

PRODUCTION AND MARKETING HANDBOOK FOR HORTICULTURAL CROPS IN BARBADOS

by
James S. Lohoar



SIMON BOLIVAR FUND

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PROJECT: FOR THE IMPROVEMENT OF THE AGRICULTURAL
MARKETING SYSTEM IN BARBADOS
SIMON BOLIVAR FUND

PRODUCTION AND MARKETING HANDBOOK
FOR HORTICULTURAL CROPS
IN BARBADOS

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INTRODUCTION

In 1979, an agreement was signed between the Ministry of Agriculture Food and Consumer Affairs and the Inter-American Institute for Cooperation on Agriculture (IICA) for technical assistance in the field of agricultural marketing. The project is financed by funds from the Simon Bolivar Fund. The overall objective of the agreement is to improve the performance and efficiency of the marketing system in Barbados for non-sugar crops by strengthening the capabilities and marketing services of the Barbados Marketing Corporation (BMC) and other organizations involved in this field.

The various investigations undertaken as part of the project have generated a substantial volume of material which will be of value to those working in the horticultural sector. At present there is a need for improved integration of the production and marketing of horticultural produce in Barbados. If this can be achieved, it will be possible to generate increased sales of vegetables, root crops and fruit both within Barbados and in intra and extra regional export markets. The Handbook therefore emphasizes the need to consider market requirements when production decisions are being made.

In the Handbook, the results of a number of investigations undertaken within the project are summarized together with the findings of a number of other studies. It is hoped that the information will prove useful for producers, extension personnel and others working in

This One



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the horticultural sector. The Handbook should be used alongside the planting recommendations published by the Ministry of Agriculture in relation to crop varieties, fertilizers, sprays, etc.

The helpful collaboration of the Planning Unit of the Ministry of Agriculture, the BMC and the staff of the Barbados Agricultural Society in the provision of data and assistance is gratefully acknowledged.

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PRODUCTION AND MARKETING HANDBOOK
FOR HORTICULTURAL CROPS
IN BARBADOS*

1. BACKGROUND

Although sugar cane has traditionally been the major crop in Barbados, in recent years the production of non-sugar crops, particularly of vegetables, root crops and fruit has increased in importance. A well defined horticultural sector has now developed and is likely to continue to expand as the demand for fruit and vegetables grows and the price of imported produce continues to increase. The make-up of the horticultural industry can be viewed in relation to production and marketing as follows:-

(i) Production

Vegetables, root crops (mainly yams and sweet potatoes) and fruit are produced almost exclusively by the private sector in Barbados. The only exception to this is limited plantings (approximately 80 acres) of vegetable crops - mainly carrots, cabbages and onions - by the Barbados Agricultural Development Corporation (BADC).

Barbados has both "small" (less than 10 acres) scale and "large" scale (10 acres and over) producers of horticultural crops. The most recent census (1971) suggests there are some 12,600 holdings in the "small" category but only 230 in the large. At that time there were only 16 holdings in excess of 500 acres.

.../...

* *The assistance of Marcia McDonnough and Lucy Harris in the preparation of this Handbook is gratefully acknowledged.*

Vegetable production in Barbados is estimated to cover some 1750 acres, 1200 acres of which are irrigated. The probable location (based on an earlier survey) of this production is concentrated in the low rainfall zones in St. Philip and Christ Church. The 1200 irrigated acres in vegetables consist of 500 acres in small holdings (usually less than $\frac{1}{2}$ acre) and 700 acres in vegetable production on medium sized farms, and on some sugar estates that in recent years have selectively experimented with diversification because of the limited financial returns from their sugar operations. The total vegetable output (including onions) is currently estimated to be of the order of 10,000 metric tons.

(a) Large scale production on sugar land

Most large scale farms primarily produce sugar cane. These farmers also grow some vegetables and, to a lesser extent, fruit either by:

- i) Planting between the ploughing out of one cane crop and the planting of the next (typically during the wet season of June to December); or by
- ii) Taking land out of cane production for a year or more and planting vegetables during this period.

