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Price control, marketing and product manufacture

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During infancy, the Indian natural rubber (NR) plantation industry had a unique structure characterized by its export-oriented production evolved under British capital, patronage and technology and using immigrant or indentured labour. The fine-tuning of institutional support at various levels of production, processing and marketing for the highly receptive and enterprising farmers has been instrumental in maintaining the tempo of growth with quantifiable results in both production and productivity. The protected domestic market and the relative remunerative and reasonably stable price have provided necessary momentum for the subsequent dynamic growth of the industry. The marketing system for NR had evolved over the past century as the logical consequence of the distinctive structural and geographical concentration of NR production and manufacturing, the inward market orientation and the price control mechanism in the country. A kaleidoscopic view of the evolutionary developments in price control measures, marketing system and the product manufacturing sector presents a collage of the factors that are instrumental in the sustained development of the industry over time.

Evolution of Price Control Mechanism

The statutory regulations on NR prices in India, which began in 1942 through the monopoly purchase of NR at fixed prices was a major milestone in the evolutionary growth of the industry in India. Notification of maximum and minimum prices (Table 1), buffer stock, direct market interventions through State Trading Corporation (STC), export and barriers on NR import through tariff and non-tariff measures etc. are the subsequent policy initiatives followed by the Government of India to stabilize NR prices at remunerative levels so as to insulate the domestic market from fluctuations in the global market and to achieve self-sufficiency in NR production. Till the early 1970s, rubber manufacturers directly undertook import of NR by the quotas prescribed by the Central Government. The government control on NR imports through the imposition of import duty and regulations on the mode of imports were crucial in protecting domestic prices from fluctuations in the world market during this period. Since the intervention of STC of India in 1970s in NR marketing, the major share of NR imported was channelised through them. This mechanism, though not fully successful, was instrumental in protecting NR price from larger fluctuations till early 1990s. These polices on price ensured the relative profitability of NR cultivation and maintained the tempo of growth in area and production during the period between 1947-91.

As part of the economic reforms launched April 1992, manufacturers were allowed to undertake direct import through duty free channels and channelised import of NR through the STC was discontinued. Since then, the lion's share of the total quantity of rubber imported was routed through manufacturers' duty free channels especially through the advance license scheme (ALS). Consequently, the integration process of the Indian market with the global market has taken place and trends in world market, whether boom or depression began to reflect in the Indian market too. Thus when the international rubber price was Rs.50.30 per kg during 1995, the Indian price rose to Rs.50.59 per kg. When the international price declined to Rs.27.15 per kg during February 1998, Indian price also went down to Rs.27.30 per kg.

Since 1942, the thrust of NR price control measures under the protected

Table 1. Government control of NR prices in India

Period				Policy		
From		To		Minimum price	Maximum price	Others
May	1942	September	1946	Yes	No	-
October	1946	November	1947	-	-	-
December	1947	December	1963	Yes	Yes	-
January	1964	September	1967	Yes	No	-
October	1967	November	1986	Yes	Yes	-
December	1968	-	-	-	-	Entry of STC
December	1968	August	1981	Yes	No	-
September	1981	February	1968	No	No	STC operations
February	1986	February	1994	Yes	Yes	BSS, STC
February	1994	September	2001	No	No	BMPS
September	2001	Till date		Yes	No	-

BSS: Buffer stock scheme BMPS: Bench mark price scheme

market in India was aimed at achieving self-sufficiency in production. The statutory minimum prices and restrictions on import of NR that were imposed during the course of development had an insulating effect on the domestic prices from fluctuations in the international market. This mechanism functioned more or less successfully till 1991 ensuring remunerative prices and achieving rapid strides in NR production.

Today the Indian NR prices are not determined by demand and supply alone, but predominantly by the trends in international NR prices. The efficacy of NR plantation industry and the perceived objective of achieving self-sufficiency in production through appropriate institutional support for production, processing and marketing were complementary and compactable in the pre-liberalised phase. But in the post-liberalised phase which is characterized by the process of market integration consequent to the elimination of tariff and non-tariff barriers, the priorities are to be refocused on the emerging issues, which were subdued under the pre-liberalised protected price policy regime.

Evolution of Marketing System

Initially, all the rubber produced in India was exported till the late 1930s and the large estates themselves were managing the sales. But during the great depression, the price on export of NR declined and new planting, production and thereby exports were regulated under the provisions of IRRA in 1934. In 1942, under the Indian Rubber Control and Production Order, free movement and sale of rubber was restricted and the Government with a depot at Cochin purchased all available rubber at the controlled prices to boost up the war efforts.

