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INDUSTRIAL PROJECT IDENTIFICATION AND DEVELOPMENT TEAM

DP/MAL/78/001

MALAYSIA

Technical report:
ASSISTANCE IN EVALUATING AND
PROMOTING THE SELECTED PROJECTS' ECONOMY. (1976)

Prepared for the Government of Malaysia by the United Nations Industrial Development Organization, acting as executing agency for the United Nations Development Programme

[redacted]

V.78-1583

United Nations Development Programme

INDUSTRIAL PROJECT IDENTIFICATION AND DEVELOPMENT TEAM

DP/MAL/72/001

MALAYSIA

Technical report: Assistance in evaluating and promoting the rubber products' industry

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

Based on the work of Anton J. Rucker, adviser in rubber-based industry projects

United Nations Industrial Development Organisation
Vienna, 1976

Explanatory notes

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

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

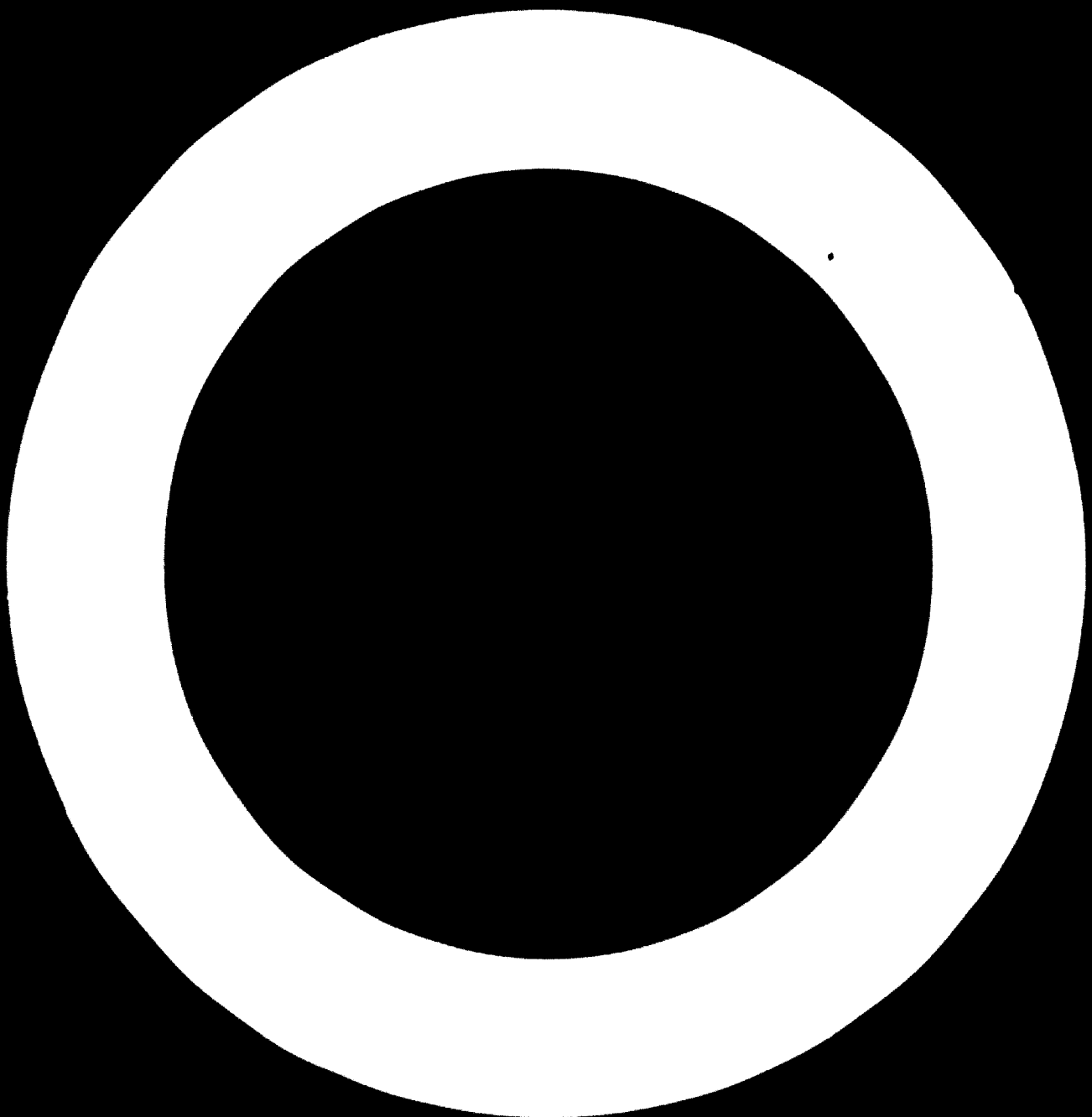
References to "tons" are to metric tons, unless otherwise specified.

