Amazon valley and spread to other parts of the world, particularly to the cheap plantations of the South and South-East Asia. Henry Wickham, a pioneer in the expansion of natural rubber cultivation played a crucial role in supplying the rubber seeds from the plantations in the Amazon River basin to other parts of the world. There are references in several colonial documents written in those days about his initiative to supply rubber seeds to East Asian countries like Indonesia, Thailand, and Sri Lanka etc. Though the prices of the rubber fell with the supply from low cost rubber plantations in the South-East Asian region, this had a little impact on the prices in the long run as the demand for natural rubber was stable and unaffected in the long run.

From 1914 to 1942, the only elastomer available in commercial quantities was natural rubber. But in the latter years, the United States Government implemented a programme to develop the synthetic rubber material which eventually contributed to the success of Allied war effort. By 1944, output of synthetic rubber was over 80000 tonnes. As it can be seen, the Natural rubber and Synthetic rubber are completely different in their characteristics. This differentiation is also a reason why these materials are used for different purposes with the amount of substitutability between the two is generally high. In other words, for almost every

commodities, except certain goods like healthcare items, both synthetic and natural rubber can be used as perfect substitutes in the production process. As a result, prices of these two commodities and their raw materials have an inverse relationship existing between each other. The production of rubber also follows a seasonal pattern in such a manner that certain periods of the year experiences high production of natural rubber whereas certain other months experience lower volumes of output. Meteorological data of past several years can be used along with the monthly rubber production for a comparison in order to derive this relationship (Mathews, 2014).

For instance, in the year 2014 when the rubber had huge demand and higher prices in the international market, the total production from January to August was 12265000 tonnes. The production during the period September to December of the same year was 14987000 tonnes (Rubber Bulletin, 2015). Thus, it is not just merely the demand and price levels that influences the natural rubber production but also various other external factors like climatic conditions, average rainfall, etc. It is also worth mentioning that this trend in natural rubber production with respect to weather conditions is applicable across the world. This is because of the reason that natural rubber is only cultivated in the selected few regions of the world where the climatic conditions are more or less similar; where the atmosphere is humid and dry with moderate level of rainfall throughout the year making it suitable for the optimal growth.

3.4.1 Global Rubber Production

Less than 10 countries across the world generate at least 1% of total natural rubber production of the world. Though there are several other natural rubber producing countries, their contribution to the total output volume is nominal. Most of the top leading rubber- producing countries are concentrated along the Equatorial line where the climate is stable for a long period of time and is characterized by Tropical Savanna Climate in which the regions will experience

year-round dry weather with cool atmosphere and the monsoon season will be polyphasic.

Table 3.1. India Position in Production of Rubber (Natural) in the World		
(2015)		
(In Tonnes)		
Rank	Top ten Countries	Production
1	Thailand	3863000
2	Indonesia	3107544
3	Vietnam	949100
4	India	900000
5	China	864806
6	Malaysia	826421
7	Ivory Coast	289563
8	Brazil	185725
9	Burma	148000
10	Nigeria	143500
	Other Countries	688187
	World	11965846

Note: ^ adapted from the statistics published by Food and Agricultural Organization, ON07.

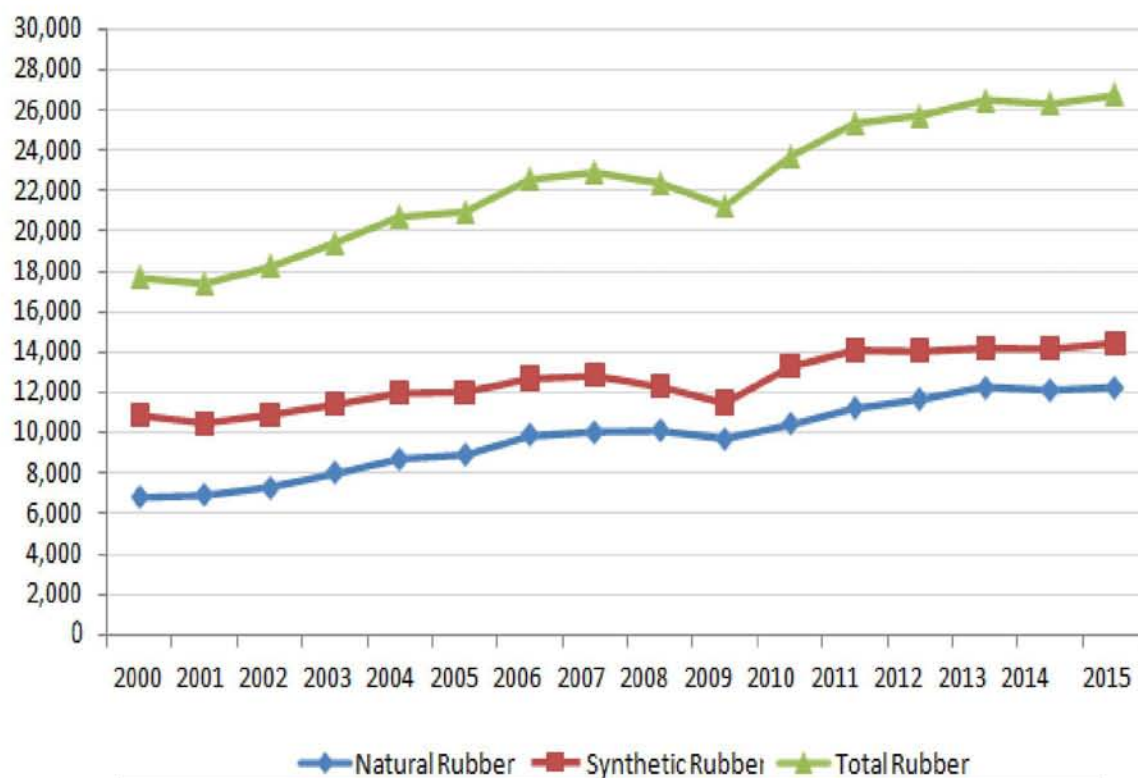
Among the natural rubber producing countries, Thailand leads the list with an annual output of 3863000 tonnes of rubber. They are followed by Indonesia, Vietnam and India occupies fourth slot. This output was made from a cultivable area of 442000 hectares. However, while referring to the global rubber production, it is also important to take the volume of synthetic rubber produced every year into consideration as the synthetic rubber also plays a crucial role determining the prices and nature of the foreign trade of natural rubber. Synthetic rubber is an artificial elastomeric substance, primarily produced as a by-product from petroleum.

Year	Table 3.2 Rubber Production ('000 tonnes)		
	Natural Rubber	Synthetic Rubber	Total Rubber
2000	6811	10870	17681
2001	6913	10483	17396
2002	7317	10906	18223
2003	7986	11414	19400
2004	8726	11979	20705
2005	8921	12025	20946
2006	9850	12700	22550
2007	10057	12829	22886
2008	10098	12285	22383
2009	9723	11488	21210
2010	10403	13277	23680
2011	11239	14091	25330
2012	11658	14042	25700
2013	11981	14199	26480
2014	12265	14179	26290
2015	11965	14435	26702

Annual Report, *Malaysian Rubber Board Website*

World Rubber Production

Fig 3.1



Note: ^Data adapted from Malaysian Rubber Board, *Rubber Statistics 2015*. Retrieved on August 3, 2016.

refining process. It is estimated that on an average, around 15 billion kilograms (5.3×10^{11} Oz.) of synthetic rubber is produced annually. Since its main raw material is crude oil, variations in the crude oil prices in the international markets directly affects the price of synthetic rubber.

3.4.2 Global Rubber Consumption

By the advent of various technologies and improvements in the rubber-based industries, the production of such rubber-intensive goods have gone up. This has also increased the amount of

Table 3.3 Top Consumers of Natural Rubber in the World (2015-16)		
(In Metric Tonnes)		
Rank	Top Countries	Consumption
1	China	5130
2	India	1134
3	United States of America	987
4	Japan	726
5	Thailand	563
6	Indonesia	547
7	Malaysia	459
8	South Korea	408
	Other Countries	4967
	World	14921

Note: ^Data adapted from Malaysian Rubber Board, *Rubber Statistics*. Retrieved on May 3, 2016.

rubber consumed over years and a steady rise in consumption can be observed as the trend from 1980's till present. Lion share of the consumption of rubber is concentrated in few countries who have a strong manufacturing sector, particularly a growing automobile sector. The above table shows the consumption

of rubber by various countries across the world. China and India leads the list of largest rubber consuming nations in the world followed by USA and Japan.

Natural rubber is mainly consumed by the manufacturing industries, particularly the automobile industry in the form of tyres and other minor components required for the functioning of motor vehicles. The growth in the automobile sector during the 1980s and 1990s along with the hike in the oil prices contributed to the increased demand for natural rubber which is now an unavoidable industrial component. Till the end of the 20th century, USA dominated the total world consumption of the natural rubber.

However, today China is the leading consumer of rubber with an annual consumption equalling to the 34.3% of total world consumption. This is followed by India which consumes 7.6% of total world consumption. USA, now third in the list, consumes 6.61%. Though the trend of rubber consumption was increasing over years starting from 1990s, a huge dip in this trend of increasing consumption can be seen for the year 2014-15. The decrease in global oil prices along with reduced demand due to economic slowdown in major manufacturing countries like China, Japan etc. is cited as the reason for the decreased consumption in the natural rubber. In other words, the lowering consumption trends of natural rubber can be attributed to economic slowdown in major manufacturing countries.

Another factor contributing to the lower consumption of natural rubber is the economic slowdown in the rubber consuming countries including India, China, USA, EU etc. Particularly after the 2008 slowdown, there has been a sluggishness in the economies of these nations leading to lower demand from production houses. Similarly, the lower financial security has also forced people to spend less on automobiles leading to a ripple effect in the rubber sector as well. As a result when the rubber prices fall, people tend to produce less, which in turn will also create problems in the labour market, allied industries and even in the rural economy of regions where the natural rubber is one of the important crop.

Fig 3.2

Global Rubber Consumption 1990-2015

3.5



Indian Scenario

Since its entry in 1900's into the Indian soil, natural rubber has become one of the most important product of Indian agricultural sector as well as an important constituent of various manufacturing units and industries. Though initially rubber was primarily used for the tyre manufacturing, later it was diversified into various other commodities as well.

Today, natural rubber and the rubber tree is used in the production of more than fifty thousand goods and products which have an indispensable position in our day to day lives. Natural rubber-based industries and related manufacturing units along with the foreign trade of natural rubber today provides a lot of employment to people in States like Kerala, Nagaland etc. As of the latest statistics, India is the fourth largest producer and second largest consumer of rubber (Indian Rubber Statistics, 2015). Rubber also forms a major source of earning foreign reserves for the economy as it is exported to countries which has a strong automobile manufacturing industry. Examples would include Japan, China, Germany and USA.

Year	Table 3.4 Total Natural Rubber	Annual Growth
	(In Tonnes)	(in Percentage)
2000-01	630405	1.31
2001-02	631400	0.16
2002-03	649435	2.86
2003-04	711650	9.58
2004-05	749665	5.34
2005-06	802625	7.06
2006-07	852895	6.26
2007-08	825345	-3.23
2008-09	864500	4.74
2009-10	831400	-3.83
2010-11	861950	3.7
2011-12	903700	4.8
2012-13	913700	1.1
2013-14	844000	-7.6
2014-15	645000	-16.7

^Data gathered from **Indian Rubber Statistics**, 2000-2015 May issues.

3.5.1 Production of Natural Rubber

Rubber production in India is concentrated to certain few pockets of the country. The production pattern is in such a way that three States produce around 97% of total rubber output of the country. Kerala leads

the list with contribution of 92% of total output of the natural rubber in the country followed by Tamil Nadu (3.4%) and Karnataka (2.1%). Most of the remaining States together contribute remaining 2.4% of gross national output of natural rubber. This includes States like Tripura, Assam, Meghalaya, Nagaland, Manipur, Goa and Andaman and Nicobar Islands. The production of natural rubber in India is mainly carried out by 'Rubber Producing Societies', which functions as an intermediary between small scale farmers and rubber manufacturers and exporters. Large scale producers like plantation owners and planters also contribute a sizeable amount of natural rubber to the total output.

