



TECHNOLOGY TRANSFER  
IN THE  
PALM OIL REFINING INDUSTRY  
OF MALAYSIA

by

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ABSTRACT

A series of interviews were conducted with corporate executives in twelve firms in the palm oil refining industry of Malaysia in July and August of 1981. The primary focus of the interviews was technology transfer.

The results of the survey showed that key sources of information for Malaysian-owned firms were machinery/equipment suppliers and other firms in the industry, and that skill transfer was primarily achieved by exposure to local experts. Respondents from companies with foreign ownership, however, pin-pointed their parent firm/joint-venture partner as their key source of information, and foreign experts as their primary sources of skill transfer. Ownership also separated the sample firms' spokesmen's view of problems in the industry, particularly labor and hiring difficulties. The foreign-affiliated respondents tended to view problems as being more severe than the wholly local.

All interviewees were united in their view of technology transfer as an on-going process of diffusion and in identifying human skill transfer as the most important aspect of this process in the palm oil refining industry today. The results also showed the impact of the Malaysian government's policies and regulations on the sample as a whole.

Thesis Supervisor: Professor Richard D. Robinson

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## Chapter I. Introduction

Purpose of this report.

The purpose of this thesis is to examine current conditions of technology transfer in the palm oil refining industry of Malaysia and to illustrate the general business environment in Malaysia by contrasting the experience of local versus foreign firms in this particular industry. Based on extensive library research and on a series of indepth interviews with corporate executives from twelve randomly selected firms in the Malaysian palm oil refining industry conducted in July and August of 1981, prevailing modes and sources of technology transfer are identified. And, recommendations concerning issues of technology transfer in the industry are proposed. The contrast between the experiences of local and foreign firms is then used to clarify aspects of the commercial environment in Malaysia, with particular reference to the entry of foreign firms.

Study design.

Type of approach.

An industry-specific approach to the general topic of technology transfer in Malaysia was considered to be potentially more effective than a varietal, geographic-specific study in that it would be possible to explore the history and conditions surrounding the chosen industry before beginning the interview process. This would enable the questionnaire or interview format to be particularized and to carry more authority by virtue of some degree of demonstrated knowledge of the issues, history and processes involved.

### Selection of industry.

Criteria for the selection of the industry to be studied included first, that the industry be a manufacturing or processing type industry which is relatively new to the country, which is capital intensive but in which most firms employ more than twenty-five people, and which is not too large or small in terms of number of firms/entrants. And second, that it be an industry in which there is some clear foreign participation, one which is linked to some product, good or commodity which makes significant contribution to the Malaysian economy, and preferably one which displays relative sophistication by the existence of trade or marketing associations. The reasons for these criteria are as follows: it was felt that innovation could be more easily pinpointed in a manufacturing or processing industry than in a service industry; that newness of the industry would tend to assure that some foreign-local technology transfer was still ongoing, as would clear evidence of foreign participation; and that capital intensity was assumed to act to cut down the number of firms engaged in the industry, making a representative sample easier to obtain, and to affect foreign-local technology transfer by guaranteeing the importation of machinery and equipment. Setting a minimum size in terms of numbers of employees was also assumed to act to diminish the number of firms engaged in the industry, as well as to impact on the transfer of management and technical skills. Linkage to an economically significant product, good or commodity was to serve as a "Malaysianization" factor, so that the survey could draw out peculiarly local effects. And, it was assumed that the existence of trade or marketing associations

would ease the information-gathering function and would imply the existence of intra-industry, intra-country technology transfer.

By process of elimination, the palm oil refining industry was chosen because it is a resource-based processing industry with a significant history of less than ten years in which paid up capital is estimated at M\$734 million for the forty-five plants in operation as of February, 1981.<sup>1</sup> Generally, these plants tend to employ no fewer than forty people. And twenty-five of the forty-five are joint ventures with foreign participation. Further, as of 1979, palm oil and its products became Malaysia's fourth largest foreign exchange earner after rubber, petroleum and timber.<sup>2</sup> And, finally, the existence of the following four organizations indicated a well-developed intra-industry infrastructure: the Palm Oil Refiners' Licensing Authority (PORLA), the Palm Oil Refiners' Association of Malaysia (PORAM), the Palm Oil Research Institute of Malaysia (PORIM), and the Malaysian Oil Palm Growers' Council (MOPGC).

The sample.

After elimination of licensees who had not yet begun production or who were not planning to do so in 1981, and who were located outside Peninsular Malaysia, a random number table was used to rank the remaining fifty-two population members in the order in which they should be polled. The first eighteen sample units so selected were then grouped by geographic area in order to minimize both cost and time. The first three units in the Kuala Lumpur area were set aside for

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<sup>1</sup>"Industry Notes." The Star. Kuala Lumpur, 20 February 1981, p. 7.

<sup>2</sup>"Introduction." PORIM Bulletin. No. 1, November 1980, p. 2.

pretest. And, as three refusals occurred during scheduling of appointments for the remaining fifteen sample units, two more units were added to the schedule in the order dictated by ranking. Two firms were later eliminated from this sample of fourteen because insufficient data was elicited in the interview process.

Of the twelve "successful" firm interviews, the number of persons interviewed per firm ranged from one to four, the median number of persons being two. The time spent interviewing each person varied from forty-five minutes to four hours. But the time per firm interview averaged approximately two hours per firm, which is quite close to the median time per firm. These time estimates do, however, reflect only the time spent on actual interviewing. They do not include the time spent touring refining facilities, of which three were visited.

#### Questionnaire design.

A selected list of information categories commonly addressed in technology transfer studies was compiled as follows:

- I. Personal background
  1. Position and tenure with the firm
  2. Educational background
  3. Employment history
  4. Experience abroad
  
- II. General information about the firm
  1. Dates of incorporation and production
  2. Ownership and changes in ownership
  3. Production capacity and changes
  4. Range of products and changes
  5. Markets--export vs. domestic
  
- III. Formal technology transfer agreements
  1. Types of agreements
  2. Duration
  3. Mode of payment
  4. Restrictive effects
  5. Problems with agreements

- IV. Technology transfer in general
  - 1. Opinions
  - 2. Sources
  
- V. Engineering design and adaptation
  - 1. Sources of design and adaptation
  - 2. How and why of adaptation
  - 3. Origin of machinery and equipment
  - 4. Factors in choice of machinery and equipment
  - 5. Availability of spare parts
  
- VI. Organizational structure and training and employment
  - 1. Size of workforce
  - 2. Use of expatriates
  - 3. Turnover in workforce
  - 4. Training programs and skill transfer
  - 5. Sophistication of organizational structure
  - 6. Country factors in skill availability
  
- VII. Research and development and quality-control
  - 1. Locale and ties with outside agencies
  - 2. Local staffing
  
- VIII. Marketing
  - 1. Methods
  - 2. Use of outside agencies
  
- IX. Roles of government and financial backers
  - 1. Gov't assistance--actual and desired
  - 2. Key agencies
  - 3. Aid from backers (aside from \$\$)
  - 4. Degree of contact with backers
  
- X. Sourcing for decisions, information and other aid
  - 1. With reference to company history
  - 2. With reference to key people
  - 3. With reference to own background
  - 4. With reference to travel
  - 5. With reference to association memberships
  - 6. With reference to journal subscriptions
  
- XI. Closing of questionnaire
  - 1. Opinions about technology transfer
  - 2. Key problems in the industry and their solutions
  - 3. General comments

Certain sensitive topics, such as financing and degree of Bumiputra (indigenous-Malay) participation, were not included in this listing in order to facilitate response in interviewing. A questionnaire based on this listing was then developed for use in pre-testing.

The questionnaire as adapted after the pre-test for use in the survey appears in Appendix A. The primary concern in developing and adapting the questionnaire was that each question be understandable. Although English is the common language of Malaysia for business and for government, British usage prevails and degree of language facility varies considerably from person to person. The questionnaire format was therefore designed as for a mail questionnaire, using a mixture of open-ended and alternative choice questions. These alternative choices could then be used by the interviewer to prompt the respondent's understanding of the questions. It should be noted that this questionnaire was used merely as a guide to the interviewer in information-gathering in a relatively unstructured environment, and that the overall questionnaire was critiqued by a local consulting firm.

The interviewing process.

The development of good rapport with the respondent was of primary concern in the interview process. Because respondents were drawn from an elite pool, because they were busy, high-ranking executives, undue repetition of questions which might produce frustration, alienation and boredom had to be avoided. It was therefore decided that if a previous question had already drawn response applicable to a later question, the later question should be eliminated or just touched on, and that reading of all alternative choices should be governed by the interviewer's discretion. On the longer "ranking" questions, the respondent was handed the questionnaire to read and check himself. And, on the shorter ones, the interviewer would read him the alternatives, asking which did he think most

useful or important, second most, third, etc.

Each interview was begun by introducing the interviewer, then by explaining what was meant by technology transfer for the purposes of this survey, that is, that technology transfer is "the flow of knowledge, of physical machinery, of industrial processes and of human skills from one country/one person to another." This was followed by an explanation of the importance of the survey. The fact that no questions would be asked about financial matters or trade secrets, and that complete confidentiality would be observed, were pointed out. This was followed by asking for the respondent's personal background--beginning with the most general, "could you begin by telling me something about your own history?", then probing with questions about tenure with the company, previous work experience, and educational background. This generally lead to questions about the company quite naturally.

#### Limitations.

The limitations of this thesis are three-fold. First, the use of an unstructured interviewing technique increases the potential for low reliability of results. And, this may be compounded by the comprehensive nature and subsequent length of the questionnaire/ interview times in this case. Second, the cross-cultural nature of the survey also raises the issue of reliability. And third, in virtually any sample-based survey, questions about the degree of generalization which may be accurately attempted occur.

Use of an unstructured interviewing technique involves a trade-off between reliability and rapport. With the unstructured approach, the respondent has greater freedom of response which can result in

very good qualitative data and in a deeper probing of issues which might not have been adequately dealt with in a structured questionnaire. The increased rapport between respondent and interviewer when this technique is used may also produce strong positive results in terms of increased accuracy as a result of increased commitment on the part of both participants. On the other hand, it is difficult to aggregate information gained via an unstructured approach without impacting on the reliability of results as unique responses must be interpreted by the interviewer or coder as being identical/similar/different along some scale.