The monetary unit in Malaysia is the Malaysian dollar ($M). In June 1975 the value of the Malaysian dollar in relation to United States dollars was $US 1 = $M 2.25.

The following abbreviations are used in this report:

Bhd.	Limited
FIDA	Federal Industrial Development Authority
MRRDB	Malaysian Rubber Research Development Board
NR	Natural rubber
RRI	Rubber Research Institute
SBR	Styrene-butadiene rubber
Sdn.	Private
SMR	Special Malaysian rubber
SR	Synthetic rubber

CONTENTS



SUMMARY

This report deals with the promotion of the rubber products industry in Malaysia, and forms part of the project entitled "Industrial Project Identification and Development Team" (DP/MAL/72/001) of the United Nations Development Programme (UNDP). The project arose from a request by the Malaysian Government in February 1972, and, following its approval by UNDP, field operations were initiated in December 1972, with the United Nations Industrial Development Organization (UNIDO) as the executing agency.

The objectives of the project were to strengthen the capability of the Federal Industrial Development Authority (FIDA), the body responsible for the promotion and co-ordination of industrial development in Malaysia, to identify, evaluate and initiate viable industrial projects, and to develop the skills of its staff by providing on-the-job training in those functions.

This report deals with the part of the programme concerned with the promotion of the rubber products industry in Malaysia. The mission covered the period from July to December 1975, during which time the expert on the rubber products industry was responsible for the supervision and guidance of the rubber industry team assigned to FIDA. With the active participation of the expert, the team continued to perform as before, but attempts were made to streamline earlier activities and to plan for future work. In one case the team prepared the terms of reference of a bilateral technical assistance proposal for an overseas rubber products marketing survey. In another case it played a more vigorous role in the Government's deliberations on co-operation within the Association of South-East Asian Nations (ASEAN) in matters relating to the rubber industry. A series of reports were prepared culminating in the submission of a comprehensive paper identifying specific product groups of interest for ASEAN joint ventures and mutual trade development. The team is expected to be actively involved in this area for some time.

The expert and his team visited a number of rubber products manufacturing plants and considered the possibility of joint ventures with foreign investors. It was concluded that Malaysia's great wealth of natural rubber and the quality of its existing manpower provided a strong basis for the development of a large, competitive, export-oriented rubber products industry. The achievement

of this objective would require outside assistance for the provision of the necessary know-how and the re-training of the labour force in modern industrial techniques. This could be ensured through joint ventures with companies of more technologically advanced countries. Any action taken should, however, be combined with careful studies of existing enterprises in Malaysia, in order to increase their efficiency and promote their expansion.

INTRODUCTION

During the 1960s most industrial projects in Malaysia arose from private sector initiative, and industry concentrated mainly on supplying the protected domestic market. Most new plants were sited near the main population centres, and during the period of the First Malaysia Development Plan (1966-1970) manufacturing output grew by 10.4 per cent, compared with 5.4 per cent for the economy as a whole, while 54,000 new jobs were created.

In late 1967 the Malaysian Government established the Federal Industrial Development Authority (FIDA) to assume overall responsibility for the promotion and co-ordination of industrial development and to advise the Government on tariffs and investment incentives to new industries. Following the establishment of FIDA and a simplification of investment incentive and tariff protection approval procedures, there was a rapid expansion in the approval of new industrial projects. With the introduction of the Second Malaysia Plan (1971-1975), which aimed at a 12.5 per cent increase in manufacturing output, a doubling of manufactured goods and the creation of 108,000 new employment opportunities, it was considered that greater efforts would have to be made by the Government, and in particular FIDA, in identifying and promoting the implementation of new industrial projects. As a result, the Government of Malaysia submitted in February 1972 a request for UNDP assistance in industrial project identification and development, which was subsequently approved and implemented as the "Industrial Project Identification and Development Team" (DP/MAL/72/001).

This report covers the part of the project relating to the promotion of the rubber products industry in Malaysia. The purpose of the mission was to advise FIDA on projects to manufacture rubber products that could be developed in Malaysia. The expert was entrusted in particular with the following tasks: reviewing the existing studies on world trade in rubber products, examining potential projects identified thus far, and identifying other potential opportunities for the manufacture of rubber products in Malaysia; working with a team of national staff to evaluate the prospects for new projects thus identified; preparing pre-feasibility or feasibility studies, where appropriate, on potential projects; advising on the best ways and means of promoting the implementation of these projects; and evaluating proposals for rubber-based projects submitted to FIDA by potential investors.

In carrying out his mission the expert was attached to the Industrial Studies division of FIDA, and was responsible for the rubber industry team set up under the project. The work programme included visits to a number of existing plants and discussions of the possibility of joint ventures with foreign investors. It was hoped that a solid foundation for the team's future work had been laid as a result of the mission.

