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**PRODUCT  
ADAPTATION  
FOR MANUFACTURE  
OF RUBBER GOODS  
FOR EXPORT**

IS/SRL/74/070

**SRI LANKA**

**TERMINAL REPORT**

Prepared for the Government of Sri Lanka by the  
United Nations Industrial Development Organisation,  
executing agency for the  
United Nations Development Programme



**United Nations Industrial Development Organization**

United Nations Development Programme

PRODUCT ADAPTATION FOR MANUFACTURE OF  
RUBBER GOODS FOR EXPORT

IS/SRL/74/070

SRI LANKA

Project findings and recommendations

Prepared for the Government of Sri Lanka  
by the United Nations Industrial Development Organization,  
executing agency for the United Nations Development Programme

Based on the work of A.V. Abraham, product adaptation adviser

United Nations Industrial Development Organization  
Vienna, 1976

Explanatory notes

A full stop (.) is used to indicate decimals.

A comma (,) is used to distinguish thousands and millions.

References to dollars (\$) are to United States dollars, unless otherwise stated.

The following abbreviations are used in this report:

|        |   |
|--------|---|
| CISIR  | Ceylon Institute for Scientific and Industrial Research |
| CRA    | Convertible Rupee Account                               |
| GATT   | General Agreement on Tariffs and Trade                  |
| RRISL  | Rubber Research Institute of Sri Lanka                  |
| UNCTAD | United Nations Conference on Trade and Development      |

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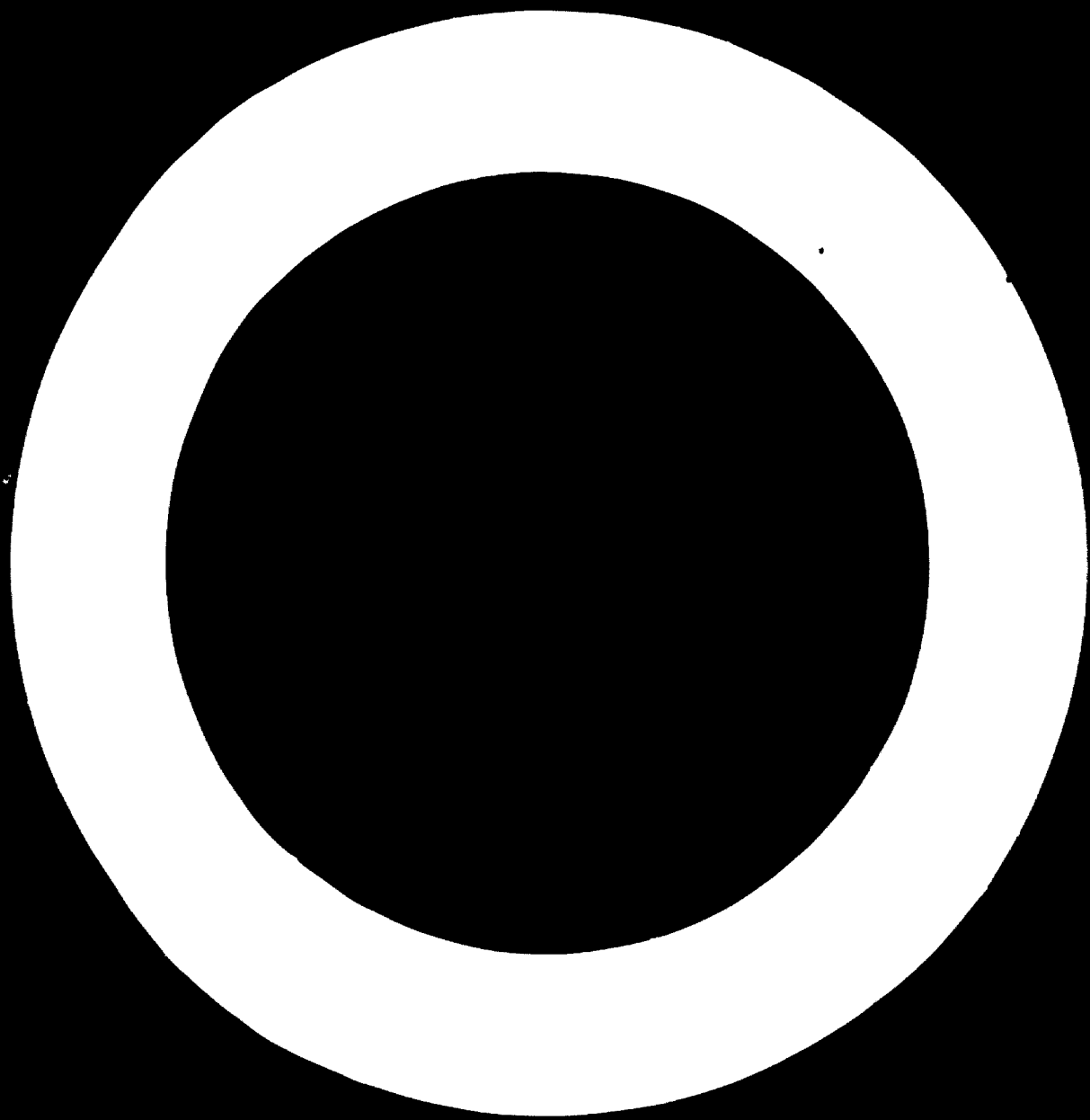
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ABSTRACT

