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Tyre Industry – Current Status and Future Opportunities

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The global rubber products industry includes over 50,000 products that serve different consumer needs in diverse applications. The automotive sector, which comprises of tyres, tubes, and automotive rubber components, is the major contributor to over 60% of the total global rubber products. Besides the automotive sector, mining, medical & sports, aerospace, agriculture, construction, machinery, engineering and electrical appliance manufacturing industries are the major drivers of the rubber products industry. The global statistics for 2015 reveal that the rubber products industry has yielded total revenue estimated at US\$ 400 billion by transforming nearly 27 million tons of natural and synthetic rubber into value added products and this value is expected to reach US\$ 600 billion by 2025. However, the market value of raw rubber worldwide amounts to US\$ 40.71 billion, and comparative products turn over shows a noteworthy value addition in the conversion process of rubber into products. The global scenario with respect to production and consumption of natural and synthetic rubber is given in Table 1. The data indicates

that within a couple of decades the rubber consumption has increased by almost 76% and that shows a significant growth in the rubber products industry.

Rubber product manufacturing is a labour-intensive industry involving many “state-of-the-art” machinery. Technologies are continuously changing with the improvements that shift the production possibilities further. It is important to note that advances in technology are a result of innovations and innovative practices leading to product diversification and process improvements bringing in enhanced productivity. This is well established in the global rubber products industry through deep rooted research and development segments.

Impact of COVID – 19 Pandemic on the Rubber Industry

The coronavirus pandemic has had an adverse economic and social impact on all businesses around the world including the rubber industries as well. The

Table 1: Global Situation of Rubber Supply & Consumption in '000 MT

Description	Year of Production				
	1995	2000	2005	2010	2015
Natural Rubber Production	6,070	6,811	8,921	10,403	12,277
Synthetic rubber Production	9,380	10,870	12,025	13,277	14,460
Total Rubber Consumption	15,450	17,681	20,946	23,680	26,737
Natural Rubber Consumption	5,950	7,108	9,049	10,759	12,146
Synthetic rubber Consumption	9,210	10,830	11,731	13,225	14,563
Total Rubber Consumption	15,160	17,938	20,780	23,984	26,709

(IRSG-Rubber Statistic, 2017)

Association of Natural Rubber Producing Countries (ANRPC) stated that the global plastics and rubber products market was expected to decline from US\$ 1378.6 billion in 2019 to US\$ 1345.4 billion in 2020 at a negative compound annual growth rate (CAGR) of 2.5%. In view of disruption of global economic activities and restrictions on imports, material inputs such as carbon black, silica, rubber chemicals, and many other rubber compounding ingredients were experiencing interrupted supply. Even under difficult conditions, the rubber industry has a leading role to play, since rubber as a versatile material that facilitates numerous needs of humans. The supplying of rubber products to medical, agriculture and transport sectors is vital during the pandemic to save the lives, to retain a secure food supply and to ensure safe movement of people. Under the circumstances, companies shifted rapidly to online channels, automated production tasks, increased operational efficiency by innovative operating models, and sped up decision making and implementation of advances in communication technologies.

STATUS OF SRI LANKAN RUBBER INDUSTRY

Plantation Sector

Sri Lanka embarked on the rubber industry with the planting of few germinated rubber seedlings by Sir Henry Wickham in 1876 and this historic event was the stepping stone in venturing into commercial rubber plantation in the wet zone. Sri Lankan rubber industry has been a long standing contributor to the island's economic and social well-being. It is understood that rubber is a trust industry that rest on a sustainable resource base, capable of contributing immensely for the growth of economic

development in the country.

In 1976, plantation sector produced 156 million kg of raw rubber and 5% of this was utilized for producing finished products while majority of this was consumed by the Ceylon Tyre Corporation. The remaining bulk quantity was exported as raw rubber without any value addition. In early 1970's over 200,000 hectares of land were covered by rubber plantation. Unfortunately, within five decades this has dropped to around 150,000 ha. The local annual demand for rubber is about 140 million kg, and the current production stands at around 80 million kg creating a major deficit in production. Hence in 2018, over 76 million kg of natural rubber in both dry rubber and latex forms have been imported to meet the shortfall. Table 2, represents the position of natural rubber produced in the country in the past decade starting from the year 2008.

