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THE GOVERNMENTS OF MALAYSIA AND THE STATE OF JOHOR

FRUITS AND VEGETABLES

WORKING PAPER

JOHOR TENGAH AND TANJONG PENGGERANG REGIONAL MASTER PLAN

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FRUITS AND VEGETABLES

WORKING PAPER

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<u>CONTENTS</u>	<u>PAGE</u>
MARKETS	1
Local Production	1
The Local Market	2
The Singapore Market	5
Other Exports	7
Current Production Techniques	11
Production and Processing costs of Green Beans	14
Source	14
A Possible Project in Tanjong Penggerang	17

TABLES

Table 1	Acreage of Sundry fruits - W. Malaysia and Johor - Sole crop equivalent 1968	3
Table 2	Acreage of food crops - W. Malaysia and Johor - sole crop equivalent 1968	4
Table 3	Wholesale and Retail prices of selected vegetables - Johor Baharu - January-June 1970	6
Table 4	Exports of fruits - West Malaysia 1966-68	8
Table 5	Exports of Vegetables - West Malaysia 1966-68	9
Table 6	Production costs for Green Beans, W. Malaysia and U.S. (\$M)	15

APPENDIX A

The Market for Tropical Fruits	i
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FRUITS AND VEGETABLES

MARKETS

Local Production

Some appreciation of the range of products involved can be gained from Tables 1 and 2 showing the acreages of fruits and vegetables in West Malaysia and Johor as reported by the Ministry of Agriculture. These figures must be subject to a degree of error since many of them are planted as mixed crops and acreages must be estimated by eye. Acreages in terms of "Sole Crop Equivalents" are estimated as follows:-

Sole Crop = crop which occupies the whole of the cultivated area

Main Crop = crop which is predominant and occupies 75% of the area

Mixed Crop = crop which is planted together with other crops in the same area

Then

Sole Crop Equivalent = acres Sole crop + 0.75
(Acres Main Crop) + 0.5
(acres mixed crop).

This type of estimation is inevitable given that mixed cropping of these crops is widespread. It does mean that acreage figures are subject to considerable error and should be taken only as rough guides to the extent of production.

The total acreage of fruits in West Malaysia was reported as 166,000 of which 38,000 was pineapples for canning. Of the remaining items the major are bananas, (40,000 acres), rambutans (23,000 acres) and durians (23,000 acres). The others are grown on a relatively minor scale. Production of these crops is fairly widely distributed around the country (except for canning pineapples which are heavily concentrated in South West Johor especially Pontian District). Except for dukus, Johor is not a particularly large producer of the other fruits.

The vast majority of these fruits are locally consumed although there is some export trade particularly to Singapore. Total exports amount to some \$6 million

to \$7 million mainly of bananas and "other tropical fruit", presumably chiefly rambutans and durians.

Vegetable and food crops production is again widely dispersed with a total of 44,000 acres excluding tapioca. There is some concentration of market garden activity in the neighbourhood of Kuala Lumpur and Ipoh and in the Cameron Highlands. Again exports are principally to Singapore amounting to \$4 million to \$5 million per year.