The project "Product adaptation for rubber products export industries" (IS/SRL/74/070) arose from a decision by the Government of Sri Lanka, within the framework of its policy of export expansion and diversification, to take steps to overcome the considerable difficulties experienced by the rubber products export industry of Sri Lanka on world markets. A request for assistance from the United Nations Industrial Development Organization (UNIDO) was made in October 1974 and approved by the United Nations Development Programme (UNDP) in December 1974, with UNIDO acting as the executing agency and the Sri Lanka Ministry of Industries and Scientific Affairs as the counterpart agency.

The six-month project, which began at the end of October 1975, confirmed the need to improve efficiency, productivity, manufacturing techniques and product quality in the Sri Lanka rubber products industries, and led to specific proposals to achieve those goals, including the acquisition of essential new equipment and facilities, the stimulation of industry by the granting of suitable export promotion incentives, and the encouragement of the greater use of local materials in place of imported components.

With regard to follow-up action, it was recommended that urgent attention should be given to the proposed establishment of a central mixing and testing centre to function as a common service unit, and of a latex concentration plant for the export of latex and for assisting in the production of latex-based items for export.



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## INTRODUCTION

Export expansion and diversification have been major goals of the economic policy of Sri Lanka. Such expansion would involve the promotion of traditional products in non-traditional form and on more competitive terms. The rubber products export industry, for example, has in the past experienced considerable difficulties meeting world market requirements. The Sri Lanka Ministry of Industries and Scientific Affairs, through its Export Promotion and Development Division, is therefore particularly anxious to assist manufacturers of rubber products with export potential to adapt products and to improve production processes to meet competition on world markets. In this connexion, a survey of rubber products manufactured in Sri Lanka, carried out by the Geneva-based International Trade Centre (UNCTAD/GATT), has indicated an urgent need for quality control. Many of the plants currently exporting such products or with export potential face urgent problems in organizing their production on the basis of a well-defined quality control programme. In order to help the rubber products export industry to overcome its many difficulties, the Government of Sri Lanka, in October 1974, therefore made a request for UNIDO assistance, with particular emphasis on product adaptation problems. Sri Lanka was already receiving assistance in export promotion and marketing through a large-scale project carried out by the International Trade Centre (UNCTAD/GATT), and product adaptation assistance would supplement this project. The request was approved by UNDP in December 1974, with UNIDO acting as executing agency and the Ministry of Industries and Scientific Affairs as the counterpart agency, and with a project budget involving a UNIDO contribution of \$US 18,000, subject to later adjustments to meet unforeseen expenditure.

The export product adaptation adviser began his six-month mission at the end of October 1975, his duties being defined as follows:

- (a) To review current manufacturing methods and identify technical shortcomings;
- (b) To direct assistance designed to upgrade and improve manufacturing methods;
- (c) To advise on the setting-up of new plants manufacturing rubber products;
- (d) To advise on machinery, equipment and techniques of export production;
- (e) To train Sri Lanka counterparts in the above-mentioned fields.



The project resulted in a number of important findings and valuable recommendations. The rubber products export industry as a whole has considerable potential for developing its production and strengthening its position on world markets. To achieve those goals, steps must be taken to improve efficiency, productivity, manufacturing techniques and quality control, to acquire essential new equipment and facilities, to stimulate industry by granting suitable export promotion incentives, and to encourage the greater use of local materials in place of imported components.

With regard to follow-up action, it is recommended that urgent attention should be given to the proposed establishment of a central mixing and testing centre to function as a common service unit, and of a latex concentration plant for the export of latex and for assisting in the production of latex-based items for export.

## I. PROJECT ACTIVITIES

An interim report covering the first phase of the programme was submitted to the Ministry of Industries and Scientific Affairs of Sri Lanka in February 1976. It is on file at UNIDO and would be useful to consult in conjunction with this report.