From the official data, it can be observed that the total area under rubber cultivation increased from 711560 hectares in 2010-11 to 795135 hectares in the year 2014-15. Thus, the total area under cultivation showed an increase of 1.175% in the span of five years. Similarly, the total production of natural rubber increased from 864650 tonnes in 2010-11 to 917755 tonnes in 2012-13, which is an increase of 6.14%. It can also be inferred from these statistics that the rate of increase in the total production is greater than the rate of the increase in the area under the cultivation of *Hevea brasiliensis*. This in turn implies that the productivity of natural rubber has increased over the course of time, primarily due to the modern agricultural practises and various policies to promote the expansion of cultivation of natural rubber. However, it is also worth mentioning that the rate of growth was uneven across the country. While the traditional regions saw a slow and steady growth, the non-traditional rubber cultivating areas had a giant leap in rubber production.

In India, the natural rubber is made in the form RSS rubber sheets or the Ribbed Smoked Sheets. Ribbed Smoked Sheets (RSS) are coagulated rubber sheets which are made from the latex collected from plantations that follow scientific, modern agricultural practises. The higher grades RSS 1X to RSS 3 are mainly used for manufacture of products for medical, pharmaceutical and engineering. The lower grades of RSS 4 and RSS 5 are generally used for the manufacture of automobile tyres, re-treading materials and all other general products. RSS 3 and RSS 4 are the preferred raw material for radial tyres.

Table 3.5 Selected State-wise Area and Production of Natural Rubber in India (2010-2011 to 2012-2013 and 2014-2015)							
(Area in Hectare; Production in Tonne)							
States/UT	2010-11		2011-12		2012-13		2014-2015
	Area	Prod.	Area	Prod.	Area	Prod.	Area
Traditional Regions							
Kerala	534228	770580	539565	798940	545030	800050	549955
Tamil Nadu	19767	25160	19790	25220	20770	25350	20925
Sub Total	553995	795740	559355	824110	565800	825400	570880
Non Traditional Regions							
a) North-Eastern Region							
Tripura	59285	25875	64480	30590	67730	33220	75070
Assam	32659	8050	38090	10310	43335	11740	51795
Meghalaya	10584	5135	11875	6380	12865	7110	14775
Nagaland	-	1054	-	1395	-	1655	14235
Manipur	-	730	-	920	-	1035	3955
Mizoram	-	189	-	250	-	300	3550
Arunachal Pradesh	-	167	-	195	-	220	4065
Karnataka	38110	23705	41588	27910	44900	31250	49210
Other North-East	11157	2140	14025	2760	17105	3210	-
Sub Total	113685	67045	128470	80710	141035	89740	216655
b) Others							
Andaman and Nicobar Islands	879	312	-	270	-	220	805
Goa	1081	351	1125	555	1153	585	1165
Maharashtra	1173	102	1513	195	1830	340	2310
Odisha	-	177	-	200	-	220	1840
West Bengal	-	299	-	375	-	325	850
Andhra Pradesh	-	64	-	65	-	80	630
Others	2637	560	2729	890	2802	845	-
Sub Total	43880	1865	46955	2550	50685	2615	7600
India	711560	864650	734780	907370	757520	917755	795135

Note: ^Data adapted from *Indian Rubber Statistics*; retrieved on May 3, 2015

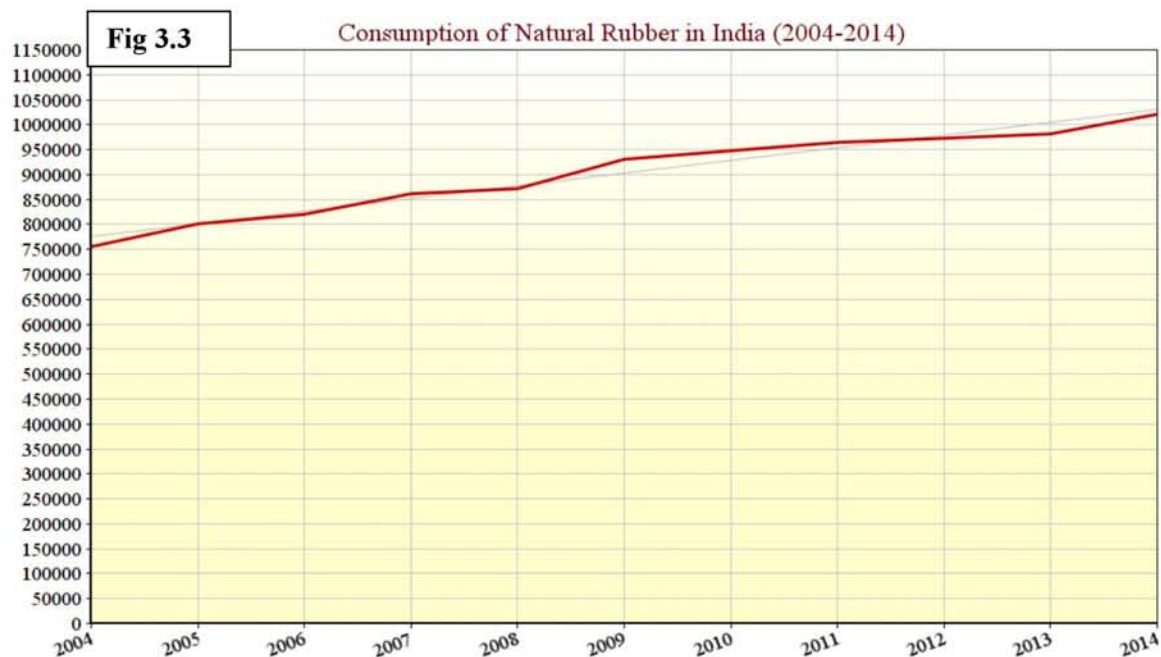
Quality of Ribbed Smoked Sheets is ascertained as laid down in Green Book Standards RSS 1X and RSS 1 are the superior quality rubber. Oxidized spots or streaks, weak, heated, under-cured, over-smoked, opaque and burnt sheets are not permissible in this grade. The rubber must be dry, clean, strong, sound and evenly smoked, and free from blemishes, specks, resinous matter (rust), blisters, sand, dirty packing and any other foreign matter. Following these grades are RSS 2 and RSS 3. They are also of good quality but are not as superior as RSS 1 or 1X. The poor quality rubber sheets are categorized under RSS 4 and RSS 5. In these grades of rubber sheets, large bark particles, bubbles and small blisters, stains,

over-smoked, slightly sticky rubber and blemishes are permissible. Slightly under-cured rubber is also permissible under these categories. However, weak, heated, burnt, oxidized spots or streaks are not permissible. The rubber must be dry, firm and free of blisters. Dirty packing, sand and all other foreign matter other than specified above is also not permissible. Other than the production in the form of sheets, natural rubber is also extracted in the forms of latex or CENEX, Indian Standard Natural Rubber or ISNR, crepe rubber etc. Latex is a form of natural rubber produced for commercial purposes wherein the natural rubber latex is extracted and processed into high quality latex concentrate of 60% dry rubber content. This is achieved through the centrifugation process. The centrifuged latex is again broadly divided into two categories namely high ammonia latex and low ammonia latex based on the amount of ammonia present. ISNR is another unique product from the rubber producers of India where the natural rubber is processed into blocks using modern and economically viable production processes. Unlike the RSS rubber where the focus is on the visible quality, the ISNR emphasizes the importance on the real quality of rubber making it perfectly suitable for the commercial use. Due its technical certified quality rather than the visual quality, ISNR is known for its consistency in its quality and has a huge demand from across the world and within the country. Bureau of Indian Standards has laid down certain parameters and specifications for the production of ISNR by the taxonomization of the same into various qualities namely ISNR 3CV, ISNR 3L, ISNR 5, ISNR 10, ISNR 20 and ISNR 50.

Natural rubber produced in India is used for domestic consumption as well as exports to other countries. For the purpose of exports, natural rubber in India is branded as Indian Natural Rubber, a name given by the Rubber Board for the purpose of the promotion of natural rubber produced in the country.

3.5.2 Consumption of Natural Rubber in India

India is one of the worlds' largest rubber consumers. India stands second behind China in terms of consumption of natural rubber. India achieved this position by consuming 9.60% of total global consumption of natural rubber.



^Retrieved on May 3, 2016 from <http://rubberboard.org.in/reports/statisticalhighlights.pdf>

**Table 3.6 Consumption of Rubber in
the Production of Final Products 2014-15 (in tonnes)**

Products	Natural Rubber	Synthetic Rubber	Reclaimed Rubber
Auto Tyre & Tubes	682350	382690	49640
Cycle Tyres	75465	29585	26750
Camel Back	44675	31785	4730
Footwear	62635	35190	9650
Belts and Hoses	42170	17730	10750
Latex Foam	28385	--	--
Dipped Goods	41215	--	--
Others	44015	39150	27545
Total	1020910	536130	129065

^adapted from Indian Rubber Statistics, April 2016

Consumption of natural rubber is on steady increase over the past few decades, which is mainly due to the growth of automobile and tyre industries functioning in the country. In 2014-15, India consumed 1020910 tonnes of natural rubber domestically. Out of this, 680840 tonnes of natural rubber was consumed by the tyre industry alone. This was against the 981520 tonnes in the previous year.

3.5.3 Production and Consumption of Natural Rubber in Kerala

The case of natural rubber, its production, consumption and impact within the economy of the State of Kerala is worth mentioning as Kerala accounts for more than 90% of total natural rubber production in the country. From the beginning of rubber cultivation in the country, Kerala leads as the biggest producer as well as one of the largest consumers of rubber within India. Both production and consumption have grown over the course of time primarily due to the modernization in the technologies related to farming and industrial processes related to rubber. The total plantation area under rubber cultivation in the State increased from 479602 hectares in the year 2003 to 545030 hectares in 2015, showing a net growth of 13.6%. The total production of natural rubber within the State increased from 798940 tonnes in 2014 to 800050 tonnes in 2015, showing a net increase of 0.13%. The productivity (per hectare) of land under cultivation for the year 2015 is 1.46 tonnes/hectare.

3.6 Natural Rubber and Its Influence on the Economy

Natural rubber is concentrated in the few pockets of the country. However, the impact of rubber in the economy is significant. Particularly, for a State like Kerala where the rubber contributes more to the economy than any other crop points to the fact that the any fluctuation in the prices of the rubber can have a major impact on the economy as well as the lives of the people in the concerned region. According to the Rubber Board statistics, the direct employment by the rubber plantations for the past year is 4.45 lakhs. Adding the indirect employment made by the rubber (which is around 16.7 lakhs) sector to this

number, around 20 lakhs of people are either directly or indirectly employed by the rubber sector in the State (Indian Rubber Statistics, 2015).

From the previous sections, data showed how the country consumes more rubber than its domestic production. While India is the fourth largest producer of natural rubber with a production of 645000 tonnes of rubber, it is the second largest consumer of natural rubber with a consumption 1020910 tonnes of rubber. This points to the fact that there is a huge gap between the demand-supply of natural rubber domestically. This gap is filled by the supply of natural rubber through imports from various other foreign markets. Natural rubber is also beneficial for the government in terms of the revenue that it generates in the form of taxes. For instance, the total revenue collected by the government in 2014 from the natural rubber ₹100.8 crore, according to the Statistical Bureau of Rubber Research Institute.

