

THE ESTABLISHMENT OF RUBBER-BASED INDUSTRIES IN A DEVELOPING COUNTRY

BY

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INTRODUCTION

Several countries in South East Asia have a pronounced economic dependence upon the natural rubber produced by them. It is therefore not surprising that many of the countries concerned are taking the necessary steps to diversify their economies. New crops have been introduced and steps taken to industrialise so as to reduce the current imbalances. It will nevertheless remain a fact that the livelihood of million of people of the region will continue to be inextricably linked with natural rubber for a considerable time to come.

It therefore, becomes a matter of primary concern to us, Scientists, Technologists, Industrialists, Governments and others associated with this raw material to do our utmost to secure and strengthen the status of natural rubber both at home and abroad.

In recent years, natural rubber has effectively countered the competition from an ever expanding range of synthetic rubbers. But, it is known that the proportionate usage of natural rubber, in the total rubber consumed, has been steadily declining. That the total volume of natural rubber utilised has continued to expand is a reflection of the overall sustained growth of the rubber industry. The question that has to be asked is whether this growth is likely to continue or not in the foreseeable future.

While it is difficult to answer this with any reasonable degree of certainty—there are certain factors which cause concern. The heavy usage of rubber products in modern forms of transport means that its future can affect that of rubber. The current problems related to environmental pollution and the energy (or resources) crisis can substantially alter the transportation requirements in the future. Will a possible shift to mass forms of transportation in lieu of the individual automobile mean a reduction in the growth of rubber usage in future? On the other hand, if mankind begins to conserve crude oil does this mean that synthetic rubber production might be curtailed? Furthermore, natural rubber as an environment enricher rather than a polluter should be able to form a strong propaganda lobby for promoting the use of natural rubber based products. These are some pros and cons related to the future of natural rubber.

In the light of this and in our own interest what can be done to promote the utilisation of rubber? Will the development of rubber based industries in our countries strengthen the future market and technology for natural rubber?

It is my considered opinion that the establishment of rubber based industries on a national and regional basis will be beneficial in several tangible aspects. First, it will reduce the import of what must be predominantly synthetic rubber based products into the region, while simultaneously promoting the export of natural rubber based products. Secondly, it will involve utilisation of an indigenous raw material as the principal component while achieving the objective of industrialisation. Thirdly, the industries created

if committed to developing an NR oriented technology can with sufficient stimulus and cooperation with the Research Institutes achieve significant breakthroughs in rubber product technology. The Institutes might concentrate on the research into the production and fundamental aspects of natural rubber and provide the scientific backing to the developmental efforts of the industrial technologists. In this connection, in India while considerable progress has been made, we are only at the fringe of the problem. It is possible to envisage natural rubber modified to compete not only with the general purpose but also the specialised synthetics. Then again there is the need to develop indigenous materials as the compounding ingredients for rubber—I believe that these possibilities will only become realities when industry and research bodies, each existing in their own right, begin to cooperate.

In India, a NR oriented technology has developed out of convenience but there is no commitment to continued development in that direction. This is a pity because industry in India has reached a take-off stage where development efforts are now not simply confined to import substitution but instead look for new and improved product applications. Synthetic rubbers are also beginning to make their presence felt and we expect two more plants within a decade. However, there is probably quite a lot that other developing neighbours can learn from India—in following what has proved beneficial and rejecting our mistakes. Therefore, before discussing individual factors related to industrialisation, it is worthwhile to briefly review the status of the rubber industry in India today.

THE INDIAN RUBBER INDUSTRY

India with its own resources of natural rubber has, in the 25 years since independence, developed a rubber products industry; they manufacture over 10,000 items and is dependent upon less than 10% of its raw material requirements in imports.