Table 2: Natural rubber status in Sri Lanka

Year	Production in million kg	Exports in million kg	Domestic Consumption in million kg
2008	129.2	48.6	80.1
2009	136.9	56.0	84.9
2010	153.0	51.5	107.2
2011	158.2	42.6	111.7
2012	152.1	37.4	110.0
2013	130.4	23.6	107.3
2014	98.6	16.3	85.6
2015	88.6	10.4	127.4
2016	79.1	16.2	142.0
2017	83.1	17.2	128.14
2018	82.6	13.98	135.24

(Rubber Development board – Statistics)

At present, the local rubber industry provides over 300,000 direct and indirect job opportunities to Sri Lankans across various professions as knowledge workers. Furthermore, the local rubber industry extends its employment opportunities to all categories of trained skilled workers in various disciplines in both product manufacturing and plantation sectors. Thereby, this industry makes an enormous contribution to the socio-economic wellbeing of both rural and urban populations in Sri Lanka.

Products Manufacturing Sector

The Sri Lankan rubber industry can be broadly classified into two sectors namely latex based products and dry rubber products. Latex products include medical, industrial, and household gloves; hygienic or pharmaceutical articles, latex thread, and articles of apparel and clothing products. Dry rubber products sector encapsulates tyres and tyre related products, and non-tyre products. When considering rubber exportation, dry rubber-based products have an export value share of 78 percent whereas the latex based rubber products have a comparatively limited share of 22%.

Rubber industry is positioned as the fourth largest source of foreign income for the country accounting for approximately 8% of export income. In 2013, value of rubber-based products made locally exceeded US\$ 1,084 million, whereas export value of finished product is US\$ 864.4 million and the revenue gained by export of raw rubber was only US\$ 71 million. Although Sri Lanka is not a producer of synthetic rubber (SR), the consumption of SR was over 12% of total rubber consumption. The synthetic rubber imports which stood at 14.4 million kg in 2013 increased to 23 million kg in 2019 and was expected to double in 2024, since there is a greater potential for the industry to move forward in the direction of specialty products with higher value addition. To achieve this goal, the industry should focus on synthetic rubber-based product diversification to cater to a more sophisticated quality conscious market. However, under the current situation due to the COVID-19 pandemic, set targets and future forecast may have to be reviewed.

The country's rubber products industry is based on about 4,530 manufacturing units of small, medium and large-scale enterprises dispersed mostly in western and

southern provinces. All large and medium-scale rubber industries can provide employment for knowledge workers in disciplines of Management, Technology, Engineering and Science, and to a great extent to technically skilled work force. Nearly 95% of industry turnover is generated by around 7% of the manufacturing units and the contribution by small and medium sized enterprises (SMEs) is estimated to be less than 5%.

Within a relatively short period of less than four decades, the Sri Lankan rubber industry has become a reputable major world supplier of quality rubber products and this appears to be the result of collective inputs of all stakeholders who are part of the industry.

Rubber Tyre Industry

From the early days of the automobile upto now, tyre manufacturing has gone through many technological advancements. The tyre manufacturing process technology will continue to develop to accommodate issues related to safety, health and environment and to exploit the advantages of new materials such as nano-composites, plasma surface modified carbon blacks, and the development of computer simulation techniques in product design, process improvements and in product performance analysis. The tyre industry maintains its position as the largest in the rubber product sector that transforms around 60% of natural and synthetic rubber globally available in producing products.

Within the rubber industry, the tyre sector enjoys the highest value addition and turnover, and retains its position as the largest player in the global market for rubber products. It was valued at \$ 112.16 billion in 2019, and is projected to reach \$ 154.40 billion by 2027, at an estimated growth over 5% based on global economic status. Sri Lankan tyre industry earned a revenue of US\$ 549 million in 2018, which is 63% of the total value of rubber goods exported in the same year.

Functional Features of Rubber Tyre

The major function of the rubber tyre is to protect the wheel rim and offer tractive force between the road surface and the vehicle. Since it is manufactured from rubber, it also provides a flexible cushion, thereby reducing the impact of the vibrations while absorbing the shock of the vehicle. Rubber also offers many other

technological properties such as resistance to wear and tear, good tensile, resilience and excellent elasticity. Combination of these rubber properties plays a vital role in maintaining high performance of tyres in use.