The enactment of Rubber Act, 1947 and its amendments in 1954 were significant in the evolution of a marketing system for rubber. With the implementation of the Rubber Act, 1947, NR became a controlled commodity with its production, processing, marketing and consumption to be carried out under the provisions of the Act. The Act provided for licensing of rubber dealers and collection of cess by the Rubber Board and the Rubber Rules 1955 laid down modalities to be followed by the dealers. A declaration in Form N was introduced in 1976 for the close monitoring of inter-state movement of rubber to prevent cess evasion.

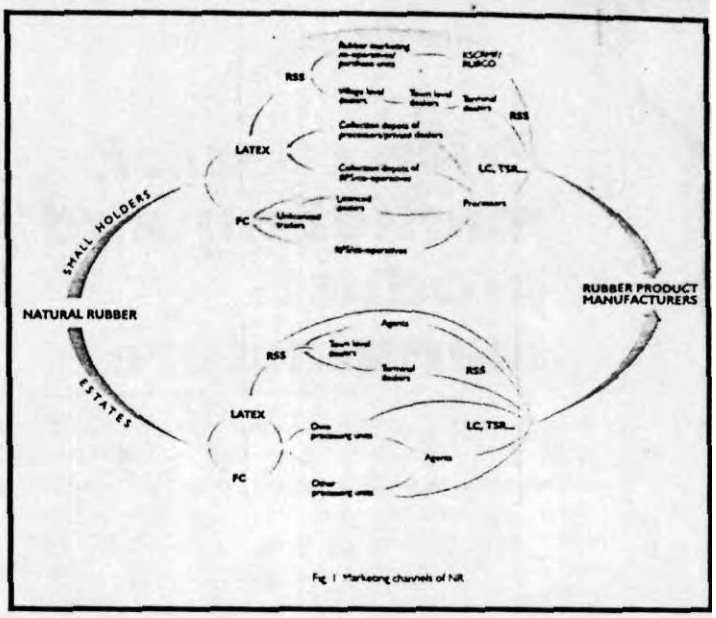


Fig. 1 Marketing channels of NR

The gradual dominance of smallholdings over the estate sector necessitated suitable changes in the NR marketing system. A clear and distinct difference emerged in the marketing systems for large estates and smallholdings (Fig. 1). The estate sector followed direct sales and the holdings relayed on marketing chain consisting of primary dealers, medium dealers and big dealers before their produce reaches end users. This marketing chain remained unchanged and handling levels got reduced to minimise marketing margins. Medium and small estates, which have facilities to process sheet rubber only, sell their products to purchase depots of manufacturers or to terminal dealers in Kottayam or Cochin and their field coagulum (FC) is sold as such. Some of the estates sell latex to centrifuging units also. Brokers also began to appear in the rubber trade with the increase in the number of dealers. They are basically rubber dealers, operating at terminal centres like Kottayam and Cochin but not undertaking routine trading activities but arrange sales by bringing together the buyer and seller and collect the brokerage from both the parties.

The system of marketing of FC also had undergone changes over time. There had been little change in the large estate sector, which is having processing facilities. Medium estates and those without processing facilities are selling FC as such. Earlier smallholder's FC was channeled through primary licensed or unlicensed dealers. At present along with them, co-operatives, crepe mills and TSR factories also buy smallholders' FC and the pronounced change that emerged over time is the replacement of private crepe mills by TSR factories as the main buyers.

The entry of co-operatives in the field of rubber marketing in the late 1960s has brought about notable changes in the marketing of rubber from the smallholding sector, which was virtually under the monopoly control and exploitation by dealers, both in pricing and grading. During 1960s, the small growers all over Kerala were encouraged to organise themselves into co-operative societies to facilitate marketing of NR ensuring fair price to rubber. In Kottayam, co-operatives were formed at taluk level and even block-wise, whereas in other districts the organization was mostly district-wise. The Kerala State Co-operative Rubber Marketing Federation (Rubber Mark) was formed on the 5 November 1969, as an apex organization with its headquarters in Cochin, to co-ordinate the activities of primary co-operatives, which are affiliated to it. Rubber Mark opened sales depots at main consuming centres like Bombay, Calcutta, Delhi and Jullandhar. During the early 1990s, RUBCO with its headquarters at Kannur, with a series of purchase centres also entered into the rubber co-operative marketing arena. Both Rubber Mark and RUBCO are engaged in export in addition to their routine purchase and sales operations. Many of the primary marketing societies have diversified their activities by establishing full-fledged processing factories.