In this particular survey, the comprehensive nature of the questions to be asked dictated that, in most cases, interviews had to be set up with more than one person per firm in order to avoid the problem of inaccessibility of information. When these multiple appointments were scheduled, two persons within each firm were each asked for thirty minutes of their time. However, since the average time spent interviewing per firm equalled approximately two hours, it may be inferred that, in fact, rapport between interviewer and respondent was well-developed. However, these lengthy interviews also indicate that a fatigue factor may influence the reliability of the results of this survey.

Also, since this was a cross-cultural survey, results are open to question due to the potential for unreliability in both the interpretation of the questions by the respondents, and in the interpretation of the respondent's answers by the survey administrator. However, given the good rapport evidenced above and the fact that the questionnaire was developed with the aid of a local consulting firm, too much

weight should not be ascribed to this factor in considering this particular survey.

Finally, in considering the issue of generalizability of survey results, the question of whether the sample is representative of the population must be examined. Since, at the time the survey was conducted the population of palm oil refineries numbered only fifty-two and the sample encompassed twelve firms, or twenty-three percent of the population, and since the firms included in the sample range from large to small in terms of size of operations and from long-established to newly-founded, we may assume that the sample is indeed representative of the population.

However, for purposes of this thesis, we must also consider whether the experience of foreign firms in a particular industry and country may be used to illustrate the conditions facing foreign firms in other industries in that country. Given that government regulations, such as those concerning ownership, and that socio-economic factors, such as size and education of the labor force, do apply across the broad range of industries, the experience of a segment of one particular industry may be generalized to include similar segments of other industries. However, factors such as information sources in technology transfer may not be so generalizable.

Organization of this report.

Historical and other background material about the palm oil refining industry of Malaysia are contained in Chapter II. Chapters III through VI report information gleaned from the survey. Specifically, Chapter III deals with such issues as entry patterns, production capacity, and changes in ownership as these relate to government

policy in part one. And, formal technology transfer agreements, self-reported co-operation with foreigners and opinions concerning sources of technology transfer are contained in part two of this chapter. Issues of technology transfer in plant design and adaptation, and in the selection and modification of machinery and equipment, are incorporated in Chapter IV, as are approaches to problem solving. Chapter V consists of employment and training issues in the transfer of human skills, and differences in the way expatriate and local managers view these issues. Chapter VI deals with questions of, and recommendations for, government assistance. And Chapter VII concludes this report with a broad sketch of the general business environment in Malaysia as typified by the results of the survey.

Chapter II. The Palm Oil Refining Industry of Malaysia:  
Background Information

The Malaysian palm oil industry.

The oil palm was first introduced into Malaysia from Africa in 1870 as an ornamental plant. It was, however, not until 1917 that the first commercial planting of the palm in Malaysia was seriously undertaken in Tennamaran near Batang Berjuntai, Selangor. By this time the rubber industry had already been firmly established in Malaysia, which acted to slow the development of palm oil as a major industry. However, the high price of palm oil coupled with the declining price of natural rubber in the early 1960's provided impetus for an accelerated program of oil palm planting.<sup>3</sup>

The total oil palm acreage rose from 54,656 hectares in 1960 to 792,670 hectares in 1977, showing an increase of nearly fourteenfold. For 1978, 1979 and 1980, it is estimated that the total planted acreage is 852,097 hectares, 924,038 hectares, and 1,042,708 hectares, respectively.<sup>4</sup> In the estate sector, the increase in cultivated acreage was partly due to the conversion of large areas from rubber to oil palm. In the smallholder sector, acreage under oil palm rose from about 83,700 hectares in 1970 to 461,060 hectares in 1980 due to extensive replanting and new planting programs by government agencies such as the Federal Land Development Authority (FELDA) and the Rubber Industry Smallholders Development Authority (RISDA).<sup>5</sup>

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<sup>3</sup>"Malaysian Palm Oil Refining Industry," PORAM, 1981, p. 1, and "Palm Oil Statistical Handbook, 1980," PORLA, 1980, p. 3.

<sup>4</sup>Ibid. (PORAM), p. 1.

<sup>5</sup>Economic Planning Unit. Fourth Malaysia Plan, 1981-1985, 1981, p. 13.

A more detailed breakdown may be seen in the table below:

Table I. Oil Palm Acreage: Ownership

Private estates	581,648 hectares	56%
Government Schemes		
FELDA	306,593	29
FELCRA	20,311	2
RISDA	24,141	2
State Schemes	63,098	6
Smallholdings	<u>46,917</u>	<u>5</u>
	1,042,708	100

from Palm Oil Update,  
January, 1981.

Palm oil production showed a corresponding increase, rising from 92,150 long tons in 1960 to around 2.56 million long tons in 1980.<sup>6</sup> Projected crude palm oil (CPO) production in 1981 is estimated at 2.7 million long tons, and is expected to increase to 4.0 million by 1985/86 with Malaysia's continuing expansion in oil palm acreage. By 1990, production is projected to increase to 5.0 million long tons.<sup>7</sup> The following tables graphically illustrate these increases in both acreage and production over the last 20 years:

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<sup>6</sup>"Palm Oil Update," PORLA, January 1981, p. 5.

<sup>7</sup>"PORIM Bulletin," p. iv.

Table II. Malaysian Oil Palm Area (Hectares)

Year	Peninsular Malaysia	East Malaysia (Sabah & Sarawak)	Total
1960	54,634	n.a.	--
1961	57,143	n.a.	--
1962	62,079	n.a.	--
1963	71,030	n.a.	--
1964	83,200	n.a.	--
1965	96,947	n.a.	--
1966	122,703	n.a.	--
1967	153,610	n.a.	--
1968	190,765	n.a.	--
1969	231,176	n.a.	--
1970	261,199	30,064	291,263
1971	294,149	34,672	328,821
1972	348,741	41,010	389,751
1973	412,070	47,124	459,194
1974	500,244	57,602	557,846
1975	568,770	64,569	63,339
1976	637,617	75,392	713,009
1977	712,002	80,668	792,670
1978(e)	763,714	88,383	852,097
1979(e)	819,945	104,093	924,038
1980(e)	924,029	118,679	1,042,708

Note:

n.a. -- not available

(e) -- estimates

Table III. Malaysian Palm Oil Production (Tonnes)

Year	Peninsular Malaysia	East Malaysia (Sabah & Sarawak)	Total
1960	91,793	--	91,793
1961	94,846	--	94,846
1962	108,171	--	108,171
1963	125,634	57	125,691
1964	122,034	879	122,913
1965	148,682	1,729	150,411
1966	186,337	3,350	189,687
1967	216,827	8,931	225,758
1968	264,871	18,113	282,984
1969	326,062	26,034	352,096
1970	402,307	28,762	431,069
1971	550,846	38,244	589,090
1972	657,003	71,955	728,958
1973	739,296	73,318	812,614
1974	942,330	103,645	1,045,975
1975	1,136,796	120,777	1,257,573
1976	1,260,608	131,357	1,391,965
1977	1,483,591	129,156	1,612,747
1978	1,640,311	144,614	1,785,525
1979	2,032,025	156,674	2,188,699
1980 (e)	2,400,000	200,000	2,600,000

Note:

(e) -- estimate

from "Malaysia Palm Oil  
Refining Industry," p. 13

In terms of overall world production, Malaysia's share equalled 62% in 1980, making her the world's largest producer and exporter of palm oil and palm oil products. Measured internally, exports of palm oil rose substantially by 38% per annum during 1971-75 and by 14.3% per year during 1976-80, increasing palm oil's share of Malaysia's agricultural exports from 9.8% in 1970 to 25.3% in 1980. Although the price of palm oil fluctuated during the period, the expansion in exports resulting from increases in both volume and price made it an important source of foreign exchange earnings.<sup>8</sup> For example, although per unit export value during the period January to September, 1980, declined relative to the same period in 1979, export earnings totalled M\$1,870.5 million--a 14.9% increase over the same period in 1979.<sup>9</sup> The following tables show the pattern of palm oil exports from Malaysia from 1970 through 1980 in terms of volume, unit value and value, as well as projections for 1985:

Table IV. Palm Oil Exports: Value

	1970	1975	1980	1985 <sup>e</sup>
Volume ('000 tonnes)	402	1,161	2,260	3,573
Unit value (\$/tonne)	657	1,137	1,140	1,326
Value (\$ million)	264	1,320	2,576	4,738

Table V. Growth in Exports

	<u>Average annual growth rate (%)</u>		
	1971-75	1976-80	1981-85 <sup>e</sup>
Volume ('000 tonnes)	23.6	14.2	9.6
Unit value (\$/tonne)	11.6	0.1	3.1
Value (\$ million)	38.0	14.3	13.0

from the Fourth Malaysia Plan,  
1981 - 1985.

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<sup>8</sup>Fourth Malaysia Plan, p. 277.

<sup>9</sup>"Palm Oil Update," p. 5.

The refining industry.

The agricultural diversification policies of the Malaysian government in the sixties aimed at reducing the country's overdependence on rubber led not only to rapid growth in oil palm production in the seventies, but also to the establishment and development of the palm oil refining industry. Prior to 1970 only two refining operations were in place. By 1979, the Malaysian Industrial Development Authority (MIDA) had approved licenses for 58 such establishments (with a combined rated capacity of 2.8 million tonnes of CPO per annum) and 33 of these refining plants (capable of processing 1.75 million tonnes of CPO per annum) were already in operation.<sup>10</sup> By the end of 1979, the total number of plants in operation was 41. And, four more facilities were added in 1980, bringing the total to 45--with processing capacities of 2.88 million tonnes of crude palm oil per year.<sup>11</sup> It should be noted, however, that these plants have typically not operated up to full capacity. In January, 1981, it was estimated that average capacity utilization was approximately 85%.<sup>12</sup> Total CPO uptake by local refineries in Peninsular Malaysia in 1980 was estimated at about 2.38 million tonnes, or 92.9% of total Malaysian CPO production.<sup>13</sup> This represents an increase of 5.9% over the 87% uptake of local CPO in 1979, a considerable slow down in percent increases from the nearly 20% increase in 1978 (67% to 87%) and 10% increase in 1977 (57% uptake to 67% uptake).<sup>14</sup>

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<sup>10</sup>"Usahaluan," MIDF, Vol. 1, No. 2, 1979, pp. 1-2.

