

Growth and Prospects of Natural and Synthetic Rubber Production and Consumption in India

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Abstract

Rubber has an essential role in today's society. Rubber industry can be separated into two main sectors, specifically tire manufacturers and industrial rubber manufacturers. It produces a wide variety of products that people normally rely on in their daily life. The rubber products are either used as tires, hoses or as sealing material on windows. Automotive industry is the most significant market for both tires and industrial rubber products. In India, over the last three decades, the numbers of vehicles have approximately doubled and further increases are expected over the next decade. This trend will eventually increase the consumption of rubber products, which will also augment the use of non-renewable resources, emissions to the air, water and soil during their manufacturing and usage stages. The Indian rubber industry has performed reasonably well, the industry has been growing further during the current financial year, both with respect to total turnover and exports. Though the overall balance of trade in rubber products is in favour of the country, the data indicates that India is becoming a favourable destination for rubber products. It is also noticed that while tyres/tubes, beltings etc are being imported to the country, the bulk of the imports comprises technical goods, sheeting's etc. Today the amount of rubber used in tires represents approximately 60% of the total rubber consumption in the world. About 25% of the remaining 40% of industrial rubber production is also utilized by automotive industry. This paper focuses on the growth and prospects of natural and synthetic rubber production and consumption.

Key-words: Natural Rubber, Synthetic Rubber, Rubber Products, Growth, Production, Consumption.

1. Introduction

The first rubber products manufacturing unit was established in the year 1921, in India and has attained the extraordinary development and expansion, mainly during the post-independence era. The rubber plantation sector produces over 640 hundred thousand tones of natural rubber and there is a

projected production of more than one million tones in near future. This has helped in the essential and rapid growth of the Indian rubber industry. This prospect of growth for rubber products is improved and has a boom in the vehicle industry. The boom is due to improved standard of living of the people and rapid growth of overall industrialization. This is another factor leading to marvelous growth and prospects of the industry in the year to come.

2. Objectives of the Study

1. To study the profile, background, and growth of the rubber industries in India.
2. To analyze the contribution of natural and synthetic rubber production to the growth of rubber products/ industries in India.

3. Marketable Forms of Rubber

The widespread marketable forms of natural rubber are ‘ribbed smoked sheet (RSS)’, ‘crepe rubbers’, ‘technically specified rubber (TSR)’, and preserved latex concentrates. While Compare to other major natural rubber producing countries, India’s natural rubber processing sector is characterized by the dominance of sheet rubber with a relative share of about 72 percent (Source: Rubber board, 1998).

Sheet rubber dominates the NR processing sector in India as it is the oldest and the simplest method of processing latex. The supremacy of sheet rubber is also the outcome of less initial investment, inward orientation of NR production in the country and structural characteristics of the rubber products manufacturing sector.

4. Growth in Number of Rubber Industries Established in India

The following table 1 shows the number of rubber industries established in India for production of rubber products on the basis of their consumption.

Table 1. No. of rubber industries in India for production of rubber products on the basis of their consumption

S.No	Industries	Consumption Groups	Natural Rubber Consumption (Tonnes)/Year	No.
1	Tiny	A	Upto and including 10 tonnes	1868
2	Small	B and C	Above 10 tonnes and upto and including 100 tonnes	2443
3	Medium	D and E	Above 100 tonnes and upto and including 1000 tonnes	427
4	Large	F	Above 1000 tonnes	62
Total				4800

Interpretation

The above table indicates that there are 2443 small scale industries that produce rubber products and consumes above 10 tonnes to 100 tonnes of natural rubber per year and belongs to B and C consumption group. There are 1868 tiny industries that produce rubber products and consumes 10 tonnes of natural rubber per year and belongs to consumption group A. There are 427 medium size industries that produce rubber products and consumes above 100 tonnes to 1000 tonnes of natural rubber per year and belongs to the consumption group D and E. There are 62 large scale industries operated in india for producing rubber products and consumes above 1000 tonnes of natural rubber per year and belongs to the consumption group F.

Share of State Wise Rubber Industrial Units Operated in India

The given table 2 shows that the growth of state wise rubber industrial units operated in India during the year 2014-15 to 2019-20.