During the pre-liberalized phase when the focus was on achieving self-sufficiency, the NR marketing system functioned more or less successfully ensuring remunerative price to the producers. But the efficacy of the

prevailing system will be tested in the liberalized trade policy regime. With the strength and dynamism acquired during the past 100 years, the Indian NR marketing system will respond positively with necessary resilience and greater adaptability to face the future challenges that it may have to encounter.

Evolution of Rubber Manufacturing Industry

The birth of the indigenous rubber manufacturing industry in India during the 1920s also played a crucial role in the growth of the production sector by absorbing the steadily increasing rubber production in the country. The steady growth of the industry during the next decade gradually created an internal market for rubber goods transforming its export orientation that persisted throughout the first quarter of the 20th century. The slump in NR prices during the economic recessions (1929-33) and subsequent imposition of restrictions of export thorough the provisions of IRRA in 1934 laid the foundation for its initial growth.

Though the first rubber factory, namely the Dixie Rubber Factory Limited, was established in Calcutta in 1920, the manufacturing industry had its real organized footing and sustained growth during the mid- 1930s. The involvement of India in the IRRA, which ensured availability of NR at low price for domestic consumption, the British patronage to cater to the increased industrial requirements during the inter-war years and the World War II, mainly in the defense and highway segments, contributed for the steady growth and development of the industry. With the entry of foreign companies such as Bata Shoe Company (1930), Dunlop (1936) and Firestone Tyre and Rubber Company (1940) with their factories in India to tap the advantages of cheap raw materials and labour, the development of the industry gathered momentum. In 1935, Travancore Rubber Factory was started at Trivandrum. Subsequently a large number of Indian-owned small-scale units, mostly located in and around Calcutta, were also established. The internal demand for NR in India registered a sharp increase and in 1947 the domestic consumption outstripped production.

Table 2. Sector-wise natural rubber consumption

Product	1975-86 Quantity (t)	1975-86 Relative share (%)	2000-01 Quantity (t)	2000-01 Relative share (%)
Dry rubber products	105839	84.20	518322	82.08
Latex products	5511	4.39	63701	10.09
Others	14342	11.41	49452	7.83
Total	**125692**	**100.00**	**631475**	**100.00**

Under the colonial patronage most of the manufacturing units sprang up initially around the traditional regions of industrial production, namely, Calcutta, Bombay and Madras. During the post-war period, small-scale units consolidated their position and diversified their structure. The pattern of growth continued even in the post-independent era with more concentration in the production of dry rubber products and extending the distribution more dispersed throughout the country.

Entry of foreign companies such as Firestone (1920), Goodyear (1922), Dunlop (1926) and India Tyre and Rubber Company (1930) in the trading of imported tyres in India started the era of Indian tyre sector. In 1936 Dunlop India Ltd started domestic production of tyres in India. During early 1960s Indian companies like MRF, Premier Tyres and Incheck Tyres entered the field with foreign technology. With technical collaborations of foreign multinational corporations (MNC), large Indian business firms like J.K. and Modi entered into the field of tyre production since mid-1970s. During early 1990s, with the liberalisation in external trade policies, corporate giants in the tyre field like Goodyear, Bridgestone and Michelin have been exploring the possibilities of exploiting the vast potential both in tyre production and marketing.

Presently the dry rubber product sector has a dominant position (Table 2) with more than 88% of the total consumption of NR. The tyre and tube sector of both automobiles (45.07) and cycles account for about 59% of the natural rubber consumption, a feature that was evident in the Indian manufacturing sector from its very beginning (Fig. 2).

In the tyre sector, the top four tyre manufacturing companies like MRF, CEAT, JK Industries and Apollo Tyres account for more than the 60 per cent of the sales (Fig. 3). The non-tyre sector, comprising more than 85 per cent of the total 5062 manufacturing units, is utilizing only about 40 per cent of the total NR consumed in the country.

The regional distribution of licensed rubber product manufacturers and the relative share in NR consumption show a positive association (Table 3). The share of Kerala, which accounts for about 90 per cent of India's NR production, in the total NR consumption, is only less than 14 per cent. In spite of the near monopoly position in NR production, Kerala could not achieve the desired level of development in rubber-based industries. It is high time to explore the possibilities of an agency for the promotion and guidance of NR industries for the exploitation of the NR-based industrial potential of the state.