<sup>11</sup>"Malaysian Palm Oil Refining Industry," p. 3.

<sup>12</sup>"PORIM bulletin," p. vii.

<sup>13</sup>Ibid., p. ix.

<sup>14</sup>Ibid., p. x.

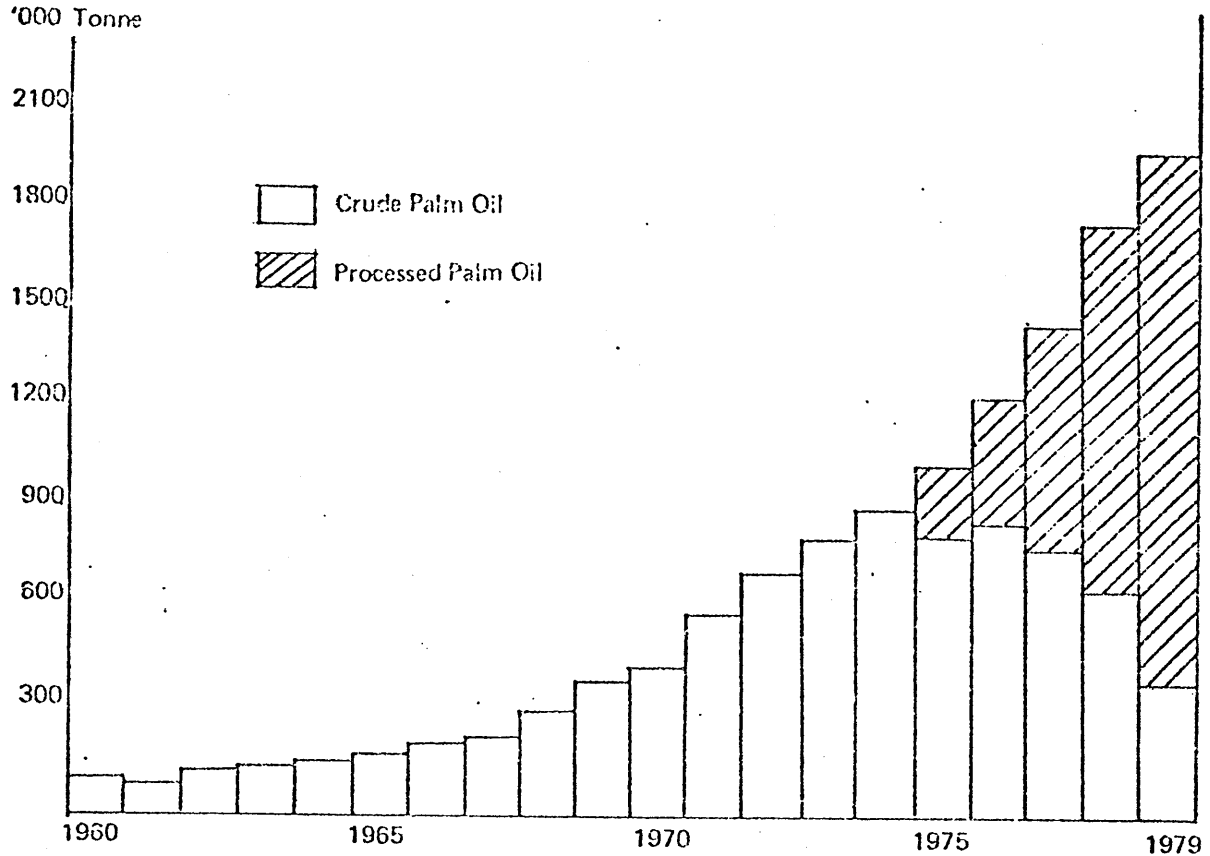
And, as both crude palm oil and processed palm oil are essentially export commodities, the export data in the following tables also illustrate the changing nature of the Malaysian industry:

Table VI. Annual Export of Crude and Processed Palm Oil  
From Peninsular Malaysia from 1960 to 1980  
(Tonnes)

Year	Crude Palm Oil	Processed Palm Oil	Total
1960	97,568	--	97,568
1961	94,928	--	94,928
1962	107,386	--	107,386
1963	116,736	--	116,736
1964	125,247	--	125,247
1965	141,477	--	141,477
1966	181,282	--	181,282
1967	180,020	--	188,916
1968	267,923	--	285,965
1969	330,809	--	356,743
1970	373,280	--	401,930
1971	535,260	--	573,356
1972	625,306	--	696,983
1973	724,772	--	797,808
1974	813,044	--	901,043
1975	829,192	203,232	1,032,424
1976	749,088	457,951	1,207,039
1977	577,538	726,046	1,303,584
1978	429,670	935,519	1,365,189
1979	203,045	1,543,179	1,746,224
1980 <sup>e</sup>	156,978	2,086,246	2,243,224

from the "Palm Oil Statistical Handbook, 1980," p. 13.

### Malaysia: Exports Of Crude And Processed Palm Oil



The refining process converts CPO into refined palm oil through the intermediate stages of neutralizing, bleaching and deodorisation. If an alkali-neutralisation process is used, soapstock and acid oil are produced as well as refined, bleached, deodorized (RBD) palm oil, palm olein and palm stearin. If a physical refining process is used, fatty acid distillates replace soapstock and acid oil as secondary by-products. And, either crude palm oil or the refined product may be fractionated to produce palm olein and palm stearin. These refined products and by-products may then be used to produce a wide variety of industrial and retail goods, including margarines, shortenings, ice cream, coffee creamer, cosmetics, emulsifiers, soaps, resins, crayons, candles and paints.

Due to this flexibility and to the efficiency and cheapness of

palm oil and palm oil products, prospects in the world market of oils and fats for these products are promising. The World Bank projects that palm oil's share of the world market of oils and fats will increase from its present fourteen percent to twenty-eight percent by 1990.<sup>15</sup> This growth will reflect changing patterns of consumption in Central and South America, Africa and Asia, as the traditional markets of Western Europe and North America are not expected to change much in the next ten years. Therefore, the Malaysian government, PORIM and PORAM are all turning their attention toward developing these newer markets as trading partners.

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<sup>15</sup>"Palm Oil Update," April 1981, p. 2.

### Chapter III. Industry Development/Technology Transfer

General information and government policy.

With the introduction of the New Economic Policy in 1971, the Malaysian government shifted its industrial focus in economic development from import substitution to resource-based export promotion. The rapid growth of the palm oil refining industry in the 1970's is generally attributed to this change. Of the twelve firms surveyed in this study, all but one were incorporated or licensed during this time. And, when respondents were asked why their firms had entered the industry when they did, most replied that entry had primarily represented a sought after expansion opportunity, and that government incentives had been the second most important reason for entry, closely followed by availability of capital for investment and increased demand for refined palm oil products in the export market.

This flooding of entrants into the palm oil refining industry in the 1970's also produced an industry-wide situation today in which over-capacity in production facilities has become the norm. In the firms surveyed, production capacity ranged from 100 to 900 MT/day uptake of crude palm oil, but actual production as a percent of total firm capacity averaged a little less than ninety percent.

Generally speaking, Malaysia welcomes foreign investment, but government policy does impact on ownership in that the stated goal of the NEP is thirty percent Bumiputra, forty percent other Malaysian and thirty percent foreign ownership in the corporate sector by 1990. While the government has assured investors that this is an overall target and will not necessarily be applied on an individual company basis, joint-ventures are encouraged to include as much local equity

as possible, particularly Bumiputra participation. Companies may be permitted to start with higher foreign equity if it is understood that they will reduce their holdings within a prescribed time. For example, of the twelve firms surveyed in the palm oil refining industry, three are now foreign-controlled joint ventures with established time frames in which majority equity control will be shifted to their Malaysian partners; four are locally-controlled joint ventures of which two are companies in which such a shift has already taken place; and five describe themselves as local ventures without foreign involvement (although one of these is a publicly held company in which the main shareholder is a foreign vegetable oil processor.)

Technology transfer agreements and perceptions of technology transfer.

As of August, 1981, five of the twelve firms surveyed were bound by some form or forms of formal technology transfer agreements other than the usual short-term plant commissioning agreements common at start-up. Each of these cases involved a joint-venture agreement in which payments were on-going in the form of running royalties as a percent of profits. None of the contracts included revision clauses--which is typical of technology transfer agreements in Malaysia at the present time. But duration of each contract was limited to five years, at which time the agreement may be re-negotiated or dropped, so that potential ill effects from too rigid an agreement were minimized by the short time span of the agreement. Aside from these joint venture agreements, there were also a number of ancilliary contracts which include technical assistance agreements (for all five firms) for which terms were similar to those cited above; management agreements (for four firms) for which terms were similar to those cited above, with one exception in which payment

was in the form of a lump sum; and marketing agreements (for three firms) in which output was tied to a sole distribution agent in all cases. This relative lack of restrictive clauses is important in that conditions which inhibit the receiving partner from purchasing know-how from sources other than his contract partner, or which force him to buy his raw materials from the contract partner, or which dictate the selling prices of his products, for example, all tend to reduce the competitiveness of the receiving partner--leading to inefficiency with its bad effects in terms of growth, employment and profitability.<sup>16</sup>

In the survey, the companies were asked whether they co-operate with foreigners through utilization of licenses, employment of foreign personnel, common research, technical co-operation agreements, or training of personnel overseas. Among these alternatives, technical co-operation agreements was most frequently cited, followed by training of personnel overseas and employment of foreign personnel by the eight firms who felt that they co-operated technologically with foreigners in any way. Not surprisingly, these eight firms included all the joint-venture enterprises, and the rankings were dominated by those firms having some degree of foreign ownership. Utilization of licenses and common research lagged far behind the others, each being cited only once.

On the other hand, when asked how spread of know-how to their firm could best be effected, mutual exchange of knowledge within the

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<sup>16</sup>Lutz Hoffman and Tan Siew Ee. Industrial Growth, Employment and Foreign Investment in Peninsular Malaysia. Kuala Lumpur: Oxford University Press, 1980, p. 119.

industry was the strong first choice of the predominantly local firms. This may be contrasted with the responses of the five youngest firms in the survey, of which three suggested that mutual exchange was impossible as the industry is too competitive. However, the firms were all united in the opinion that know-how could not be spread by training through government agencies and that organization of common research was not a practical alternative.