Table 2 - State wise Rubber Industrial units Operated in India (during 2014-15 to 2019-20)

State/Union Territory	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Kerala	974	891	906	854	851	896
Maharashtra	623	612	624	578	563	542
Punjab	552	554	539	522	478	472
Tamilnadu	506	502	503	486	483	483
Uttar Pradesh	450	438	439	439	430	435
West Bengal	484	447	437	435	409	403
Gujarat	395	378	377	381	368	374
Haryana	311	289	307	324	324	332
Delhi	297	276	242	220	206	195
Karnataka	249	229	219	203	194	199
Andhra Pradesh	140	139	155	160	160	160
Rajasthan	92	87	99	111	109	111
Madhya Pradesh	91	88	86	82	77	74
Goa	28	25	31	33	33	26
Jharkhand (Bihar)	33	34	28	27	27	25
Orissa	16	14	13	13	12	10
Others	62	59	61	63	37	34
Total	5303	5062	5066	4931	4761	4771

Interpretation

From the above table it is indicated that 5303 rubber industrial units have been operated during the year 2014-15, during 2015-16 there are 5062 rubber industrial units, during the year 2016-17 there are 5066 rubber industrial units, during the year 2017-18 there are 4931 industrial units, during the year 2018-19 there are 4761 industrial units and during the year 2019-20 there are 4771 industrial units operated in India.

Contribution of Natural Rubber Production to Total Rubber Production in India

The total production of natural rubber gradually increased from the year 2010 to 2020 which indicates the growth of rubber and rubber product manufacturing industry in India. The growth of natural rubber made the researcher to study about the contribution of natural rubber to the total production in India. The following table 3 shows the contribution of natural rubber production to total production in India for the year 2010-11 to 2019-20.

Table 3 - Contribution of Natural Rubber Production to Total Production in India (From 2010-11 to 2019-20)

Year	NATURAL RUBBER (Metric Tonnes)	TOTAL PRODUCTION (Metric Tonnes)	CONTRIBUTION OF NATURAL RUBBER PRODUCTION IN TOTAL PRODUCTION (%)
2010-2011	631475	802145	78.72
2011-2012	631400	701053	90.06
2012-2013	649435	729836	88.98
2013-2014	711650	800016	88.95
2014-2015	749665	843874	88.84
2015-2016	802625	900259	89.15
2016-2017	852895	952408	89.55
2017-2018	825345	931631	88.59
2018-2019	864500	961239	89.94
2019-2020	864500	961239	89.94
Mean	758349	858370	88.27
SD	96755.92	97282.68	3.395
CV	12.76	11.33	3.85

Interpretation

From the above table it is observed that mean Share of total production by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **8,58,370** metric tones. Whereas the mean share of natural rubber production was **7,58,349** metric tones and the contribution of natural rubber production in total mean production was **88.27**.

The standard deviation for the Share of total production by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **97,282.68** metric tones. Whereas the standard deviation for share of natural rubber was **96,755.92** metric tones and the standard deviation for contribution of natural rubber production in total production was identified as **3.395** metric tones.

The co-efficient of variance for the Share of total production by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as 11.33. Whereas the co-efficient of variance for share of natural rubber production was **12.76** and the co-efficient of variance for contribution of natural rubber production in total production was identified as 3.85 metric tones.

Growth of Synthetic Rubber Production to Total Production in India

The growth of synthetic rubber production is high during the year 2010-2011, during the year 2011-2012 synthetic rubber production has been suddenly decreased and latter on the growth of synthetic rubber has gradually increased. This made the researcher to study about the growth of

synthetic rubber production in the total rubber production in India. The following table 4 shows the growth of synthetic rubber production to total rubber production in India for the year 2010-11 to 2019-20.

Table 4 - Contribution of Synthetic Rubber Production to Total Rubber Production in India From 2010-11 to 2019-20)

Year	SYNTHETIC RUBBER (Metric Tonnes)	TOTAL PRODUCTION (Metric Tonnes)	CONTRIBUTION OF SYNTHETIC RUBBER PRODUCTION IN TOTAL PRODUCTION (%)
2010-2011	170670	802145	21.28
2011-2012	69653	701053	9.94
2012-2013	80401	729836	11.02
2013-2014	88366	800016	11.05
2014-2015	94209	843874	11.16
2015-2016	97634	900259	10.85
2016-2017	99513	952408	10.45
2017-2018	106286	931631	11.41
2018-2019	96739	961239	10.06
2019-2020	96739	961239	10.06
Mean	100021	858370	11.7268139
SD	26946.05	97282.68	3.395
CV	26.94	11.33	28.95

Interpretation

From the above table it is observed that mean Share of total production by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **8,58,370** metric tones. Whereas the mean share of synthetic rubber production was **1,00,021** metric tones and the contribution of synthetic rubber production in total mean production was **11.73**.