The first phase of the programme concentrated on visits to major rubber products manufacturing industries in the country, identified products which have an export potential, assessed shortcomings in the quality and efficiency of production and outlined steps to be taken to make the products competitive in the export market. Other jobs undertaken during this period included giving advice to an entrepreneur in setting up a new manufacturing unit primarily for export and also assisting government officials in holding discussions with two foreign manufacturers with a view to launching a joint export venture.

During the next phase of the programme, attention was concentrated on the activities enumerated below.

1. Engineering workshops in and around Colombo were visited in order to assess available facilities and capacities as well as the know-how required to undertake the manufacture of moulds and other currently imported equipment. The following companies were visited:

- (a) Brown & Co., Ltd
- (b) Walker Sons & Co., Ltd
- (c) Ceylon Steel Corporation

2. Further visits were paid to manufacturing units to go into details of equipment and other requirements for up-grading their production and also to assess the effectiveness of existing incentives for export performance. The following factories were visited and discussions held with the respective managements:

- Bata Shoe Co., Ltd, Ratmalana
- Richard Peiris & Co., Navinna
- Associated Motor Products, Kalutara
- Elasto, Bentota
- D. Samson Industries, Galle
- Ceylon Malayan Rubber Goods (Sinwa), Dehiwala

3. The laboratories of the Ceylon Institute for Scientific and Industrial Research (CISIR) in Colombo and the rubber research laboratories in Ratmalana were visited in order to inspect the testing facilities available and to assess the requirements of the central mixing and testing centre proposed in the interim report.

4. Discussions were held with the General Manager of the Ceylon Tyre Corporation, who sought advice on the organizational structure of the Corporation and on certain proposed changes. Advice was also given to the industrial planner for the UNDP-financed master plan for the metropolitan area of Colombo on the anticipated growth of the rubber industries in Colombo and its suburbs.

5. The proposal made in the interim report for putting up a plant for the production of concentrated latex for export and to provide buffer stocks for the export production of latex-based products was discussed with the International Trade Centre senior adviser in the Export Promotion Secretariat, who showed great interest in the scheme.

6. Owing to the late arrival of the quality control expert to take up his assignment in Sri Lanka, it was not possible to undertake a joint programme with him as envisaged in the project. However, a number of industries were approached and visits organized for the quality control expert.

## II. PRODUCT ADAPTATION FOR EXPORT

The position with regard to the main objectives of the project is summarised below. An analysis will be made of each of the main products with export potential.

### Foot-wear

This item accounts for approximately 60% of the value of all exports of rubber products from Sri Lanka, according to the latest statistics available. Detailed comments are presented on pages 14 and 15 of the interim report. The main findings are summarised below.

1. No importance is given to labour efficiency and productivity is far below international standards.
2. Lack of facilities for making moulds and lasts locally makes it difficult to adapt to changing fashions on export markets.
3. The low quality of pigments of local manufacture gives a poor appearance to the products.
4. There are high scrap arisings owing to poor manipulation of sizes out from soling sheets.
5. No attempt is made to recycle scrap materials.
6. Better packing with harder cardboard and more attractive printing is required.

The above comments do not apply to the Bata Shoe Company, which maintains a high standard of efficiency and has a crumbing plant for recycling scrap. It also uses the research and development facilities of its international organization and imports moulds and lasts from its branches in other countries.

To deal with the problems described above, action along the following lines is recommended.

1. Efficiency. Training on the fundamentals of work study and methods study should be given to the production supervisors and managers. This could well be included among the activities of the common service centre proposed in the interim report. The wages paid are very low in many of the smaller factories, which tend to be family concerns giving preference to relations in employment. These conditions are not conducive to efficiency. Bata, on the other hand,

pays very good wages, and also has a system of incentive payments which ensure efficiency and good quality in production.

2. Mould-making facilities. There are a number of industries, such as Brown & Co. and Walker Sons & Co., which are capable of producing the required moulds and lasts. Bata has its own workshop, but smaller industries should develop suitable sources and not be content to produce with old and worn-out equipment.
3. Pigments. Local pigments need improvement in quality. There should be a strict control on quality standards.
4. Scrap. The Bata Company, by proper manipulation of sizes, has reduced its scrap of sole cuttings to as low as 10% and should serve as a model for other industries, which produce as much as 35% scrap.
5. Recycling. It is perhaps too much to expect each small unit to have a crumbing plant. This is another common service facility that should be considered for inclusion in the central mixing and testing centre.
6. Packing. There has been some improvement in the quality of cardboard, since the expert's initial visits. This should be maintained.