I. PROJECT BACKGROUND

As a result of the Government's forward-looking policy, Malaysia has become the leading producer of natural rubber (NR), and in 1974 had increased its share of world production to 45%. The domestic consumption of NR for the existing rubber products industry amounted to 27.8 thousand tons compared to a total production of 1,549 thousand tons of NR in 1974. Past growth had been geared primarily to the local market and only marginally to the export market. Imports had increased from $M 33 million in 1970 to $M 86 million in 1974, which, compared with the total of $US 1,500 million for the major rubber goods exporting countries of the world, represents a very small fraction for Malaysia.

The remarkable work done by the Malaysian Rubber Research Development Board (MRRDB) and the Rubber Research Institute (RRI) over the past 50 years has resulted in good NR crop results and processing, and provided a better technological basis for domestic production.

The Malaysian market for various rubber products is supplied by approximately 100 firms in the country and by a limited number of imports. Since the local market is relatively small, new establishments must be wholely export-oriented.

In view of the foregoing, it is understandable that considerable interest has been expressed in increasing the output of finished products to 300,000 tons of NR a year. New studies have therefore been initiated and many comprehensive discussions have been held. Existing studies have been reviewed and the prospects for new projects evaluated. Feasibility studies could stimulate interest among potential investors by informing them about the advantages of manufacturing rubber products in Malaysia. There is no doubt that some of those investors will be sufficiently interested to participate in the establishment of new industries.

Many incentives are granted to new enterprises, and FIDA provides considerable assistance in setting up new industries.

II. PROJECT ACTIVITIES

The 14 studies carried out over the past two years were carefully considered, and many new ideas concerning manufacturing processes and marketing methods and possibilities were discussed by the rubber team. Those studies included the following: a survey of the rubber industry; an investigation of the Malaysian market for rubber automobile parts; a feasibility study of bicycle tires and tubes; a study of rubber protective foot-wear; a feasibility study of rubber gloves; a report on the manufacture of wiper blades; a report on the manufacture of floor tiles; a promotional project study of rubber fingercots; a report on the manufacture of car mats and mudflaps; a report on the manufacture of rubber moulded articles; and some other reports about retreading, recapping and reclaiming.

A. Visits to manufacturing concerns

The existing rubber products industry of Malaysia consists of about 100 manufacturing units, and only 10 of them can be described as relatively large ones. The majority of the small enterprises are backyard operations run by local owners, mostly with their families, in small towns or rural areas throughout the country.

Perusahaan Mita Rubber Products Sdn. Bhd.

The first visit by the team was to a small enterprise, Perusahaan Mita Rubber Products Sdn. Bhd. (see annex II for a list of the names and addresses of the establishments visited), which manufactures moulded products such as basing plugs, window and door stoppers, and other small household and industrial items such as rings and sealings. This visit showed that enterprises with few workers could manufacture products of considerable quality even with old and obsolete machinery. The management plans to start a new line of packings blended with asbestos.

Heveafil Sdn. Bhd.

The next establishment visited, Heveafil Sdn. Bhd., was a completely new modern plant owned by an Italian group with an Italian management. This company is producing rubber thread for the export market, and is the largest of its kind

in the region. Its present production capacity is 2,000 tons per year. Trial production started in April 1975 while commercial production will begin soon. Investment amounted to $M 10 million. Employment at full capacity would involve about 60 people.

The company still faces many problems, including high tariffs imposed by Asian and south-east Asian countries, such as India, the Philippines, the Republic of Korea and Thailand. The import duties range from 70% to 110%. The company would therefore like to work out special arrangements enabling it to overcome such barriers. However, it does not know which government department to contact for particular problems. It has been advised to approach FIDA for assistance as the local market is relatively small and the company's production is geared for export.

Eighty per cent of its raw materials consist of NR latex and the remaining 20% are chemicals, 90% of the latter being imported. Ammonia and zinc oxide are available locally, the price for the latter being the highest in the world. Currently, the price is $M 2,770 per ton, while the world price is around $M 1,400 per ton. Packaging materials are costly too. About 50% of such costs represents the difference between local and imported materials.

The management expressed it satisfaction with the labour force.

Goodyear Malaysia Bhd.

Goodyear Malaysia Bhd. started a new tire plant about two years ago and is manufacturing passenger car tires, truck tires, tubes, flaps, repair materials and retread rubber compounds. The company has a pioneer status, offering many advantages with regard to taxation, tariffs and depreciation, and employs 438 people. Its production capacity is about 1,600 tires a day. Its products are manufactured with modern machines where necessary, although carbon black is used in quantities which are having a pollution effect above the levels accepted in Western Europe. Manufacturing seems to be geared to local demand and not for export. Goodyear plants are also established in many neighbouring countries.