The standard deviation for the Share of total production by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **97,282.68** metric tones. Whereas the standard deviation for share of synthetic rubber was **26,946.05** metric tones and the standard deviation for contribution of synthetic rubber production in total production was identified as **3.395** metric tones.

The co-efficient of variance for the Share of total production by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as 11.33. Whereas the co-efficient of variance for share of synthetic rubber production was **26.94** and the co-efficient of variance for contribution of synthetic rubber production in total production was identified as 28.95 metric tones.

Share of Natural Rubber, Synthetic Rubber Production to total Rubber Production

The share of natural rubber production, synthetic rubber production to the total production seems to be gradually increased from the year 2010 -2020. This indicates the growth of natural rubber and synthetic rubber production in India to the total production. This made the researcher to study about the share of natural and synthetic rubber production to the total production in India. The table 5 given below indicates the share of natural rubber, synthetic rubber production towards the total production by the Indian rubber growers for the year 2010-11 to 2019-20.

Table 5 - Share of Natural Rubber, Synthetic Rubber Production towards the Total Production in India (From 2010-11 to 2019-20)

Year	NATURAL RUBBER (Metric Tonnes)	SYNTHETIC RUBBER (Metric Tonnes)	TOTAL PRODUCTION (Metric Tonnes)
2010-2011	631475	170670	802145
2011-2012	631400	69653	701053
2012-2013	649435	80401	729836
2013-2014	711650	88366	800016
2014-2015	749665	94209	843874
2015-2016	802625	97634	900259
2016-2017	852895	99513	952408
2017-2018	825345	106286	931631
2018-2019	864500	96739	961239
2019-2020	864500	96739	961239
Mean	7,58,349	1,00,021	8,58,370
SD	96755.92	26946.05	97282.68
CV	12.76	26.94	11.33

Interpretation

From the above table it is observed that mean Share of natural rubber production by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as 7,58,349 metric tones. Whereas the mean share of synthetic rubber production was 1,00,021 metric tones and the total mean production of both natural and synthetic rubber was identified as 8,58,370 metric tones. The standard deviation for the Share of natural rubber production by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **96,755.92** metric tones. Whereas the standard deviation for share of synthetic rubber production was **26,946.05** metric tones and the standard deviation for total production of both natural and synthetic rubber was identified as **97,282.68** metric tones. The co-efficient of variance for the Share of natural rubber production by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as 12.76. Whereas the co-efficient of variance for share of synthetic rubber production was **26.94** and the co-efficient of variance for total production of both natural and synthetic rubber was identified as **11.33**.

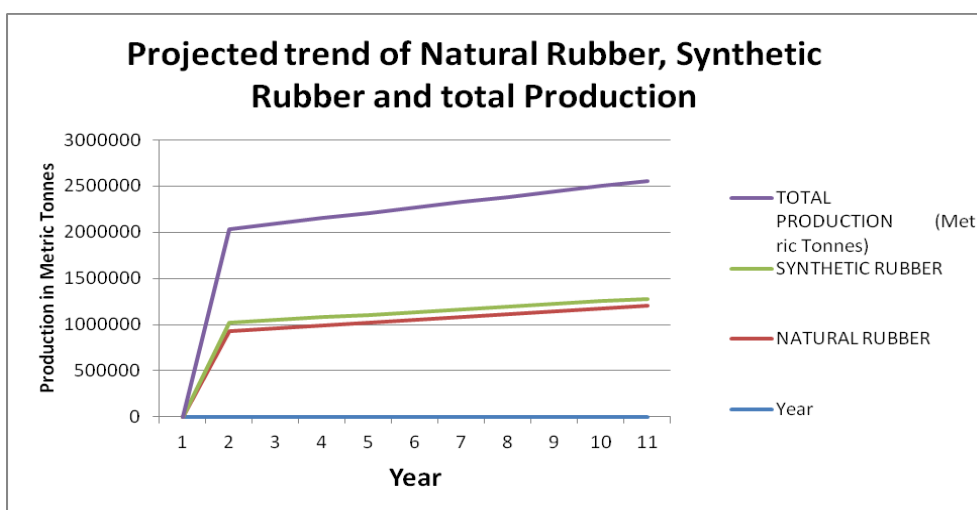
Projected trend of Natural Rubber, Synthetic Rubber and total Production by the Indian Rubber Growers

The following table 6 shows the projected trend of natural rubber, synthetic rubber and total production by the Indian rubber growers. The projected trend is estimated for the next ten years from 2020 to 2030. The estimated projected trend shows a gradual increase in natural rubber and synthetic rubber for the next ten years. From the trend it is predicted that there is a growth for rubber industries in India in future. Since there is growth in automobile sector there is growth for the rubber product industries in India.