Without presenting the detailed statistics some salient features are :

- (1) Approximately 100,000 MT of natural rubber and 30,000 MT of SBR are produced in India. Another 10,000 MT of synthetic rubbers are imported annually.
- (2) Nearly 2,000 units are engaged in rubber products manufacture. Seven tyre companies operating 9 tyre plants are the giants of the industry and consume over 50% of the rubber. 95% of the units are in the small or cottage scale sector and account for less than 10% rubber consumption. Another 5 major tyre companies, several medium scale and innumerable small scale units are expected to come up before the end of this decade.
- (3) Approximately Rs. 3,000 million is the annual turnover of the industry with about Rs. 200 million worth of exports of rubber goods. This can be expected to double by the end of the seventies.
- (4) The majority of the raw materials are manufactured in the country, though several primary feedstocks are being imported. However, a programme for the manufacture of basic chemicals should reduce this dependence. However, ultimately we have to depend upon the crude oil for many chemicals and on that we will remain dependent upon oil producing countries. Our oil resources account for less than 10% of our own needs.

- (5) Machinery manufacture has developed in a big way in recent years. Several international manufacturers are commissioning their plants in India. In the related plastics field a major international manufacturer has shifted their international design and development office to India because of lower overhead costs and because prototype building and testing is cheaper in India.

Briefly that presents the industry as it exists today. In the sphere of R & D the main efforts have been in import substitution of raw materials, products machinery and assimilating the technological processes involved. With this phase more or less complete it is anticipated that the next stage of applied research and development by industry should see some major advancements. Government is also now insisting that 1-1.5% of turnover must be utilised for R & D so that growth through development is generated rather than through the repetitive imports of technology. Nevertheless, Government recognises that the door to foreign collaborators should be kept open so that industry in India does not alienate itself from the mainstream of technological development in the advanced countries.

India thus is in a pivotal position in respect of development of rubber based industries having already transferred the technology from the advanced countries and adapted it to our environment. Unfortunately, I don't believe that industry has as yet evolved an effective method of transferring this technology to other developing countries. Consultants do play an important role in transfer of know-how into India and within India. Perhaps, the Consultant has a role to play to transfer from India to other developing countries but this depends upon both the transferor and transferee to develop this role effectively.

It is now appropriate to consider factors that play a role in the development of rubber based industries. Similarities and difference to developments in India have been indicated wherever possible. While what I have to say is based upon a limited experience—I hope that those gathered here may be able to add from their own experiences so that a broader framework may be developed.

FACTORS THAT INFLUENCE THE DEVELOPMENT OF RUBBER-BASED INDUSTRIES

While the abundant availability of indigenous natural rubber is not the sole criterion for establishment of rubber based industries, it however forms a nucleus around which this facet of industrial development can be planned. The factors that influence the establishment and growth of rubber based industries are listed below:

- (1) Government policies and plans
- (2) Raw materials availability
- (3) The market potential
- (4) Economic unit sizes and the investment levels necessary
- (5) Support facilities available or to be created
- (6) Technology available
- (7) Labour situation

Each of these factors are briefly discussed below :

Government policies and plans :

Government policies and plans are pivotal in deciding the extent and quality of the development of rubber based industries. Some of the key decisions to be taken by Government include the following :

- (a) The overall extent of industrialisation to be planned for in the economy.
- (b) Priorities to be established in the industrialisation plan.
- (c) Roles of the public and private sector in relation to the industry concerned.
- (d) Fiscal policies and assistance to be extended to the industries concerned, including allocation of foreign exchange resources for materials, machinery, royalties.
- (e) Policy towards foreign investments and technical collaborations.
- (f) Labour policy.

Government, therefore, has to establish clearcut guidelines within which the development of the industry can take place. Uncertainties at this level will reflect itself in the growth process of the industry concerned, ultimately.

Furthermore, any plan developed cannot be static but has to be dynamic to meet changing situations. As Government gains in experience in the planning and execution process, clearcut directions emerge. Surprisingly, in India I don't think any plan existed for development of rubber based industries as it was not in the one sector. Perhaps it is because of this that the industry has developed relying on its own initiative and ingenuity !