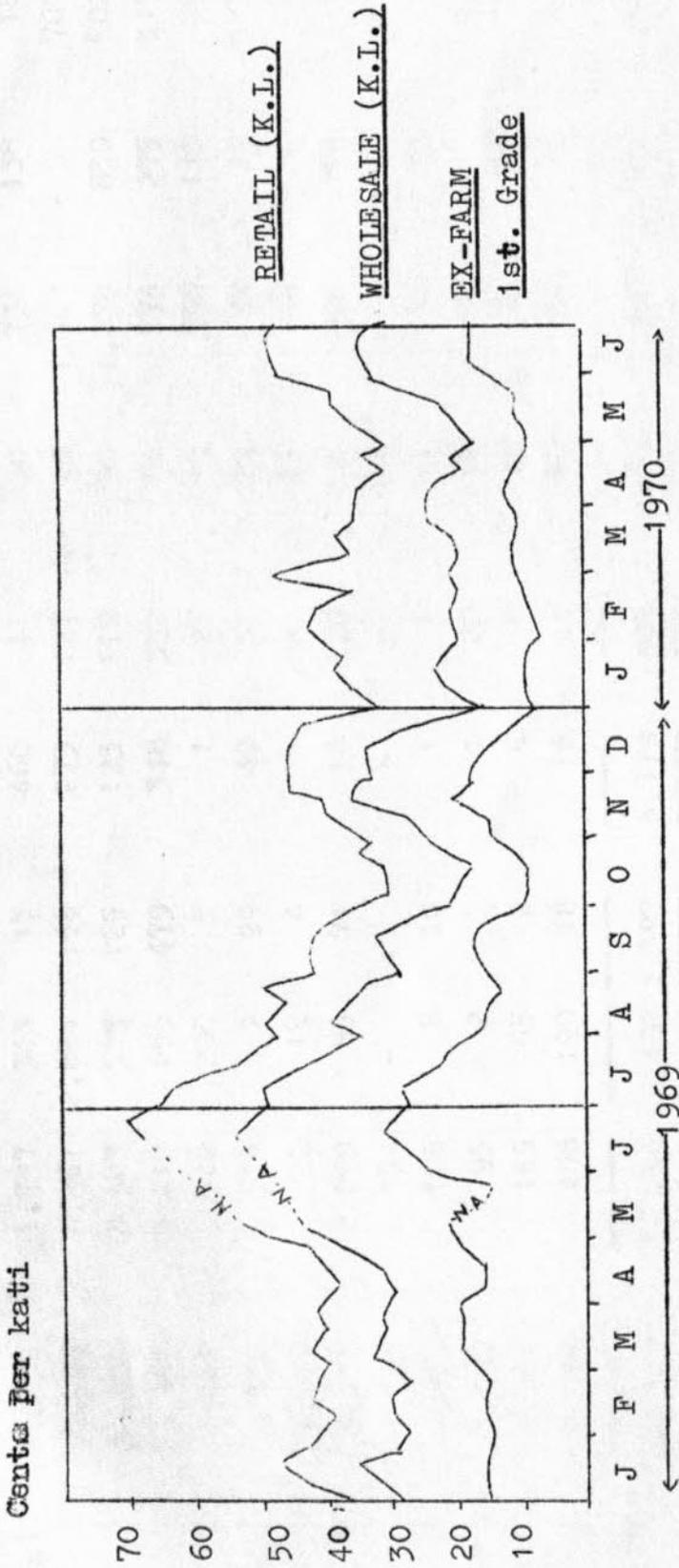
The Local Market

Data on quantities of vegetables and fruits handled in local markets are not available. Investigations are being carried out by F.L.D.A. into fruit and vegetable marketing which will undoubtedly yield greater insight into local marketing arrangements and the amount of produce handled. Grumbles about the marketing system usually revolve around two areas:-

- (a) That the margin between the farm level price and retail is too wide.
- (b) That prices fluctuate unduly.

F.A.M.A. has been collecting data on agricultural produce prices and these give some guide to the extent of these problems. Table 3 shows the average wholesale and retail prices quoted by F.A.M.A. for a series of vegetables for Johor Baharu in the first 6 months of 1970. The figures here are monthly averages and obviously disguise day to day fluctuations. The general month-month fluctuations obviously vary considerably from crop to crop. For items such as sweet potatoes which do not "ripen" but can be left in the ground for a few days and fairly easily stored the price fluctuations are minimal. For items which are fruiting parts of the plant, supply variations are more common and it is much more difficult to match these to demand fluctuations. Price changes can be quite dramatic especially if climatic changes cause a sudden change in output. Thus the prices of chillies, cucumbers and long beans all fell sharply between April and May of this year. Green leafy vegetables such as cabbage and kangkong which must be harvested over a relatively short period and do not store well are somewhat intermediate in nature.

LOCAL CABBAGE: AVERAGE WEEKLY PRICES FOR JANUARY 1969 - JUNE 1970



Source: FAMA.

TABLE 1 ACREAGE OF SUNDRY FRUITS - W. MALAYSIA AND JOHOR - SOLE CROP EQUIVALENT 1968

Fruit	W. Malaysia		Johor		Johor Districts		Muar		Pontian		Segamat	
	W. Malaysia	Johor	B.P.	J.B.	Kluang	K.T.	Mersing	Muar	Pontian	Segamat		
Pineapple (Canning)	37,819	34,069	3,402	471	5,100	11	45	1,178	23,862	-	-	-
Pineapple (Others)	10,136	1,797	343	15	460	41	50	731	138	18	18	18
Banana	39,524	5,961	2,854	166	273	127	66	1,767	-	707	707	707
Durian	22,808	3,387	575	125	123	119	38	1,075	830	502	502	502
Rambutan	23,393	3,249	655	479	348	352	61	775	275	315	315	315
Mangosteen	4,445	549	200	5	1	27	10	160	115	35	35	35
Mandarin Orange	4,532	373	2	29	40	31	24	57	13	175	175	175
Other Citrus	4,373	92	18	4	1	-	14	48	-	7	7	7
Duku & Langsat	4,471	2,259	85	71	10	208	6	1,607	281	120	120	120
Cashews	4,683	154	-	-	-	-	154	-	-	-	-	-
Mango	1,864	108	8	10	1	1	13	38	35	1	1	1
Rambai	1,502	95	2	2	1	20	10	35	-	24	24	24
Chempedak	2,602	155	55	2	5	5	20	33	20	15	15	15
Other Fruits	3,725	408	190	18	16	41	45	68	15	14	14	14
	<u>165,877</u>	<u>52,656</u>	<u>8,407</u>	<u>1,397</u>	<u>6,379</u>	<u>983</u>	<u>556</u>	<u>7,572</u>	<u>25,584</u>	<u>1,933</u>	<u>1,933</u>	<u>1,933</u>

TABLE 2 ACREAGE OF FOOD CROPS - W. MALAYSIA AND JOHOR - SOLE CROP EQUIVALENT 1968

	W. Malaysia	Johor	B.P.	J.B.	Kluang	Johor K.T. Districts Mersing	Muar	Pontian	Segamat
Sweet Potatoes	13,107	889	115	98	22	15	228	93	165
Groundnut	5,413	99	3	10	4	3	24	-	30
Vegetables	18,262	1,515	283	406	73	48	126	179	400
Sugar Palm	264	7	-	-	-	-	-	-	7
Colocasia	1,558	691	300	12	13	5	140	210	5
Yam	561	55	55	-	-	-	-	-	-
Water Melon	3,684	350	-	-	19	5	2	-	60
Soya Bean	93	15	-	-	-	1	-	-	-
Pulses	160	-	-	-	-	-	-	-	-
Ragi	48	1	-	-	-	1	-	-	80
Rock Melon	186	80	-	-	-	-	-	-	-
Ubi Kemili	189	-	-	-	-	-	-	-	-
	<u>43,525</u>	<u>3,702</u>	<u>756</u>	<u>526</u>	<u>131</u>	<u>78</u>	<u>520</u>	<u>482</u>	<u>747</u>