#### Micro-cellular sheets

This item has good export potential to the Middle East and to the Fiji Islands. It has been reported that the freight rate was high to Fiji because of the need for trans-shipment. Producers in Singapore are at an advantage in this respect. Possibilities of direct shipment should be investigated.

#### Bicycle tires and tubes

As mentioned in the interim report, two manufacturers, Associated Rubber Industries and Sinwa, are in a position to produce bicycle tires of reasonable quality for the export market. In addition to the popular size of 28 x 1  $\frac{1}{2}$  (inches). Associated Motor Products have moulds for four other sizes: They are: 26 x 1  $\frac{3}{8}$  (2 moulds), 24 x 1  $\frac{3}{8}$  (2 moulds), 20 x 1  $\frac{3}{8}$  (1 mould), and 18 x 1  $\frac{3}{8}$  (1 mould).

At the present level of efficiency, the two companies between them have the capacity to produce 100,000 tires per month for export after meeting the local demands of Sri Lanka. The Managing Director of Associated Rubber Industries mentioned that the party which had been suggested as a prospective importer in an earlier International Trade Centre survey did not respond to their inquiry.

The boom in the cycle tire market seems to be over and there is intense competition from all producing countries for the export market. The difficulty according to him was to find interested parties, since they are not in a position to undertake an international survey, unless foreign exchange was made available to them for extensive travel. At the moment, the competition is from China. Prior to this, there was competition from Japan and earlier from India. The prices of Sri Lanka products have to be reduced to make them competitive.

The ban on the export of bicycle tires and tubes from Sri Lanka, which was only recently lifted, had an adverse effect on the market in Bangladesh, which lost faith in Sri Lanka exporters, but this position is slowly improving. A shipment of 5,500 cycle tubes was recently dispatched by the Associated Rubber Products, which also has orders for 55,000 tubes with new orders still coming.

With regard to finishing, the tires produced by both factories have a dull finish, and the patterns are not sharp. This has to be rectified by more frequent mould cleaning.

From the point of view of cost reduction, the compound used by both manufacturers can be said to be too good for the job. The addition of crumb up to 20 parts per 100 of rubber will help to reduce the cost. Reclaim can be added even in larger proportions with no adverse results. On the other hand it will be possible to reduce the cure time, thereby increasing the production capacity. Lower power consumption for processing is another advantage of the addition of reclaim. Formulations with reclaimed rubber must be made with care to suit quality requirements, processing advantages and curing limitations.

With regard to tubing, Sinwa manufactures only mandrel-made tubes, but Associated Rubber Industries produce both mandrel and moulded types. The so-called "seamless" tubes of the moulded type are more in demand in the export market. Both factories use only natural rubber for the tubes since butyl is not available. Butyl tubes are considered superior on account of better air retention, but tubes made from natural rubber, properly refined and free from impurities are quite satisfactory.

#### Rubber hose

Richard Peiris & Co. are the biggest producers of rubber hoses of all types. The type of water hose produced by them is not of braided (reinforced)

construction and has only a limited export market. Richard Peiris & Co. export approximately 600,000 to 700,000 feet per year. Production of braided hose is said to be one of the items covered by the India-Sri Lanka economic agreement for production in co-operation with an Indian manufacturer.

#### Conveyor and transmission belting

These are also items included in the proposed co-operation agreement with an Indian manufacturer. Export potential, particularly to India, was considered good in a previous survey, and indications are that the position is still very good, and that steps should be taken by the Government to expedite this proposal.

#### Hard rubber balls

This has proved to be a good item for export. Richard Peiris & Co. have an expansion scheme to produce 560 tons a year for export. As noted in the interim report, the finish of the balls needs to be improved by improving the quality of the mould surface by hard chroming. The "Dalio" process for hard chroming in situ is being investigated by one of the manufacturers. With improved finish of the balls, the packing should also be made more attractive. Polythene bags are preferable to hardboard cartons.

#### Moulded rubber goods

Richard Peiris & Co. produce a wide range of products to meet local demand. These include automotive components, cycle parts and items for domestic use. Associated Motor Products also produces a number of items for local consumption. Production for the local market can be done on a cottage industry basis. The expert visited a small manufacturer, Mercia Rubber Products, whose proprietor operates his business in a small room in his own house, where he makes many types of complicated rubber parts required by car owners to keep their cars running. He has a little mill for mixing compound, a small boiler and a press, and his moulds are made by an outside workshop. His overheads are very small and his knowledge of the job is commendable.