Table 6 - Projected trend of Natural Rubber, Synthetic Rubber and total Production by the Indian Rubber Growers (From 2021 to 2030)

Year	NATURAL RUBBER (Metric Tonnes)	SYNTHETIC RUBBER (Metric Tonnes)	TOTAL PRODUCTION (Metric Tonnes)
2021	927855	89705	1017559
2022	958674	87829	1046503
2023	989493	85953	1075447
2024	1020312	84078	1104390
2025	1051132	82202	1133334
2026	1081950	80326	1162277
2027	1112769	78450	1191220
2028	1143588	76574	1220164
2029	1174408	74698	1249107
2030	1205227	72823	1278051

Chart 1 - Projected trend of Natural Rubber, Synthetic Rubber and total Production by the Indian Rubber Growers (From 2021 to 2030)



Growth of natural rubber consumption in India

India is the second largest consumer of natural rubber in the world. India is in fourth place in the production of natural rubber and second place in world consumption. The given table 7 denotes the consumption of natural rubber to the total consumption in India. There is a gradual increase in consumption of natural rubber which indicates that the usage of rubber products has been increased. The major consumption of NR was made by the automobile tyre industry. There is a rapid growth in automobile industry which leads to the growth of the consumption of the natural rubber.

Table 7 - Contribution of Natural Rubber Consumption to total Consumption in India (From 2010-11 to 2019-20)

Year	NATURAL RUBBER (Metric Tonnes)	TOTAL CONSUMPTION (Metric Tonnes)	CONTRIBUTION OF NATURAL RUBBER CONSUMPTION IN TOTAL CONSUMPTION(%)
2010-2011	631475	802145	78.72
2011-2012	638210	812740	78.53
2012-2013	695425	890275	78.11
2013-2014	719600	929790	77.39
2014-2015	755405	980055	77.08
2015-2016	801110	1038605	77.13
2016-2017	820305	1091135	75.18
2017-2018	861455	1158610	74.35
2018-2019	871720	1164670	74.85
2019-2020	871720	1164670	74.85
Mean	766642.5	1003269.5	76.62
SD	92685.86	141679.73	1.66
CV	12.09	14.12	2.17

Interpretation

From the above table it is observed that mean Share of total Consumption by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **10,03,269.5** metric tonnes. Whereas the mean share of natural rubber Consumption was **7,66,642.5** metric tonnes and the contribution of natural rubber Consumption in total mean Consumption was **76.62**. The standard deviation for the Share of total Consumption by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **1,41,679.73** metric tonnes. Whereas the standard deviation for share of natural rubber was **92,685.86** metric tonnes and the standard deviation for contribution of natural rubber Consumption in total Consumption was identified as 1.66 metric tonnes. The co-efficient of variance for the Share of total Consumption by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as 14.12. Whereas the co-efficient of variance for share of natural

rubber Consumption was **12.09** and the co-efficient of variance for contribution of natural rubber Consumption in total Consumption was identified as 2.17 metric tones.

Growth of Synthetic rubber consumption in India

The synthetic rubber is used where natural rubber may not be appropriate. The forthcoming table 8 indicates the growth of synthetic rubber consumption in India for the year 2010-11 to 2019-20. There is gradual growth in the consumption of synthetic rubber during the year 2010-2020.

Table 8 - Growth of Synthetic Rubber Consumption in India (From 2010-11 to 2019-20)

Year	SYNTHETIC RUBBER (Metric Tonnes)	TOTAL CONSUMPTION (Metric Tonnes)	CONTRIBUTION OF SYNTHETIC RUBBER CONSUMPTION IN TOTAL CONSUMPTION(%)
2010-2011	170670	802145	21.28
2011-2012	174530	812740	21.47
2012-2013	194850	890275	21.89
2013-2014	210190	929790	22.61
2014-2015	224650	980055	22.92
2015-2016	237495	1038605	22.87
2016-2017	270830	1091135	24.82
2017-2018	297155	1158610	25.65
2018-2019	292950	1164670	25.15
2019-2020	292950	1164670	25.15
Mean	236627	1003269.5	23.38
SD	49410.8	141679.73	1.66
CV	20.88	14.12	7.11