The tyres are manufacture as solid or pneumatic (filled with air) and made with natural rubber or using blends of natural and synthetic rubber. Tyres are distinguished by their end use, type of construction, and performance characteristics.

- Passenger car tyres maintain top performances in terms of safety, driving stability, fuel efficiency and mileage.
- Tyres for medium-duty and heavy trucks and buses manufactured by processes that are supported by the latest technologies in achieving high mileages, reliable power transmission and low consumption of fuel.
- Segment of low cost tyres that are used for three wheelers, motorcycle as well as bicycles. Rubber tyres also find number of applications in castors that are used in small movable objects such as material transport trolleys, shopping carts, wheel chair or a hospital bed.

There is an increase in the market for tyres due to the rise in the vehicle production and the market is further supported by the availability of sizable replacement volumes. The tyre sector dominates over the non-tyre sector with a value share of 85 percent of dry rubber product exports in Sri Lanka.

Solid Tyres

Solid tyres are non-pneumatic, slow moving and mainly used for off – road industrial applications. The solid tyres are manufactured by constructing layers of rubber comprising of base, cushion and the tread around a metal frame or a wheel structure followed by a moulding and vulcanizing process. Product shows different features depending on the type of equipment or the vehicle where the tyre is fitted. Solid industrial tyres are primarily used in material handling vehicles in areas such as airports, seaports and transporting goods for storage and they still play an important role in agriculture, industrial and construction sectors. (Figure 1)

Sri Lanka enjoys the position as the world's leading solid rubber tyre manufacturer and over 13 industrial enterprises are currently engaged in manufacturing or retreading solid tyres for export. As the global hub for solid tyre manufacturing, Sri Lanka caters to nearly 25% of the global demand that exist for solid and industrial tyres.



Resilient Black Solid Tyres



Resilient Solid Tyre–
Non-Marking



Resilient Solid Tyre Sectional View

Figure 1: Resilient Solid Tyre

The solid tyre sector earned US \$ 352 million in year 2011 and US \$ 331 million in year 2012 while exporting tyres mainly to Belgium, Germany, Italy and USA. USA is the largest importer of solid tyre from Sri Lanka. The tyre and tyre-related products sector contributed to 2.8% of total cumulative merchandise exports from Sri Lanka, which amounted to US\$ 11.7 billion in 2017. Although the pneumatic tyres find uses in many applications, the solid tyre still plays an important role in agriculture, industrial and logistic sectors and is used in variety of unique industrial applications owing to their special features including the extreme product stability, economical, puncture-resistant, and maintenance-free nature. Solid tyres have a high load-bearing capacity in extreme service conditions and are best suited for forklift trucks, airport vehicles, heavy-duty transport vehicles, platform trucks, and other industrial vehicles.

Pneumatic Tyres

In pneumatic tyres the air is held under pressure inside the tire. Until recent times, pneumatic tyres had an inner tube to hold the air pressure, but now the automotive tyres are designed to form a pressure seal with the rim of the wheel. Pneumatic tires are used on many types

of vehicles, including cars, motorcycles, buses, trucks, heavy equipment, aircraft and bicycles (Figure 2). At present, the global pneumatic tyre market is dominated by radial and cross ply tires. The top automotive tyre manufacturers in the world include Japan, China, Korea and India.

One of the biggest benefits of using pneumatic tyres is their ability to absorb the unevenness of terrain. This allows for a smoother ride, and less bumping and shaking; and provided with a thicker tread, which provides traction to drive over loose and uneven surface.



Figure 2 : Pneumatic Tyres in range of applications

Sri Lanka (then Ceylon) initiated the first facility to retread used pneumatic tyres in 1936 under the “Ceylon Defense Force” and its primary objective was to retread tyres of defense vehicles needed in World War II. In 1959 as a joint venture, a plant was setup to manufacture bicycle tyres and inner tubes using Japanese technology. The pneumatic tyre manufacturing factory was setup in mid-1970 with Russian technical assistance at Kelaniya and was named “Ceylon Tyre Corporation” and this served as the nucleus of the rubber products industry in Sri Lanka. This plant was also considered as the largest bulk consumer of natural rubber and its annual consumption was 5 million kg. In 1983, Samson Rubber Industries (Pvt) Ltd with its flagship brand DSI Tyres started its operations on pneumatic tyres and currently positioned as the market leader for bicycle, motorcycle, three-wheeler tyres and tubes in Sri Lanka.