3.7 Schemes and Organizations to Promote the Production of Natural Rubber

3.7.1 Rubber Board of India

Various programmes, schemes and subsidies are dispersed periodically for the promotion of cultivation, production and exports of natural rubber. It is the rubber board which is the foremost institution to promote the natural rubber in the country. Established under the Rubber Board act of 1947, it is a statutory body reporting directly to the Ministry of Commerce and Industries. According to the Rubber Board of India Act (1947), the main functions of Rubber Board of India are:

“.....to promote by such measures as it thinks fit the development of the rubber industry; Without prejudice to the generality of the foregoing provision the measures referred to therein may provide for: undertaking, assisting or encouraging scientific, technological or economic research; training students in improved methods of planting, cultivation, manuring and spraying; the supply of technical advice to rubber growers; improving the marketing of rubber; the collection of statistics from owners of estates, dealers and manufacturers; securing better working conditions and the provision and improvement of amenities and incentives to workers; carrying out any other duties which may be vested

with the Board as per rules made under this Act; to advise the Central Government on all matters relating to the development of the rubber industry, including the import and export of rubber; to advise the Central Government with regard to participation in any international conference or scheme relating to rubber; to submit to the Central Government and such other authorities as may be prescribed, half yearly reports on its activities and the working of this Act, and; to prepare and furnish such other reports relating to the rubber industry as may be required by the Central Government from time to time.” (P43-51)

3.7.2 Rubber Research Institute of India

Rubber Research Institute of India is a pioneering research and development organization working in bringing technological up gradations and research to increase the productivity of natural rubber in the country. Established in the year 1955, it is a member organization of IRRB and was the major stakeholder behind the release of hybrid varieties like RR II 430, RR II 414, and RR II 105 etc. Rubber Research Institute has also ties with Manila Agricultural University, Kerala Agricultural University, etc. and the research is funded by Ministry of Commerce and Industries.

3.7.3 Labour Welfare Scheme

Rubber board takes care of the labour protection in the natural rubber sector and allied industries by the implementation of The Plantation Labour Act of 1951. Besides, there are periodic training programmes meant for the skill development of the rubber farmers and labourers to increase their productivity and output. There are also special funds where the amount is disbursed among the beneficiary labourers who need financial security. On an average, Rubber Board disburses ₹15-17 Cr every year to assist the labourers in skill development required in cultivation and production of natural rubber.

3.7.4 Market Promotion Department

There is a market promotion cell functioning directly under the Rubber Board Chairman. Their activities include the promotion of Indian Natural Rubber in Foreign markets, issuing export/import license to

businessmen, supporting the small-scale industries in selling their products to both domestic as well as international buyers etc.

3.7.5 Rubber Cooperative Societies

The cooperative society movement which took its flight in the early 1970's created an impression in the natural rubber sector as well. Following the inspiration from the cooperative wave that hit the country shortly after the success of AMUL, Rubber Board as well as the State government encouraged the farmers to form cooperative societies for better productivity and marketing of natural rubber. Such cooperatives also helped the farmers to procure loans from the banks at lower rates and flexible terms. At present, there are about 200+ cooperative societies operating in the State of Kerala with Rubber Mark, a State government agency, acting as the apex body to regulate the behaviour of such farmer consortiums.

The cooperative model has proven a success due to its ability in educating the farmers about the latest schemes, subsidies, and technological up-gradations and even in supplying labour force during the time of labour shortage. In most cases, cooperative societies are tied with a rural cooperative bank to act as a financial agent or intermediary between the farmers and the formal banking institutions. There is also a Rubber Development fund along with the General fund by the Rubber Amendment act of 2009 for the welfare of the rubber growers. Rubber Research Institute, an institution under Rubber Board engages in the development of various high-yield varieties *Hevea brasiliensis* which are adaptive to the weather conditions prevailing in the region. Several workshops, seminars, conferences and training programmes are also organized periodically for the skill development of small-scale farmers, cultivators, tapping workers etc. for making them adaptive to the changing trends in the sector as well as to make use of several modern techniques and viable methods to get the maximum out of the natural rubber cultivation. However declining prices and adverse weather conditions still continues as some major challenges in the sector. This plight of rubber famers due to the volatility and low prices often forces

them to quit rubber cultivation and use the land for other purposes including non-agricultural activities like real estate development.

Analysing the recent trends, however, it is clear that several policies that the government once had for the welfare of rubber sector is being reverted back for petty economic benefits and political reasons. An example would be the suspension of subsidies for replanting the rubber after clearing the plantation for re-cropping. Earlier, government had the scheme where a one-time subsidy amount of ₹25,000/Hectare was distributed to all farmers. This scheme is discontinued citing financial burden incurring from the scheme over the shoulders of the government. Similarly, last year, government allocated a sum total of ₹967 Cr only for the functioning of Rubber Board and its research institutes, creating problems in programme design and execution.

CHAPTER IV

**AN ANALYSIS OF FOREIGN TRADE
OF
NATURAL RUBBER**

4. Foreign Trade of Natural Rubber

Being one of the largest producer as well as consumer of natural rubber in the country, India is one of the major players in the foreign trade of natural rubber in the world. Along with the demand from high domestic consumption, large volume of production each year results in exports as well as imports of natural rubber. The recent relaxation of trade barriers are also a reason behind growing international transactions.

4.1 Exports and Imports of Natural Rubber from India

Table 4. Exports and Imports of Natural Rubber from and to India		
Year	Exports (MT)	Imports(MT)
2000-01	13356	8970
2001-02	6995	49769
2002-03	55311	26217
2003-04	75905	44199
2004-05	46150	72835
2005-06	73830	45285
2006-07	56545	89799
2007-08	60353	86394
2008-09	46926	77762
2009-10	25090	177130
2010-11	29851	190692
2011-12	27145	214443
2012-13	30594	262753
2013-14	5398	360263
2014-15	1002	442130

^ from *Indian Natural Rubber*; Retrieved from www.indiannaturalrubber.com on Dec 21,2016

According to Ministry of Commerce and Industries, (2015) India has imported 442130 tonnes of natural rubber during 2014-15 against the import of 360263 tonnes during 2013-14. The quantity imported

through the open channel with payment of customs duty at the prevailing rate, constituted around 76.5% of total imports, due to low prices in the international market.

Natural rubber exports remained unattractive due to high domestic price compared to international prices. The total exports during 2014-15 was at 1002 tonnes, compared to 5398 tonnes exported during 2012-13. Foreign trade of natural rubber, specifically the imports of natural rubber, takes place on a large scale primarily due to the differences in the domestic and international prices along with low customs duties and import tariffs. During 2014-15, natural rubber prices in the domestic and international markets were low compared to the previous financial year. The domestic market prices sharply fell from ₹166/Kg at the beginning of April 2014 to touch all time average low of ₹132.57/Kg and finally closed at ₹131.95/Kg at the end of financial year. The average international price for RSS 3 grade was ₹112.71/Kg, while average domestic price for RSS 4 was ₹132.57/Kg for the year 2014-15.

4.2 Organizations Related to Foreign Trade of Natural Rubber

There are several policies and trade agreements existing in the sector to regulate the exports and imports of natural rubber. While many of them are implemented by the Indian government and its affiliates, there are numerous other Intra-Governmental agencies and organizations that effectively regulates the foreign trade and transactions. These agencies and apex bodies plays a vital role in dictating the direction and nature of foreign trade of natural rubber.

4.2.1 International Rubber Study Group (IRSG)

IRSG is an organization based in Singapore working for the promotion of the trade of the natural rubber as well as synthetic rubber. Established in 1944, it is one of the oldest organizations in the rubber sector to act as a forum where every stakeholder in the sector could discuss their problems and concerns and get easy remedies and solutions. IRSG also has a research and statistical unit which produces information about consumption, production and trade of rubber and often shares the same with the member nations and international agencies. As of 2014, the organization has 36 member countries including India, EU,

China etc. and nearly 120 industrial outfits as member companies. Among those includes Indian companies like MRF, Midas, CEAT etc.

4.2.2 Association of Natural Rubber Producing Countries (ANPRC)

ANPRC is yet another organization which acts for the welfare of natural rubber sector. Established in the year 1970, it has the major rubber producing nations as its members. Membership is restricted to countries and as of 2016, there are 11 member nations which includes government representatives of Papua New Guinea, Cambodia, Vietnam, Indonesia, Singapore, China, India, Malaysia, Sri Lanka, Philippines and Thailand.

It acts as an authentic source of statistical information for its member nations as well as it acts for the settlement of the issues that are pertaining within the trade of natural rubber in the global economy. Its functions, as listed in its constitution (ANPRC Manual, p13-17) are:

- Serving as an authentic and up-to-date information resource centre of natural rubber industry;
- Promoting activities conducive to sustainable growth in production, processing, marketing and consumption of natural rubber;
- Promoting natural rubber as an environment-friendly industrial raw material by projecting its green credentials and socio-ecological contributions;
- Identifying short, medium and long-term challenges and opportunities by undertaking suitable studies on rubber industry;
- Establishing linkages with relevant institutions including international rubber organisations for information sharing and technical cooperation;
- Making policy recommendations to Member Governments whenever necessary.

4.2.3 Rubber-Mark

Rubber-Mark is the frontal organization of Kerala State Rubber Development Federation. Being the nodal agency of a State with more than 95% of national rubber output, Rubber-Mark plays a prominent role in dictating the foreign trade of natural rubber of India.

It was established in 1971 as an apex institution of 38 rubber cooperatives in the State of Kerala, Rubber-Mark has since become the largest forex earning institution under the State government. Rubber-Mark is the only organization in the country that procures natural rubber from the farmers without any intermediaries on behalf of any State government. Rubber-Mark actively engages in purchases and sales to bring the market conditions in favour of the natural rubber producing farmers.

4.2.4 All India Rubber Industries Association

All India Rubber Industries Association (AIRIA) is a not-for-profit organization, established in 1945 to channelize the needs of the rubber manufactures in the official forums as well as to act as a pressure group for interested parties. It organizes annual Rubber Meets and conferences and also keeps a tab on the governmental responses to various issues and policy frameworks.

It has a diverse membership culture whereby the members are admitted based on different classifications. However, the body acts as common platform for the concerned sector and also plays a crucial role in the functional behaviour of the rubber and allied industries.

4.3 Policies Related to Foreign Trade of Natural Rubber

Trade policies and schemes related to the foreign trade can be broadly divide into two types: Internal policies pertaining to the foreign trade framed by the Central and State governments and the bilateral and multilateral trade treaties to which Indian government is a party. Though they vary in terms of their legal coverage and geography, they are distinct in the sense that they approach the whole issue of the foreign trade of the concerned commodity from a different angle. For instance while most of the

multilateral treaties to which India is a party, they give utmost importance to the globalization phenomenon and free trade of goods and services over the interests of the domestic markets and the agricultural community.

In a similar fashion, the domestic policies always look forward into the possibilities of the protectionism and favours the local sectors over the interests of other nations. However, a close analysis of the recent policies and legislations points to the fact that our policy makers are compromising the domestic legal framework to favour the friendly nations for diplomatic gains as well as for the compliance with the treaties that we have ratified so far and the standards of the organizations in which we hold a membership.

This section analyses the most important policies and treaties related to this matter and an attempt will be made to critically examine and cross check how these policies are influencing the nature of natural rubber sector and its foreign trade and whether undercurrents leads to the trends favourable to the market of natural rubber.

4.3.1 External Policies and Agreements Related to the Foreign Trade of Natural Rubber

4.3.1.1 Bangkok Agreement 1976 (Asia-Pacific Trade Agreement)

Asia-Pacific Trade Agreement (APTA) was a multilateral treaty signed in the year 1976 to promote the objectives of the Kabul declaration, which emphasized on the importance of expanding the trade of the region, which houses a vast majority of the developing nations of those days and to increase their economic interaction with the rest of the world, particularly the Pacific nations like USA, Latin America etc. The agreement was guided by the Economic and Social Commission for Asia (ESCA) under the auspices of Asian Trade Expansion Programme (ATEP). The signatories included the five nations of the region, India, Bangladesh, Sri Lanka, Laos and the Unified Korean Republic. This agreement reinforced the Article IV of GATT agreement as well as the WTO provisions for subsidies and countervailing

duties. The treaty also encouraged a common customs nomenclature and offered a provision where the signatories were encouraged to extend the Most Favoured Nations (MFN) trade preferences to other parties of the agreement as well (Ministry of Commerce, 2006, p. 19).