The type of week to week variation in produce prices and the retail/farm price spread is shown in figure 1, which traces the average weekly prices for local cabbage from January 1969 to June 1970. Wholesale and retail prices are for Kuala Lumpur and ex-farm is for Cameron Highlands. Quarterly average prices have been:- (\$ per pikul)

<u>Ex-farm</u>	1969		1970	
	<u>1st Quarter</u>	<u>2nd Qrt.</u>	<u>1st Qrt.</u>	<u>2nd Qrt.</u>
Ex-farm 1st grade	16.00	21.27	9.19	12.61
2nd. grade	14.50	19.14	7.10	10.75
Wholesale - K.L.	29.00	36.40	23.65	24.91
Retail - K.L.	41	56	38	38

The farm-retail spread here is quite wide, 25 cents or more, per kati. Probably about one-quarter to one-third of the material sold from the farm is either waste such as outer leaves or is left unsold and has to be disposed of either at much lower prices or thrown away. Thus in the second quarter of 1970 the average amount realised at retail, per kati shipped ex-farm was probably 25-28 cents. This then leaves 12-15 cents to cover transport, handling charges etc.

As noted earlier the total acreage required to produce domestic requirements of fruits and vegetables is relatively small and there is no real shortage of land for this purpose. Unless any part of the Project Area is peculiarly suited to one or more of these crops and could supply most of the national requirements (to date there has been no indication of such a position) then there appears to be little justification in attempting to plan fruit or vegetable schemes in the Project Area to meet domestic needs

The Singapore Market

The Singapore market for fruit and vegetables is in effect an extension of the Malaysian market, since with the direct road and rail link produce can be quickly and easily transported between the two countries and

TABLE 3 WHOLESALE AND RETAIL PRICES OF SELECTED VEGETABLES - JOHOR BAHRU
JANUARY - JUNE 1970

Commodity	Level	Cents/Kati					
		January	February	March	April	May	June
Cabbage - Long	Wholesale	37	39	45	61	70	72
	Retail	48	47	55	72	81	84
Kangkong	Wholesale	22	20	22	20	17	18
	Retail	27	25	28	25	25	24
Cucumber	Wholesale	22	20	20	20	10	15
	Retail	27	25	25	25	18	20
Long Beans	Wholesale	28	29	28	34	14	17
	Retail	32	34	33	40	24	24
Sweet Potato	Wholesale	12	12	12	12	11	11
	Retail	15	15	15	15	15	15
Fresh Green Chillies	Wholesale	35	41	42	51	16	19
	Retail	40	45	47	58	30	32

Source: F.A.M.A.: Quarterly Commodity Statistics Vol. 1 No. 2 April/June 1970

there are strong historic trading links between them. Tables 4 and 5 show that the vast bulk of Malaysia's fruit and vegetable exports go to Singapore.

Johor is of course ideally situated to supply the Singapore market, especially with relatively perishable products. Vegetable production in Johor for this market is concentrated in two areas, Kelapa Sawit -- Bukit Batu and Tangkak. Main crops are cucumbers, chillies, hairy squashes, long beans and sword beans. Leafy vegetables are not grown since they find it difficult to compete with Singapore's own supply because of the problem of maintaining freshness. Sub-tropical and temperate crops e.g. tomatoes, cabbages are mainly shipped from Cameron Highlands, and other fruits e.g. durians, pomelos, and other citrus, and rambutans from more northern states.

The other major supplier of fresh fruit and vegetables is Indonesia and Johor growers complain that because of low labour costs in Indonesia they find it difficult to compete. Unfortunately the proportion of Singapore's supplies which come from that source is not known as no data are published on Singapore trade with Indonesia. This means ~~that~~ it is not really possible to estimate the size of the Singapore market. It was estimated in 1967 by the Primary Production Department that there were about 4,400 acres of vegetables in the republic yielding 30,000 tons of produce. In addition there were 3,000 acres of tapioca, sweet potatoes and sundry root crops. Fruit acreage amounted to 4,500 acres, half of which were rambutans. This information leaves us very much in the dark as to the potential size of the market for fresh fruit and vegetables in Singapore. However there is a slow but steady increase in production in the Kelapa Sawit area.