Such an establishment is satisfactory for the local market, where customers are happy to have their requirements satisfied irrespective of quality or appearance. In order to compete successfully in the overseas market, there are some basic requirements. Automotive parts, particularly oil resistant components, require special synthetic rubbers whose import is restricted.

Apart from this, the quality standards specified by foreign automobile manufacturers are very stringent, and would need more sophisticated equipment, such as injection moulding equipment. However to meet this need would require high capital outlays with low employment potential, conditions which are both unsuitable for Sri Lanka. Hence there seems to be a case for international subcontracting through the proper United Nations agencies, such as UNIDO and the ITC.

Engine mounts using natural rubber have export potential, and the Elasto factory plans to produce them.

#### Truck and passenger car tires

The Sri Lanka Tyre Corporation covers nearly 85% of local demand for new tires. Being a protected market with no competition at all, the quality of the tires could not be expected to reach export standards. The laboratory and testing facilities in this factory are very good. The big handicap is its dependence on 100% natural rubber. As mentioned in the interim report, the percentage of local materials utilized in their operations in 1974 was only 16% in value. The economic advantages of an export-oriented tire industry without a significant increase in the use of local materials have to be carefully assessed. In any case, the only way to capture the export market to any significant extent is to find a well known foreign manufacturer to start a joint venture with local participation. This is under active consideration by the Government. A revised white paper setting out government policy on private foreign investment is being prepared.

#### Latex-based products

Foam rubber. As mentioned in the interim report, Richard Peiris & Co. produce a good quality foam mattress, but the pillows are too hard. This matter was discussed in detail with their technical manager. The main trouble is with the "Oaks" machine, which is very old and not performing satisfactorily. The mattresses would require better quality and more attractive covers, which textile mills in Sri Lanka are able to produce. The prices are very competitive compared to prices in other countries. The content of imported materials in this product is low, and there appear to be good prospects for entering the export market, even taking into account the high freight costs.



Balloons, toys, feeding-bottle teats

These are made on a small scale by a number of producers, who are also exporting them in small quantities. The quality of balloons is rather poor (see pages 11 and 12 of the interim report for detailed comments).

One point of major importance which cannot be over emphasized is the health hazards involved in making products like feeding-bottle teats and toys without conforming to health safety standards. The Government must take steps to enforce standards so that teats contain no harmful ingredients which are likely to go into solution and contaminate the milk or liquid baby food. Care must also be taken to ensure that the ingredients used are not harmful to the baby, causing contact dermatitis in acute cases.

Rubber bands. This is an item that can be produced by the dip process from latex or by extrusion. The latter process is more commonly used in Sri Lanka. The dip process needs virtually no equipment and can be a good cottage industry. This product has good export potential. Richard Peiris & Co. have an expansion plan to produce 306 tons of bands a year.

Surgical gloves, prophylactics. Production of these items in export qualities requires sophisticated manufacturing techniques, and foreign co-operation is essential in the early stages.

Latex thread/textile strips. A foreign co-operation agreement to produce up to 1,000 tons of latex thread a year for the garment industry has been under consideration for some time. The Elasto factory has developed the production of textile strips from latex-based sheets and arranged to market 200 tons annually in co-operation with a United Kingdom firm. Its present capacity is 100 tons, and it is commendable that the entire plant was put up without any foreign exchange.

### III. EXPORT PROMOTION INCENTIVES AND REQUIREMENTS OF DIFFERENT INDUSTRIES

Discussions were held with the managements of the various factories visited to find out the reasons for the rather poor export performance in general. One of the major producers felt that the conditions stipulated by the Development Finance Corporation for granting foreign exchange loans for expansion were very stringent. Apart from a high interest rate on loans, which could vary at the discretion of the financing body, there were restrictions on the industry with regard to incurring capital expenditure in excess of rather small amounts in a year and to declaring dividends in excess of 10% or issuing bonus shares. The Development Finance Corporation insists on representation on the board of directors of the company and the terms and conditions of the loan would be subject to change from time to time as necessary.

Export profits are usually very low in view of the high cost of imported components and the general low level of efficiency of production, and in spite of rather low wage rates. In many cases, profits from local sales have to pay for losses incurred in exports. Under these circumstances, it is not surprising that some of the producers prefer the security of the protected market to the uncertainties of the export markets. The only real incentive appears to be the facility of the convertible rupee account (CRA) allowed to exporters to the extent of 5% of the export value. The industries are eager to make use of the CRA for foreign travel for business purposes or for the import of an automobile, and are not unduly worried even if they do not make a profit in the export.