Interpretation

From the above table it is observed that mean Share of total consumption by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **10,03,269.5** metric tones. Whereas the mean share of synthetic rubber consumption was **2,36,627** metric tones and the contribution of synthetic rubber consumption in total mean production was 23.38. The standard deviation for the Share of total consumption by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **1,41,679.73** metric tones. Whereas the standard deviation for share of synthetic rubber was **49,410.8** metric tones and the standard deviation for contribution of synthetic rubber consumption in total consumption was identified as **1.66** metric tones. The co-efficient of variance for the Share of total consumption by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **14.12**. Whereas the co-efficient of variance for share of synthetic

rubber consumption was **20.88** and the co-efficient of variance for contribution of synthetic rubber consumption in total consumption was identified as **7.11** metric tonnes.

Growth of rubber product consumption (Tonnes) in India

A wide assortment of rubber products are produced all over the country. “Footwear production units are highest in number and modified form of rubber production units are the least”. Table 9 shows the growth of rubber product consumption with reference to their end product for the year 2015-16 to 2019-20.

Table 9 – Rubber product wise consumption (Tonnes) in india (2015-16 to 2019-20)

Product	2015 – 16	2016 – 17	2017 – 18	2018 – 19	2019 – 20
Auto Tyres & Tubes	357017 (44.5)	393933 (45.8)	385242 (45)	385242 (44)	519024 (49.29)
Cycle Tyres & Tubes	117802 (14.7)	116504 (13.5)	116120 (13.4)	119577 (13.6)	127095 (12.07)
Camel Back	48557 (6.1)	50003 (5.8)	50844 (5.7)	51566 (5.9)	56202 (5.4)
Footwear	99884 (12.5)	106530 (12.4)	109934 (12.7)	113485 (12.9)	120079 (11.40)
Belts and Hoses	48024 (5.9)	49306 (5.7)	50076 (5.8)	52667 (6)	56683 (5.38)
Latex foam	31353 (3.9)	31763 (3.7)	31621 (3.6)	32535 (3.7)	32972 (3.13)
Wires and cables	4113 (0.5)	4158 (0.6)	4228 (0.5)	4244 (0.5)	4547 (0.43)
Battery Boxes	14541 (1.8)	14452 (1.7)	14231 (1.6)	14266 (1.6)	14764 (1.40)
Dipped Goods	28103 (3.5)	29898 (3.5)	32081 (3.7)	32381 (3.6)	33899 (3.22)
Others	61641 (6.7)	62232 (7.4)	65722 (7.9)	70653 (8.3)	87694 (8.33)

Source: Rubber Board

*Value in paranthesis gives % of rubber consumption

Interpretation

Auto tyre and tubes are the major products in highest rubber consumption. Total rubber consumption was incessantly increasing during the period 2015 – 2020. Going by share of rubber consumption, automobile tyre and tube sector is the single largest sector accounting for about 50% consumption of all kinds of rubber, followed by bicycles tyres and tubes 12%, footwear 11%, belts and hoses 5%, camel back and latex products 5%. All other remaining rubber products put together account for 17%.

Growth of Natural Rubber, Synthetic Rubber Consumption

The rubber industry include wide range of products like adhesives, auto tyres, auto tubes, auto and cycle parts, footwear, belt, cables and wires, sports goods, surgical and pharmaceutical products etc. The following table shows the share of natural rubber, synthetic rubber consumption towards the total consumption for the year 2010-11 to 2019-20.

Table 10 - Share of Natural Rubber, Synthetic Rubber Consumption towards the Total Consumption
(From 2010-11 to 2019-20)

Year	NATURAL RUBBER (Metric Tonnes)	SYNTHETIC RUBBER (Metric Tonnes)	TOTAL CONSUMPTION (Metric Tonnes)
2010-2011	631475	170670	802145
2011-2012	638210	174530	812740
2012-2013	695425	194850	890275
2013-2014	719600	210190	929790
2014-2015	755405	224650	980055
2015-2016	801110	237495	1038605
2016-2017	820305	270830	1091135
2017-2018	861455	297155	1158610
2018-2019	871720	292950	1164670
2019-2020	871720	292950	1164670
Mean	766642.5	236627	1003269.5
SD	92685.86	49410.8	141679.73
CV	12.09	20.88	14.12