Other Exports

Because of transportation and storage problems, the majority of exports of other fruits and vegetables produced in Johor must be in some processed form. Because of disease problems in particular, to be discussed later in the paper, the range of fruit and vegetables which can be grown economically in Johor is relatively limited. It is felt that those where Johor is likely to have production

TABLE 4 EXPORTS OF FRUITS - WEST MALAYSIA 1966-68

Commodity	Country	1966		1967		1968	
		Quantity	Value	Quantity	Value	Quantity	Value
Mandarin	(tons) Singapore	190	72,444	18.7	7,743	220	77,943
	Other			10.8	6,126	1	
	Total	190	72,444	29.5	13,889	221	79,281
Other Citrus	(tons) Singapore	25.7	14,538	200.6	63,512		
	Other			0.3	188		n.a.
	Total	25.7	14,538	200.9	63,710		
Bananas	(tons) Singapore	19,593	2,300,668	19,400	1,949,380	17,036	1,989,814
	Other Tropical Fruit(Tons)	5,749	2,377,907	14,926	4,836,024	20,662	5,293,546
	Others	430	135,491	65	20,502	-	304
Total	6,179	2,513,398	14,991	4,856,526	20,662	5,293,850	
Other Fresh Fruit	(tons) Singapore	1,804	255,845	2,111	302,161	3,477 ⁽¹⁾	567,840
	Other	16	3,004	31	26,403		
	Total	1,820	258,849	2,142	328,564		

Source: W.Malaysia Trade Statistics
 (1) From Singapore Data

TABLE 5 EXPORTS OF VEGETABLES - WEST MALAYSIA 1966-68

Commodity	Country	1966		1967		1968	
		Quantity	Value	Quantity	Value	Quantity	Value
Legumes (mainly dried) tons	Singapore	43	28,458	64	39,545		
	Other	1,162	472,366	186	93,335		n.a.
	Total	1,205	500,824	250	132,880		
Onions	Singapore	193	50,668	167	51,629		
	Other	517	157,580	99	30,665		n.a.
	Total	710	208,248	266	82,294		
Garlic	Ceylon	70	49,906	91	82,805		
	Others	7	5,856	11	8,170		n.a.
	Total	77	55,762	102	90,975		
Tomatoes	Singapore	441	125,635	1,599	466,905	3,051 (1)	855,784
	Other	2	420	-	-		
	Total	443	126,055	1,599	466,905		
Other Fresh Vegetables tons	Singapore	22,531	3,730,271	26,221	3,980,883	26,834	4,104,945
	Other	-	-	57	9,340	2	754
	Total	22,531	3,730,271	26,278	3,990,223	26,836	4,105,699

Source: W. Malaysia Trade Statistics

(1) From Singapore Data

advantages over potential competitors include, rambutans, papaya, passion fruit, guava, seedless lime, green beans, sweet corn, squash, and okra (ladies fingers).

Investigations were made in trade channels of market potential for these products and the gist of the replies is covered by Appendix A, which contains the conclusions of a study by the Tropical Products Institute, London on "The Market for Exotic Fruit Products in the U.K.". (A copy of the report is on file D.48).

These investigations indicated that the potential market for these tropical products is relatively small. Because the products are unfamiliar to most consumers they are not normally handled by large scale retailers but mainly by speciality "delicatessen" type stores, or, particularly in U.K., by stores catering to West Indian, or Indian/Pakistani immigrants. Because of low volumes, marketing margins are higher than for high volume commodities e.g. canned pineapples. However demand is increasing fairly rapidly as more people become acquainted with these tropical products. Problems of unreliability of supply have frequently occurred. Any attempt to produce for export should be preceded by contact with potential wholesalers and by trial shipments. Comprehensive market information can be obtained from the Tropical Products Institute, London or from the International Trade Centre, UNCTAD/GATT., Geneva.

At the present time, the best prospects appear to be for a canned stoned, rambutan and passion-fruit juice. Other products, such as soursop juice, being developed by the Food Technology Institute, could be promising. Prominence has recently been given to new dehydration techniques e.g. accelerated freeze drying (sometimes known as Lyophilisation). However the potential market for tropical fruits and vegetables processed in this way appears to be very limited at the present time. The process is costly being about twice as expensive as conventional drying although transportation costs are reduced. While flavour retention is good, the product usually does not recover its original form (except for some items like prawns, mushrooms), and is most likely to be used in preparation of drinks, soups or pureed foods e.g. baby food.

CURRENT PRODUCTION TECHNIQUES

A study was made of a vegetable growing area near Bukit Batu about 33 miles from Johor Baharu. Several farmers and dealers were questioned during two visits to the area.

The land extends to 135 acres, divided into 3 acre lots, and was opened up in June 1969. The topography is a complex of small hills with streams running through the valley bottoms. Water is taken from these for irrigation purposes.

Most of the farmers live in Kelapa Sawit and travel out to the area daily by moto-cycle or car. Previously the area is said to have been pineapple growing pre-war and it is thought that tapioca was grown during the Japanese occupation. Since then the land has been abandoned till last year. A group of vegetable growers, led ^{by} one of their number, applied for the land when their previous land in Kelapa Sawit was taken back by the land-owner. Forty-five farmers have been given 3 acres each for which they pay \$10 per year per acre. Apparently title will be confirmed after 3 years.

The main crops grown are cucumbers, chillies, hairy squashes, long beans, sword beans and a few brinjals. All these are sold in Singapore. No leafy vegetables are grown as they cannot compete in freshness with Singapore's ~~own~~ leafy vegetables.

The farmers generally operated their land with a total of 3 family workers per plot, hiring some casual labour particularly at harvesting and replanting times. The land was originally prepared by tractor and disc plough operated by a local contractor who charged \$60 to \$70 per acre ^{for} disc ploughing three times. No set rotation of crops is followed, plantings being carried out according to advice on market conditions from the local dealers. It was said that 3 acres was all the family could manage at one time but it was constantly reiterated that at least six acres was essential for a long term enterprise as the land was rendered infertile by the very high cropping intensity practised.