No more than a passing reference will be made to this problem, which, though not strictly within the terms of reference of this study, deserves special mention in order to understand the general situation. When the Government is convinced that the national interest would be best served by the promotion of manufactured exports, it has to deal with the problems of selecting industries which have the potential for export production and encouraging their development. With this in mind, the requirements of some of the promising industries for improving the quality and efficiency of their production are described below.

Richard Peiris & Co., Navinna

This industry is producing far too many diversified products with old and worn-out equipment to be able to concentrate on quality. There should be a certain degree of specialization in an export-oriented industry, which seems impossible as things now stand. After discussions the authorities have agreed to the suggestion that a special wing should be set up for export production with a select labour force, supervisory personnel and more modern equipment. An import licence has already been granted to this industry for one 3D Banbury and a pair of 60-inch mills, which could form the nucleus of this section. French firms have agreed to co-operate by providing two extruders (2.5 and 3 inches) and a pair of 60-inch mills for production of rubber bands. These could also be housed in the new section.

In addition to a good workshop capable of manufacturing many types of moulds, they have the following equipment: 1 milling machine (2D), 8 lathes, and 2 grinding machines (a big and a small one).

They feel that the acquisition of another milling machine (3D) and a small size heat treatment unit would make them self-sufficient. In order to encourage specialization, the expert considers that the rubber industry must do day-to-day maintenance jobs in its own workshops and contract out bigger jobs to specialized workshops. During the discussions their requirements were identified as follows:

- (a) An improved conveyor system for water cooling of moulds;
- (b) Compressed-air-operated tools for the opening and closing of moulds.

It should be possible to manufacture these items locally, with the exception of certain components.

Since this industry has qualified technicians and the capacity to produce quality products for export, the above-mentioned suggestion concerning the setting-up of a special export wing should be followed up.

Elasto, Bentota

As mentioned earlier, this factory has shown a remarkable ability to manufacture local equipment without the aid of foreign exchange. It has concluded a foreign co-operation agreement for marketing 200 tons of textile strips, and is therefore in need of a small item which has to be imported, namely, power-operated scissors for cutting sheets into strips.

D. Samsco Industries, Galle

This is a very progressive company which has managed to install modern equipment for foot-wear and run the establishment on modern lines. The quality of its products is nearly comparable with Bata's. The main drawback in the plant is that instead of a Banbury internal mixer, a battery of open mixing mills was installed, thus causing considerable pollution. The purchase of a Japanese "Inter Mix" is now being considered. This machine is cheaper than the Banbury machine, but has the disadvantage of not being able to mix high carbon content mixes.

The firm has made an application for a crumbing plant for recycling scrap. Its own scrap arisings are in the region of 500 kg per day. The smallest unit will have a capacity of 1,000 kg per day. The equipment requirement for recycling scrap should be studied on a zonal basis, so that all the scrap in the southern zone, which includes Galle and Bentota, can be handled by one unit, and the requirement of Colombo and its suburbs dealt with separately. This would save the cost of transport and idle equipment capacity.

Sinwa, Dehiwala and Mins, Diskwella

These factories need to improve their production efficiency by a radical change in their layout, by modernizing equipment, by ensuring trained shop floor supervision, and by acquiring better technical know-how.

#### IV. REPLACEMENT OF IMPORTED COMPONENTS BY LOCAL MATERIALS

The low percentage of local components used by the tire industry in Sri Lanka has already been mentioned. The position is not so bad in the case of other products. However, the development of the use of indigenous production is of the utmost importance.

It is quite evident that the labour force in Sri Lanka has an aptitude for mechanical repairs and manufacturing. Given the right materials and tools, it is capable of producing even complicated equipment.

##### Moulds

The manufacture of moulds will require precision machinery and instruments. There is one firm, Monuldex in Ratmalana, which has the necessary equipment. The facilities available here should be fully utilized. Batas and Richard Peiris & Co. have their own workshops and are able to do most of the work themselves.

Brown & Co. has tried to make tire moulds, but without much success. It could make the aluminium segments, but had trouble with the castings of the shell with the core. It is interested in getting the necessary know-how if the ministry concerned could arrange a visit to some of the Indian companies through intergovernmental channels. At the moment, this firm is concentrating on repair work for its customers, which seems to give a better return than new production.

Walker Sons & Co. has a very good workshop which is capable of doing most of the work required for the rubber industry, and it has expressed keen interest in undertaking work of this type. It is confident of being able to make any type of moulds, including tire moulds.

##### Mill rolls

So far only soft rolls required for processing in the rubber estates have been manufactured in Sri Lanka. Brown & Co. can cast and machine the following sizes (in inches) in its workshop: 48 x 18, 42 x 18, 32 x 16, 26 x 14, and 22 x 12.