The agreement covered several agricultural commodities as well as several other raw materials produced in the region under the purview of the concession list, whereby the countries could ask other member nations to ease the duties and tariffs on such commodities in order to ensure their free flow. This also had provisions for the reduction in the tariff structure of the natural rubber products like tyre, tyre tubes, health products etc. at a discounted rate of 16% of total import value.

4.3.1.2 United Nations Conference on Trade and Development (UNCTD-Nairobi, May 1976)

In the fourth session of UNCTD, it was agreed that there will be a special initiative from the part of the United Nations to encourage the global trade and to improve the terms of trade of developing countries so as to reduce the "...imbalances between the developing and developed nations of the world through adopting trade related policies in favour of the domestic markets of those nations, or at least without hurting their interests." (United Nations Conference on Trade and Development, 1976, p. 07, 13-14)

Accordingly, nearly 27 commodities, including natural rubber was included in the list so as to enhance and encourage the domestic markets for these commodities and also to incentivise the farmers from developing countries who rely upon the production of these goods.

4.3.1.3 India-Sri Lanka Free Trade Agreement (ISFTA)

India-Sri Lanka Free Trade agreement was the result of years of negotiations in order to improve the ties between two nations, which was at its historic low after the Indian mission in Sri Lanka to cleanse the island nation from LTTE. The agreement was signed in 1999 and it came into effect in 2000. While India met its pledges by the mid-2003, Sri Lanka fulfilled the ease of trade framework by 2008.

Under this agreement, commodities are grouped into positive list and negative list to regulate the nature of cross-border trade. There will be complete waiver of duties and taxes for these commodities

over the both nations have mutually agreed upon. As per the provisions, rubber products like tyres can be imported at nil customs duty. Considering the lower labour costs and availability of the cheap rubber in the Island nation, several Indian companies have trade interests in the region for the tyre and allied industries. This has also created a situation of free flow of natural rubber between the two countries due to the differences in the exchange rate and the prices of rubber in both nations.

The total volume of India-Sri Lanka bilateral trade is around \$3.6 billion in 2014 where more than 67% is the Indian exports to the island nation in the form of refined petroleum, software, consumer goods etc. Most of the trade happens via the Chennai, Kochi and Vishakhapatnam ports of Indian and the Colombo, Jaffna ports on the Sri Lankan side.

4.3.1.4 SAARC Preferential Trade Agreement (SAPTA, 1995)

SAARC was formed as a regional alliance to counter the rowing influence of the Soviet and American blocs in the region and to maintain the political neutrality and non-alliance principle of the member nations. It formed as an organization to encourage the cross border trade by understanding the unique culture that each nations share.

SAPTA was the major milestone in the history of the SAARC after its inception in 1985 as SAPTA helped in creating a common ground for the countries to engage in economic activities and trade that are beneficial for both parties and their domestic markets. Another objective of this treaty was to enhance the trade in the region, which accounts for more than 40% of global population and 15.6% of total populated area. SAPTA was considered as the first step towards the SAFTA agreement, which was signed nearly a decade later.

SAPTA was the result of four rounds of negotiating talks which covered nearly four thousand commodities produced in the region with the objectives of making the trade a comparatively advantageous process for both the engaging parties, to create a common framework of customs duties in favour of the least developed nations within the organization, to help such nations to overcome the

problem of capital deficiency and lagging technological progress etc.

The treaty follows the negative list approach of the WTO, wherein the commodities are divided into a positive listed or negative listed item. There will be sizeable amount of restrictions over the trade of the items in the negative list whereas the positive items will have relatively smaller duties and in most cases, the countries will negotiate to bring those rates to zero.

Regarding the rubber sector, while most of the by products made from the natural rubber are included in the positive list of the treaty, it must be mentioned that the natural rubber as a raw material is excluded from free trade and it is considered as a negative listed commodity with sizeable amount of restrictions over its transaction across the borders of the member nations.

4.3.1.6 ASEAN Free Trade Area (AFTA, 2009)

ASEAN Free Trade Area is a multilateral treaty signed between the ASEAN member nations and the observer nations like the China, India etc. wherein the primary objective is to create a free trade area in the model of European Union across the region so as to facilitate the trade and to encourage regional cooperation. The trade deal was negotiated over a period of nine years and it came into effect in the fiscal year 2006-07. It was later extended to include more than 8,000 commodities.

The main feature of the ASEAN treaty is that it encourages Common Effective Preferential Tariff five percentage to fifteen percentage. This is done by creating various schedules of commodities and categorizing them into sensitive, highly sensitive and general exceptions. The tariff structure will be different according to the schedule in which the commodity is included. Though this is the case with the member signatories, there is a degree of freedom in the case of the observer nations. As per the existing negotiated deal, with regard to the natural rubber, there is nil tariff concessions for the trade between Indian and other nations in the region. However, this has been only applicable to the natural rubber and most other rubber related products like tyre and tyre tubes have minimal or zero tariff structure. The ultimate aim of the free trade area is to reduce the trade barriers existing in the region to encourage trade.

However, it must be noted that though it will create more markets for the Indian industries and other exports, to an extent it influences the domestic prices and the wellbeing of the farmers as well.

4.3.1.7 WTO Regulations and the Status of Natural Rubber

WTO is the premier organization in determining the nature of the foreign trade that's takes place in the highly globalized 21st century. Formed as a successor of the GATT agreement, WTO acts as an inter-governmental organization which facilitates free flow of the goods, one single global market, and a settlement body to mediate in the disputes that arises between various member nations. WTO framework seeks regular programmes to improve the free market situation by removing trade barriers and encourage countries to move away from protectionism. India, being a signatory to the WTO, has those commitments it must fulfil to not face retaliatory actions from the organization and the participating nations.

According the WTO agreement, natural rubber is considered as an input or raw material used in the production of the various industrial commodities like dipped gloves, surgical items, tyres, valves etc. As a result, often the policy makers fails in giving special preferences and consideration to the natural rubber sector. In fact, as per the understanding of the WTO, there is no significant difference between the synthetic rubber and the natural rubber, as it considers both of them as inputs for rubber products, made through two different methods. Since rubber is considered as the non-agricultural commodity, often it becomes difficult for the natural rubber sector to enjoy the protectionism offered for the agricultural products.

Similarly Natural rubber lost its position in the negative list of items, which are restricted to be imported to India in 2001. It was moved from the items with limited imports to the Open General License list and thus allowing anyone to import any quantity of natural rubber after paying a particular amount of the total imports value as the customs duty. It must be mentioned that to overcome this scenario, central government prepared a list of commodities under "State Trading List" to prevent their tremendous flow to the India mainland. However since rubber is considered as an industrial output, it

became difficult for the policy makers to incorporate rubber into this particular list, leading to further degradation of the natural rubber sector in the country.

4.3.2 Domestic Policies and Tariff Framework of India

Domestic policies regarding the foreign trade of natural rubber is prepared by the Ministry of Commerce after receiving appropriate suggestions and inputs from the Rubber Board of India and other related nodal agencies in the country.

The existing policies for the foreign trade of natural rubber is popularly known as the EXIM policies, which were formulated at the beginning of this millennium. As per the policies, any individual/party can export the natural rubber produced in this country to some other States after getting the prior approval of the rubber board. Once the request is submitted to the rubber board, it will issue a registration certificate which could be later used for the trade of natural rubber. Once the registration is done, the seller can find and locate a potential purchaser with the help of business directories, listings published by the governments, Indian embassies in various countries, trade representatives in various consulates etc.

In the case of imports, no prior licensing process is involved. After the payment of the prescribed amount of duties and tariffs, the companies can import natural rubber from foreign sellers and exporters. The import duty is fixed based on the domestic prices prevailing in the market for the preceding three years along with considering the domestic market conditions and international rubber prices. In a similar fashion, natural rubber can be imported through open channel and under the provisions of Duty Entitlement Passbook Scheme (DEPS) provisions.

There is yet another scheme to encourage the local rubber manufacturing industries in the country through the scheme of Duty Exemption Entitlement Certificate (DEEC). It is an advanced licensing mechanism whereby the parties will be allowed to import natural rubber as a raw material, provided the export back manufactured, final goods as mentioned in the Standard Input Output Norms (SION).

Recently, Rubber Board of India has also kick-started a programme to brand the domestically produced natural rubber to maintain a special demand for the commodity and to promote its superior quality that it enjoys among the other competitors. For this purpose, the rubber exported from the country is branded as Indian Natural Rubber (INR) and as a part of the promotion, all the exports across the borders are branded under this name. Rubber Board also runs various promotional activities along with various business meets and commerce promotion festivals across the globe by bringing the prospective sellers in the country and potential foreign buyers under a single umbrella.

4.4 Other Factors Influencing the Foreign Trade of Natural Rubber

4.4.1 International and Domestic Prices

The foreign trade of any commodity occurs primarily due to the differences in its domestic and international prices. When the domestic price of a commodity is lower than the international price, exports take place. When the international prices are lower than that of the domestic prices, imports happen. This is applicable for natural rubber also. Due to the availability of cheap labour and other factors of production in countries like Thailand, Vietnam etc. the rubber prices are low in these regions compared to that of India. This scenario along with low customs duties contributes to huge inflows of natural rubber into the Indian market. Thus, the domestic rubber sector is closely tied up with these markets.

4.4.2 Crude Oil Price and its Influence

The major component in the production of synthetic rubber is crude oil. Thus, whenever there is a rise in the crude oil prices, there will be an increase in the demand for natural rubber. The reason behind this relationship is that both natural and synthetic rubber are substitutes. The recent trend of decreasing crude oil prices is a major reason behind the decreasing demand for natural rubber produced in India. As the synthetic rubber is becoming cheaper day by day, manufacturers are finding it as an economically viable option.

4.4.3 Tariff and Non-Tariff Trade Barriers

Tariff barriers like export duty, import duty, price floor etc. are often imposed to regulate the foreign trade of natural rubber. Non-tariff barriers like distinction in quality and rubber grades, various policies and promotional programmes, preference for local rubber etc. are also implemented for effective control of foreign trade.

4.4.4 Demand from Automobile Industry

Lion share of domestic natural rubber consumption in the country is fulfilled by the automobile industry. Thus, a higher demand from the automobile industry increases the domestic prices of natural rubber within the given stock of rubber. A sluggish growth in the automobile industry in turn will lead to less demand for tyres and thus less demand for natural rubber. It must also be noted that most of the rubber imports to the country is initiated by the tyre manufacturers.

4.5 Analysis of Foreign Trade of Natural Rubber

Given the information about the existing trade policies, both domestic and international, along with the other factors like crude oil prices that determines the price and trade of natural rubber, it will be a fruitful exercise to have a critical analysis of the situation that is prevailing and the nature of its impact over the welfare of the rubber farmers and small scale traders in the country.

It has been observed that most of the foreign trade agreements and policies at the national level to dictate the foreign trade of the natural rubber is based on the principles of the Comparative Advantage Theory of Trade given by David Ricardo four hundred years back. Most of the trade mechanisms of this globalized world is based on the assumption that free market will bring welfare to every party taking part in it and it will thus lead to the overall social welfare as well.

However, a close gander at each of these policies will help us to arrive at the finding that though they help in the free flow of goods and technology, they have also resulted in the degradation of the domestic

market. For instance, while most of these treaties don't remove the restrictions put over the exports and imports of the natural rubber as such, they on the other hand, encourages the free flow of the rubber based products across the border. So when these policies prevent the business class to export and import natural rubber freely, it has few restrictions over the flow of the products made from the same rubber. Thus the whole essence of protecting the interests the domestic markets and its' stakeholders from the predatory expansion of the foreign markets is at vain. An example would be the WTO agreement which considers the natural rubber as an industrial input rather than protecting it as a sensitive agricultural commodity prone to frequent price fluctuations and market conditions. Similarly, opening up the domestic market to the regional players for the purpose of integrating various markets will incur high costs for the country considering the fact that we are one of the largest producer of the natural rubber and all these nations have relatively smaller but cheaper rubber due to the abundant labour supply and cheap factors of production.