Kayel Retreads Sdn. Bhd.

Another group of rubber products was studied during visits to large re-treading enterprises, including Kayel Retreads Sdn. Bhd., near the main con-

sumption areas of Kuala Lumpur. The enterprises visited were family-owned, and each had several hundred workers, ranking among the leading manufacturers of rubber goods in the country. They were half modern and half backyard establishments, each with a daily production of 600 retreads and many other rubber products. It was therefore very difficult to make an overall survey during a short visit. However, there seemed to be some confusion in their manufacturing lines and workshop organization.

The earliest retreading companies are believed to have been set up in the 1920s. The retreading done today is about 70% for passenger car tires and 30% for light trucks and commercial vehicle tires.

There are about 6 to 8 big retreaders and over 100 small ones in peninsular Malaysia. The latter are mostly backyard operators who send retread tires to other companies for vulcanising.

Owing to road conditions, it would be advisable to improve the quality of retreads and to apply standards similar to those of other nations.

Pung Keong Rubber Manufactory (Malaya) Sdn. Bhd.

On a visit to one of the largest local rubber manufacturers, Pung Keong Rubber Manufactory (Malaya) Sdn. Bhd., in Klang, Selangor, it was found that the following products are manufactured: cross-ply motorcar tires (in very small quantities); motorcycle and bicycle tires in tubes for the local market and eventually for export to the Middle East, the Netherlands and the United Kingdom; rubber bands for export; canvas shoes and rubber boots for export to Denmark; air bags and moulded goods such as O-rings, bead wires for tires, and different types of hoses, including mining, water and oil hoses. The annual production of hoses is around 6,000 pieces of various lengths with six or eight plies, 95% of which is for the local market, the balance being exported.

It employs a total of 1,800 people.

Shum Yip Leong Rubber Works Sdn. Bhd.

In the same area, about 25 miles west of Kuala Lumpur, there is another large family-owned establishment, Shum Yip Leong Rubber Works Sdn. Bhd., manufacturing beltings, tires for motor-cycles, scooters and bicycles, canvas

foot-wear and boots, dock fenders, rubberized sheets and also mining hoses, brake hoses, railway vacuum brake hoses, submarine and air hoses, oil hoses and garden hoses. These products are sold mainly on the local market, and a small proportion of them are exported to Thailand. The factory has an engineering department. The annual raw material consumption of NR and synthetic rubber (SR) in this plant is about 1,000 tons and 20 tons respectively. Two hundred tons of carbon black and 80 tons of zinc oxide are also consumed annually.

This company is the only one producing dock fenders, a product which it would be prepared to export to neighbouring countries. It has difficulty getting duty-free raw materials such as tire cords for motorcycle and bicycle tires, chemicals and cotton hose duck, and also faces difficulties obtaining local supplies of cheaper textile materials for its canvas foot-wear.

Dunlop Malaysia Industries Bhd.

This company was established in 1962 with its parent company in the United Kingdom. The factory in Malaysia employs about 2,000 people and produces tubes and tires for passenger cars, trucks, aircraft, vehicles, tractors, various implements, motorcycles and scooters. Its average daily production capacity is about 1,600 tires. The Dunlop Corporation also has another plant which produces golf balls, adhesives and sealings and retreadings of aircraft tires. The bulk of production is for the Malaysian market, and only heavy-duty tires are exported.

Wilkinson Process Rubber Co.

This company has existed in Malaya since 1926. The company is now a corporation and was previously a family-owned enterprise, but the manager of the plant still belongs to the founder family. The company produces rubber sheets for industrial equipment linings designed to protect metal parts against corrosion and abrasion. The rubber linings are produced to order and rubber sheets under the brand name of Linatex are supplied through many distributing companies in various countries. The company also produces mining hoses. The imported reinforcement material, core-spun nylon, is preferred to rubberised canvas because of its superior tensile strength. Hoses are exported to Thailand and Singapore.

The company employs about 900 people and consumes about 300 tons of NR latex a month, which makes it one of the largest latex consumers in the country.

Some of the problems facing the company are the following: delays in obtaining import duty exemption for its raw materials; the failure to obtain an import permit for lorries from the Road Transport Department; difficulties connected with quarterly applications for import duty exemption; inefficient use of manpower.

Belting Malaysia Sdn. Bhd.

Other visits were made to a belting manufacturer, Belting Malaysia Sdn. Bhd., producing various kinds of conveyor belts and v-belts. This establishment is of very recent date, and still faces many problems relating to tariff protection, tax-free imports, synthetic rubber cords, chemicals, the protection of trade marks, dumping practices by Japanese competitors. Steps are to be taken to overcome these problems, and FIDA has already introduced certain measures to that end.