Until recently, vegetables grown on cane lands have been rain-fed and therefore largely dependent on the weather, or yield and time of harvest. However, in the last few years irrigation has become more common and a 12-month (or longer) rotation of vegetables with sugar is now practised more frequently. Three horticultural crops are usually grown before returning the land to sugar cane.

Data compiled by the Barbados Agricultural Society indicate that a total of 52 "large" farms have at least part of their land planted in vegetable crops.

(b) Production of fruits and vegetables by small farmers

About 2,000 small farms (0.1 to 10 acres) grow horticultural crops for sale, although some 80% (40,000) of all households grow vegetables or fruit for their own use. Most small horticultural farms are rain-fed but an increasing number (estimated) at 50%, use at least partial irrigation.

(ii) Marketing System

The present marketing system includes the following components:-

(a) Hawkers (or hucksters)

Hawkers (or hucksters) market an important part of the island's fruit and vegetable production. A significant number of these traders operate throughout the island. Most buy for cash at the farmgate and market the produce personally- many also pick or harvest the crop. The system of distribution is entirely traditional- it has serviced the island for decades and is likely to continue for some years to come.

(b) Wholesalers

In addition to the indigenous hawker system in Barbados there are also a number of small scale fruit and vegetable wholesalers.

.../...

These wholesalers are especially active in the hotel and restaurant trade. Typically they operate out of a small van, buying produce from the farmers and delivering it to hotels, restaurants and the various institutions. They are also active in the fruit import trade.

(c) Supermarkets

The supermarket sector in Barbados is well developed when compared to other countries in the Eastern Caribbean. There are a total of about 150 supermarkets, including small village "Supermarkets". The supermarket trade generally buys directly from producers. With the exception of the larger supermarkets, fruit and vegetable sales do not normally represent a large part of the total turnover in these outlets.

(d) Barbados Agricultural Society (BAS)

The BAS operates a retail fruit and vegetable outlet three days a week. Producers bring their produce to the BAS at the beginning of the week and the market is open on Thursday, Friday and Saturday. Cold storage facilities are available and a wide range of good quality vegetables and fruit is sold to both housewives and the hotel and restaurant sector.

(e) Hotels and Restaurants

Barbados has a well developed tourist industry. In addition to tourist hotels, there is also a substantial number of better quality restaurants that cater to both tourists and residents. Some visiting cruise ships are also supplied with fresh fruit and vegetables. In 1980

there were nearly 400,000 visitors who stayed an average of 10 days. Tourists therefore represent an increase of approximately 4 percent to the total population over a full year. However, the consumption pattern of visitors reflects a higher demand for horticultural products. The tourist industry in Barbados has grown dramatically in recent years. This growth is forecast to continue in future, although at a slower rate.

(f) Barbados Marketing Corporation (BMC)

The B.M.C. is a statutory body which was established in 1963. The Corporation operates a system of contract purchases at pre-agreed prices. This in effect represents a price support programme but the prices offered are generally only attractive to producers in periods of over supply. The B.M.C. is not currently a major force in the market since for most crops it handles less than 10 percent of total output.

CHARACTERISTICS OF INDIVIDUAL OF HORTICULTURAL CROPS

II. CHARACTERISTICS OF INDIVIDUAL OF HORTICULTURAL CROPS

In order to meet the increasing domestic demand for vegetables and fruit, it is essential that more information is available for farmers to make management decisions. This is particularly necessary in the relation to the specific crops to be produced and the times of year when domestic supplies are limited.

1. Classification of Horticultural Crops

Because of the large range of different root crops, vegetables and fruit which are available in Barbados, it is helpful to classify these crops in relation to their popularity and various end uses. A classification on this basis is shown in Table 1. The various crops have been grouped in five categories:-

- i) Root crops
- ii) Major vegetables
- iii) Salad crops
- iv) Other vegetables
- v) Fruit

It is seen that nearly 60 percent of total vegetable consumption is made up of sales of carrots, cabbage, onions, beans, pumpkins and beets. Although consumption of other individual vegetables is not large, taken as a group they represent approximately 20 percent of all vegetables consumed.

In the fruit sector, the importance of melons is to be noted as these are used extensively in the tourist outlets as well as for general consumption.

.../...