It is not just the foreign treaties but also the domestic policies that puts the rubber market at a disadvantageous position. For instance, the premier agency for the sector, the Rubber Board of India is often inefficient as an institution. Huge number of vacancies, low funding in the recent years, less allocation in the subsequent budgets, failure in farmer protection by withdrawing several subsidies and benefits have all resulted in the fall of the rubber sector in the country. Rubber board has often failed to take tough stance against the inefficient market tendencies and practises of the tyre companies and rubber importers. An example would be the tremendous inflow of natural rubber to the country amidst the falling domestic prices in the 2013-14 period, which is observable from the secondary data provided in the preceding chapters. Thus rather than looking away from the domestic market, future policies must be oriented towards the interests of the Indian market and producers.

CHAPTER V

**A SURVEY BASED ANALYSIS OF
FOREIGN TRADE AND
INTERPRETATION OF DATA**

5. Analysis and Interpretation of Data

In order to analyse the foreign trade of natural rubber and its impact on the small scale farmers in India, particularly the farmers from Kerala, a field study was conducted in order to gather statistical data regarding the situation. A questionnaire was prepared, tested and was circulated among people who were ready to be a part of the research survey. Prior to this, a pilot study was conducted and the questionnaire was altered accordingly to fit the requirements of objectives of the research. A few officials and experts were also interviewed to get an overall picture of the situation. These interviews have been included in the appendix section of this research.

Primary data was collected through a questionnaire, prepared in both English as well as Malayalam for the benefit of the participants. The questionnaire was circulated through cooperative societies and some were given directly to the farmers with whom the researcher had direct contact. The area under study was primarily within the surroundings of Central Kerala, due to the fact that a large share of farmers are concentrated here and the city itself being the home for Rubber Board of India. Though a total of 110 questionnaires were distributed, only 88 people responded in time or returned their responses. Out of this, few had problems with the way the responses were entered; like leaving certain questions blank or giving multiple responses for same question. All these lead to the analysis of 83 samples collected.

5.1 Profile of People

Almost all the people participated in the survey has completed high school education. Twenty three of them finished higher secondary education (equivalent to PUC) and nine of them are having a qualification above or equivalent to post graduation. All the respondents are males with age ranging from 22 to 78.

5.1.1 Occupational Status

Since the study was about the condition of domestic economy, majority of the respondents were farmers. However, there were also people who earned a sizeable share of their total income from the rubber even

though they engaged in other activities as their primary occupation. For instance, the researcher was lucky enough to record the response of an individual who owns 14 acres of rubber plantation though his primary job was that of being a Captain in a foreign vessel. While 71.07% of respondents (59 people) are engaged in rubber cultivation in a full time basis, the remaining 28.93% (24 people) were engaged partially. The criteria to determine whether it is a primary occupation or not was based on the involvement of the respondents in the activity in terms of time and the rate of income that they earn as a proportion of the total income from all other sources.

Table 5.1
Occupational Status of People Surveyed

Fully Occupied in Rubber Cultivation	59
Partially Occupied in Rubber Cultivation	24

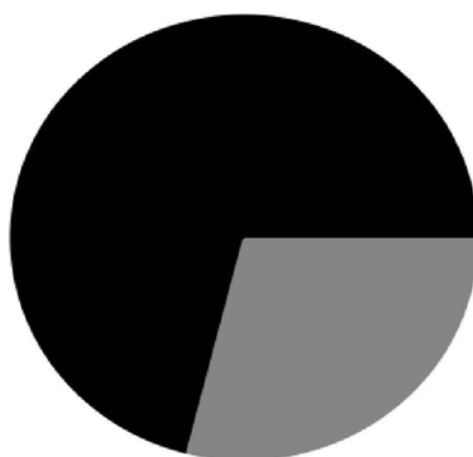
Source: Based on the data collected by the field survey

Fig 5.1 Occupational Patterns

71.07 % ■
Full Time

28.93 % ■
Part Time

Occupation Pattern of Respondents



Source: Based on the data collected by the field survey

5.2 Size of the Land Holding

The respondents were broadly divided into two categories. Small-scale farmers whose holdings are below 10 acres of land and large-scale farmers whose land holding is greater than 10 acres of land.

Table 5.2

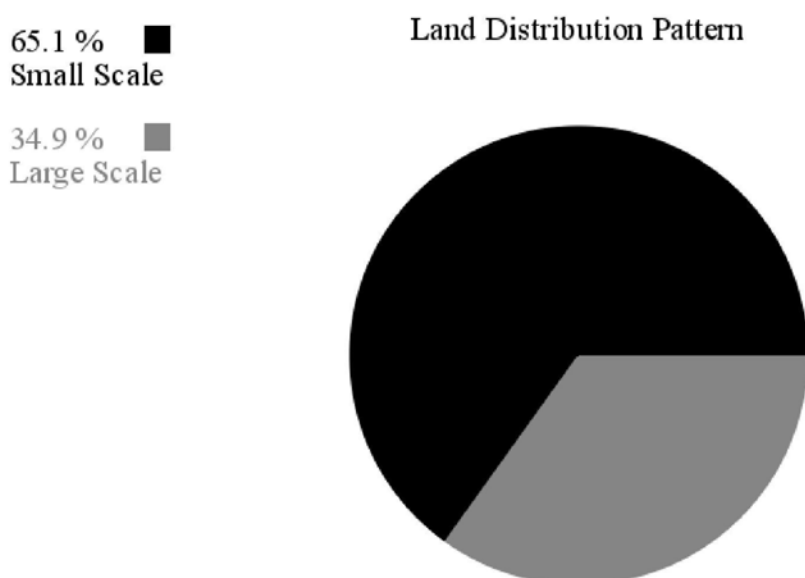
Size of Land Holdings of the People

More than 10 acres of Land	29
Less than 10 acres of Land	54

Source: Based on the data collected by the field survey

Accordingly, 29 of the total respondents are categorized as large-scale farmers (34.9%), whereas the majority 65.06% (54 of them) are small-scale farmers with cultivable land less than 10 acres.

Fig 5.2 Classification based on the Size of Land Holdings



Source: Based on the data collected by the field survey

5.3 Form of Output

Out of the total people surveyed, 38 of them (45.7%) primarily produce natural rubber in the form of sheet, which is the traditional way of transferring rubber from plantation to collection hubs and then to manufacturers. However there is a recent trend of an increase in the non-conventional forms of output like latex. Out of the total, 32 of them (38.5%) have switched to collecting rubber in the form of latex. Latex is collected and preserved by chemical treatment to prevent coagulation. Five of the total respondents (6.02%) collected rubber in the form of scrap and eight of them (9.6%) in other forms.

Table 5.3 Forms of Output

Rubber Sheet	38
Latex	32
Scrap	5
Others	8

Source: Based on the data collected by the field survey

Fig 5.3 Forms of Output

45.7 % ■
Sheet

38.5 % ■
Preserved Latex

6.02 % ■
Scrap

9.78 % ■
Others

Forms of Extraction



Source: Based on the data collected by the field survey

5.4 To Whom the Farmers Sell their Rubber

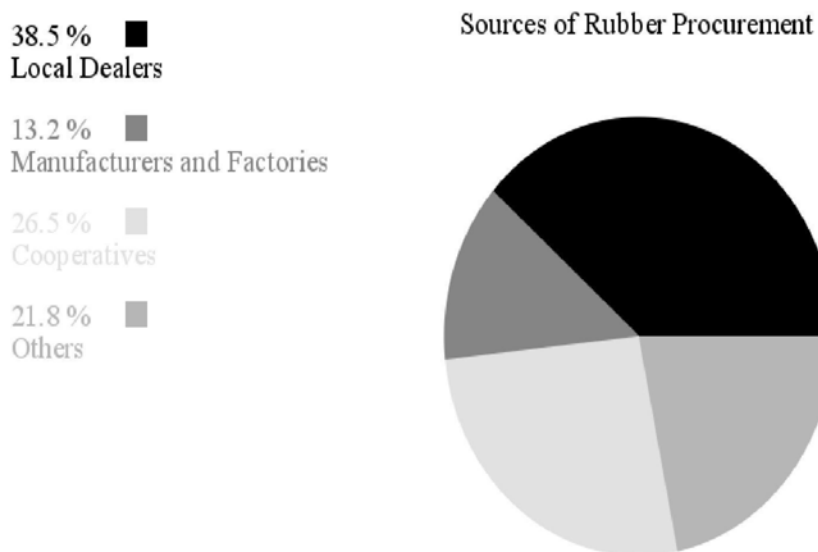
Among those surveyed, 38.5% prefer selling rubber to local rubber dealers. 26.5% responded saying they sell rubber to cooperative societies and 13.2% to local factories and manufacturers, and 21.8% to other sources including Rubber Mark.

Table 5.4 To Whom the Rubber is sold

Co-operative Societies	22
Small Local Dealers	32
Manufacturers and Factories	11
Others	18

Source: Based on the data collected by the field survey

Fig 5.4 To Whom the Rubber is sold



Source: Based on the data collected by the field survey

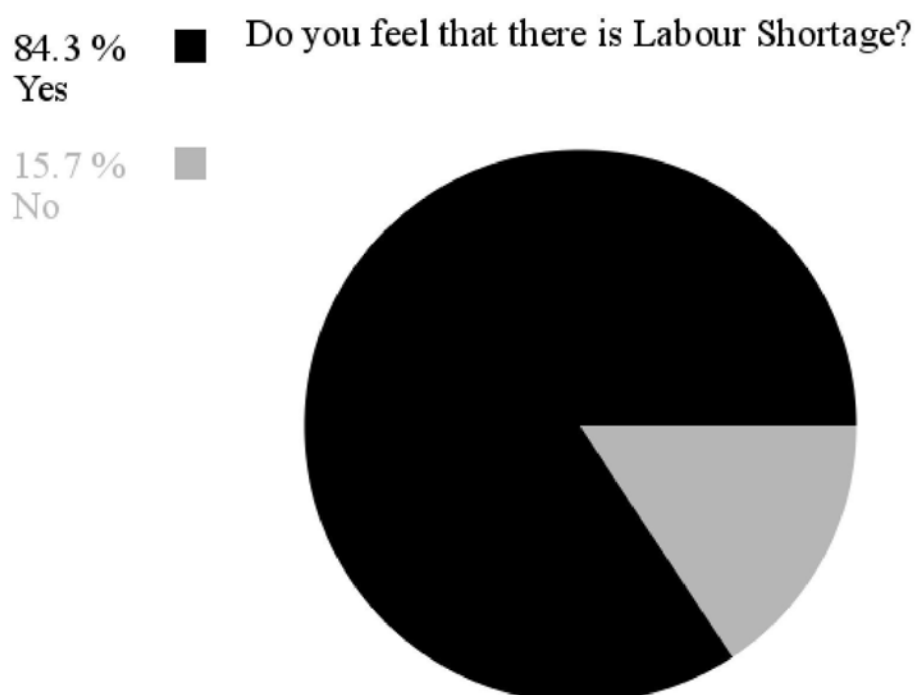
5.5 Labour Supply in the Sector

A question was asked to find whether there was labour shortage in the sector. The purpose was to look into whether the labour shortage crisis, a prevailing issue in the contemporary Kerala economy, is present

in the natural rubber sector as well. This finding will help to get an overall picture of difficulties in production process as well as the range of labour cost.

Out of the total responses, 84.3% replied saying yes, there is a labour shortage existing in the sector (70 respondents). The remaining (13 respondents) responded saying there is no labour shortage in the sector.