On new land, 2 lorry-loads of chicken manure costing \$200 to \$250 per load and 15 bags (40 kilos each)

of artificial fertiliser at \$13.50 per bag is applied per acre (analysis 15N - 15P - 15K). After this first application only half the total amount of each is applied to every crop. Chicken manure is applied 3 times and artificial fertiliser twice to each crop. Chicken manure was stored in sheds under cover to stop leaching and loss of nutrients. Spraying of insecticides is carried out regularly on all crops. The main insecticides used are Dipterex and Basudin 60E. The cost is reported to be about \$24 per acre for spray materials. Beans are grown on ridges and staked with Chengai stakes, imported from Indonesia and bought in Singapore at 3¢ each; 9,000 stakes per acre are used and they last about 2 years or 6 crops. About 12 katis of seed are used on one acre. Most of this is saved from the previous crop but when it has to be bought for various reasons it costs \$2.50 per kati.

Yields were quoted as follows:

	<u>Yields about</u>	<u>Price range</u>
Long beans	9,000 katis	5 to 20¢ per kati
Short beans	8-12,000 katis	10 to 40¢ per kati
Cucumber	8-16,000 katis	3 to 20¢ per kati
Hairy squash	16-20,000 katis	4 to 10¢ per kati
Chillies (red)	3,000 katis	10¢ to \$1.50 per kati
(green)	4,500-6,000 katis	10¢ to 30¢ per kati

	<u>Usual price</u>	<u>No. of plants per acre</u>
Long beans	15¢	9,000
Short beans	20¢	8,000
Cucumber	8¢	8,000
Hairy squash	10¢	4,000
Red chillies	50¢	3,000
Green chillies	20¢	

Three crops per year were obtained from cucumber, squash and long beans and 1 crop per year from chillies because the chilli yielding season extends over 4 to 5 months. Chillies were a risky enterprise as they were attacked by an unknown fungus, possibly Colletotrichum sp., and Phytophthora sp. From the look of the infection it would appear that this could be controlled by Bordeaux mixture or some other copper fungicide. Use of this would, however, entail washing of the chillies before

marketing. Beans were attacked by a small stem borer which was still evident in spite of frequent spraying. This was apparently ineffective but it is suspected that spraying is mostly carried out during the heat of the day and absorption of the systemic insecticide may be more effective if spraying is done early or late in the day.

No advice was apparently available to the farmers and none was actively sought. The farmers use their sprays and fertilisers on a trial and error basis, trying each at varying rates and strengths.

Most of the credit requirements of the farmers' operations would appear to come from the local dealers in Kelapa Sawit. Certainly production credit is available from this source but it is thought that small personal loans were made as well. In return, crops are marketed through the dealer who supplies the credit. There is a slight price differential between dealers but apparently not enough to warrant anyone shopping around for a better price.

The dealers claim that since the inception of the scheme business had increased by 50%. They supplied agricultural inputs as well as buying the crop but were not in the position to give advice on the use of these inputs.

The main problems seemed to be centred around the availability of technical advice. While many advanced chemicals and fertilisers were being used, these were tried at various dilutions, application rates and in various mixtures. Nothing is known of the actual value of rotations in controlling pests and diseases which thrive in the warm humid conditions experienced. Irrigation was carried out by using fixed pumps and plastic hand held hoses with a spray rose. While this is a cheap method, many instances of watering in the heat of the day were observed. This practice is both wasteful of water due to the high evaporation rate and potentially harmful as the sun can burn wet leaves.

In general, very high labour inputs are evident. This is possibly a reflection on the lack of alternative opportunities, or a shortage of land to the individual and a low capital situation. A farmer with a larger acreage would have to develop and use labour saving techniques. This is shown in the following section on the production costs of green beans which is one crop with a potential for canning.

PRODUCTION AND PROCESSING COSTS OF GREEN BEANS

Available information is somewhat scanty. Data from the United States suggest the following breakdown of canning and freezing costs for green beans:

	<u>Canning</u>	<u>Freezing</u>
	<u>(Percent)</u>	
Raw Material	18.25	24.06
Processing:-		
Average fixed cost	5.54	9.59
Wages	10.10	13.32
Supervising	2.00	2.65
Packaging	34.22	21.48
Supplies	9.88	8.88
Inventory Tax and Selling Expenses	10.00	10.00
Top level management	10.00	10.00

Source

D. Freeman "International Competition in Producing, Processing and Marketing Snap Beans". Unpublish. Ph. D Thesis, University of Minnesota, 1968.

These figures suggest that raw materials comprise 18 to 24 percent of the total costs. The higher proportion for freezing reflects the lower packaging costs involved. Malaysian pineapples fetch about \$1100 per ton cif. U.K. Allowing for transport charges etc. this amounts to about 42 cents/lb ex-factory. The canners pay 2.8 cents per pound for fruit of which 75 percent is waste. This means a gross fruit cost of 11 cents per pound or about 26 percent of the total.

