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Modern Developments In The Application Of Rubber

DR N R PEETHAMBARAN

Rubber cultivation in India was started on a commercial scale in 1902. The area planted was 200 ha. Even though the plantation industry passed through many vicissitudes, its rate of growth over the years has been phenomenal. During 2000-01, the area under rubber is estimated to about 5.59 lakh hectares, production 6.30 lakh tonnes and the average yield per ha is 1576 kgs. The rubber is harvested by tapping the bark of the tree and the crop consists of 80 per cent latex and 20 per cent field coagulum materials. The crop obtained is crude and is to be processed into various marketable forms. Latex is processed and marketed as sheet rubber, pale latex crepe, technically specified crumb rubber and latex concentrates. Of the total processed rubber, 73 per cent is sheet form, 9.7 per cent as crumb rubber, 9.85 per cent as latex concentrate and 7.55 per cent all others.

India is a producer as well as a consumer of natural rubber. During 2000-01, the total consumption of natural rubber is 6.31 lakh metric tones. In addition to natural rubber, synthetic rubbers are also used for specific requirements like oil resistance, heat resistance and chemical resistance. The important synthetic rubbers under this category are Nitrile rubber, Neoprene rubber, Butyl rubber, Fluro carbon rubber, Silicone rubber, EPDM rubber etc. These are produced in industries from chemical monomer by polymerisation technique and now new polymers with specific properties are being produced synthetically. The pattern of use of natural rubber and synthetic rubber in India is in ratio 79:21 while the global pattern is 39:61.

The natural rubber is an excellent polymer and is enough to meet general industrial and home requirements. The per capita consumption of rubber in India is only 0.75 kg where as in developed countries like America it is about 12 kgs and this shows the potential for development or rubber industry in India in the future.

Rubber is elastic, flexible, and durable and so thousands of products take advantage of these unique properties. Some are very familiar to us and so many other rubber products do their work unseen. About 45 per cent of the rubber is used for making tyres. A tyre is not just a hunk of rubber, it is skillfully designed to do its job and is made not only from rubber, but of other materials like fibres, steel and chemicals. For the tough kinds of tyres like aircraft tyres, natural rubber is fully used. Also, a lot of non-tyre components are also used to control vibrations, seal in fluids, seal out dirt, reduce noise and transport fluids. In a representative average car, there are close to 750 rubber parts; roughly 350-375 body parts and 375-400 chassis parts comprising five per cent of the total weight of the vehicle. Natural and special synthetic rubbers are used in aircraft of all kinds. Apart from the usage of natural rubber in tyres, the requirements are special purpose synthetic rubbers. The applications are seals, sealants, hose and insulations. A number of rubber items are also used in ships and in defense equipments.

A lot of engineering applications can also be cited. Many bridges are mounted on large steel-laminated natural rubber bearings to allow the bridge to expand and contract when the temperature goes up or down. The unique design property of rubber is its high vertical stiffness and the low shear stiffness. Buildings can also be built on similar steel-laminated rubber bearings for isolating buildings from ground-borne noise and vibrations. It is reported that the first building constructed in UK on rubber bearings was Albany court, a six-storey apartment block built in 1965 over St James Park underground station in London.

The rubber bearings may also help buildings withstand earthquakes. Another important use of rubber is the rubberisation of roads. In this technique, rubberised bitumen is prepared by mixing two per cent rubber in latex form with bitumen at high temperatures and the 'rubberised bitumen' is prepared. It is then used conventionally for road surfacing. The principal benefits, which arise from the addition of small quantities of rubber to bitumen, include enhanced strength and elasticity, increase in viscosity and softening point and diminished sensitivity to changes of temperature. Rubberised bitumen has remarkable 'rubberiness' even though the rubber content is low. Ultimate benefit is the more durability of rubberised roads. Rubber impregnated concrete also has advantages such as better resistance to freezing, acid and sulphate attack, water absorption, abression and impact. Improved adhesion of steel to concrete is also reported with the incorporation of polymers. Throughout the industry, rubber does different kinds of jobs. Hose to carry liquids, conveyor belts to carry coal and ores, seals for machinery, pipelines, V-belt to move machines etc. The list is endless.

In every day life we are using a lot of rubber items. The transparent sticky tape is coated with natural rubber for adhesion, the elastic tapes contains rubber threads which provide self tightening power to our garments. The tightening power can be varied with varying quality rubber threads. This is made from natural latex and chemicals by extrusion process. The pillow, foam bed and fibre foam bed are all made using latex concentrate and chemicals. The foam rubber made from natural latex is highly comfortable, durable and is free from toxicity and so is the best for home use. Natural rubber latex is also used for variety of applications in the carpet industry. The three major applications - precoating, secondary backing and foam backing, which provide comfort and durability for home use. Another major use of rubber is in footwears. About 10 per cent of the rubber is used in this area and the main items are the shoe sole, Hawai chappals and Kattai sheets. About 12 per cent rubber is also used in making cycle tyres. Rubber hand-gloves are used to protect our hands from injuries and the important items are

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Alarming State Of Rubber In Kerala

Rubber and rubber-products are used by us almost everyday. The unique property of elasticity, power to absorb shock, ability to tolerate moderate heat and to be used even in low temperatures has made automobile, medical industry and a man's world invalid without rubber.