Fig 5.5 Availability of Labour

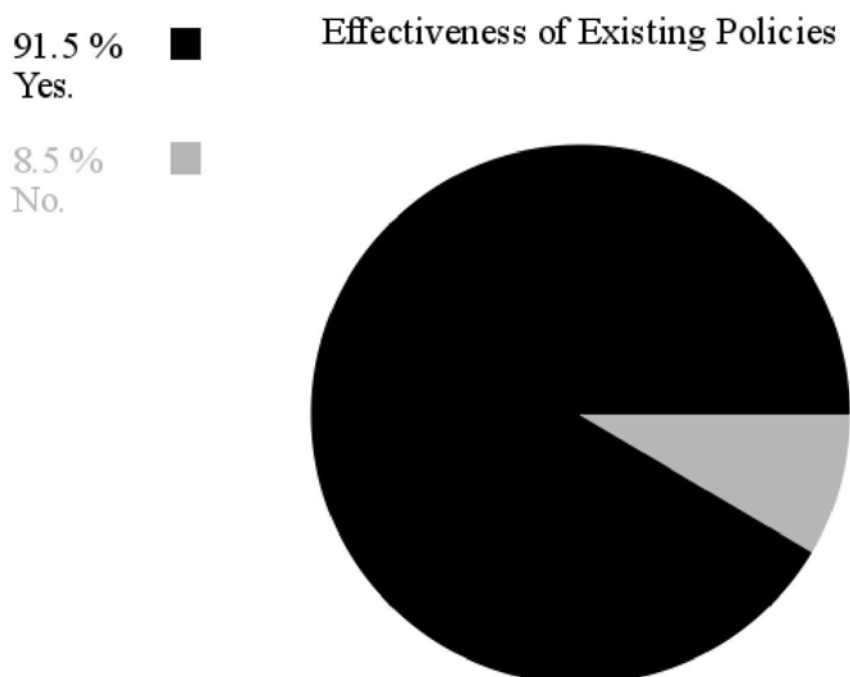


Source: Based on the data collected by the field survey

5.6 Foreign Trade Policy Regarding Natural Rubber

In a democracy, policy is said to be efficient and fruitful if the people gets some forms of benefit from it or at least they are not harmed by it. In order to find the acceptability of current policies related to the foreign trade of natural rubber, respondents were asked with the question “Whether the present foreign trade policy regarding rubber should be changed or not?” 91.5% (76 people) responded saying they seek a change in the foreign policy whereas for the remaining, the present policy was acceptable.

Fig 5.6 Acceptability of Foreign Trade Policy among Farmers



Source: Based on the data collected by the field survey

5.7 Decreasing Domestic Prices

One of the features of the domestic rubber market is that the prices are highly fluctuating in nature. Unlike several other sectors, the natural rubber prices doesn't show any form of stability for a longer period of time, primarily due to the uncertainties attached with the factors that influences the prices of natural rubber.

For the past few months, the domestic prices of the natural rubber is showing a decreasing trend. This makes the cultivation and production of natural rubber fruitless. Most of the respondents cite increased imports of cheap rubber from foreign markets as the reason behind this trend. 54.2% of the total cites unrestricted imports as the main reason. 19.35% attributes lower domestic prices to falling

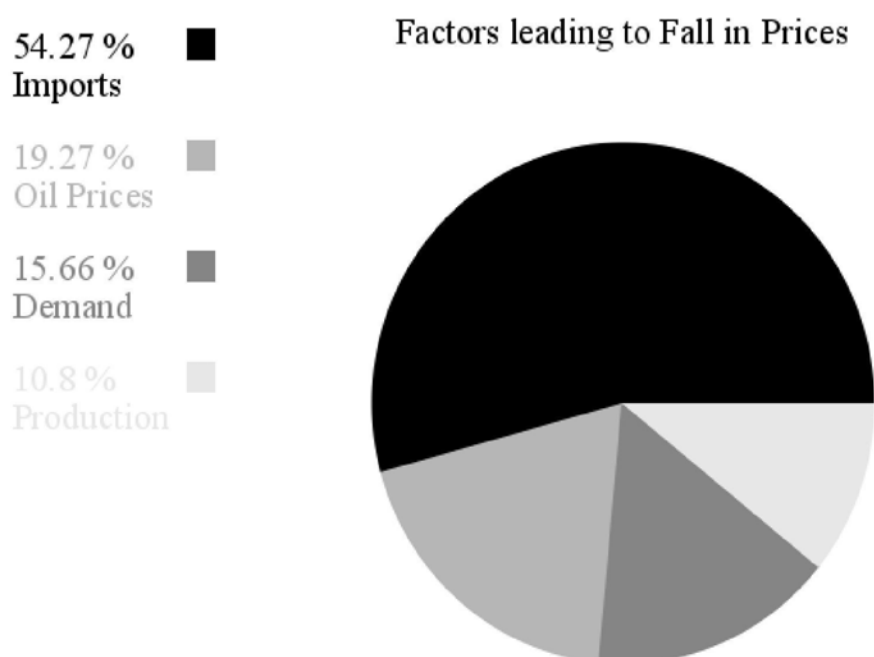
crude oil prices. Higher domestic production is quoted as a reason by 10.8% and sluggish growth in the automobile industry is quoted by 15.66%.

Table 5.5 Reasons behind the Decreasing Domestic Prices

Unrestricted Imports of Cheap Rubber	45
Increased Domestic Production	9
Reduced Crude Oil Prices	16
Sluggish Growth in Automobile Sector	13

Source: Based on the data collected by the field survey

Fig. 5.7 Factors behind Falling Rubber Prices



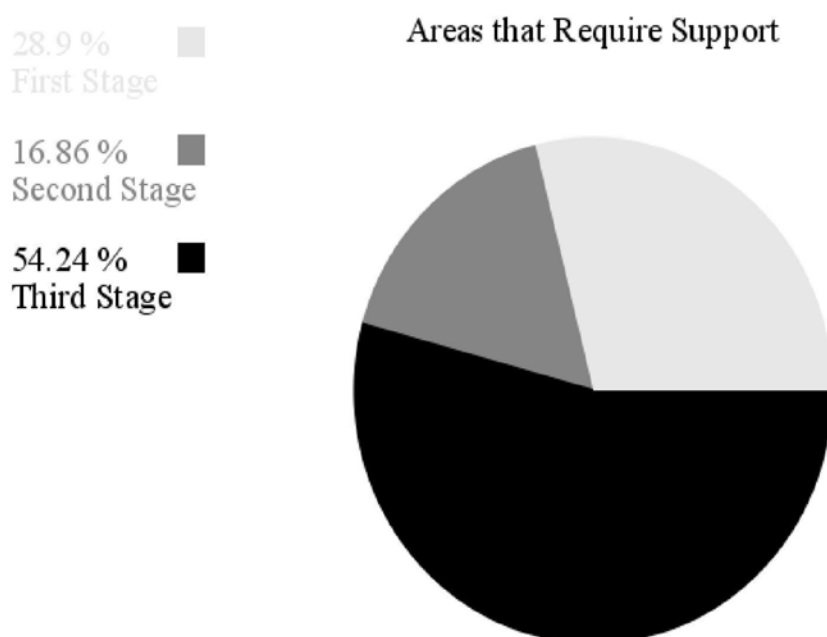
Source: Based on the data collected by the field survey

5.8 Government Aid and Support

The whole process of natural rubber cultivation can be broadly divided into three stages. First, the 'Cultivation and Maintenance' stage, secondly the 'Tapping and Extraction' stage and finally the 'Processing and Distribution' stage.

Mostly, the funding for supporting the rubber cultivation is categorized as whether the money disbursed is targeted for which of these stages. While a funding for the Cultivation and Maintenance stage leads to expansion of area under cultivation, any funding support for the second stage will be beneficial for the existing farmers. Subsidies given for the third stage, 'Processing and Distribution' leads to the value addition of the rubber produced from within the existing capabilities.

Fig. 5.8 Distribution of Subsidies and Aid Funds



Source: Based on the data collected by the field survey

When asked about the government support in the form of subsidies, training, skill development and procurement, 54.2% responded in favour of government support during Processing and Distribution

stage. 28.9% of respondents consider funding for first stage as crucial compared the 16.86% who thinks that Tapping and Extraction (Second Stage) requires more support than anything else.

Table 5.6 Government Aid and Support

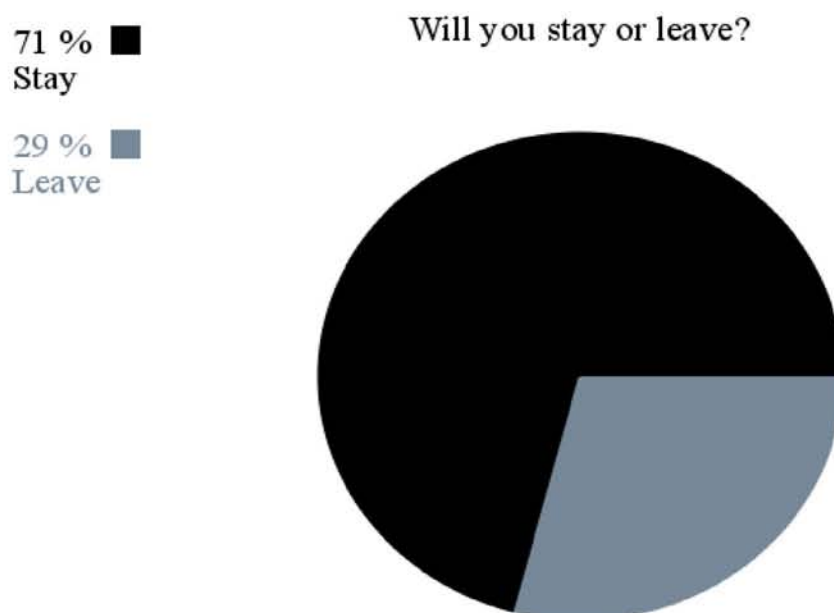
Cultivation and Maintenance	24
Tapping and Extraction	14
Processing and Distribution	45

Source: Based on the data collected by the field survey

5.9 Commercial and Economic Viability of Rubber Production

In order to analyse the effect of foreign trade on domestic market, respondents were asked about the commercial profitability and economic viability of natural rubber sector.

Fig. 5.9 Will you stay/leave if the profitability declines?



Source: Based on the data collected by the field survey

Every economic agent acts upon the costs involved and benefits that they could derive. Hence, it is necessary to maintain the sector attractive by keeping the returns above the standards. At the break-even point, when the farmers find the sector as unattractive due to the lower returns, they might quit the farming activity or may switch the activity with an alternative.

For the question “Whether they will continue in the natural rubber sector amidst crisis”, 70.9% of total respondents or 59 of the total people surveyed said they will continue despite the decreasing tendency of domestic prices. Another 29.1% (24 people) responded they might switch natural rubber with some other crop.

5.10 Effective Measure to Improve Domestic Prices

As the educational profile of the farmers are comparatively high compared to the other farming sectors, it is worth mentioning that most of the farmers that were interviewed were aware of the policies existing in the country, with regard to the sector. Similarly, most of them were clear about the policies and agreements that are going against the interests of the domestic sector.

A majority of respondents when asked about the effective policy measure from the part of the government to improve the condition of domestic rubber market gave “increased import tariffs” as their response. Any adjustment in the tariff regime will lead to lower inflow of rubber, which will in turn increase the welfare of the concerned sector.

While a change in tariff structure was the most desired policy change for the majority, which is 57.83% of respondents, 19.27% responded in favour of increased subsidies and aids from government. 7.22% of the respondents call for reduction in taxes associated with the sector, 2.40% believes in Skill Development and implementation of technology as a remedy and a 13.25% of the total firmly believes in the diversification of the product market, so that demand will increase.

Table 5.7 Effective Measure to Improve Domestic Prices

An Increase in Import Tariffs	48
Subsidies and Government Aids for the Sector	16
Reduction of Taxes and Surcharges	6
Skill Development and Technological Change	2
Diversified Use of Natural Rubber	11

Source: Based on the data collected by the field survey

Fig 5.10 How to Improve the Welfare of the Sector?

57.86 % ■
Trade Barriers

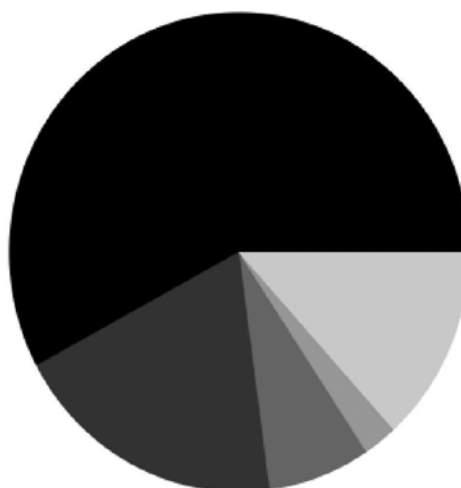
19.27 % ■
Subsidies

7.22 % ■
Tax Reduction

2.40 % ■
Skill Develop.