The price of canned green beans in the U.S. in 1966 was 17 U.S. cents/lb. Assuming the cif. price for imported supplies is the same and freight rates are similar to those for pineapples this would mean an ex-factory price here of about 43 cents per pound. Using the above range of raw material proportions i.e. 18 to 26 percent, this could mean a factory price of raw beans of about 7.3 to 11.2 cents/lb or 9.7 to 14.9 cents/kati. In the first half of 1970 the retail price of french beans in Johor Baharu averaged 41 cents per kati, and long beans averaged 32 cents. Assuming farm price is half retail this would mean farm prices of

about 20 and 16 cents per kati respectively. Thus prices would probably have to come down if this product is to be processed and exported competitively.

Data on production costs of vegetables in Malaysia are scarce but some comparison of costs is possible for french beans where data are available for W. Malaysia and U.S.A. The comparison is not exact since different production techniques are used. In the U.S. dwarf varieties of beans are used which are cultivated and harvested mechanically. In Malaysia climbing varieties are grown which are provided with stakes for support. Because of the presence of the stakes cultivation and harvesting has to be carried out manually. However, the fixed costs of providing stakes etc. are usually spread by growing two or three consecutive crops on the same set of stakes. The data presented in Table 6 for W. Malaysia assume 3 crops are grown on one set of stakes and the cost is spread over the 3 crops.

Table 6

per acre
Production Costs for Green Beans, W. Malaysia and U.S. (\$)

Item	Malaysia	U.S.	
		<u>New York</u>	<u>Mississippi</u>
Herbicides		14.00	8.60
Insect. & fungicides	25.00	6.75	18.75
Fertiliser	93.00	53.40	61.05
Seed	30.00	93.00	105.00
Fuel & oil	-	3.00	3.00
Land preparation	5.00		
Stakes	50.00		
Labour	450.00	24.03	22.30
Management		24.03	22.30
Machinery		36.00	48.50
Irrigation		-	51.00
Harvest	.	49.05	66.50
Land tax	3.00	12.63	1.65
Hail insurance	-	9.09	24.18
Interest	-	6.45	7.41
	<u>656.00</u>	<u>331.43</u>	<u>440.24</u>

Cost per lb at various yields:-

<u>Item</u>	<u>Malaysia</u>	U.S	
		<u>New York</u>	<u>Mississippi</u>
2.0 tons/acre	14.64	7.39	9.82
2.5 tons	11.71	5.91	7.86
3.0 tons	9.76	4.93	6.55
3.5 tons	8.37	4.22	5.61

Sources - Malaysia - College of Agriculture Serdang
 - U.S. - Freeman.

The expected yields in these areas are 3 tons in Malaysia, 2 to 2½ tons in New York, 2½ to 3 tons in Mississippi under irrigation. This means production costs per lb of about 9-8 cents in Malaysia, 6.6 cents in New York and 7.2 cents in Mississippi. The categories in the above table are not exactly comparable but a number of major differences stand out as being mainly responsible for the higher costs in Malaysia:-

(a) Insecticide and fungicide costs. In the humid warm climate of Malaysia fungi and bacteria are considerable problems. The \$60 per acre per crop here refers to 3 gallons/acre at \$20 per gallon ingredient unspecified. This does appear rather excessive in comparison to other crops.

(b) Fertilisers

Malaysia:- 7 bags Nitrophoska green

= 92.4 lbs. N

= 92.4 lbs. P2O5

= 92.4 lbs. K2O

U.S. - Newfolk = 54 lbs. N

= 72 lbs. P2O5

= 24 lbs. K2O

Mississippi = 62 lbs. N

= 70 lbs. P2O5

= 35 lbs. K2O

Use of all major nutrients as reported in Malaysia was higher than current use in U.S. This is partly reflected in higher yields but may suggest excess use of nitrogen (since the crop is a legume) and K₂O although Malaysian soils are generally deficient in this element.

(c) Labour. Labour charges (including management) are

10 times as high in Malaysia as in U.S. This is partly because of the use of hand methods. The total cost is estimated as 120 man days/crop/acre at \$3.78 per day. Since a high proportion of this labour will be from the family the amount recorded is perhaps an overestimate of the amount which would be used if it all had to be paid for (or put another way, the opportunity cost of the labour is less than \$3.78 per day).

Thus there would appear to be some scope in Malaysia for reducing the production costs noted above. However, since it was noted earlier that the factory price of beans would have to be about 8-10 cents per pound or so, the margins involved are likely to be very slim, and, given that prices for direct retail sale generally fluctuate between 7 and 20 cents per lb., it is likely to be difficult to persuade growers to accept contracts, or to sell on any regular basis at price levels as low as this.

In general, therefore, the prospects for large scale fresh fruit or vegetable (excluding pineapples) production in the Project Area do not appear to be particularly exciting. There are a number of food processing companies in the country mainly producing for the local market, with some export sales. Some of these are trying to process local raw materials on a small scale. The Food Technology Institute has also been investigating this problem for some time without achieving any real breakthrough. At the moment none of these processors are located in Johor. There could be some value in attempting to persuade one or more to move to the area, perhaps using fish and meat and as well as fruits and vegetables as raw materials.

A POSSIBLE PROJECT IN TANJONG PENGGERANG

The Chemaran development unit in Tanjong Penggernag consists of 3400 acres gross, of which about 3000 is believed to be plantable. It is located inland of the proposed initial tourism project and adjoining the proposed urban development zone and master village. About half the area consists of deep Marang soils suitable for all crops except rice. The other half of the area is riverine alluvium which is liable to flood. Actual flooding status is unknown but, situated around the head waters of S. Chemangar, risk of flooding could be slight. This land is known to be

suitable for grass but detailed survey is necessary before suitability for other crops is proven.