TABLE 1 ESTIMATED PER CAPITA CONSUMPTION OF ROOT CROPS,
VEGETABLES AND FRUIT, BARBADOS, 1980

<u>ROOT CROPS</u>	ESTIMATED PER CAPITA CONSUMPTION (KG)
Yams	18.5
Sweet Potatoes	18.1
Eddoes/Tannias	1.9
Irish Potatoes	30.9
Cassava	0.2
Total	69.6
 <u>MAJOR VEGETABLES</u>	
Carrots	6.5
Cabbage	4.5
Onions	8.5
Beans	3.2
Pumpkin	3.0
Beets	2.0
Total	27.7
 <u>SALAD CROPS</u>	
Tomatoes	4.9
Cucumber	5.5
Lettuce	1.5
Total	11.9

OTHER VEGETABLES

Christophene	1.5
Plantains	1.4
Egg Plant	1.2
Marrow	0.7
Sweet Peppers	0.8
Cauliflower	0.6
Breadfruit	1.1
Okra	0.7
Squash	0.5
Fresh Peas	0.1
Parsley	0.1
Total	8.7
TOTAL VEGETABLES	48.3

FRUIT

Citrus

Oranges	4.4
Grapefruit	2.4
Limes	1.5
Lemons	0.1
Avocado Pears	1.4
Mangoes	1.4
Bananas	2.9
Apples	2.4
Pineapples	0.1
Paw-Paw	0.6
Water Melon	2.4
Cantaloupe	0.6

Musk Melon	0.3
Honeydew	0.2
Total	20.6
TOTAL ALL PRODUCE	139.1

SOURCE: IICA Survey of the Hotel, Restaurant, Supermarket
and Institutional Markets for Fresh Produce in
Barbados, September, 1981.

2. Seasonality of Production

A study of vegetable production undertaken in 1969 concluded

"a policy of import substitution with respect to vegetables can never be fully effective in Barbados unless some means can be found of altering the existing seasonal pattern of production so that more vegetables are produced locally, either on small holdings or estates, during the present "off-season" 1/

Although considerable progress has been made in growing vegetables more consistently through the year, there often continues to be reduced supplies during the May to November period. This reflects the lower yields obtained during the summer months when both temperatures and rainfall are higher. Against this background there remains considerable scope for profitable vegetable production during this period if the technical problems of lower yields and increased pest and disease attacks can be surmounted.

The seasonal production pattern of individual horticultural crops in Barbados is summarised in Figure 1. (Source: BMC, Relocation and Expansion of Facilities, June 1979). The resulting monthly variation in total vegetable production is illustrated in Figure 2.

.../...

1/ *Vegetable Production in Barbados, K.A. Ingesent, A.H. Brathwaite, J.O.J. Nurse, Ministry of Agriculture Bulletin N^o 3 December, 1969.*

CROP	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	REMARKS
YAMS													March-June from store
EDDOES													March-June from store
SWEET POTATOES													Low yields July-Sept.
DEANS (STRAINING)													
BEEF													
CABBAGE													
CARROT													
CAULIFLOWER													
CHRISTOPHERNE													Mainly Sept-Dec.
CUCUMBER													
EGG PLANT													
LETTUCE (HEAD)													Apparently limited by temperature.
LETTUCE (OTHER)													
MALIZE													Uneconomic for irrigated production.
OKRA													
ONION													Limited by day length
PEAS (PIGEON)													All year cultivars low yielding.
PEAS (OTHER)													
PEPPERS (HOT)													Low yields Feb-Sept. unless irrigated
PEPPERS (SWEET)													
PUMPKIN													
SQUASH													
SQUASH (ZUCCHINI)													
TOMATO													
AVOCADO													
BAKANA													
BREADFRUIT													Peak Aug-Sept. unless irrigated
CHERRY													Occasional fruit throughout the year
CITRUS (EXCEPT LIMES)													Irregular peaks unless irrigated
GUAVA													Some bearing all year round
LIME													
MANGO													Some cultivars give second crop.
MELON													
PAMPAM													
PLANTAIN													Peak Aug. - Sept. unless irrigated

FIG. 1. FOOD PRODUCTION IN BARBADOS - SEASONALITY OF MAJOR FOODCROPS (SOURCE: -DORNEY G. V., PERSONAL DISCUSSIONS)