13.25 % ■
Diversification

Welfare can be improved by



Source: Based on the data collected by the field survey

CHAPTER VI

**SUMMARY OF FINDINGS AND
SUGGESTIONS**

6. Summary of Findings and Suggestions

The purpose of every research is to find something that is new to the field; something that can contribute to the intellectual, economic and moral welfare of the society. In this concluding section, an attempt is made to recapitulate and summarize the findings of this study along with certain suggestions regarding the existing policies on natural rubber and its foreign trade. These suggestions are given towards the purpose of forming the base of future policy frameworks. Since the arguments are substantiated with the survey based analysis, author firmly believes that the suggestions given here are both populist as well as economically-sound.

6.1 Major Findings and Summary

1. The total global production of natural rubber was 12265000 tonnes in the year 2014. The data for 2015 is partial and that of 2016 is yet to be announced by the ANRPC.
2. Thailand contributed 31.4% of global output of natural rubber, which is equivalent to 3863000 tonnes. Most of the production is from the inland regions whereas the concentration of rubber plantations towards the coastal regions are minimal. Thailand also has the unique feature of being a country where the production is largely supported by the government mechanism. Most of the training is given by the government agencies and the production process is also largely State-funded.
3. Thailand was followed by Indonesia, Vietnam and India. India's total rubber production was 900000 tonnes in 2014. The major rubber-producing regions in the country includes Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Goa, North-East Sister States and parts of Bengal.
4. India is the world's second largest rubber consumer after China. Most of this consumption is contributed by the tyre manufacturing industry of the country. In 2014, India accounted for 9.6% of global rubber consumption. Major manufacturers include MRF, CEAT, Modi, Bridgestone, Hindustan Life Care Ltd etc.
5. Kerala leads the natural rubber production in the country with nearly 92% of contribution to the gross national output of natural rubber. The major reason is the historical and cultural influence of the rubber cultivation and the suitable climate in the region, which is fit for rubber cultivation

6. In 2012-13, Kerala produced 800050 tonnes of natural rubber from a total cultivable area of 545030 hectares. This includes the larger plantations as well as the small farm lands occupied by the small-scale farmers in the State. Though there are several large landholdings, a majority of the total rubber production comes from the farmlands, whose average size is around 10-16 acres.
7. One of the reasons behind the scattered distribution of farmlands in small sizes, across the farmer community is the successful land reforms implemented in the State during early 1960's.
8. It is also observed that the rubber cultivation is falling in Kerala in terms of annual growth and percentage change in the area under cultivation. However, the reverse trend is happening in other parts of the country. The major reason that attributes to this trend of falling cultivation in the State is that the young men are not interested in the farming sector anymore. Most of them are entering the service sector jobs. Similarly, the survey conducted as a part of this research also points to the changing attitude of the existing farmers. Nearly 29% of them are willing to leave the sector, given the trend of declining profitability and returns from the sector.
9. It is also observed that climate and weather conditions adversely affect the production of natural rubber. Month-wise production table of several years shows that maximum amount of rubber is produced during the period of September-December. However, in order to overcome the uncertainties of the weather conditions, the government as well as its nodal agencies are engaged in the research and development of several new varieties of natural rubber which can grow in extreme, harsh weather conditions without compromising their levels of productivity and the quality of the output. As we have seen in the case of Rubber Research Institute of India, the premier organization in developing new varieties, such innovations are leading to the situation wherein the farmers can rely upon the natural rubber as a reliable source of income and avoid the risks associated with the sector.
10. There are several schemes and programmes in place to promote the production of natural rubber. One among them is Rubber Development Fund.

11. However, it is also found that Rubber Development fund is the single allocation in the Union budget for meeting the expenses of running the Rubber Board as well as the expenses of the officials associated with the agencies working for the welfare of the sector. Rubber Board also organizes several training programmes and workshops periodically. This includes the training on new farming techniques, technological up gradation of the processing units, subsidized tree saplings etc.
12. There are many reasons that resulted in the stagnation of rubber sector. The main reason behind the falling prices is the increased imports. Several trade agreements and bilateral treaties like Indo-Sri Lanka Free Trade Agreement, WTO Restrictions, ASEAN Treaty of 2009 etc. resulted in the free flow of cheap natural rubber from other countries to Indian market.
13. Weather also plays an influential role in rubber sector. Increase in temperature and drought like situation are not good for natural rubber. Weather forecasts also points to the fact that the global weather conditions may worsen by the annual increase in the atmospheric temperature. Estimates points to a 2° C in the atmospheric temperature levels, a threat to the plant which grows well in tropical regions.
14. Another important factor which determines the price of natural rubber is the price of crude oil. Crude oil is a raw material used in the production of synthetic rubber; and crude oil is a perfect substitute for natural rubber. Thus, an increase in the price of crude oil will result in an increase in the natural rubber prices. It has been observed from that since the 1970 oil shock and the creation of OPEC, the oil market is full of uncertainties. Similarly, the overall trend is of increasing prices in the case of Brent Crude oil. Though the oil prices are rising, which is beneficial for the natural rubber sector, the uncertainties are nullifying the phenomenon leading to a situation wherein the synthetic rubber is becoming highly competitive with the natural rubber.
15. Growth of related industries like automobile industry, tyre industry and other rubber-based

industries also influences the natural rubber sector.

16. Larger the growth of such sectors, more the demand for the natural rubber and its by-products. This is because, most of the tyre industry depends on natural rubber for production. Similarly, environmental concerns and obligations are also forcing the industry to stick to the use of natural rubber.
17. Natural rubber trade in India is influenced and regulated by Tariff Barriers and Non-Tariff Barriers. However, we could see the influence of the globalization and easing of trade restrictions over the natural rubber sector as well.
18. The major factor contributing to this is the obligations that India made under various multilateral treaties as well as with WTO.
19. In 2000, government removed several restrictions on the natural rubber imports. As a result, today anyone can import any volume of rubber after paying a prescribed amount of customs duty.
20. Current customs duty on imports of natural rubber is either 25% of total value or ₹30/Kg, whichever is lower.
21. There are several organizations working to study, understand and promote natural rubber and its foreign trade. This includes International Rubber Study Group, Association of Natural Rubber Producing Countries, Rubber Board, Rubber Research Institute of India, Rubber Mark etc.
22. It is noted that most of the farmers surveyed produce rubber in the traditional form of sheets of various grades. However, due to the high costs of production, there is a trend in which people are shifting from sheets to latex, scrap, plain scrap etc.
23. Most of the farmers rely upon the local small rubber dealers to sell their produce.
24. This study also shows how critical is the problem of labour shortage prevailing in the market. Many farmers are finding it too difficult to find cheap labour in the production process. Potential reasons are the changing pattern of demographics, preference for the service sector jobs, outflow of the potential labour force out of the State etc.

25. Most of the people in the sector are against the foreign trade policies of the country regarding the imports of natural rubber. They are unsatisfied with these policies and calls for a strict regulatory framework.
26. It is also found that domestic rubber market is affected by huge inflow of imported cheap rubber. This has affected the domestic prices drastically and has reduced the profitability of natural rubber cultivation.

5.2 Inferences and Suggestions

The aim of this study was to analyse the natural rubber sector of the country by looking through the lenses of political economy, wherein the comparative advantage theory of David Ricardo was critically analysed.

David Ricardo's theory of foreign trade within the framework of the possible comparative advantage that the parties could derive is the soul of the modern day free trade agreements and the globalization. Though the theory sounds fit in the mathematical sense, it has several flaws in terms of pragmatic behaviour under the reality of uncertainties and information asymmetry. While the trade agreements are meant for the welfare of the all engaging parties, or at least a situation where the no one loses but someone gains, this is often not the case in reality. In the case of natural rubber, we saw how the trade agreements to which India is a signatory is against the interests and ultimate welfare of the people involved in the sector. For example, in most of the treaties, we saw that though the natural rubber as such is excluded from the list of the free-tradable goods, the by products like Tyre, tubes, healthcare items etc. are allowed to be transferred across the border without much restrictions. There are few implications for this situation:

- One, the nations with cheap labour will get an advantage over the counterpart in the production and export of the finished goods.
- Secondly, the smaller nations tends to get tariff waiver whereas the nations with an

advantage in the given sector will always sacrifice the benefits that they used to enjoy

- Comparative advantage theory narrates that the trade will be beneficial for both parties by focusing on the good in which they are comparatively good. However, the theory is silent about the scenario where two nations have the same set of goods over which it has a comparative advantage.
- The theory itself is based on the concept of prices. This means that there is no accountability for the externalities. This in turn acts as an incentive for the countries to create 'comparative advantage' by neglecting the externalities and thus by producing cheaper goods.
- Comparative advantage looks the entire scenario from the gains that a nation could gain from trade. However, when we look it from the perspective of the individual stake holders (Farmers in our case), Ricardian theory is silent. Thus there is no accountability for the inequalities that may arise from such trade deals.

Thus, it must be inferred that most of the present agreements that exist over the natural rubber sector is based on the assumptions of comparative advantage. However, looking from the micro level, several such agreements are hurting the interests of the farming and small business community, who finds their livelihood from the natural rubber.

With the help of this scientific study, this researcher would like to propose the following suggestions regarding the policies related to natural rubber sector and its foreign trade.

1. Since the modern day globalization largely derives its intellectual synergy by the combination of Ricardian theory and liberalization, there should be a case by case inspection of any trade agreements based on these principles so that the government could avoid the threats against the domestic market, arising from such initiatives.
2. The government should reinstate the restrictions on imports of rubber from other countries to the Indian market. These restrictions can be either tariff or non-tariff trade barriers. If such trade

restrictions are brought back into the picture, they can effectively bring stability to the prices and rubber market as a whole. In most cases the diplomacy and relationships with various foreign governments are enriched at the cost of hurting the interests of the domestic economy and the silent majority involved within it. It is worth remembering that though the contribution of the primary sector is on decline, it is an important component of every economy as it produces basic raw materials for the secondary sector as well as the food to feed the population.

3. Considering the fact that India is a signatory of WTO trade agreements, any restrictions in terms of price or tariff structure would be equivalent to the violation such treaties. Thus instead of taking a conflicting stance with the global agency, we may use several other techniques like quality based measures, incentives for the domestic producers, branding of the Indian Natural Rubber etc. An example worth mentioning would be the market intervention measures of Malaysian Rubber Board, wherein they intentionally encourage the farmers to reduce the output levels during the times of falling prices and vice versa.
4. Government should also consider creating awareness amongst the farmers and rubber producers. Most of the small scale farmers lack adequate knowledge in new technology and agricultural practises that can increase the returns from natural rubber. This will also help the people to overcome the concerns raised by the phenomenon of 'technological displacement.'
5. Some of the respondents stated they will leave the rubber sector if this trend of falling price continues. Though their size is small compared to the larger group of the sample population, their concerns are legitimate. More subsidies and developmental packages must be declared for the welfare of the small scale rubber farmers. Further, it may not be the favourable situation in the sector that is pulling them back but the uncertainties of a job or area where they could find income.
6. In order to tackle the issue of labour shortage, government must either give training to unemployed youth in the State who are willing to work in the sector or government should push

for more mechanization of the sector by making latest technology and machinery available to the farmers at a reasonable price.