The location and physical qualities make careful consideration of the use of the area necessary. The area could eventually serve the needs of the urban zone for perishable commodities such as fruits, vegetables and milk. Undoubtedly, suitable sites would be found for inland fish culture. If nothing else, the riverine areas would grow grass and thus support dairy farming which could provide the needs of milk and veal to both the resident and tourist populations.

There is, however, the uncertainty of the rate of growth of the tourist and urban developments which acts as a constraint on planning in the area. There is also the need for fairly early development of this promising piece of land which will be well served by a spur road off the Penggerang Highway. This road should make the area accessible by 1974.

If the area is developed to rubber or oil palm, the advantage of the potential for a wide cropping range is negated. If, on the other hand, the area is planted to vegetables and fruit in the early stages, these products may meet a very limited market until the tourist development starts to fulfil its promise.

The answer may be to consider the establishment of a processing and preserving industry in the master village, which will provide the primary market for high value, perishable produce and which can market firstly in Johor Baharu and Singapore and eventually in the tourist area as well. Processed products should find a ready market in the tourist area even though it is on the doorstep, as there should be a demand for quality graded produce, processed and packed for convenience for the larger catering concerns.

The two main processes involved would probably be canning and freezing, although Accelerated Freeze Drying may be eventually both feasible and appropriate.

Investment in such a plant could be either private, public or joint venture. It is possible that MARA or SEDC might be interested in such a venture.

Investment in the primary production could also be private or public. If a processing plant were to operate successfully in a new area, there is a case for at least a high proportion of the production to be coordinated through

contract with the requirements of the markets for the processed products. This may also be an appropriate operation for either MARA or SEDC.

The enterprise should be evaluated by the investor with the active help and cooperation of the Food Technology Division which itself is constantly attempting to develop and test market local processed food products. The area should be developed in relation to the best crops for processing and rate of development may depend largely on the efforts of the Food Technology Division.

It is also possible to foresee such a scheme serving two further objectives. Being a new type of agro based industry, it would be an ideal base for the employment and training of youths. These could be employed on the scheme for cash wages of, say, \$100 per month, with the balance of a commercial wage, say another \$20-30 per month, being held back and invested. They would also, perhaps, be entitled to a share of the profits and this too could be held back until they leave after a set period. In this way, they would be trained in a sophisticated form of agricultural activity, would have opportunities to develop and demonstrate a variety of skills such as management, extension and business acumen and would be able to leave with a small capital sum. It is suggested that the utilisation of the capital should not be restricted in any way.

The enterprise could also extend its activities to the numerous villages that will be developed in Tanjong Penggerang. FLDA villages are being planned with 50-60 acres of crop land apart from the main enterprises. Field officers from the farm and from the processing plant could stimulate production of the right crops and could award contracts, regulate deliveries, check produce quality and give general technical advice.

As has been mentioned before, there are little data on the production parameters of the majority of fruits and vegetables. These must be developed. No attempt is made here to evaluate the scheme but the Ministry of National and Rural Development, MARA, SEDC, MARA and the Food Technology Division could all cooperate in an evaluation.

Possible crops for consideration would be:

French beans

Okra

Cucurbits

Chillies

Sweet corn

Passion fruit

Durian

Papaya

Guava

Seedless rambutans

Seedless limes

Soursop

Starfruit

Others - Dairy

Fish farming

All of these are **suitable** for some form of processing although both technical and market research has yet to be carried out.

APPENDIX A

THE MARKET FOR TROPICAL FRUITS

A report has recently been produced by the Tropical Products Institute entitled "The Market for Exotic Fruit Products in the U.K.". This deals in considerable detail with the characteristics of the market, tariffs and trade restrictions, trade channels and promotion and advertising. A copy is available on File SEJP/3/D48. The conclusions of this study give a good review of market conditions for tropical fruits and vegetables and are therefore reproduced below:-

"With one exception - mangoes in brine - all the exotic fruit products now imported into the UK are ready to consume and the bulk goes to the retail trade; a proportion goes to specialist caterers, principally Chinese and Indian restaurateurs, and a small quantity of tropical fruit salad may be used in the production of an ice cream sundae.

The retail market may be thought of as being divided into three fairly distinct groups - "British", "Indian"⁽¹⁾ and "West Indian". It is in fact her relatively large immigrant population which explains why the UK is the foremost importer of exotic fruit products in Europe.

Imports of (or in some cases notional demand⁽²⁾ for) ready to consume products amount to some 4,000 tons per annum at present, while about 850 tons of brined mangoes (for chutney manufacture) could be used if supplies were available.

Only small quantities of nectars are imported. Europeans do not like these ultra-sweet products and even peach and apricot nectars (relatively more popular than tropical fruit nectars) are only occasionally encountered. So far as immigrants are concerned, one importer who specialises in immigrant foodstuffs believes that temperate climates are not conducive to the consumption of nectars.

Juices of passion fruit and mango (some members of the trade define the mango product as a nectar) are imported, respectively some 20 and 40 tons. The former goes principally to the "British" market and the latter to the "Indian" market.

(1) The term "Indian" as used here to identify a sector of the market should be interpreted as including both Indians and Pakistanis.