Interpretation

From the above table it is observed that mean Share of natural rubber consumption by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **7,66,642.5** metric tones. Whereas the mean share of synthetic rubber consumption was **2,36,627** metric tones and the total mean consumption of both natural and synthetic rubber was identified as **10,03,269.5** metric tones. The standard deviation for the Share of natural rubber consumption by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as **92,685.86** metric tones. Whereas the standard deviation for share of synthetic rubber consumption was **49,410.8** metric tones and the standard deviation for total consumption of both natural and synthetic rubber was identified as **1,41,679.73**metric tones. The co-efficient of variance for the Share of natural rubber consumption by the Indian rubber growers during the year 2010-2011 to 2019 -2020 was identified as 12.09. Whereas the co-efficient of variance for share of synthetic rubber consumption was **20.88** and the co-efficient of variance for total consumption of both natural and synthetic rubber was identified as **14.12**.

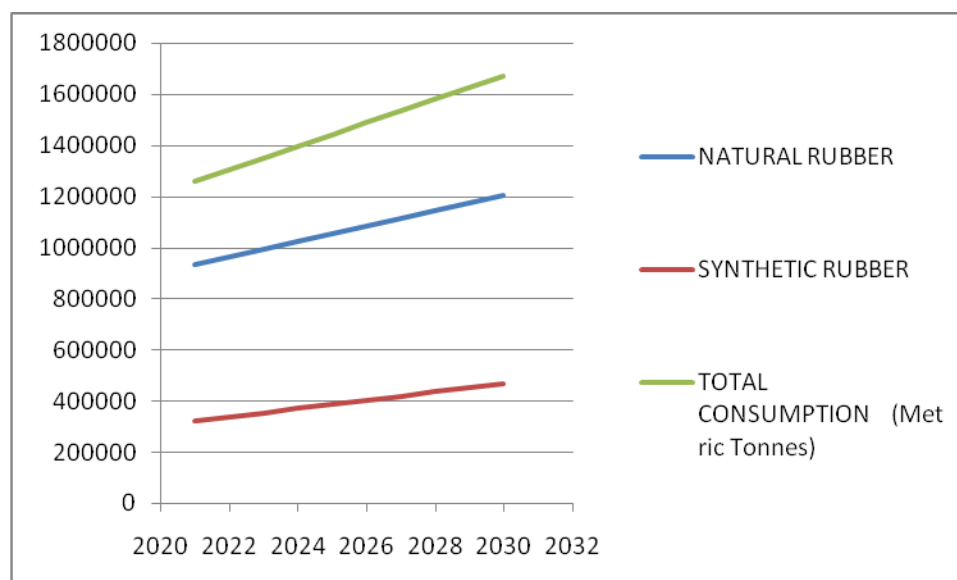
Forecasting of Natural Rubber and Synthetic Rubber

The forthcoming table 11 indicates the forecasting of natural rubber, synthetic rubber and total consumption for the period of 2021 to 2030. There is a gradual increase in the consumption of natural rubber, synthetic rubber because of the high usage and durability of rubber products.

Table 11 - Projected trend of Natural Rubber, Synthetic Rubber and total consumption for the period of 2021 to 2030

Year	NATURAL RUBBER	SYNTHETIC RUBBER	TOTAL CONSUMPTION (Metric Tonnes)
2021	932467	324485	1256953
2022	962617	340460	1303077
2023	992767	356434	1349201
2024	1022917	372408	1395325
2025	1053067	388382	1441450
2026	1083216	404357	1487573
2027	1113366	420331	1533697
2028	1143516	436305	1579821
2029	1173665	452279	1625946
2030	1203815	468254	1672070

Chart 2 - Projected trend of Natural Rubber, Synthetic Rubber and total consumption by the Indian Rubber Growers (From 2021 to 2030)



5. Conclusion

The rubber industry is suspended to grow both in terms of strength and dominance with increased potential in future. The rubber board provide training to the rubber growers, for improved

methods of planting cultivation etc. and also provide technical advice. The vigorous demand for natural rubber is increasing in global prospects and has made it inevitable for the industry to retain its domain as a vital component. “The fifth largest producer of natural rubber in the world is India”. The increase in prices and the demand for the rubber products internationally has motivated the rubber growers to produce more which has resulted in increased production. Undertaking, assisting or encouraging scientific, technological or economical research

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