Terco (M) Sdn. Bhd

One of the largest retreaders in the country is Terco (M) Sdn. Bhd., which belongs to the Dunlop Group and makes retreads for passenger car tires, truck tires and also scooter tires. Their rubber consumption consists of approximately 70% NR and 30% SR. The company is retreading about 4,000 truck tires and 7,000 to 8,000 car tires per month. The management is very well informed and believes that even in rural areas where backyard retreaders are doing business the big operators cover about 75% of the trade. Truck tires are recapped two or three times a year, passenger car tires less, depending on where the tires are used, on bad country roads or only in downtown traffic.

This company is operating at full capacity. There is a shortage of casings but this shortage is also faced elsewhere, for instance in Singapore. Collecting casings in rural area is not as efficient as in urban areas.

In price terms, the retread tire of popular passenger cars costs about half the price of a new tire and one third the price of a new tire for less popular models. With regard to performance, a retread tire is about 75% as good as a new one. Good casings are bought from customers at $M 4 per piece,

while the price of poor casings is negligible. A truck tire of size 8.25 x 20 costs $M 137 ($M 60 for retreading and $M 70 for casings), while a similar new truck tire costs $M 262.

For the market as a whole, there are one and a half new tires for each retread.

There is a Tyre Retreaders' Association in Petaling Jaya near Kuala Lumpur.

Potential investors from abroad

Visits were also made with potential investors from abroad to other small manufacturers making retreads, recappings and latex products such as swimming caps and toy balloons.

B. Identification of new projects

The intentions of FIDA have been twofold: on the one hand, it has sought to identify small projects for Bumiputras (sons of the soil) who are able to manufacture rubber products and to finance them; on the other hand, it has aimed at setting up industries consuming a large amount of NR. Taking into account these two goals, some new smaller projects have been identified and a study of the feasibility of larger enterprises has been initiated.

Among the smaller enterprises there is a small plant with a daily production capacity of 1,100 lbs for cement dipped gloves. This plant should manufacture electrician's gloves and shoulder-length sleeves through a dipping process in solvent-based rubber cement. The principal raw material is NR and the solvent is another type of compound. The material consumed averages from 1,100 lbs of rubber and about 1,000 gallons of solvent per day. Each pair of gloves requires approximately 1 lb of rubber and the sleeve requires more. A study of this plant has been initiated.

A medium-sized plant for the manufacture of hoses of various sizes was identified. Reinforced hoses should be manufactured in sizes ranging in diameter from approximately 3/4 in. to 6 in. Hoses are made from both rigid and flexible materials, and in most diameters can be made in lengths up to about 100 meters. Hose is reinforced with yarn and wire using braided and spiral winding methods. Vulcanisation is carried out by both cloth wrapping and lead-sheathing techniques. A daily manufacturing capacity of 9,000 kilograms is planned.

Special attention has been given to the manufacture of hoses made of NR (see annex III), but this would make it necessary to import SR for the manufacture of many other rubber products. Since dependence on such imports is too expensive, it is encouraging to note that the prospects for making SR in the country are good, owing to the steady growth in Malaysia's crude oil production.

With regard to large enterprises, pre-feasibility and feasibility studies of reclaiming processes, bicycle tires, truck tires and beltings are in preparation. Before completing such studies, new marketing research has to be carried out, especially in foreign countries, including the major consumers such as the United States and Europe. An evaluation of prices has been made on the basis of the catalogues of large chain stores and department stores abroad. There is, however, a need for further marketing analysis by locally informed agents and representatives of FIDA. A detailed market research study would make it possible to provide investors and bankers with reliable feasibility studies based on data reflecting the present economic situation and indicating future trends.

After the MRRDB meeting, it was agreed to begin a feasibility study of the manufacture of passenger car tires and truck tires for export, based on the use of the country's natural rubber supply. The main emphasis has to be put on truck tires which make heavy use of NR compounds. A programme was therefore drawn up for the production of 1,200 truck tires a day in sizes of from 8.25 x 20 to 10.00 x 20 for export to the United States, and an additional production of 400 passenger car tires a day probably for marketing in Malaysia. Both radial and belted truck and passenger car tires should be manufactured. The pre-feasibility study based on available quotations for land, machinery and sales would show an investment of about $US 50 million with a capital return within five years. The layout for the plant should provide for the possibility of doubling the initial production capacity.

The know-how for the establishment of a radial tire plant should be provided by an existing leading rubber company from either Europe or the United States, and up-to-date marketing research would be necessary before finalising the feasibility study.

Such a truck tire plant, with its initial capacity of about 60 tons a day, would add 10,000 tons a year to the 1974 average annual consumption of 28,000 tons of NR. This would represent only a first step forward towards larger consumption of NR, but it should have widespread ramifications, such as the development of new items or the enlargement of existing lines.