Rainfed _____ Irrigated - - - - -

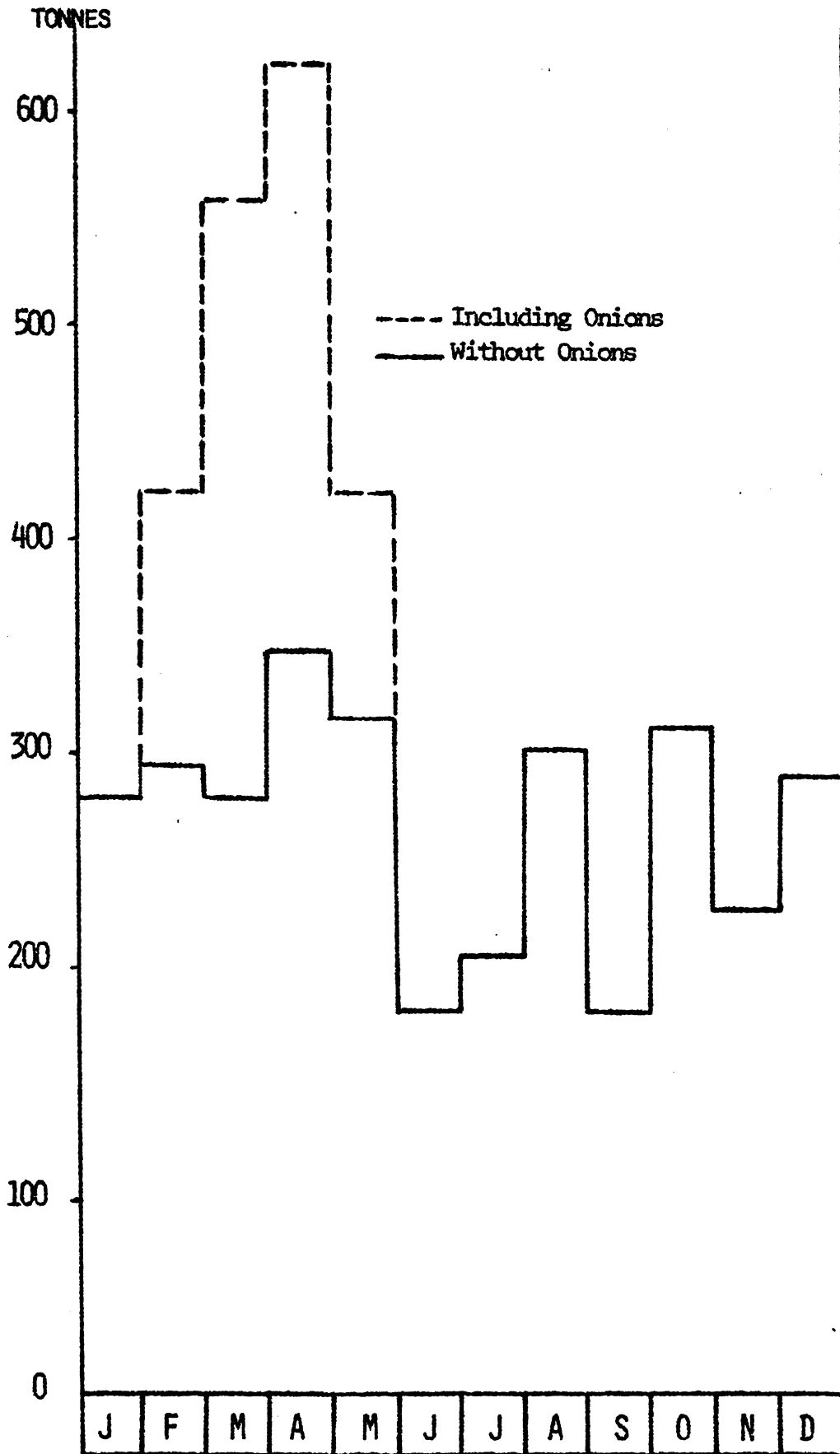


FIGURE 2 ESTIMATED MONTHLY PRODUCTION OF VEGETABLES IN BARBADOS

SOURCE BMC, Relocation and Expansion of Facilities, June 1979

COSTS OF PRODUCTION

III COSTS OF PRODUCTION

The Ministry of Agriculture compiles cost of production figures for a range of vegetables each year. In addition to being used for extension purposes, the calculations for some crops e.g. onions form the basis for establishing the prices received by farmers.