(2) "Notional" demand is the estimated total current demand if supplies were available.

The only significant pulp import is mango (150 tons) which goes almost wholly to the "Indian" market.

Guava jelly (60 tons) and mango jam are imported, the latter is sold exclusively to Indians while the former is in demand in all three markets but is nevertheless sold mainly to immigrants.

Fruits in syrup comprise the bulk of the exotic fruit products imported, with lychees (1,575 tons) heading the list, followed by tropical fruit salad (925 tons), then by guavas and mangoes (each about 500 tons), after these comes pawpaw (125 tons) and finally a number of fruits such as tamarind, cape gooseberries, etc., which are imported in only small quantities.

Whereas in the trade in "volume" fruit packs the traditional wholesaler is disappearing he is still an important link in the distributive chain for exotic fruit products, although some firms may combine the import and wholesale function. Most of the importers and wholesalers engaged in the trade have specialised in handling these and possibly other "moderate" volume commodities; however they may be divided to some extent into groups according to the rather distinct markets which they supply - "British", "Indian" and "West Indian" and in the case of lychees, Chinese restaurateurs.

The main retail outlets are department stores, delicatessens and shops specialising in the sale of immigrant foods. Multiples do not as a rule buy many of these commodities centrally as is their practice for most items (exceptions as regards tropical fruit salad, guavas and lychees may be found); however individual branch managers may buy and stock them if local conditions warrant it.

Officially published trade data are so meagre that it is impossible to determine past trends or predict future prospects statistically; however some members of the trade have commented on these aspects. One leading importer supplying the "British" market said that the demand for all types of canned exotic fruits which he handled had increased at a rate of about 20 percent over each of the last two to three years and that demand would continue to increase but probably at a rather slower rate; he mentioned pawpaw as having particularly good prospects. However another importer also supplying the "British" market thought that little expansion would

take place until prices declined. An importer whose interest is in immigrant foods said that his trade in exotic fruit products had doubled in two years but warned against interpreting this as a national growth rate. Another possible indicator of future prospects is that some importers whose trade is in "volume" lines are keeping a "watchful eye" on, for example, the prospects for mangoes.

It will be seen that opinions diverge somewhat but the general tenor of the comments recorded above, and of others, is optimistic. There are however qualifications such as "supplies are erratic and this hinders progress", "prices are too high", "quality is of fundamental importance and only the presently imported products measure up to the required standards, there is some variation even in these products", "labelling of some samples seen leaves much to be desired".

The problem of labelling should be easy to resolve if overseas supplies are prepared to take the advice of importers and/or experienced label manufacturers.

As to quality, importers are very keen to see samples, comment and offer advice since they are mostly very interested in new sources of supply. The main quality factors are grading, colour, peeling, flavour, absence of foreign matter and no de-tinning. The importers are in the best position to advise on quality but it must be recalled that there are "markets within the market" particularly as regards mangoes.

The erratic nature of supplies is a problem aggravated by there being only a few suppliers who may wilfully (changes of emphasis on domestic and export marketing policies), or unintentionally (adverse weather conditions) alter the supply situation - hence the eagerness of importers to find alternative sources of supply.

The problem of price is fundamental to the future prospects for exotic fruit products. It has been seen that most exotic fruit products are considerably more expensive, weight for weight, at retail level than "volume" line popular fruits. This is due in part to high distributive margins and in part to high import prices. So long as these products are distributed through the present trade channels in relatively small quantities margins are bound to remain high because (a) of the type of retail outlet stocking them and

(b) the importers and wholesalers need higher margins to cover their costs and make a reasonable profit. The question then is whether or not a reduction in the landed price is on the one hand possible and on the other likely to stimulate demand to such an extent that these products attract the interest of the "mass" market and become commonplace items in multiples. In the absence of definite information to the contrary it does not seem that these products receive exports subsidies so the landed prices in the UK, assuming that only "normal" profit margins are made, must therefore reflect production costs, price levels on the domestic market and export marketing costs. Canneries in developing countries are frequently relatively small concerns and cannot therefore enjoy economics of scale, besides which fruit supplies may be problematic. It seems unlikely therefore that prices of these fruits will fall to the common level of major fruit packs.

Furthermore, what stimulus to demand would result from a narrowing or closing of the gap between retail prices for exotic and popular "volume" line fruits? This is of course extremely difficult to assess; however it might be noted there is one product - guavas - whose price is competitive with major fruit packs and another - tropical fruit salad - whose price is competitive with deciduous fruit salad yet the imports of these commodities have not increased dramatically, nor do the importers expect them to do so. Price is not therefore the only constraint - unfamiliarity is another and although price reductions would probably stimulate demand, whether or not exporters' net profits would improve is another matter. Familiarising the public with the products is a promotional exercise the cost of which would have to be carefully evaluated. On balance it seems that a premium is justified for exotic fruit products because present day consumers do not buy on impulse and are prepared to pay the premiums currently asked. Furthermore the rate of growth in demand is generally better than for "volume" packs which suggests that the activities of distributors are widening the market despite the high prices asked. Moreover, the market has more often suffered from conditions of under than over-supply so canners would be best advised to concentrate on solving this problem if possible, striving all the time to reduce costs, so that latent

demand can be encouraged and met."

Other reports and material on a number of fruit and vegetable products are available on files SEJP/3/D.12 and D48.