C. Promotion and conclusion of contracts

Considerable emphasis has been placed on the promotion of latex or dipped items. Products based on NR latex and SMR would have a comparative export advantage. The local company is exempted from export duties and the cess (tax) on research and replanting, and no freight costs would be involved, a considerable saving since exported latex has a water content of about 40%. The local company therefore saves on the insurance and freight charges paid by overseas rubber purchasers. The following example illustrates the possible savings on exports of ripped smoke sheets (RSS).

Given an f.o.b. price of 60 cents/lb ($M 1 = 100 Malaysian cents) for RSS, the following sums (in cents/lb) would have to be deducted:

Export duty	2.4
Research cess	1.0
Replanting cess	4.5
Total	7.9

The total cost to the company would therefore be 60.0 - 7.9 = 52.1 cents/lb. Normal c.i.f. export prices are calculated as follows:

c.i.f. price = f.o.b. price + insurance and freight

Since insurance and freight costs to Japan, the United Kingdom and the United States are 3.9, 7.7 and 8.4 cents/lb, respectively, the following c.i.f. prices (in cents/lb) are obtained:

Japan	63.9
United Kingdom	67.7
United States	68.4

These figures therefore represent eventual savings of 11.8, 15.6 and 16.3 cents/lb, respectively, on exports to the above-mentioned countries.

The savings on latex concentrate are even greater because of greater savings in freight, insurance and port handling charges.

Some introductory letters have been written to dealers, manufacturers and organisations in the United States and Europe to promote interest in joint ventures and manufacturing in Malaysia. Some local investors have also been briefed on the possibility of setting up small rubber industries.

Two large bicycle tire manufacturers from Europe have shown interest in joint ventures for the manufacture of bicycle tires and tubes for export. Many discussions and exchanges of views have taken place on this subject. Studies and market analyses have been carried out concerning bicycle tire sizes and special tire finishes. In connexion with the manufacture of radial tires, some wholesalers and dealers have been contacted in Europe and the United States. Moreover, the promotional activities of the authorities, and especially of FIDA, have evoked a response among some of the rubber goods manufacturers in Europe, and they should also be approached.

Bandag of the United States is trying to market a Bandag retreading system in Malaysia, and proposals submitted to the Malaysian counterparts have been studied thoroughly. A franchise agreement and the technical aspects of the cold retreading method have also been considered. Contacts have also been established with a felt manufacturing company abroad for the manufacture of tennis balls in Malaysia.

A series of meetings were held and visits made to existing plants with Wilhelm Everts, an investor from the Federal Republic of Germany (see annex IV for the names and addresses of foreign investors with whom contacts were established) interested in toy balloon manufacture. The possibility of setting up a joint venture enterprise in Malaysia has been discussed. Some local manufacturers have expressed interest, and bankers have made known their willingness to finance a joint export venture. The German investor was able to guarantee the marketing of the entire Malaysian output in addition to his own substantial balloon production in Germany. A pilot plant for such production has been found and further discussions and exchanges of views are taking place in order to reach a final decision.

This company has an annual production of about 300 million toy and advertising balloons, and there could be a further initial demand for

50 million balloons in the Malaysian market, which means a consumption of approximately 300 tons of NR latex a year.

An Indian group, the Rubber Reclaiming Company of India Ltd, has expressed interest in technical co-operation, and is prepared to provide the know-how for a rubber reclaiming industry. Although reclaiming in Malaysia does not seem worthwhile at present owing to the availability of NR, the growing demand for reclaimed rubber in India could form the basis for mutually beneficial co-operation. It could also contribute to the fight against pollution through the recycling of waste.

A local investor has expressed interest in the manufacture of hard rubber items such as bins and other products, and has been advised on how to market those items both locally and abroad. In this connexion the Middle East seems to be an area of considerable promise as a potential export market.

Another investor from the Federal Republic of Germany, MAPA GmbH Gummi- und Plastikwerke, is interested in a joint venture for the manufacture of swimming caps in Malaysia in addition to his own operations in Germany. Many discussions have been held and proposals made in this connexion, and some fruitful contacts could be established. Here again the German manufacturer would be prepared to guarantee the export of the total output. However, a plant of this kind has already been established in Malaysia by another German group.

A large chemical concern of the Federal Republic of Germany, Bayer Leverkusen, is studying the feasibility of manufacturing rubber chemicals in Malaysia. A detailed study of Malaysia and other Asian markets has been made, and decisions can be expected in the near future.

The company in question believes that it would become feasible to manufacture chemicals in Malaysia as soon as the country's consumption of NR for industrial purposes reaches at least 100,000 tons a year.

Finally, meetings have been scheduled and exchanges of views concerning possible joint ventures are taking place with the Wirtschaftsverband der deutschen Kautschukindustrie and the National Tyre Dealers' Association, with two state-owned rubber industries in Czechoslavakia and Hungary, and with some other manufacturers in the Federal Republic of Germany. Moreover, in the course of a meeting of Austrian and Malaysian bankers at the Austrian Embassy, interest was expressed in co-operation to achieve common goals.

III. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. The existence of a sufficient number of small factories to meet local demand shows that low-cost skilled labour ($M 3 to $M 10 a day depending on the level of skill) is available locally for employment in new, larger and more efficiently organized industrial units.

2. Malaysia's rich natural resources and active government encouragement of developing industries greatly strengthen the prospects of success of the proposed ventures.

3. Despite a recession-induced slowdown in the annual growth rate of NR and SR consumption (5 per cent as compared with 6.8 per cent over the last 35 years), the outlook for further capacity increases and the establishment of new, competitive, export-oriented industries in Malaysia is highly promising, provided the appropriate decisions are taken.

4. Modern plants would require the special training of labour for new manufacturing lines, and the necessary know-how would have to be provided either through joint ventures or by recruiting qualified personnel (engineers and foremen).

5. The lack of knowledge of export markets must be overcome by training marketing staff and by providing market data and surveys on a continuing basis.

6. Outside assistance will be required in order to hold seminars for the training of marketing staff, to obtain the necessary knowledge of export markets by periods of study or work in those areas, and to train engineers and foremen at the plants. The duration of such training would be about six months for foremen and engineers, and seminars of two months for management and marketing personnel should suffice.

7. The initial manufacture of about 60 tons of radial tires per day would create additional employment for approximately 3,000 people.

Recommendations

1. In case of joint ventures with manufacturers of more industrially advanced countries, arrangements should be made for the provision of technology and the marketing abroad of the locally produced goods.

2. The organisation of existing enterprises should be carefully studied in order to reduce red tape wherever possible and promote their expansion.

Annex I

LOCAL STAFF

R. Karunakaran

Kon Fook Thian

Ong Swee Hwa

Duties: To participate in the work of the rubber team

Starting date of team work: 7 July 1975

Concluding date: 7 December 1975

Mr. R. Karunakaran received the one fellowship thus far awarded to local staff.

Annex II

ESTABLISHMENTS VISITED

Company names	Addresses
Perusahaan Mita Rubber Products Sdn. Bhd.	24, Jalan Theatre Overseas Union Garden Klang Road Kuala Lumpur Malaysia 21-09
Heveafil Sdn. Bhd.	Batang Kali Selangor
Goodyear Malaysia Bhd.	Batu Tiga Industrial Estate
Kayel Retreads Sdn. Bhd.	Lots 28 and 30 Phase III Shah Alam Selangor
Fung Keong Rubber Manufactory (Malaya) Sdn. Bhd.	1st Mile, Kapar Road Klang Selangor
Shum Yip Leong Rubber Works Sdn. Bhd.	P.O. Box 26 Klang Selangor
Dunlop Malaysian Industries Bhd.	4, Jalan Tandang P.O. Box 66 Petaling Jaya
Wilkinson Process Rubber Co. Ltd.	Batu Caves Selangor
Belting Malaysia Sdn. Bhd.	No. 50, Jalan Segambut Tengah Utara, Segambut Kuala Lumpur
Teroo (M) Sdn. Bhd.	4, Jalan 217 Petaling Jaya

Annex III

NATURAL RUBBER HOSE PRODUCTION

Hoses made of NR	Tube NR	Cover
Steam hose	1	Neoprene
High-pressure air hose	Neoprene	1 NR
High-pressure water hose	SBR	1 NR
Steam hose 200 psi	1	Neoprene
Steam hose 250 psi	1	Neoprene
Steam hose 150 psi	1	Neoprene
Steam hose 100 psi	1	SBR
Non-twist fire hose	1	Neoprene
Acid discharge hose	1	SBR
Acid suction hose	1	SBR
Dry material hard-wall hose	1	Weather resistant
Flour handling hose	1	Weather resistant
Ammonia bulk-loading hose	1	Neoprene
Ammonia transfer hose	1	Neoprene
Dust and fume conveying hose	1	1 NR
Paper mill washdown hose	1	SBR

Annex IV

FOREIGN COMPANIES INTERESTED IN JOINT VENTURES

Wilhelm Everts
4354, Datteln in Westfalen
Federal Republic of Germany

Rubber Reclaiming Company of India Limited
New Delhi
India

MAPA GmbH Gummi- und Plastikwerke
Goebenstr 3A
3000 Hannover
Federal Republic of Germany