Finally, each firm was given a list of seventeen potential sources of technical information. Respondents were then asked to select those sources which were, in fact, useful to their company, and then to rank these in order of importance. The aggregated results are as follows:

- 1 machinery/equipment suppliers
- 2 education and training of personnel
- 3 research institutes
- 4a customers
- 4b parent firm/joint-venture partner
- 4c firms in the same industry
- 5 business and industrial associations
- 6 employment of foreign experts
- 7 trade journals
- 8 trade fairs/trade missions
- 9 machinery/equipment directories
- 10 publications other than trade journals
- 11 private consultants
- 12 licensing agreements
- unranked universities
- " government departments
- " firms in different industries

The first, second and third choices each received strong support from a broad range of firms, as did one of the three sources which tied for the fourth position--"customers." However, advocates of "parent firm/joint-venture partner" versus "firms in the same industry" can be segmented into firms with foreign partners versus local firms, respectively. This suggests that other firms in the industry may

serve local firms in much the same way that partners serve foreign affiliates, at least in terms of exchange of information. And, a similar breakdown and analysis of backing for "business and industrial associations" (position five) with local support and "employment of foreign experts" (position six) with foreign support may be made. That is, industrial and business associations may fill a similar function for local firms as expatriate personnel fill in foreign-affiliate firms, at least in terms of information sourcing. Only four firms selected more than six sources from the list. However, it should be noted that not one firm selected "universities" or "government departments" as a useful source of technical information.

## Chapter IV. Adaptation and Problem Solving Behavior

Design and adaptation.

The palm oil refining industry in Malaysia is based on the importation of physical technology from abroad, primarily from Europe, but also from the United States and Japan. A key issue is then how this hardware is adapted to suit local conditions, and by whom.

In the sample survey, plant design was found to be the responsibility of the individual firm's own Malaysian personnel in seven cases, although in four of these instances responsibility was shared by the machinery/equipment supplier, whose exposure to plant design abroad may be assumed. In any case, Malaysian personnel involved in plant design attribute their own expertise to previous work experience in palm oil refineries in Malaysia and, again, to consultations with machinery/equipment suppliers. In the case of the five firms with foreign affiliation, plant design was generated by foreign personnel with the aid of either the partner company (four cases) or a machinery/equipment supplier (one case.)

Adaptation of the original plant design occurred in nine out of the twelve sample firms, primarily as part of an effort to increase production capacity, although some modifications were made to suit changes in the firm's product lines, and two firms--one local, one foreign--cited their desire to improve the quality of the product. The responsibility for adapting the refineries' design follows the same pattern as original design. In those foreign-affiliated firms that adapted their plants, foreign personnel were used for this process. In local firms that adapted, Malaysian personnel and Malaysian personnel in conjunction with machinery/equipment suppliers were employed.

Finally, previous work experience was cited by plant designers/adapters as the single most important source of information which affected their decision-making, followed by meeting with machinery/equipment suppliers, visits to other refining operations and help from the parent company/joint-venture partner.

Again, in the selection and adaptation of machinery/equipment, Malaysian personnel and suppliers worked together to select and adapt machinery and equipment for local ventures. Foreign personnel tended to consult with their parent firms.

The overall pattern in information sourcing as of 1981, then, is clear. Ownership dictates not only who bears the responsibility for plant design and adaptation, and machinery/equipment selection and adaptation, but also where guidance and information is sought. It is of course quite logical that expatriate personnel temporarily in place in a Malaysian refinery seek information in the most familiar place, particularly when large amounts of money, and correspondingly great risk, are involved. And, given that the machinery/equipment supplier may well have a broader-based experience with the physical technology in question than the Malaysian employee(s) who are seeking information, it is also logical that the supplier add the role of consultant to those of salesman and service engineer. However, it should be recognized that this places him in a powerful position in terms of technology transfer. In fact, he is assuming a role quite similar to that of the gatekeeper.

It should also be noted that responses to questions about factors in choice of machinery and about reasons and means of adapting machinery closely paralleled the results of the Hoffman-Tan industrial survey of Malaysia conducted in 1974. That is, that product quality was cited

as the single most important factor of choice, followed by volume of production, price of equipment and operating costs. And, adaptation has occurred primarily to increase productive capacity, but also to decrease production costs and to improve product quality, in that order. The most popular means of adaptation of equipment was increasing the speed of the equipment to obtain more output per unit of time, followed by changing the man-machine ratio from that usual in highly industrialized countries. In 1974, Hoffman and Tan found that this ratio was moving upward so that more labor per unit of capital was employed, which was appropriate to the levels of unemployment at that time. However, at the time this study was conducted in 1981, there was a shortage of available labor such that the man-machine ratio was declining.

#### Approaches to problem solving.

Each firm was asked to list two major problems or decisions which had occurred since the start-up of production, then to trace the decision-making process by which the situation was resolved. Of the fourteen problems listed by the local firms in the sample, all were decided by internal management. In six cases, machinery/equipment suppliers were consulted, in three cases bankers and brokers were consulted, and in one case the Palm Oil Research Institute of Malaysia (PORIM) was consulted. Of the ten problems outlined by foreign-affiliated firms, four were decided by the foreign partner. In three cases the foreign partners were consulted, and in one case each brokers, bankers, PORIM and work contacts from outside the palm oil industry were consulted.

The differences between these two groups is particularly remarkable since the problems described by each were substantially the same,

having to do with increasing productive capacity in eleven cases, changing the product line in eight cases, and obtaining new financing in five cases. And, once again, the local firms used machinery/equipment suppliers as primary sources of information while those firms with foreign affiliation used their foreign partners.

Managers were also asked how many people they knew in top management positions in other palm oil refineries, and how often they discussed business with these people. Based on a choice of "all," "most," "some" or "none," local firms' managers claimed acquaintance with "all" in five out of seven cases and "most" in the remaining two cases. And, these same managers unanimously declared that they discussed business with top management of other companies in the industry often. Managers of firms with foreign affiliation, on the other hand, estimated that they knew "all" of the people in top management in other firms in only one case, knew "most" of them in three out of five cases, and were acquainted with "some" in one instance. And, these managers replied that they discussed business "often" only in one case and "sometimes" in four out of the five cases.

These results produce a picture of the industry strongly networked among the local firms, less so among the foreign, as of the summer of 1981. However, foreign firms ranked the importance of contacts within the industry as more important on a five-point scale than did the local firms. The reasons behind this ranking phenomenon are not clear. It could be that the foreign firms value contact with other firms more highly than do local firms simply because such contact is less frequent. Or, it is possible that foreign firms feel that they are in a position to gain more from such communication. Or, it could

be some kind of "outside looking in" phenomenon, providing that the foreign firms are aware of the differences in depth and frequency of such communications between themselves and local firms. There is no clear cut answer at this time.

## Chapter V. Employment and Training Issues

The Malaysian Government requires that Malaysians eventually be trained and employed at all levels. However, expatriate officers are permitted in areas where there is a shortage of qualified Malaysians. The principal elements guiding the government in its consideration of expatriate posts are as follows:

- (a) Key posts (i. e., posts which can be held indefinitely by foreigners to safeguard their interest) can be considered for companies where foreign capital participation is approximately M\$500,000 (US\$220,000). This figure, however is a guideline only, and the number of key posts is negotiable depending upon the merits of each case.
- (b) For executive posts which require professional qualification and practical experience, expatriates may be employed up to a maximum period of 10 years subject to the condition that Malaysians are trained to take over the posts eventually.
- (c) For non-executive posts which require technical skills and experience, expatriates may be employed up to a maximum period of 5 years subject to the condition also that Malaysians are trained to eventually take over the posts.
- (d) Every effort must be made to train more ethnic Malays (Bumi-putra) such that the employment pattern at all levels of the organization will eventually reflect the multi-racial composition of the country.
- (e) For industries designated by the government as priority industries, i. e., normally those which are labor-intensive and those manufacturing industries which are wholly export-oriented, the conditions in (a), (b) and (c) above may be relaxed depending on the merits of each case.<sup>17</sup>

### Employment issues.

Employment figures in the sample ranged from nine hundred to fifty-five full-time employees per firm, mirroring the sample's size range in production capacity. The median number of employees per firm was approximately one hundred. Five of the twelve sample firms employed expatriate personnel, all of whom were "on loan" from their

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<sup>17</sup> "Labour and Employment," MIDA, 1977.

various firms' foreign partners. The number of expatriates in each of these firms and the functions they perform were as follows:

	Firm 1	Firm 2	Firm 3	Firm 4	Firm 5
General Administration	1	1	2	1	4
Engineering	2	1	1	1	2
Chemistry	1	1	0	0	1
Marketing	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>2</u>
Total	4	4	3	2*	9

\*plus 1 or 2 "floating advisors" on occasion

Thus the total number of expatriate employees in the sample was approximately twenty-two. And, these twenty-two were primarily administrators and engineers. Of the nine general administrators, only one had had previous experience in palm oil refining, three, in vegetable oils, not including palm oil; and five had had no previous experience in palm oil refining or in fats and oils generally. But, all of the technical specialists had worked in either oil engineering or in oil chemistry. And, all of the marketing experts had experience in commodities trading.

Six of the twenty-two expatriates were included in the interview schedule. All stated that they were in Malaysia for two reasons. First, each was there to provide general guidance to the start-up of the operation and to train local personnel in functional techniques and skills which were lacking in the Malaysian labor force. And second, each was there as a link to the joint-venture partner, acting as a two-way conduit of information for the company. It may be assumed that this second purpose has the greater long-term importance in that, despite the training function, in no case did management foresee a complete withdrawal of expatriate personnel from the Malaysian operation.