In the past, chilled mill rolls were imported and fitted with frames and the rest of the equipment manufactured locally by Brown & Co. and Walker Sons & Co. The same situation is said to exist in the case of the Colombo Commercial Company. Here again, it would be desirable for the ministry

concerned to arrange a study tour for selected technicians from these companies to Indian companies working in this field.

A visit to the Sri Lanka Steel Corporation showed that it has a good foundry and the best heat treatment facilities in the country. These could be utilized in the future, but at present they are geared for the manufacture of construction materials.

#### Extruders

Small extruders up to 4" made by local firms are functioning well. The only snag is that the screws are wearing out too quickly. This could also be a matter for study by the technicians visiting Indian companies.

#### Raw materials

Sri Lanka is almost wholly dependant on imported rubber chemicals and fillers. The only exception is kaolin from the Ceylon Ceramics Corporation. The initiative taken by the Tyre Corporation resulted in substituting certain coconut oil derivatives for stearic acid.

A feasibility study was conducted by the Industrial Development Board into the manufacture of zinc oxide, making use of scrap zinc recovered from used battery cells.

#### Fabrics

The main types of fabrics used in the rubber industries are rayon and nylon for passenger and truck tires and cotton and rayon for bicycle tires.

Sri Lanka imports almost the total fabric requirements of its rubber industry. There is no reason why bicycle tire fabrics should not be produced in the weaving mills of Sri Lanka.

As mentioned in the interim report, feasibility studies should be conducted on the production of process oils, reclaimed rubber and basic accelerators and anti-oxidants.

## V. MAJOR PROJECTS THAT REQUIRE IMMEDIATE FOLLOW-UP ACTION

A summary of all the projects that require follow-up action are given in the interim report. Two of the major projects are described below:

### A. Central mixing and testing centre

This common service centre would be used for mixing compounds, testing samples, technical and industrial training and advisory services.

Both the Ceylon Institute for Scientific and Industrial Research (CISIR) and the rubber research laboratories have the basic testing equipment, and this should be taken into account when ordering testing equipment for the centre. A useful addition to the centre would be a crumbing plant to recycle scrap from the smaller units in and around Colombo.

### B. Additional production of concentrated latex in Sri Lanka

A table showing world consumption of concentrated latex and exports by the major suppliers for the years 1970 and 1971, the latest for which figures are available, is given below.

World consumption of concentrated latex and major suppliers

| Year | World consumption<br>(in tons) | Total exports of major suppliers<br>(in tons) |         |
|------|--------------------------------|---|---------|
|      |                                | Malaysia                                      | Liberia |
| 1970 | 258,500                        | 169,422                                       | 41,455  |
| 1971 | 267,250                        | 191,598                                       | 35,606  |

The total world consumption of concentrated latex is now estimated to be around 300,000 tons per year, of which Malaysia exports more than two thirds. Sri Lanka's export of this product was nil during the period tabulated and during subsequent years, while Malaysia has been steadily increasing its exports. Annual production during 1970 and 1971 in Sri Lanka was respectively 437 tons and 496 tons, which have been used mainly by three producers for the manufacture of foam rubber products, rubberised coir, balloons, gloves, dolls, etc.

During the years 1951 to 1956 Dunlops had a centrifuging plant in Sri Lanka which had a yearly output of around 5,000 tons, the entire quantity being exported to its factories in the United Kingdom. When the price of

RSS1 went up as a result of the barter deal with the People's Republic of China, this plant was dismantled and shifted to Nigeria.

#### Main uses of latex

Concentrated latex on the world market today is mainly used for carpet backing, foam rubber mattresses and upholstery, dipped goods like gloves, balloons, etc., adhesives, latex threads and strips for garment manufacture. Proposals have been made through the Rubber Research Institute of Sri Lanka (RRISL) and the CISIR for certain other uses of natural rubber latex. The RRISL has applied for a patent for the use of latex with Portland cement, and the CISIR has applied for the use of latex for emulsion paint. It has been proved in Sri Lanka and other countries that the addition of 2% of rubber to bitumen used for road surfacing improves its durability and also reduces the tendency to soften at high midday temperatures.

#### Proposed project

It is recommended that a plant with an initial daily capacity of 10 tons or from 2,500 to 3,000 tons per year, should be established in Sri Lanka partly for export purposes and partly to meet local demand. The expert recently had the occasion to visit a similar plant in India with an employment potential of about 100 persons, including supervisory and laboratory personnel. This does not include the more labour intensive operation of collecting latex from the estates.