Raw material availability :

The rubber content in a rubber product rarely exceeds 66%, so that the availability of the materials that constitute the remaining 34% has to be reviewed. Furthermore as the number of materials that make up this residue are far more numerous than the rubber itself, one has to consider more which of these are or would be available indigenously. In fact a materials review plan should be prepared to consider the short and long term implications in respect of these other materials which include the following :

- (a) Carbon blacks
- (b) Process aids—softeners, plasticisers, retarders, peptisers
- (c) Activators
- (d) Accelerators
- (e) Vulcanising agents
- (f) Antidegradants
- (g) Other special materials.

The prospects of their manufacture have to be evaluated as against a projected annual import bill.

The market potential :

The internal and export market potential has to be reviewed. India is fortunate in having a large internal market hence marketing is never a serious problem. Smaller countries with smaller markets may require regulation in the number of units to produce a particular type of item. Excessive competition can be harmful. Even in India, in many items that have severe competition and where buyers go for the lowest quotation, the quality of the product is severely affected, on the other hand where there is healthy, rather than cutthroat competition, the product qualities tend to improve with time and this is true of our major rubber products. The size and growth potential of the market is instrumental in determining the size and number of units feasible for a particular product. Gauging export market size is not an easy task and rarely can one earmark more than 10% of production for export. Here, as a preliminary step, it would be advisable for a task force to study the export markets, not for one product, but of one type of industry. Such a force comprising industrialists, technologists and government representatives can develop an export potential profile for the benefit of the units who individually may not be able to undertake this exercise. Export incentives and facilities have to be created to develop the overseas markets. Once the market potential has been established the next step is to consider the unit size.

Economic unit size and investment levels necessary :

One may be faced with several aspects related to the economic unit size. Typically this might include

- (1) The normal economic unit size may be too large for the market even allowing for growth and exports
- (2) There may be a choice in setting up a large unit or two or more smaller units
- (3) There may be a choice of processes and the economic unit size may vary for each.

What appears to be most important here is that the question of techno-economic feasibility (TEF) has to be reviewed in detail from the ground upwards. The parameters used to establish TEF in U.K. (or even in India) may not hold good at all in Sri Lanka or Thailand.

For example, while reviewing unit sizes for a rubber reclamation plant, producers from U.K. and U.S.A. claimed that sizes below 5000 tons were not feasible. Yet in India the units of 200 tons capacity and upward are doing well and in fact some of the larger units producing 2000-3000 tons are the ones in difficulty. Based upon raw materials price, finished price realisable, investment necessary for different unit sizes, in India the smaller units are more viable. Thus this exercise has to be gone through for each type of unit and while it may initially appear that the minimum economic size unit may be in excess of market potential it may be perfectly feasible to scale down the process and investment and make the units workable.

Again coming to the question of investment levels necessary—a client of ours was recently negotiating establishing a unit in Africa valued at approximately Rs. 1 million capital investment. For comparative purposes we obtained a complete quotation from Europe and found that it was $2\frac{1}{2}$ times more expensive in capital costs than what the client had estimated for the same unit size. So on the question of investment level necessary, the costs have to be worked out based upon indigenous equipment availability and quotations from various sources.

In general one might conclude that smaller unit sizes and investment levels can give feasible units in rubber based industries in protected economies.

Support facilities available or to be created :

The support facilities and ancillary industries that are required include the following :

- (1) Utilities such as power, water and steam. The former two may be supplied by the Government, while for the latter, boilers of suitable capacity have to be available from indigenous or foreign sources.

For a particular type of industry Government may set up industrial estates with common processing and tool room facilities in addition to power and water connections. This helps to reduce the investment of the individual units and provides the necessary support services.

Alternatively industries may be located around a major unit which can provide its facilities which may not be fully utilised by the unit—thus allowing the smaller units time to establish a firm financial base for expansion.