On the other hand, local firm managers were unanimous in their opinion that foreign expertise was not necessary to the day-to-day operations of the company, although most were willing to accede to the opinion of one expatriate manager that foreign personnel may be necessary to the start-up of new firms in the industry in order to provide continuity, because the turnover rate among both trained and untrained personnel was so high. More specifically, interviewees in all but one firm agreed that a high rate of turnover among general workers was a problem. Managers in four companies stated that high turnover at supervisory levels was also a problem, and one of greater significance than the turnover of general workers. And, respondents in only one of the sample firms said that turnover among management staff was a problem. (However, it should be noted that one of the three "refusals" in the scheduling of interviews was due to a firm's having lost its general manager, chief engineer and factory manager within a single two-week period.) In short, spokesmen for all but one firm stipulated that rapid turnover of workers was a problem to their respective companies. And, this one firm was one of the largest and oldest companies in the palm oil refining industry in Malaysia. It was the only firm in the sample which relied almost exclusively on word-of-mouth for recruitment of personnel, the others using predominantly newspaper advertisements for recruitment, followed by word-of-mouth. And, this particular company was referred to by managers of other firms as the best known company in the Malaysian palm oil refining industry. With this one exception, then, managers characterized labor shortage as a pre-eminent problem.

However, views of the depth and degree of the problem varied somewhat by whether the firm was local or foreign. Spokesmen for six local firms pointed out that shortage of skilled labor, in particular, was

simply a fact of life in Malaysia, and that they expected turnover to be quite high. In short, it was a problem that could be dealt with. Managers in foreign firms, on the other hand, felt that the situation was more serious, pointing out that after investing time and money to train workers, these people often left to join local firms. The reasons behind this trend were not terribly clear, as the salary and wage increments that accompanied these changes of employment were quite small compared with the loss of the seniority upon which choice of shifts was usually based.

Interviewees in foreign firms also cited difficulty in meeting New Economic Policy guidelines for proportionate hiring as a factor in their labor shortage problems. Educated and skilled Bumiputra were scarce and therefore available only at a premium from the labor pool. And, as a group, they were characterized by some foreign managers as displaying little firm loyalty--perhaps as a result of their short tenure in the industrial labor force.

One Japanese manager contrasted the situation in Malaysia with that in Japan thus,

In Japan communication is from the bottom up. We customarily begin working for a particular firm, and stay with them. And as we stay, we develop strong relationships with our co-workers, especially with our peers and immediate superiors. We see these people often outside the workplace. We eat with them and drink with them. Here, this is not possible. Traditionally communication in Malaysia is from the top down. And, because people at lower levels have never before been asked for their inputs, they are reluctant to participate in this way. Here, too, because workers come from three different racial and religious groups, they do not form strong relationships with one another. They do not see one another outside the job. They find it hard to socialize together, even if they wanted to, because their different religions dictate different eating and drinking habits. They even live in different parts of the city. And, the whole history of the country reinforces these differences between groups.

This expatriate manager, and others, all explained that they did not

know how to combat this divisiveness, whereas local managers tended to accept this as a normal way of life about which nothing need be done.

However, in terms of introducing innovative techniques for dealing with management-level employees, local firms take the lead in offering "sweetners" such as incentive plans, opportunities for equity participation, and low interest rate mortgages for managers' homes. One or more of these schemes was offered by three out of the seven local firms in the sample, while the foreign-affiliates offered no competing plans for their professional employees. However, one foreign firm was preparing to institute job rotation among its factory workers in an effort at job enrichment and at increased worker involvement.

Training issues and practices.

In all twelve firms, factory workers received on-the-job training, which was particularly intense for the first two weeks to six months of employment, depending on the job. Three firms sent supervisory and plant management staff to seminars and courses outside the firm, as made available by such organizations as the National Productivity Center, the Malaysian Institute of Management, the Palm Oil Refiners Association of Malaysia (PORAM) and the Palm Oil Research Institute of Malaysia (PORIM). Only three firms had formal development programs for upper level management, including scientists and engineers. In all three cases, staff members were sent to seminars and meetings of professional bodies and to machinery/equipment suppliers overseas, as well as to local conferences and meetings. And, all three of these firms were local ventures. Only two of the five foreign-affiliated companies had ever sent local personnel overseas. One had sent its chief engineer for a six-month training course in the joint-venture partner, and the other had sent its

production department head on an industrial tour of European palm oil refineries in preparation for a change in product line. One other foreign affiliated firm had no formal plan to send professional staff overseas because it was the duty of foreign personnel present in Malaysia to train local staff.

It is not surprising, therefore, that the general consensus of opinion was that most skill transfer took place in-house, as opposed to outside the firm. Nor was it unexpected that foreign-affiliate managers believed that the primary source of this in-house skill transfer was the foreign expert, while those in local firms maintained that local experts were the main point of origin. It should be noted, however, that all firms, with but one exception, employed foreign experts for commissioning and major installation of new equipment. And, in nine out of eleven cases, these experts did participate in training local personnel.

When asked if company development had been affected by shortages of specific skills in the workforce, interviewees in six out of seven local firms replied "no." Those in the remaining sample firms responded "yes," and listed shortages in engineering, production management, accounting and technician-type skills as lacking. They further suggested that adequate training was not available in Malaysia for cost accounting, for principles of management beyond middle-management levels, and for theoretical background in the field of engineering. It was unresolved whether training in these matters was truly unavailable, or whether the local firms merely employed the best of the local graduates--which, given the trend in employment drift, seemed possible. Or, it may have been that local managers and foreign managers had different standards of adequacy or that they valued these particular skills differently.

## Chapter VII. Government Assistance

Manufacturing plays a strategic role in the achievement of NEP objectives. Therefore, the Malaysian government has instituted numerous incentives to encourage the growth of private sector investment. Some of these incentives are listed below:

- Import Duty Exemption for plant and machinery and raw materials and component parts used in manufacturing.
- Double Taxation Agreement has been signed with India, Canada, Switzerland, Japan, United Kingdom, Singapore, Sweden, Norway, Denmark, France, Sri Lanka, Belgium, New Zealand, Federal Republic of Germany and Poland. Currently, the Malaysian Government is negotiating with Australia on similar agreements. The Government is, of course, prepared to negotiate similar agreements with other countries.
- Tariff protection for deserving local industries.
- Protection against dumping by foreign exporters.
- Foreign Investment Guarantee Agreements (against expropriation) with U.S.A., Canada, the Netherlands, the Federal Republic of Germany, France, Switzerland, Sweden and Belgo-Luxemburg. The Malaysian government is also negotiating with Norway, United Kingdom, Singapore, Austria, Australia, Rumania and Sri Lanka while interested parties are Saudi Arabia, Kuwait and Russia.
- Malaysia is also a member of U.N. sponsored "Convention on the Settlement of Investment Disputes" thus assuring foreign investors of international arbitration in cases of legal disputes.
- Preferential Government Buying of locally manufactured products. All government ministries, departments and quasi-government bodies are required to purchase locally manufactured products provided their quality is acceptable and their prices do not exceed equivalent imported prices by 10 per cent.
- Industrial Estates--Fully developed industrial sites are available at reasonable prices. All services required by industrialists are provided.
- Liberal Foreign Exchange Control Procedures.

- Loan Facilities for industry through the Malaysian Industrial Development Finance (MIDF) who also underwrites share issues.
- The provision of standard factory units by Malaysian Industrial Estate Ltd. (MIEL) for immediate occupation by industrialists.
- Free Trade Zones (FTZ's) and Licensed Manufacturing Warehouses (LMW's) provide export-oriented industries duty free import and export of machinery, raw materials and components (required in the manufacturing process) and of finished products with a minimum of custom formalities.
- And tax incentives which include:
  - (a) Pioneer status which, depending on the level of company's fixed capital investment and other criteria allows total exemption from income tax, development tax and excess profits tax for 2 to 8 years.
  - (b) Labour Utilisation Relief which provides for tax relief in the same way as for pioneer companies except that it is based on the number of full time paid employees engaged.
  - (c) Locational Incentives which offer from 5 to 10 years of tax relief.
  - (d) Investment Tax Credit which allows a company to deduct from its taxable income the sum at least equal to 25% of the sums spent on the fixed assets qualifying for that relief.
  - (e) Export Incentives consisting of 3 specially designed incentives for companies exporting their Malaysian manufactured products.
  - (f) Export Refinancing Facility.
  - (g) Increased Capital Allowance which allows the company to depreciate at a greater rate of depreciation of assets.
  - (h) Accelerated Depreciation Allowance in the form of an annual allowance of 80% on plant and machinery (instead of the normal annual allowance at rates prescribed for various industries) for all industries.<sup>18</sup>

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<sup>18</sup>"All about Investment Incentives," MIDA, 1980.

Respondents in the survey were asked to check the kinds of assistance their firms had received from government or quasi-government agencies, and then to rank this aid in order of importance. The government's post-export financing facility, which refinances exports of palm oil products at a four and one-half percent rate, was noted most important, followed by the investment tax credit. The category "other export incentives" and the accelerated depreciation allowance tied in third place, while services provided by research institutes ranked fifth. PORIM was specifically selected as the one agency which had been most helpful by those in ten of the twelve sample firms, although three of these responses were qualified by the use of the phrase "has greatest potential for being helpful."

Respondents were then asked to describe present and future problems within the palm oil refining industry in Malaysia, and to make suggestions for their solution. The current industry-wide problems of insufficient skilled labor, crude palm oil shortages and production over-capacity were seen as difficulties for the future as well as the present. Suggested solutions to these problems included: increasing automation to reduce labor needs and/or intensification of government-sponsored training programs to increase the number of skilled workers available; implementing government strategies to increase productivity at the plantation level, and using government control of licensing to restrict entry into the industry. Those in oil refining firms also expressed need for government support of R & D and for increased government-sponsored marketing efforts abroad to reduce the costs of new technology, while individualizing it to local conditions, and for an increase in the number of market outlets available to Malaysian refineries.

Several refinery executives voiced their fears that already depressed profit margins would continue to be squeezed as labor and fuel costs continued to rise, and as competition increased within the industry. One means of reducing the pressure on profit margins, they opined, was for the government to restructure the duty schedule, although this did not deal directly with the problem of increasing costs. And finally, spokesmen for several of the foreign-affiliated refiners pointed out a need for a continuing evolution of nation-wide attitudes toward, and participation in, commerce. Specifically, if NEP guidelines concerning proportionate hiring were to be enforced, more Bumiputra had to enter the labor pool. This was viewed as not likely to happen until the blue collar worker was given respect for the work he does, not only from his employer, but also from his family, friends, and neighbors. Therefore government efforts to encourage such change in attitude must be continued and intensified.