Sri Lankan pneumatic tyre sector accounts for approximately 38 percent of total tyre sector earnings in 2012. This sector earned US\$ 19.9 million by exporting 9,632,000 units in 2011 and in 2012 turnover was increased to US \$ 27.7 million and export volume increased to 10,066,243 units.

FUTURE PROSPECTS

1. Focus on Domestic Market

During the period 2015-2019, automobile population in Sri Lanka has witnessed a sizable growth and stood at over 8 million motor vehicles in 2019. There had been an overall increase of vehicle population by about 28% in the year 2019 whereas motorcycles and three-wheelers contributing to over 80% of the total vehicle population. The country's tyre market is dominated by this market segment in terms of tyre volumes. All these vehicles would contribute to a huge replacement market for tyres. The country has imported US\$ 2.8 million worth of tyres and tyre-related products. This potential domestic market needs to be exploited well, especially in sectors of passenger car, three wheeler and motor cycle.

2. Expansion of Existing Plants & Embarking on New Ventures

At present, CEAT Kelani Holdings is considered to be the largest domestic manufacturer of cross ply and radial tyres in Sri Lanka. CEAT recently embarked on a three-billion-rupee project to expand the manufacturing capabilities and improve efficiency. Furthermore, Sri Lanka's largest tyre manufacturing enterprise Ferentino Tyre Corporation (Pvt) Ltd, with US\$ 250 million investment was setup in Horana, and initiated its production early 2021. The factory will engage in manufacturing passenger car radials, and tyres for motor cycles, bicycles, three-wheelers, trucks, buses and industrial solid tyres. It is also expected to generate 3,000 new jobs opportunities and envisage in using local talent with European technology. However, it is understood that further investment is needed in the area of pneumatic tyres in order to make a significant impact in the global arena of tyre market.

3. Advancement in Tyre Technology

- The demand for high performance, reliable, and technologically advanced specialty tyres are greatly needed when facing increasing demand. The global market of specialty tyres, valued at US\$ 20 billion, includes industries that have significant stakeholder influence in the global economic climate. These comprise the agricultural, mining, forestry, industrial and off-road tires and aviation industries. In pneumatic tyres, introduction of advanced technology in the manufacturing process is expected to move the industry forward and create greater impact on specialty tyre market.
- A number of improvements have been made to winter tyres or snow tyres that have improved traction and control in heavy precipitation and freezing temperatures. Winter tyres combine extremely low rolling resistance, exceptional driving comfort, and first-class grip on snowy or icy roads. The improvement of these special features is the result of new technological developments and they represent the future of winter tyre technology.
- Constant improvements in rubber chemistry and tyre design create exciting and innovative designs for tyres that offer greater mileage and improved performance in extreme weather conditions. Innovations in tread patterns, sidewall design and overall tire construction have made today's higher-performing tyres more reliable than ever before.

4. Human Resource Needs

There are many challenges in producing knowledge workers needed by the polymer-based products manufacturing industry. In this context, universities and professional institutions need to design study courses that would minimize the knowledge and skills gap between universities and the polymer industry. The future job market in the polymer field depends on the versatility and innovative thinking of graduates. It is therefore a priority for institutions engaged in tertiary education to mould our youth in preparation for future growth of this industry.

5. Addressing the Gender gap

Today in Sri Lanka, women make up over 51% of the total population and their literacy rate stands at 90.8% which means that the industries can be benefited greatly by engaging female workers. Currently, over 50% of the female students follow industry-recognized study courses in the polymer field. Many women still struggle to get into top positions in the industry due to the existence of the "glass ceiling". As a primary contributor to the economic growth of the country, the rubber industry should pave the way for gender equality and create opportunities for career developments and addressing of the gender pay gap.

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