The investment required for the proposed plant is not very high, and much of the equipment, with the exception of centrifuge machines, lorries for transport and some laboratory equipment, can be manufactured locally. The availability of the required water and power supplies is no problem in Sri Lanka.

#### Benefits

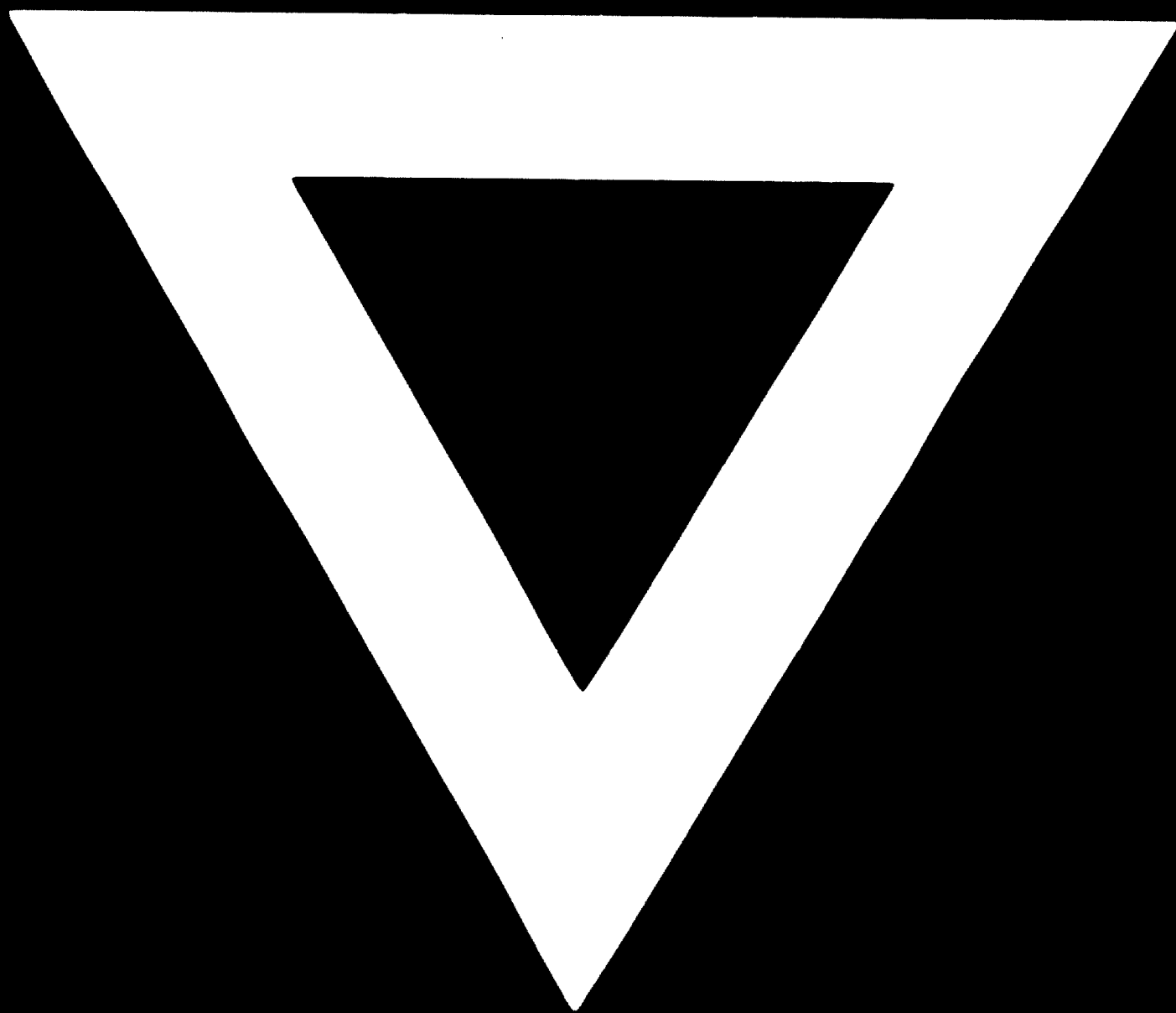
The price of concentrated latex is normally 25% higher than that of RSS1, which makes it competitive with block rubber for export. Local latex-based industries are found to show significant progress, particularly if compounded latex can be supplied to small producers. This can be produced in the proposed



plant. The possibility of carrying stocks of latex will prevent any break in the production of latex-based products by manufacturers who often stop production during heavy rains because of stock shortages. With regard to employment potential, the proposal seems likely to produce very good results in view of the labour requirements at the collection stage and in the concentration plant, and of the expansion it would stimulate in the local latex-based industries.



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