## Chapter VII. Conclusion

Real GDP growth during the Second and Third Malaysia Plans (1971-75; 1976-80) averaged seven percent per year and eight-and-six-tenths percent per year, respectively. The Fourth Malaysia Plan (1981-85) targets average annual real GDP growth at eight percent. This plan, like those before it, seeks to attain the New Economic Policy (NEP) objectives of restructuring society and eradication of poverty within the context of an expanding economy. The focus for the Fourth Plan is on developing and modernizing small-scale industries, expanding and strengthening the infra-structure, increasing industrial development in rural areas and promoting resource-based, export-oriented and heavy industries.

Malaysia actively encourages foreign and local private investment, offering a variety of incentives including tax holidays, export incentives, accelerated depreciation allowances, protective tariffs and import duty concessions. Respondents in the twelve firms in our sample voiced particular appreciation for the government's refinancing facility and, more generally, cited the existence of these government incentives as a major reason for their entry into the palm oil refining industry.

The Malaysian government does, however, reserve the right to be selective about the kinds of investment which will be approved. And, government policies and legislation restrain foreign investors' operating freedom in terms of licensing and hiring, and in percentage of foreign ownership. For example, the Industrial Coordination Act of 1975, as amended in 1977 and 1979, requires that licenses be obtained for all manufacturing activities and gives the Ministry of Trade and Industry a free hand in attaching conditions to the licenses.

However, the procedures for establishing a joint-venture in Malaysia are relatively simple as the Malaysian Industrial Development Authority (MIDA) acts as a one-stop agency which guides the potential investor through the various agencies from which approval is required.

In terms of hiring restraints, all companies are required to try to employ at all job levels a proportionate number of Malays, Chinese and Indians in order to reflect the racial distribution of the workforce. However, skilled and specialized labor is in short supply, and most of the available skilled workers are ethnically Chinese. Since national guidelines give priority to the employment of ethnic Malays, qualified Malay managers and technicians are scarce. Efforts are being made by the government to ease this situation by expanding higher education and industrial training facilities and programs. In terms of the palm oil refining industry, both the general shortage of skilled labor and problems associated with NEP hiring were apparent in the high turnover rates of employment of both skilled and unskilled workers. The competition for labor from the limited available pool had forced increases in wages and salaries and had, to a limited extent, triggered the introduction of incentive schemes for workers in the industry at the present time. The government requirement that all firms plan for the replacement of expatriates with Malaysian personnel (except in key posts) was also reflected in the expatriates' own views of their job responsibilities as including training of local replacement personnel. However, training programs in the industry were not generally formalized, relying heavily on on-the-job training and the use of seminars and staff development courses as they were made available outside the firm.

The stated goal of the NEP is that by 1990, ownership in the

corporate sector will be thirty percent foreign, thirty percent Bumiputra and forty percent other Malaysian. The government does not, however, necessarily apply these targets to individual companies. But joint-ventures are encouraged to include as much local equity as possible, particularly Bumiputra participation. Our sample clearly reflects this policy in that there were no wholly-owned foreign subsidiaries and in that joint-venture firms uniformly had built-in time frames for the transfer of majority equity to local hands.

Government approval is also required for licensing and technical assistance agreements, the criteria for which include whether there will be a transfer of technology and whether royalties and fees payable are commensurate with the technology and know-how supplied. The licensing period is normally five years, with renewal options, and lump sum payments are discouraged, as are typified by the formal technology transfer agreements found in the sample.

For the purpose of this survey, technology transfer was defined as "the flow of knowledge, of physical machinery, of industrial processes and of human skills from one country/one person to another." In analyzing the results of the survey, key sources of information were found to be predominantly machinery/equipment suppliers and other firms in the industry for local firms; and parent company/joint venture partners for firms with foreign affiliation. These patterns of information sourcing were uniformly evidenced in responses to questions about sources of technical information generally, to questions about sources of information upon which plant design and adaptation and machinery/equipment selection and modification are based, and to questions about sources of information used in problem solving behavior.

The viewpoints of foreign and local firms also differed when looking

at problems in the industry such as the labor shortage, difficulty in observing NEP hiring guidelines, and in looking at perceived sources of skill transfer. Foreign firms tended to see shortages in labor availability and in skills available in the workforce as more serious problems than did local firms. Local firms did not see NEP proportionate hiring as a particular problem, as opposed to the foreign firms' evaluations. And, each group, foreign and local, identified itself as the primary source of skill transfer within the firm.

Both local and foreign firms were united, however, in their appreciation for the government's incentive schemes and in their recommendations that the government initiate funding for R & D programs, that it undertake world-wide marketing efforts, and that it upgrade both the quality and quantity of training programs available to industry personnel.

Finally, both foreign and local firms were also united in their view of technology transfer as a process of diffusion in which, for the palm oil refining industry, at least, human skill transfer is a more crucial factor than the simple transfer of physical equipment. One manager stated it thus,

The important issue facing the Malaysian palm oil refining industry is not that of acquisition of imported technology, but that we be in a position to innovate and to improve on it. We must therefore look toward further development of the ability of Malaysians themselves to adapt foreign technology to meet our local conditions, and to build on imported technology. This mainly depends on the will and ability of the government, the refiners and the Malaysian employees in the industry.

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## Appendix

## The Questionnaire

NOTE: The questionnaire upon which this survey was based was not used in the form which appears in this appendix. Alterations in spacing, in placement of grids and in size of type have been made in order that it conform to M. I. T. specifications for inclusion in this thesis.

I. GENERAL INFORMATION

- A. Company Code: \_\_\_\_\_
- B. Date of commercial production: \_\_\_\_\_
- C. Date of incorporation/licensing/approval: \_\_\_\_\_
- D. Why was entry into the palm oil refining business begun at this particular time? Please tick those reasons which are relevant to your company and then rank these in order of importance, "1" being most important, etc.

	Please Tick	Please Rank
Logical expansion into downstream activities	_____	_____
Logical expansion into upstream activities	_____	_____
Government incentives/encouragement	_____	_____
Availability of capital for investment	_____	_____
Increased demand for refined palm oil products - export market	_____	_____
Increased demand for refined palm oil products - domestic market	_____	_____
Other: (please specify) _____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

- E. Ownership (please tick whichever is relevant to your company)
  - \_\_\_\_\_ wholly-owned foreign subsidiary
  - \_\_\_\_\_ foreign-controlled joint-venture
  - \_\_\_\_\_ locally-controlled joint-venture
  - \_\_\_\_\_ local venture with foreign contractual agreements
  - \_\_\_\_\_ local venture without foreign contractual agreements

Nationality of foreign partners: \_\_\_\_\_

History of changes in ownership:

<u>Year</u>	<u>Type of Change</u>	<u>Effect on Equity</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

## F. CAPITAL STRUCTURE

Authorized capital \_\_\_\_\_

Paid-up capital \_\_\_\_\_

## G. PRODUCTION &amp; PRODUCTS LISTING

Production capacity \_\_\_\_\_

Actual production \_\_\_\_\_  
(as % of capacity) \_\_\_\_\_

% production exported \_\_\_\_\_

If your production capacity has been increased since the  
time commercial production began, when did this change  
take place? \_\_\_\_\_And, why did you decide to increase your production  
capacity at that time? (please tick)

\_\_\_\_\_ availability of capital for investment

\_\_\_\_\_ availability of technology

\_\_\_\_\_ increased demand for refined palm oil productions -  
export market

\_\_\_\_\_ other (please specify) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Please tick the products your refinery produces and give the date commercial production was started for each product.

Name of Product	Tick	Date	Name of Product	Tick	Date
Crude Palm Olein			Palm Acid Oil		
Crude Palm Stearin			Palm Fatty Acids		
Neutralized Palm Oil			Palm Mid Fraction		
Neutralized Palm Olein			Glycerine		
Neutralized Palm Stearin			Cooking Oil		
Neutralized, Bleached Palm Oil			Vegetable Ghee		
Neutralized, Bleached Palm Olein			Vanaspati		
Neutralized, Bleached Palm Stearin			Margarine		
Refined, Bleached & Deodorised Palm Oil			Shortening		
Refined, Bleached & Deodorised Palm Olein			Soap		
Refined, Bleached & Deodorised Palm Stearin			Fatty Acid Distillates		

II. TECHNICAL TRANSFER AGREEMENTS & SOURCES OF TECHNICAL INFORMATION

A. Has your company signed one or more technical transfer agreements? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, please complete the following grid.

Type	Duration	Mode of 1 payment	Extension 2	Revision 3 Clause	Restrictive 4 Clauses
Management					
Technical assistance					
Service					
Engineering					
Trademark					
Patent					
License					
Marketing					
Joint-venture					
Others (please specify)					

- (1) Mode of payment: Lump sum/running rate as % of sales/set royalty/etc.
- (2) Extension: has the agreement been extended? If so, please give the period of extension.
- (3) Revision clause: does the agreement include a revision clause? If so, please list the time period(s) set for re-negotiation/revision.
- (4) Restrictive clauses: does the agreement restrict your company such that you cannot export to certain countries (Market), cannot purchase know how from other sources (Know-how), must buy inputs from specified sources (Inputs), have to charge prescribed prices (Prices), others (please be specific) \_\_\_\_\_

- B. Do the fees paid for the technology transferred affect your production costs to such an extent that your prices are not as competitive as they otherwise might be? (Please tick)

Yes \_\_\_\_\_ No \_\_\_\_\_

- C. What are the major difficulties faced by your firm regarding the implementation of the provisions in the agreements?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- D. Do you co-operate technologically with foreigners through the following means? Please tick those means of co-operation relevant to your palm oil refining operation, then rank these in order of importance - "1" being most important, etc.

Please Tick	Please Rank	
_____	_____	utilization of licenses
_____	_____	employment of foreign personnel
_____	_____	common research
_____	_____	technical co-operation agreements
_____	_____	training of your personnel overseas
_____	_____	others (please specify) _____
		_____
		_____

- E. How do you feel the spread of know-how to your firm can best be effected? (Please tick only one)

_____	training through government agencies
_____	mutual exchange of know-how within the industry
_____	organization of common research
_____	others (please specify) _____
	_____
	_____

- F. Please tick the sources of technical information which are useful to your company, then rank them in order of importance - "1" being most useful, etc.