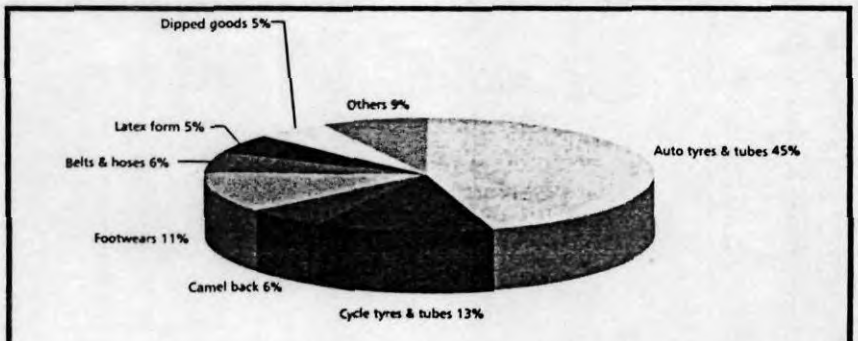


Fig. 2. Rubber consumption (2001-2002)

The Indian rubber-manufacturing sector has been evolved as a

Table 3. Regional composition of licensed rubber product manufactures and their rubber consumption (2001-02)

State	Licensed manufactures		Rubber consumption	
	No	Relative share (%)	Quantity (t)	Relative share (%)
Kerala	891	17.60	88221	13.97
Maharashtra	612	12.09	68344	10.83
Punjab	554	10.94	82843	13.12
Tamil Nadu	502	9.92	32588	5.16
West Bengal	447	8.83	43258	6.85
Uttar Pradesh	438	8.65	55684	8.82
Gujarat	378	7.47	35107	5.56
Haryana	289	5.71	38638	6.12
Delhi	276	5.45	18360	2.91
Karnataka	229	4.52	31233	4.95
Andhra Pradesh	139	2.75	19906	3.15
Madhya Pradesh	88	1.74	27732	4.39
Rajasthan	87	1.72	35867	5.68
Goa	25	0.49	23552	3.73
Orissa	14	0.28	24072	3.81
Others	93	1.84	6070	0.96
Total	**5062**	**100.00**	**631475**	**100.01**

supplementary segment catering to the needs of the large industrial base in the country and manufacturing products mostly for domestic consumption. The entire rubber produced in the country is being consumed by the manufacturing sector which is in sharp contrast to the situation in countries like Malaysia where more emphasis has been given for value addition to rubber and export of value added rubber products in the form of latex goods.

The high level of protection the Indian rubber product manufacturing industry enjoyed during the pre-reforms period has vanished with the removal of the tariff barriers and dilution of the non-tariff measures. The industry has been exposed to global competition, posing serious policy questions on quality of production and marketing strategies including exports and imports.

Conclusion

NR production in India is a success story as rubber is cultivated in 15 states and one union territory and India occupies the third position in production. Compared to global trends, the achievements has been phenomenal as the area increased by about 8 times, production by more than 40 times and productivity over 5.5 times during the period from 1947 to 2002.

Cultivation of this versatile crop has enormous socio-economic relevance as about one million growers, a the majority of whom possessing less than 5 ha, are actively involved in its production and over five million people depend on it for their livelihood. It provides employment for about 3.5 million people in the production sector and almost on equal number in the industrial sector.

The efficiency of the marketing network with its unique conglomeration of large number of intermediaries in between the growers and manufactures is instrumental in maintaining the tempo of growth in the production sector. The high level of competition existing among various categories of dealers, involvement of marketing co-operatives in the primary market and the rubber licensing system introduced by the Rubber Board are prominent among the various factors that have contributed to its effectiveness. This system has been instrumental in reducing the marketing margins of the intermediaries and thereby realising for the farmers the highest share of terminal market price for their produce.

The NR manufacturing industry had evolved with its initial inward orientation to cater to the needs of the captive domestic market. The rubber manufacturing sector which is relatively dispersed, has been dominated by the dry rubber products. Another distinguishing characteristic of the Indian rubber consuming industry is its sectoral concentration dominated by the automotive and cycle tyre manufacturing sector accounting for about 60% of the total consumption.

The striking feature of the Indian rubber industry with its comparatively wider and larger industrial base and the inward market orientation is that the entire rubber produced is being consumed by the manufacturing sector in the country. Presently India is the fourth largest consumer (6,38210 tonnes) of NR next only to China, USA and Japan.