Bayer Leverkusen
Köln
Federal Republic of Germany

Annex V

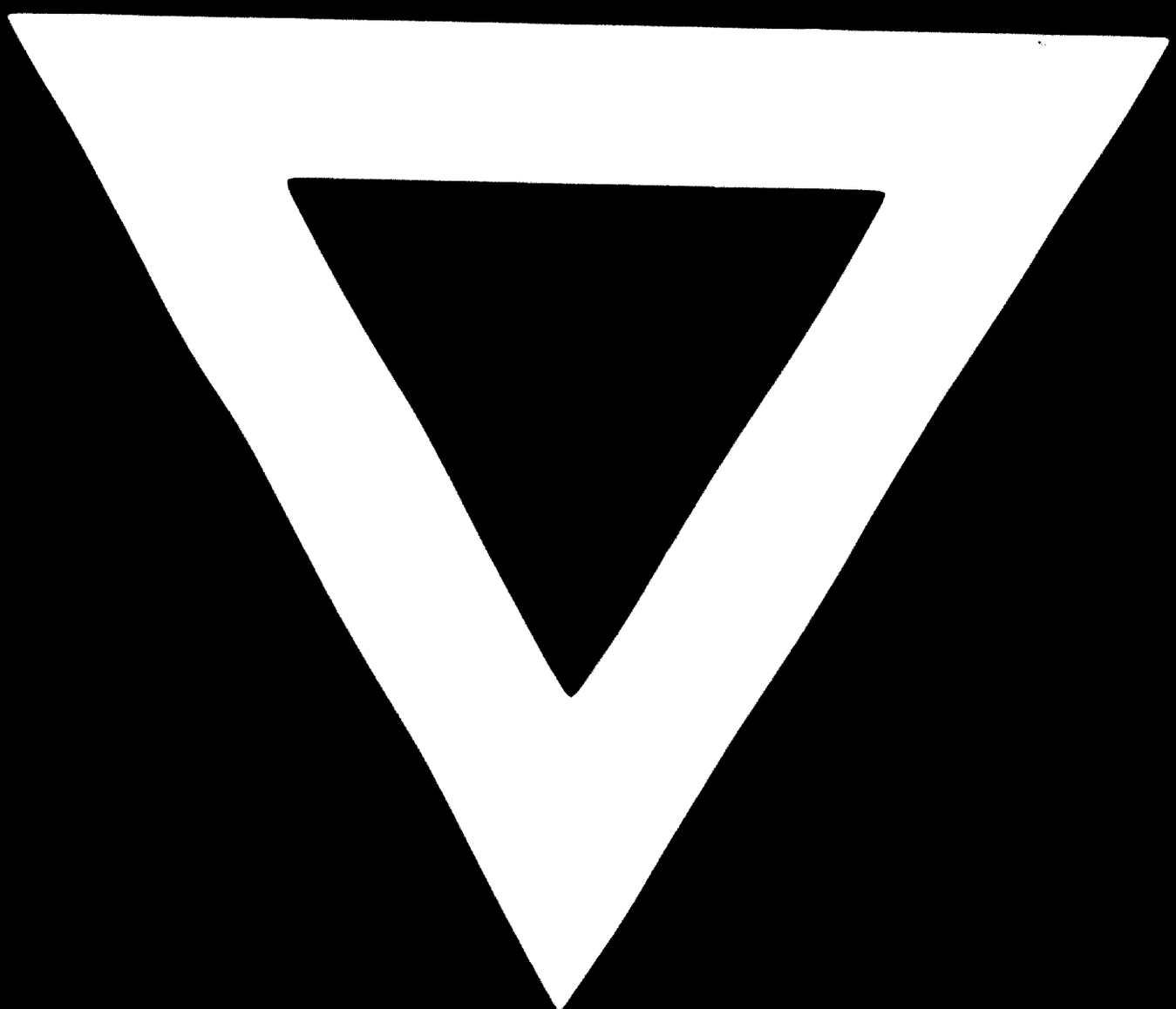
MALAYSIAN RUBBER PRODUCTS INDUSTRY

Products	Number of factories[a/]
Air bags	3
Automative spare parts	1
Bridge bearing pads	1
Balloons	1
Battery boxes	3
Beltings (conveyor, V-belts etc.)	3
Dock fenders	2
Footwear (canvas, boots, slippers etc.)	29
Finger cots	1
Golf balls	1
General moulded products	5
Industrial rollers	4
Industrial hoses	6
Inner tubes	10
Latex catheters	1
Latex foam products	9
Latex thread	2
Latex adhesives	10
Prophylatics	2
Printing rollers	1
Rubber bands	18
Rubber mats	6
Rubber gloves	3
Rubber lining	4
Rubber sheeting	3
Rubber toys	3
Radiator hoses	1
Retread compound (including latex compound)	25
Rice rollers	4
Soles and heels	13

a/ In a number of cases, the same factory manufactures a range of products.

Products	Number of factories
Swimming fins	1
Tires (for cars, buses, lorries, tractors, aircraft)	3
Tires (for bicycles, motorcycles, scooters)	5
Tire retreading: major retreaders	12
Minor retreaders and backyard operations	ca. 100

A-273



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