Please Tick	Please Rank	(continued on next page)
_____	_____	suppliers or vendors
_____	_____	parent firm/joint-venture partner
_____	_____	customers
_____	_____	firms in the same or related industries
_____	_____	firms in different industries

Please Tick	Please Rank	(continued from previous page)
_____	_____	private consultants
_____	_____	government departments
_____	_____	research institutes
_____	_____	universities
_____	_____	trade fairs/trade missions
_____	_____	business & industrial associations
_____	_____	employment of foreign experts
_____	_____	education & training of personnel
_____	_____	licensing agreements
_____	_____	machinery/equipment directories
_____	_____	trade journals
_____	_____	publications other than trade journals

### III. ENGINEERING DESIGN & ADAPTATION

#### A. REFINERY DESIGN

1. Who designed your original refinery facilities?  
(Please tick)

\_\_\_\_\_ own Malaysian personnel  
 \_\_\_\_\_ own foreign personnel (Nationality: \_\_\_\_\_)  
 \_\_\_\_\_ local consulting agency  
 \_\_\_\_\_ foreign consultant (Nationality: \_\_\_\_\_)  
 \_\_\_\_\_ parent company/joint-venture partner  
 \_\_\_\_\_ machinery/equipment supplier  
 \_\_\_\_\_ others (please specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. If the design was locally generated, how and where did the designer gain his expertise? (Please tick)

\_\_\_\_\_ visits to foreign palm oil refineries  
 (What countries? \_\_\_\_\_)  
 \_\_\_\_\_ previous work experience in palm oil refining  
 (in Malaysia \_\_\_\_\_ abroad \_\_\_\_\_)  
 \_\_\_\_\_ consultations with suppliers  
 \_\_\_\_\_ trade journals  
 \_\_\_\_\_ others (please specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

3. Has the refinery design been changed from the original?  
(Please tick) Yes \_\_\_\_\_ No \_\_\_\_\_

4. Or, does the design differ from European or American models? Yes \_\_\_\_\_ No \_\_\_\_\_

5. If "yes" to either 3 or 4, who is responsible for these adaptations? (Please tick)

- own Malaysian personnel  
 own foreign personnel (Nationality: \_\_\_\_\_)  
 local consulting agency  
 foreign consultant (Nationality: \_\_\_\_\_)  
 parent company/joint-venture partner  
 machinery/equipment supplier  
 others (please specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

6. Why were these adaptations thought necessary? (Please tick all that apply)

- increased security  
 introduction of effluent control  
 adapted to suit changes in product line  
 changed to increase production capacity  
 other (please specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

7. What were your plant designers'/adaptors' primary sources of information? (Please tick those sources which are relevant, then rank them in order of importance - "1" being most important, etc.)

Relevant	Rank	
<input type="checkbox"/>	<input type="checkbox"/>	visits to other Malaysian plants
<input type="checkbox"/>	<input type="checkbox"/>	visits to plants abroad (What countries? _____)
<input type="checkbox"/>	<input type="checkbox"/>	suppliers of machinery/equipment
<input type="checkbox"/>	<input type="checkbox"/>	vendors of your products
<input type="checkbox"/>	<input type="checkbox"/>	customers
<input type="checkbox"/>	<input type="checkbox"/>	parent company/joint-venture partner
<input type="checkbox"/>	<input type="checkbox"/>	local universities or research institutes
<input type="checkbox"/>	<input type="checkbox"/>	foreign universities or research institutes
<input type="checkbox"/>	<input type="checkbox"/>	books/trade journals/directories
<input type="checkbox"/>	<input type="checkbox"/>	trade missions/trade fairs
<input type="checkbox"/>	<input type="checkbox"/>	others (please specify) _____ _____ _____

## B. MACHINERY/EQUIPMENT

1. Who was responsible for the selection of machinery/equipment for your refinery? (Please tick)

own Malaysian personnel  
 own foreign personnel (Nationality: \_\_\_\_\_ )  
 local consulting agency  
 foreign consulting agency (Nationality: \_\_\_\_\_ )  
 parent firm/joint-venture partner  
 others (please specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. What are the countries of origin of the machinery/equipment selected?
- \_\_\_\_\_

3. What were the key factors in the choice of your machinery/equipment? (Please rank the relevant factors)

<u>Factors</u>	<u>Relevant</u>	<u>Rank</u>
quality of product	_____	_____
volume of annual production	_____	_____
raw materials costs	_____	_____
price of the equipment	_____	_____
familiarity with the technology from experience in other refineries	_____	_____
labour costs	_____	_____
ease of maintenance	_____	_____
interest on capital	_____	_____
usage of technology by competitors	_____	_____
trademark of equipment	_____	_____
availability of equipment & spare parts	_____	_____
overall attractiveness of package - maintenance/service contracts, etc.	_____	_____
elimination of labour for reasons other than labour costs	_____	_____
parent firm-joint-venture partner's preference	_____	_____
operating costs	_____	_____

4. Has this machinery/equipment been adapted in any way to suit your company's specific needs? Yes \_\_\_\_\_ No \_\_\_\_\_

5. If yes, please identify how the machinery/equipment has been adapted. (Please tick)

adaptation of imported equipment to function in tropics  
 increasing the speed of the equipment to obtain more output per unit of time  
 changing the man-machine ratio from the ratio usual in more industrialized countries  
 using less expensive, lower production-capacity equipment for multiple shift production with highly productive equipment run on single shift  
 upgrading inexpensive universal machines to special machines by means of attachments  
 others (please specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

6. And, why did you adapt the machinery/equipment?

to increase the quality of the product  
 to reduce production costs  
 to increase production capacity  
 to meet local environmental needs (please specify what needs) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

7. And, who is responsible for this adaptation?

own Malaysian personnel  
 own foreign personnel (Nationality: \_\_\_\_\_)  
 local consulting agency  
 foreign consulting agency (Nationality: \_\_\_\_\_)  
 parent firm/joint-venture partner  
 others (please specify) \_\_\_\_\_  
 \_\_\_\_\_

8. Are spare parts for the machinery/equipment readily obtainable?

Yes \_\_\_\_\_ No \_\_\_\_\_

Are they available locally? Yes \_\_\_\_\_ No \_\_\_\_\_

If no, do you regard this as a major problem? And how do you think this situation could be remedied?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

9. Have you found security to be a particular problem in your operation? And, if so, how have you responded to this problem?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

10. What are your plans with regard to effluent control? Will additional machinery/equipment have to be imported to meet environmental standards? And, will you require additional manpower to operate and maintain this equipment? How/when/by whom will these people be trained? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

IV. ORGANIZATIONAL STRUCTURE/TRAINING AND EMPLOYMENT

- A. Total number of full-time employees: \_\_\_\_\_
- Total number of expatriate employees: \_\_\_\_\_
- B. Do you have specific organizational units in the following areas? And, how many expatriate personnel do you employ in each area?

Units/Departments	Have Units?		Number of Expatriates
	Yes	No	
Administration			
Finance			
Personnel			
Production			
Research & Development			
Quality-Control			
Technical Maintenance of Machinery/Equipment			
Marketing			
Security			
Other (please specify) _____			
_____			
_____			
Total number of expatriates			

(Note: This number should equal the one listed in Question A)

How do you recruit personnel:

\_\_\_\_\_ employment agency

\_\_\_\_\_ newspaper advertisements

\_\_\_\_\_ other (please specify) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Has your company been adversely affected by a high rate of turnover among your skilled/trained employees?

Management level	Yes	_____	No	_____
Supervisory level	Yes	_____	No	_____
General workers	Yes	_____	No	_____

Does your company provide training programmes for employees?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, please complete the following grid.  
If no, please complete only column 2.

Categories	Total Number of Employees	Number Receiving Training	Duration of Training	Location of Training*	Types of Organizations Providing Training**
1. Management staff a) professional b) non-professional					
2. Scientists & Engineers					
3. Other professionals					
4. Technicians & Draughtsmen					
5. Machinists & Electricians					
6. Clerical, Sales & Service Workers					
7. Factory Workers a) skilled b) unskilled					
8. General workers					

\* location of training: in plant/elsewhere in Malaysia/abroad - please specify country

\*\* types of organizations providing training: private consulting agency/government-sponsored training/parent company or joint-venture partner/Malaysian or foreign university or technical institute, etc.



If yes, which skills? (Please tick)

- engineering  
 production  
 marketing  
 accounting  
 management  
 technicians  
 others (please specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

What skills are needed by your employees for which training is not available in Malaysia?

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_

- G. Do you employ foreign personnel in the general management of your refinery? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what is their nationality?

\_\_\_\_\_

And, are they directly affiliated with your foreign partner(s)? Yes \_\_\_\_\_ No \_\_\_\_\_

- H. Does your company's top management have previous experience in

- |                                     | Yes   | No    |
|-------------------------------------|-------|-------|
| 1. the oils and fats industry       | _____ | _____ |
| 2. the refining of palm oil         | _____ | _____ |
| 3. the palm oil industry, generally | _____ | _____ |

If you ticked "no" to all of the above, what specific skills did your company's top management bring to the company from previous training or experience?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

I. Please list below a brief summary of your departmental managers' past experience and/or training in business as related to the palm oil industry.

Current Position	Previous Work Experience	Education in Business
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

J. In the last 12 months, how many trips have your managers made to seminars, conferences and trade association meetings?

in Malaysia \_\_\_\_\_  
in Asia \_\_\_\_\_  
outside Asia \_\_\_\_\_

K. To what technical, trade or business associations does your company or its top executives belong?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

L. To what business, technical or trade journals does your company or its top executives subscribe? (Please tick)

- |  |   |
|--|---|
| <input type="checkbox"/> Asian Wall Street Journal   | <input type="checkbox"/> Modern Asia    |
| <input type="checkbox"/> Asian Business              | <input type="checkbox"/> Oil Palm News  |
| <input type="checkbox"/> Business Times              | <input type="checkbox"/> Oil World      |
| <input type="checkbox"/> Far Eastern Economic Review | <input type="checkbox"/> PORIM Bulletin |
| <input type="checkbox"/> Insight                     | <input type="checkbox"/> Others         |
| <input type="checkbox"/> International Business Week | (please specify)                        |
| <input type="checkbox"/> Malaysian Business          | _____                                   |
| <input type="checkbox"/> Malaysian Management Review | _____                                   |

## M. RESEARCH &amp; DEVELOPMENT

1. Does your company have a research and development programme?  
Yes \_\_\_\_\_ No \_\_\_\_\_

If no, please skip to Question 4.