The repercussions of the challenges arising from the growing market integration will ultimately affect the Indian rubber plantation industry also. The contingencies arising from globalization and market integration highlight the need for long-term comprehensive policies exploring value addition to rubber products and utilization of by-products of rubber plantations.

Contrary to the global trends, NR has greater acceptability and market preference than SR in the Indian manufacturing sector. In 2001-'02, the country consumed NR and SR in the ratio 79:21 while the global pattern was 40:60. The preference for NR for the Indian rubber goods industry will not change in the near future.

In the liberalized trade policy regime, the basically inward-oriented, protected, Indian NR production sector has been exposed to world market and the industry has to gear itself for facing the future challenges. In spite of India's enviable global position in the spheres of production and productivity, the possibilities of cost reduction, diversification and value addition needs to be explored earnestly for making Indian NR production sector viable and sustainable.

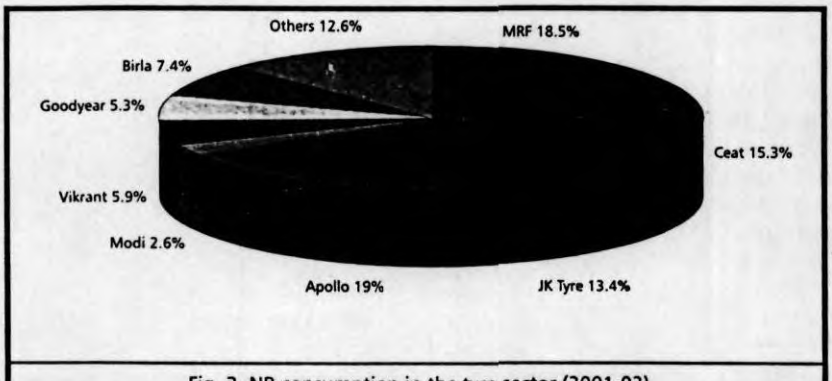


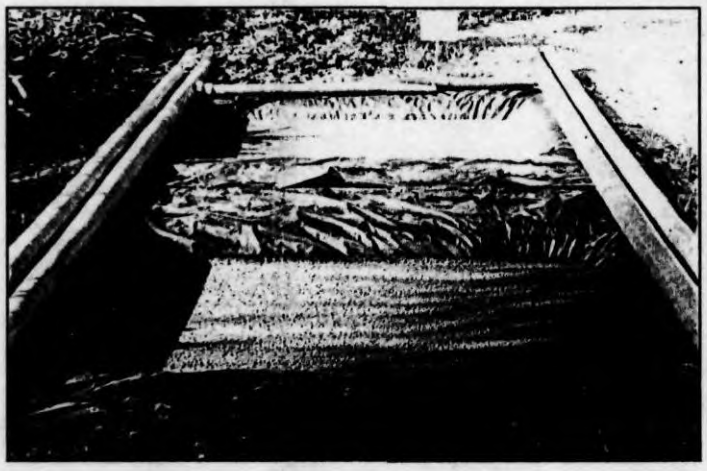
Fig. 3. NR consumption in the tyre sector (2001-02)

immobilized on organic matter content. The optimum temperature, at which the urease activity was consistently higher ensuring the continuous supply of plant available form of nitrogen at least for 20 days after fertiliser application, was worked out for individual zones. The optimum temperature for the soils of Anamallais and Wayanad was found to be 25^0 C, while for Koppa it was 20^{0}C. In Munnar, Western end and Plateau zone soils showed for optimum hydrolysis at 20^{0}C while the soils of Eastern end and lower elevation showed higher action at 25^0 C. Both Nilgiris and Vandiperiyar zone soils have shown optimum activity at 20-25^{0}C. A sharp fall in ammonium ion concentration was noted in the soils when the temperature was raised to 25^{0}C making more nitrate ion available in the soil. It is concluded from this study that since the temperature between 20 and 25^0 C was found to be ideal for urea hydrolysis, urea application during peak winter (December and early January) ıll be avoided.

(Source : S. Venkatesan and V. Sudhakar, UPASI TRF, Valparai, Coimbatore, Dist.)

Azolla as a feed for cows in coconut based mixed farming system

Azolla is a small floating water fern that can be used as a feed for animals since it is rich in proteins and minerals. In this context, in coconut based mixed farming system at CPCRI (RS), Kayangulam involving cows as one of the components, *Azolla* was used as feed supplement for cows. *Azolla* was grown in small pits with plastic sheet at the base of the pits. In about 3 days, the fern doubles itself and the fresh Azolla is fed to cows. Daily, about 250g of *Azolla* is being fed to the cow, which is being relished by animals very well. It was observed that, the milk yield increased and there is possibility to reduce the concentrates, which is very costly in the market.