7. Authorities can also seriously think about expansion of Rubber Mark outlets across the State. At present, there are only 46 collection points run by Rubber Mark. If these number increases and their service expands across the State, it will help the government in faster procurement of rubber as well as an easy way to disburse the subsidies and support price.
8. Recent central and State budgets are silent about the natural rubber sector. There is a need for the allocation of more funds for the welfare of this sector.
9. As mentioned before, lack of skilled cheap labour is one of the issues faced by the sector. This can be tackled if the government could include the natural rubber sector under the Skill India Campaign
10. Similarly, the National Rural Employment Guarantee act must be extended by bringing natural rubber sector under its purview as well.
11. Government should also take measures for increasing the value addition and quality of natural rubber produced by the farmers to increase their returns and profitability. This includes the diversification of the uses of natural rubber like the recent proposal for making rubberized roads a part of national highway constructions.
12. Malpractices by various interest groups within the rubber sector like holding the stock to raise the price, increased imports to substitute domestically produced rubber etc. should be checked periodically.
13. Rubber Board and the government together should work towards the inclusion of natural rubber as a priority item in the 'Make in India' campaign to attract foreign investments and technological collaborations in the market.
14. Rubber Board should be authorized to review Rubber Policy, as and when required.
15. Rubber cultivation should be declared as an agricultural activity and be made eligible for priority

sector benefits.

16. There must be efforts for a nodal agency to be designated by the Govt. of India, to procure natural rubber when the prices are below the remunerative level. (To be fixed by the Govt. of India on the basis of cost of production).
17. Government must also encourage the research and development of Genetically Modified Rubber Varieties to increase the productivity levels as well as the resistance against adverse weather conditions.

5.3 Conclusion

The foreign trade of natural rubber was analysed under the purview of the comparative advantage theory of David Ricardo, with substantial field data, to look at how the theory formed the basis for most of the free trade systems existing in place and how this theory misrepresents the reality of the natural rubber sector. David Ricardo's theory simplified the assumptions and considered everything as static and closed. When such a misrepresented theory is used to dictate the future of an important area of the Indian agricultural sector, it will have serious repercussions over the lives of the people who are involved within.

Natural rubber is often neglected in the larger picture of policy framework creation and legislation due to the fact that it is only produced in the few pockets of the country. However, the role of natural rubber as a component or a raw material in several industries across the country points to the fact that it's not a worthy risk to be taken by marginalizing the rubber farmers as well as treating it as a regional issue. The central as well as the State governments must spend more time and resources for the welfare of this sector, which forms the major share of income for nearly one crore farmers across the country.

None of the developed economies in the world have grown with trade liberalism and free flow of goods; rather they flourished under the warmth of protectionism and on the foundations of national preferences

over the international trade interests. From the tariff-loving Lincoln of United States to the father of modern day Germany Otto Von Bismarck, from the early 14th century Spaniards to the Thatcher government of Britain, all practised trade protectionism. Though this paper doesn't call for a complete ban on the free trade, there must be at least some form of restrictions to protect the sensitive sectors like natural rubber so as to maintain the welfare of the farmers and small-scale traders, who earn their daily bread from it. It is good to remember that free trade is only beneficial for the dominant country and when the inferior nations move in the path of the free trade and liberalization, utter care must be taken.

Bibliography & References

- Bordon, C. (1997, March 4). *Synthetic rubber Explained*. Retrieved May 4, 2016, from http://www.tis-gdv.de/tis_e/ware/kautschuk/synthesekautschuk/synthesekautschuk.htm
- Brodon, H. (2014, November 24). *The Man behind Vulcanization*. Retrieved May 3, 2016, from <http://www.britannica.com/technology/vulcanization>
- Central Tourism Dept. (2013). *Area - Kerala - States and Union Territories - Know India: National Portal of India*. Retrieved from National Portal of India website:
http://knowindia.gov.in/knowindia/state_uts.php?id=39
- Commodity Boards. (2015). *Funds Spent for the Implementation of Various Plan Schemes for Rubber Plantation Sector of India*. Retrieved from Department of Commerce, Ministry of Commerce & Industry website:
<http://www.indiastat.com/industries/18/rubberandleatherproducts/11411/rubber19502015/449595/stats.aspx>
(Lok Sabha Unstarred Question No. 1313, dated on 07.12.2015)
- George, J. G., & Chandrashekhar, H. M. (2014). Growth and Trends in Production and Marketing of Natural Rubber in Kerala, India. *International Journal of Current Research and Academic Review*, 2(8), 53-61. Retrieved from <http://www.ijcrar.com/vol-2-8/Joe%20Gigy%20George%20and%20H.M.Chandrashekar.pdf>
- Government of Sri Lanka. (2011). *Indo-Sri Lanka Free Trade Agreement (ISFTA)*. Retrieved from Embassy of Srilanka - Paris website: <http://www.srilankaembassy.fr/en/page/110-indo-sri-lanka-free-trade-agreement-isfta>
- Harp, S. L. (2015). *A world history of rubber: Empire, industry, and the everyday* (1st ed.). Chichester, CA: John Wiley & Sons, Inc.

- India Stat. (2015, September 15). Total Production of Rubber in India. Retrieved May 3, 2016, from Indiastat.in/table/industries/18/rubber19502015/449595/106165/data.aspx
- IndiaStat.com. (2015). India Stat. Retrieved April 25, 2016, from Indiastat.in/table/industries/18/rubber19502015/449595/106165/data.aspx
- John, K. K. (2002). *A study on the impact of economic liberalisation and globalisation on the marketing of natural rubber in India* (Master's thesis). Retrieved from <http://hdl.handle.net/10603/152>
- John, K. K. (2002). *A study on the impact of economic liberalisation and globalisation on the marketing of natural rubber in India* (Doctoral dissertation, Mahathma Gandhi University, Kottayam, India). Retrieved from <http://hdl.handle.net/10603/152>
- Johnson. (2011). Robert William Thomson, Scotland's forgotten inventor. Retrieved from <http://www.historic-uk.com/HistoryUK/HistoryofScotland/Robert-William-Thomson/>
- Jose, T. (2005). *The Economics of Rubber Plantation Industry in Kerala* (Doctoral dissertation, MG University, Kottayam, India). Retrieved from <http://hdl.handle.net/10603/6662>
- Jumpasut, P. (2013, October 3). *Rubber Consumption*. Retrieved May 7, 2016, from http://www.therubbereconomist.com/The_Rubber_Economist/Rubber_Consumption.html
- Kumar, Ajith. (1994). *Technological changes and its impact on rubber plantation industry in Kerala an econometric study* (Doctoral dissertation, Cochin University of Science and Technology, Kochi, India). Retrieved from <http://hdl.handle.net/10603/70260>
- Kurian, K. J. (2004). *Generation of surplus in plantation sector in Kerala and its appropriation: a study with reference to rubber growers* (Doctoral dissertation, Mahathma Gandhi University, Kottayam, India). Retrieved from <http://hdl.handle.net/10603/6550>
- Loadman, J., & John, L. (2003, November 10). *Time Line of Natural Rubber*. Retrieved May 2, 2016, from <http://www.bouncing-balls.com/timeline/rubbergoeseast.htm>

Ministry of Commerce and Industries. (2011). *Fact Sheet - Rubber*. Retrieved from Department of Commerce website: Retrieved on May 3, 2016 from http://commerce.nic.in/psft/fs_rubber.htm

Ministry of Commerce and Industries. (2015). *Statistics of Natural Rubber: Foreign Trade Volume*. Retrieved from <http://www.indiannaturalrubber.com/statistics.aspx>

Ministry of Commerce. (2006). *Bangkok Agreement*. Retrieved from Intergovernmental Committee for Cooperation website: http://commerce.nic.in/trade/bangkok_agreement.pdf

Muthamma. (1994). *An Economic Analysis of Production and Marketing of Natural Rubber in India* (Doctoral dissertation, Bangalore University, Bangalore, India). Retrieved from <http://hdl.handle.net/10603/72911>

Paul Ryan. (2003, March 3). *Earth Floor: What is the Tropical Dry Region?* Retrieved May 3, 2016, from <http://www.cotf.edu/ete/modules/msese/earthsysflr/savannah.html>

Philip, R., & Shanthamani, V. (2016). Natural Rubber Markets and the Farmers of Kerala. *Indian Journal of Research*, 5(3), 436-441. Retrieved from <http://worldwidejournals.in>

Rajesh, K. (2005). *Economics of Rubber based Industries in Kerala* (Doctoral dissertation, MG University, Kottayam, India). Retrieved from <http://hdl.handle.net/10603/6662>

RAJU, K. V. (1990). *The economics of rubber based industry in Kerala* (Doctoral dissertation, Cochin University of Science and Technology, Kochi, India). Retrieved from <http://hdl.handle.net/10603/19222>

Raju, K. V. (1990). *The economics of rubber based industry in Kerala* (Doctoral dissertation, CUSAT, Kochi, India). Retrieved from <http://hdl.handle.net/10603/19222>

Rubber Research Institute of India. (2015). Rubber Data Base. Retrieved from <http://rubberboard.org.in/rubberresearchinstitute.asp>

- Srinivasan, T. N. (2002). South Asia in World Economy. In *Trade, finance, and investment in South Asia* (2nd ed., pp. 24-26). Retrieved from <https://books.google.co.in/books?id=JK49YUikMhgC>
- Statista. (2015, February 15). *Natural rubber global production 2000-2015*. Retrieved May 4, 2016, from <http://www.statista.com/statistics/275387/global-natural-rubber-production/>
- Sumithran, P. V. (2010). *An evaluation of the working of Rubber Producers Societies in Kerala* (Doctoral dissertation, Mahatma Gandhi University, Kottayam, India). Retrieved from <http://shodhganga.inflibnet.ac.in/handle/10603/25911>
- Thomas, C. A. (2004). *Small rubber growers and rubber producer's societies in Kerala* (Master's thesis, Mahatma Gandhi University, Kottayam, Indian). Retrieved from <http://hdl.handle.net/10603/6738>
- United Nations Conference on Natural Rubber. (1989). Standards and Qualities. In *International Natural Rubber Agreement, 1987*. New York, NY: United Nations.
- United Nations Conference on Trade and Development. (1976). *Proceedings of the United Nations Conference on Trade and Development, Nairobi - Reports and Annexure* (Volume I). Retrieved from http://unctad.org/en/Docs/td218vol1_en.pdf
- Ushadevi. (1999). *Technology adoption in rubber production in Kerala* (Doctoral dissertation, Mahathma Gandhi University, Kottayam, India). Retrieved from <http://hdl.handle.net/10603/7249>
- Wikipedia. (2006, April 9). Edward Nairne. Retrieved May 2, 2016, from https://en.wikipedia.org/wiki/Edward_Nairne

Appendix I- Questionnaire of the Research

1. **Name:**
2. **Location:**
3. **Details of Occupation and Livelihood (Tick the Appropriate Column) :**

Fully Occupied With Rubber Cultivation	
Partially Occupied With Rubber Cultivation	

4. **Landholding under Rubber Cultivation:**

More Than 10 Acres Of Land	
Less Than 10 Acres Of Land	

5. **Form of Output:**

Scrap	
Latex	
Sheet	
Other	

6. **Source to whom farmers sell their rubber:**

Cooperative Rubber Societies	
Small Dealers	
Manufacturers	
Others	

7. **Do you find labour shortage existing in the production of rubber? YES/NO**

8. **Are the government policies, including the subsidies, effective or not? YES/NO**

9. **What might be the reasons for the fall of domestic prices? (Tick the Appropriate)**

Ineffective Government Policies	
Increased Domestic Production	
Low Demand Due To Low Crude Oil Prices	
Low Demand Due To A Sluggish Automobile Industry	

10. Areas of production where maximum government support is required

Cultivation And Maintenance	
Tapping And Extraction	
Processing And Distribution	

11. How aware you are about various developments in the domestic and international markets?

Very Aware Of Issues	
Almost Aware Of Issues	
Satisfactorily Aware Of Issues	
Low Awareness About The Issues	
Not At All Aware	

12. Does the weather condition has a crucial impact on rubber market? YES/NO

13. If this trend of fall of prices and instability continues, will you switch to some other sources for income and livelihood? YES/NO

14. What would be the most effective measure that you think, which can improve the domestic rubber prices?

Increase The Import Tariffs To Reduce The Imports Of Natural Rubber	
Increase Subsidies And Aids To The Farmers	
Diversify The Use Of Natural Rubber Within The Country (E.G: Rubberized Road)	
Exempt the Rubber Market From Taxes And Other Surcharges	
Skill Development for The Rubber Producers To Maximize Efficiency	