2. If yes, is R & D oriented more toward process control and development and reduction of production costs, or toward development of end use products?

process/production \_\_\_\_\_ end use \_\_\_\_\_

3. Where did your local R & D staff receive their training?

\_\_\_\_\_ in Malaysia  
 \_\_\_\_\_ from local experts  
 \_\_\_\_\_ from foreign experts (Nationality: \_\_\_\_\_)  
 \_\_\_\_\_ abroad (in what country? \_\_\_\_\_)

4. Is R & D carried out in Malaysian refinery or in parent company/joint-venture partner?

Malaysian \_\_\_\_\_  
 parent/partner \_\_\_\_\_

If in parent company/joint-venture partner, how has technology been transferred to your Malaysian refinery?

\_\_\_\_\_ visits from partner/parent company's R & D staff  
 \_\_\_\_\_ visits by local staff to parent company/partner  
 \_\_\_\_\_ printed bulletins from parent company/partner  
 \_\_\_\_\_ others (please specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

5. Do you rely on outside agencies for R & D to supplement, or in place of, your own facilities? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, whom do you use? \_\_\_\_\_

How did you know to contact this agency? (Please tick)

\_\_\_\_\_ agency initiated contact  
 \_\_\_\_\_ parent company/joint-venture partner suggested it  
 \_\_\_\_\_ knew someone in the agency from  
     \_\_\_\_\_ previous work experience  
     \_\_\_\_\_ university/school  
     \_\_\_\_\_ personal friend  
     \_\_\_\_\_ family friend  
     \_\_\_\_\_ met through business association  
 \_\_\_\_\_ other (please specify) \_\_\_\_\_

6. How much contact do you have with this agency? (Please tick)

\_\_\_\_\_ some  
 \_\_\_\_\_ moderate amount  
 \_\_\_\_\_ a great deal of day-to-day contact

## N. QUALITY-CONTROL

1. Are your products tested for quality-control?  
Yes \_\_\_\_\_ No \_\_\_\_\_
2. If yes, where are these tests performed?  
in-house \_\_\_\_\_  
outside agency \_\_\_\_\_
3. If an outside agency is used for Q-C testing, how was this agency selected? (Please tick)
- \_\_\_\_\_ selected by parent company/joint-venture partner  
 \_\_\_\_\_ known by management from previous work experience  
 \_\_\_\_\_ used by competitors  
 \_\_\_\_\_ recommended by consulting agency  
 \_\_\_\_\_ others (please specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
4. If tests are performed in-house, are foreign chemists/technicians required for Q-C services?  
Yes \_\_\_\_\_ No \_\_\_\_\_
5. Where and by whom were local Q-C staff trained? (Please tick)
- \_\_\_\_\_ trained in Malaysia  
 \_\_\_\_\_ trained by local expert  
 \_\_\_\_\_ trained by foreign expert  
 \_\_\_\_\_ abroad (in what country? \_\_\_\_\_)
6. In testing your products, what standards do you use for comparison? (Please tick)
- \_\_\_\_\_ Malaysian standards  
 \_\_\_\_\_ customers' specifications  
 \_\_\_\_\_ own company's specifications  
 \_\_\_\_\_ parent company/partner's specifications  
 \_\_\_\_\_ others (please specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## O. MARKETING

1. How do you market your products?
- |                              | Use   | % of sales |
|------------------------------|-------|------------|
| commodity brokers            | _____ | _____      |
| direct sales                 | _____ | _____      |
| other (please specify) _____ | _____ | _____      |
| _____                        | _____ | _____      |

2. If you sell direct, how do you locate these customers?

- through government agencies  
 through partner/parent company  
 through personal contact at trade fairs/trade missions  
 through personal contact gained by managers' travels  
 through other local refineries  
 other (please specify ) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

3. Have you ever received any professional advice on advertising or marketing strategies? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, who advised (position) \_\_\_\_\_  
 where located (agency) \_\_\_\_\_

How did you know to contact this person/agency?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

And, did the advice include help in the preparation of communication materials? Yes \_\_\_\_\_ No \_\_\_\_\_

V. GOVERNMENT ASSISTANCE

A. What kinds of assistance has your refinery received from government or pseudo-government agencies? (Please tick those which apply and then rank them in terms of importance, "1" being most important, etc.)

	Tick	Rank
1. Financial assistance		
a. Direct investment/shares participation	_____	_____
b. Pioneer status	_____	_____
c. Investment tax credit	_____	_____
d. Labor utilization relief	_____	_____
e. Locational incentive	_____	_____
f. Accelerated depreciation allowance	_____	_____
g. Other export incentives	_____	_____
h. Post-export financing facilities	_____	_____

(continued on next page)

	Tick	Rank
2. Non-financial assistance		
a. Management training programmes	_____	_____
b. Training programmes for supervisory personnel	_____	_____
c. Marketing assistance	_____	_____
d. Government procurement	_____	_____
3. Technical information		
a. R & D, testing, engineering services provided by government laboratories	_____	_____
b. Services provided by university laboratories and consultants	_____	_____
c. Services provided by research institutes such as MARDI, PORIM, SIRIM	_____	_____
4. Other (please specify) _____	_____	_____
_____	_____	_____
_____	_____	_____

5. Is there any one government agency or research institute which has been most helpful to your refinery operation?  
 Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, which one? \_\_\_\_\_

B. Please comment on ways the government can help you:

with technology \_\_\_\_\_

\_\_\_\_\_

with finance \_\_\_\_\_

\_\_\_\_\_

with exports \_\_\_\_\_

\_\_\_\_\_

with employment \_\_\_\_\_

\_\_\_\_\_

with marketing \_\_\_\_\_

\_\_\_\_\_

VI. COMPANY HISTORY

Every start-up firm encounters difficulties--technical, marketing or managerial. Please think of three (3) major problems that have confronted your firm since its beginning or important decisions that have had to be made.

These decisions could be:

- \* strategic decisions (Where/how to market? Use agents? Start daughter company?)
- \* management decisions (How to select team members? Where to find needed managerial personnel? Use of expatriates? Sub-contracts?)
- \* production decisions (Where to build facilities? Size? How/where to obtain machinery & equipment?)
- \* pricing decisions (How much? On what basis?)
- \* labour decisions (How to obtain? Need for training? How/where/who to train?)
- \* financial decisions (Public or privately held? Loans--size, source and terms? Issuance of new equity? Merger or acquisition of other company/by other company?)

A. List 3 major problems/decisions.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Which of these 3 would you say had the most effect on the company?

Number 1 \_\_\_\_\_  
 Number 2 \_\_\_\_\_  
 Number 3 \_\_\_\_\_

B. Who helped make this particular decision?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

C. Where was information sought to help make that decision/solve that problem?

Who was consulted with?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

What publications were used?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Which of the sources listed above was most helpful and which was least helpful?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

D. How did management know to use these particular sources?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

E. Aside from the important decision discussed above, name one other key event which has had an important effect on the company's success. (This key event may be one of the decisions/problems not listed number one, or it may be something else entirely.)

Key event \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

At the time this key event occurred, where did you seek information to help you deal with the situation? (Please rank order these sources in order of importance)

	Rank
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____

How did you know to seek information at the number 1 ranked source?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- F. What two people (besides yourself) have provided the most important technical help/business advice to the business? (Please do not list the individuals' names--only their position/relationship to the company.)

1st. person

position: \_\_\_\_\_

education: \_\_\_\_\_

Nationality: \_\_\_\_\_

helped the firm from 19\_\_ to 19\_\_

During this time he worked for:

- this firm  
 parent company/partner  
 competitor  
 sub-contractor  
 university (which one? \_\_\_\_\_)  
 research institute (which one? \_\_\_\_\_)  
 foreign consulting agency  
 local consulting agency  
 government agency (which one? \_\_\_\_\_)

If this person worked for the firm, where did he work before joining the business?

\_\_\_\_\_  
 \_\_\_\_\_

How did you find this person/know to contact him?

\_\_\_\_\_  
 \_\_\_\_\_

2nd. person

position: \_\_\_\_\_

education: \_\_\_\_\_

Nationality: \_\_\_\_\_

helped the firm from 19\_\_ to 19\_\_

During this time he worked for:

- this firm  
 parent company/partner  
 competitor  
 sub-contractor  
 university (which one? \_\_\_\_\_)  
 research institute (which one? \_\_\_\_\_)  
 foreign consulting agency  
 local consulting agency  
 government agency (which one? \_\_\_\_\_)

If this person worked for the firm, where did he work before joining the business?

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How did you find this person/know to contact him?

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G. About how many people do you know in top management positions in other palm oil refineries? \_\_\_\_\_

Taking the 3 you know best, how did you meet them?

- \_\_\_\_\_ school/university
  - \_\_\_\_\_ family friend
  - \_\_\_\_\_ local business association
  - \_\_\_\_\_ trade association
  - \_\_\_\_\_ previous employment
  - \_\_\_\_\_ others (please specify) \_\_\_\_\_
- 
- 

Do you ever discuss your business with these people?

- \_\_\_\_\_ never
- \_\_\_\_\_ sometimes
- \_\_\_\_\_ often

H. What from your past experience has proven most valuable to you in your management of the palm oil refinery?  
(Please tick and rank)

	<u>Valuable</u>	<u>Rank</u>
specific management skills gained from past employment	_____	_____
technical knowledge gained from past employment	_____	_____
personal contacts in the industry	_____	_____
knowledge gained from formal education	_____	_____
others (please specify) _____	_____	_____
_____	_____	_____
_____	_____	_____

I. What do you foresee as future needs (5 years from now) of your company in technology and training? How do you think these needs will be met?

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J. What in general terms are your plans for the company for the next 5 years?

expand  
 sell out  
 retain at present size  
 others (please specify) \_\_\_\_\_

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K. What do you see as the key problems in technology transfer in the palm oil refining industry in Malaysia today?

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What problems do you foresee for the future?

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How do you think these problems can best be solved?

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M. Please use this space for any comments you would like to make, either about the Questionnaire and its contents or about technology transfer.

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