Growth promoting vermiwash from coconut leaves

Coconut leaf vermiwash has been found to possess good plant growth promoting and soil microflora enhancing properties. This was observed from the 48% enhancement of seedling vigour in cowpea, increase in number of leaves and root length in nutmeg seedlings and enhanced population of rhizosphere micro-organisms.

(Source: CPCRI, Kasaragod)

Francois Fresneau 'discoverer' of the 'rubber' tree:

The 300th birth anniversary of Francois Fresneau (1703-1770) was observed during 2003. Modern rubber industry owes to this French engineer for the wonderful discovery of the Hevea tree, for the first detailed description of it and the method of extracting latex and for conceiving and prophesying its industrial and commercial uses.

Fresneau was born on 29th September 1703 in Marennes, France. In 1728, he became a certified engineer and two years later, a certified astronomer. On August 1732, he was appointed as the royal engineer of Cayenne in French Guiana. His responsibilities included designing and construction of new fortifications for the town and vestigating about the local flora of ıe colony for identifying new ants, which are of potential use for the empire.

During the first visit (1732-37) to French Guiana, Fresneau spent five years in Cayenne. However, political intrigues and professional jealousy made the life of the young and enterprising engineer always difficult and often unpleasant. At last, he returned to France in 1737 and married Cecile Solain-Boron on 10th June 1738.

Again, Fresneau returned to Cayenne in 1739 along with his wife and spent another nine years. Those were the worst period of his whole life. Twice he handed in his resignation, but each time he was refused.

However, on 9th November 1740 he obtained the approval for his design for the fortifications. He accomplished his task satisfactorily and was honoured with several decorations. During his continued stay at Cayenne exploring the flora of Guiana, he discovered the 'Hevea' rubber tree. He called it 'syringe tree'. In his letter dated 19th February 1746, Fresneau made the first reference to the syringe tree, with which the natives had produced syringes and other curios articles.

Finally, Fresneau's retirement was granted during the early month of 1748. He returned home in ill health. Worn out by the unpleasant life in Cayenne, his wife Cecile Solain-Baron died. He married Anne-Marie Horric de Laugerie in 1751 in Marennes and lived with Charles, the only surviving child of his first marriage.

It was during the stay at Marennes that Fresneau prepared his historic 'Memoire' which provided the first detailed descriptions of the 'syringe tree', physical properties of its elastic resin and its potential uses in the west. Fresneau sent this report on 17th June 1749 to M. Rouille, the then minister, with a request to forward the same to French Academy of Sciences for review. Accordingly, the report was sent to the Academy where it was handed over to Charles Marie de la Condamine, the renowned geographer and astronomer for review.

Condamine had already acquaintance with the syringe tree during his expeditions to Peru and despatched a few samples made of the elastic resin to the Royal Gardens in 1736. In his report about his travels in Central America, La Condamine referred to a resin called 'Cachuchu' in 1743. Being an astronomer and geographer, he did not attach any significance to the elastic resin and considered it only as a 'curiosity'.

However, when Condamine received Fresneau's report from Minister Rouille, he was well conceived of the industrial and commercial potentialities of the elastic resin. He presented it before the Academy on 26th February 1751 and later published it in 1755 with his introductory remarks.

According to Fresneau's descendent and biographer, Chassloup Laubat, the discovery of turpentine as a solvent for rubber was due to Fresneau. In 1762, Fresneau sent an account of his invention to M. Bertin, the then minister. Laubat deduced that Bertin might have let L.A.P.Herrisant and P.J.Macquer, the rival scientists who were working on the same line see it. In 1763, Herrisant and Macquer were credited with the discovery of a solvent for rubber.

Fresneau died on 25th June 1770.

The nomenclature of syringe tree as *Hevea brasiliensis* was a much later historical event. In 1770, Joseph Prestley used the word 'rubbing' for the use of the substance for erasing lead pencil marks in his famous book on perspectives. The word 'rubber' became the name of elastic resin only during the early second half of the 19th century, more than 18 decades later.

Now *Hevea brasiliensis* provides more than 99 percent of the global output of natural rubber, which at present provides basic raw material for over 35,000 products. It is amazing to see how the prophetic foresight of Fresneau has become advantageous to the humanity.

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