- (2) Ancillary industries—where any concentration of a particular group of industries occurs then ancillary industries capable of supplying common needs can be located. This would include metal working industries, small machine suppliers and repairers. The raw material industries can also be termed as ancillary to a particular industry. Adequate demand for raw materials once generated will promote the establishment of chemical based industries.

Hence, again it is possible to develop a total picture of support facilities that will be necessary—part of which would be Government implemented while other aspects may be developed in the private sector. Total requirements of power, water, steam, machinery and raw materials can be estimated for the initial phases and growths projected to enable long term planning for instituting the support facilities. Where there are existing facilities duplication should be avoided to reduce the overall expenditure to be incurred.

Technology available :

It is unlikely that all the necessary technological and managerial know-how will be available in a developing country. Hence, import of technology becomes necessary. This is also useful in speeding up the development process. Technology is available in several international market places. The price and sophistication will vary and selection could depend upon factors such as foreign credit facilities offered, etc. This may mean that sometimes the technology that is most suited may not be available to the country. Of course, this would not be applicable to a country with adequate foreign exchange reserves and balances—they can afford to shop around and obtain that which is most suitable.

Technology is available principally from manufacturers of the particular product abroad—usually this is the best source because they are familiar with problems and can rapidly adapt their process to indigenous conditions.

Machinery suppliers sometimes provide know-how but their tendency is to blame any shortcomings upon local materials or conditions, rather than faults in their preliminary plant design or erection. This has happened in many cases in India.

Consultants and repatriates are also a source for technology transfer but to a limited extent. It is usually useful to associate a consultancy organisation with major projects involving foreign know-how because the basic engineering design and probably the process package can be assimilated by them—so that future imports of technology becomes more selective.

With time, automatically technology becomes more selective as industry and Government gain experience in the working of collaborative agreements and arrangements.

Finally, there should be clear cut guidelines from Government on its attitude to technical collaborations and foreign investments so that agreements can be hammered out between parties without having to chop and change because of uncertainties at Government level. Perhaps, that is asking too much of any Government!

Labour situation :

The attitude of labour to industrial development and the attitude of Government to labour are important if the development of industries is to take place. I would like to cite what happened in West Bengal in India. This State accounted for about 40% of the rubber industry at one time—with huge rubber industries such as Dunlops and Bata. Then came a period of political unrest with the development of the extreme left forces in the State with the avowed intention of destroying the present social order. One by one industries closed down or shifted out and new investment dried up. The situation was further heightened when the Left Marxist Government was elected to power in the State and they did nothing to prevent intimidation and violence in industries. Many of the industrialists had only themselves to blame for having neglected over the years to establish and maintain even the minimum standards of wages and working conditions. Nevertheless it was a clear reflection of the power of labour to halt development, especially so, if they had the tacit approval of the Government.

Government and labour attitudes are a key factor in attracting new investment in particular industries and regions. Foreign investors and collaborators are also greatly influenced by the short and long term considerations of the political climate and its influences on the working facets of the industries.

CONCLUSIONS

In the brief time available I have tried to present some of the important aspects related to development of industries—rubber based ones in particular. Several factors are interlinked and many have sub-levels which I have not discussed at present.

Finally, I would like to say something about Sri Lanka's rubber industry. From what I have seen of it there seems to be, a very sound based with potential for growth. Markets are limiting but I think exports can be developed quite substantially. Some of you may be surprised to hear that Sri Lanka has provided India with know-how in the rubber field. The largest manufacturer in Foam in India today was started about 12 years ago in a small open shed with the assistance of one Indian repatriate from Sri Lanka. Sri Lanka's loss was India's gain, so I certainly don't think that export of technological know-how will be a prerogative of India just because in terms of size the Indian Industry is large. What may be effective is a pooling of technical and other resources to promote development on a regional scale—in the long term interests of the rubber growing countries of South-East Asia this may be the best form of cooperation that we must seek to achieve.

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