It was the British who found this tree - Hevea brasiliensis - that grew in the Amazon forest of South America. They realised that their Asian colonies had the congenial climate to grow rubber trees and thanks to them it has become a lucrative trade in countries like Thailand, Indonesia, Malaysia, Sri Lanka, India and China. The rubber farms with its canopy and trees in array resemble a small forest. They are eco-friendly too with the leaves absorbing carbondioxide and expelling oxygen doing its share of cleaning and cooling. The leaves fall in winter and decay to keep the soil moist and rich in minerals.

Owing to climatic reasons, Kerala accounts for 92 per cent of Indian rubber. Twenty-five per cent of the total income of Kerala is earned by the rubber trade. But the fate of rubber in Kerala has been in doldrums for the past three to four years. If the government continues to neglect it, they neglect it only at the risk of economic instability.

The rubber plantation in Kerala during the year 1930 extended to around 4,800 hectares. This has now risen to 5 1/2 lakh acres. The production has shot up from 2,000 tonnes to 6 1/2 lakh tonnes. There are around nine lakh families depending on rubber plantation. The state never had to look back regarding the production rate, then why is the future of the rubber trade in Kerala so bleak?

What was Rs 50-55 per kilo has now been reduced to Rs 33.75. The major reason behind it is the parity between the annual rate of production and rate of consumption. With the steady increase in the price of fertilisers, acid and spray oil, burden of taxes and lack of skilled labour, the problems for the rubber cultivation has only worsened.

On April 1, 2001, the government declared classifying rubber as an industrial raw material withdrawing its status as an agricultural produce. According to this categorisation, imported rubber attracts an import duty of just 25 per cent. Even latex attracts an import duty of only 35 per cent. Agricultural products like coffee, tea, pepper etc attract an import duty of 100-150 per cent. But the agricultural income tax is charged on rubber.

High investment rate, lack of expert advice, absence of scientifically advanced cultivating system, heavy tax rate, importing of rubber, absence of skilled labour, union problems and red tapism have aggravated the declining of the rubber market rate. The situation is alarming as the fate of the families that have entered this trade is now hanging in the air.

But more than export, Kerala has now begun to import rubber, without bothering to improve the status of rubber trade within the state, or finding out uses for the increasing and surplus rubber production. The industrialists do not hide the fact that imports would mellow the high rubber rate in the state. But this outlook has endangered the rubber farmers in Kerala sinking the rate to a dangerous level.

A practical and scientific approach can save the situation. It is agreed that the withdrawal of the regulations on import of 715 items including rubber has aggravated the descending market rate. Immediate steps must be taken to bar importing of rubber with the help of DEPB or advanced license. Indian representatives must raise objections in the WTO meeting to include rubber as an agricultural produce.

Along with these steps, the price of the rubber has to be revised and the STC has to preserve the surplus rubber, as only then will the market rate rise at least to the value recommended by the Rubber Board in September 1998. Ways must be found out to consume the surplus rubber production in the state. Officials agree that rubberisation of the roads is the best solution for it. Advanced countries import rubber for the rubberisation of roads. It is high time that the state thinks on these lines.

What is lacking is prudent planning and judicious selection supported by scientific evidence and confirmed by commercial experience. The rubber cultivators of the state must unite, and press the state and the central government to take immediate steps. The Rubber Board must join hands with the government and give active and visible support to uplift the position.

Meanwhile special efforts and monitoring must also be taken up by the rubber planters to improve the quality of their production too and raise it to the level of global market potential. If the state further delays in taking action, it will be too late to save the numerous families for whom this is a matter of bread and butter. ◆

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industrial gloves, electrician gloves and household gloves. The simplest items under this category are the finger cots. A lot of rubber components are also used in medical applications like hospital sheeting, Foley balloon catheters, injection bottle caps, medical tubings, Uridian condoms, condoms, surgical gloves and examination gloves. Rubber is also important in making colourful toys like Bendy toys, casted toys, and also balloons. In brief, the applications of rubber is spread in all walks of modern life.

The Rubber Board, Kottayam - 9, Kerala, has got experience and expertise for giving proper advise to the rubber sector for practising superior quality and cost-effective technique to the various sectors of the rubber industry. The Rubber Training Centre under the Rubber Board offers training on all aspects related to rubber cultivation, rubber processing and rubber products manufacture with a view to making available trained manpower and the overall development of the rubber industry. The major target groups are rubber growers, rubber processors, rubber product manufacturers, rubber dealers, entrepreneurs etc. Training programmes are being chalked out for the benefit of the various target groups and the annual training calender is published. The details are also available on request from the director (T&TC), Rubber Training Centre, Rubber Board PO, Kottayam, Kerala. ◆

(The author is deputy director-training, Rubber Board, Kottayam, Kerala)