The estimated cost of production figures for cabbage, carrots, onions and yams for 1980 are shown in Tables 2 to 5. It can be seen that the costs of production per acre are similar for most crops. The key element determining the actual cost per lb. is the yield obtained per acre. In the same context, whereas the cost per acre for growing a crop in either the dry or wet season will be broadly similar (although more of some inputs e.g. sprays, labour, may be required in the wet season), the cost per lb. could be significantly lower in the dry season as a result of the superior yields frequently obtained during the early months of the year.

Average yields of vegetable crops and the duration of the production periods for individual vegetables are shown in Table 6. Similar data for fruit is shown in Table 7.

.../...

TABLE 2 ESTIMATED COST OF PRODUCTION OF CABBAGE - 1980

OPERATIONS	CABBAGE
	\$ Per Acre
VARIABLE COST:	
Land Preparation	116
Planting & Propagation	209
Weed Control	150
Fertilizer	490
Pest & Disease Control	441
Irrigation	301
Harvesting	180
Cleaning/Grading	270
Packing/Bagging	330
Transport to Farm Gate	32
Interest on Working Capital	<u>25</u>
TOTAL VARIABLE COST:	<u>2544</u>
FIXED COSTS:	
Land rent	100
Management	464
Depreciation	129
Interest on Fixed Investment	<u>21</u>
TOTAL FIXED COST:	<u>714</u>

TOTAL COST:	3257
cost per lb.	0.36

SOURCE: Ministry of Agriculture, Food and Consumer Affairs
Agricultural Planning Unit

TABLE 3 ESTIMATED COST OF PRODUCTION OF CARROTS - 1980

OPERATIONS	CARROTS \$ Per Acre
VARIABLE COST:	
Land Preparation	116
Planting & Propagation	71
Weed Control	247
Fertilizer	200
Pest & Disease Control	395
Irrigation	195
Harvesting	560
Cleaning/Grading	240
Packing/Bagging	296
Transport to Farm Gate	32
Interest on Working Capital	<u>25</u>
TOTAL VARIABLE COST:	<u>2377</u>
FIXED COSTS:	
Land rent	100
Management	410
Depreciation	129
Interest on Fixed Investment	<u>17</u>
TOTAL FIXED COST:	<u>656</u>
<hr style="border-top: 1px dashed black;"/>	
TOTAL COST:	3033
cost per lb.	0.38

SOURCE: Ministry of Agriculture, Food and Consumer Affairs
Agricultural Planning Unit

TABLE 4 ESTIMATED COST OF PRODUCTION OF ONIONS - 1980

OPERATIONS	ONIONS \$ Per Acre
VARIABLE COST:	
Land Preparation	116
Planting & Propagation	352
Weed Control	290
Fertilizer	196
Pest & Disease Control	1151
Irrigation	226
Harvesting	557
Cleaning/Grading	155
Packing/Bagging	414
Transport to Farm Gate	32
Interest on Working Capital	<u>54</u>
TOTAL VARIABLE COST:	<u>3543</u>
FIXED COSTS:	
Land rent	100
Management	618
Depreciation	101
Interest on Fixed Investment	<u>33</u>
TOTAL FIXED COST:	<u>852</u>
<hr style="border-top: 1px dashed black;"/>	
TOTAL COST:	4395
cost per lb.	0.35

SOURCE: Ministry of Agriculture, Food and Consumer Affairs
Agricultural Planning Unit

TABLE 5 ESTIMATED COST OF PRODUCTION OF YAMS - 1980

OPERATIONS	YAM \$ Per Acre
VARIABLE COST:	
Land Preparation	74
Planting & Propagation	393
Weed Control	136
Fertilizer	155
Pest & Disease Control	345
Irrigation	-
Harvesting	480
Cleaning/Grading	120
Packing/Bagging	384
Transport to Farm Gate	32
Interest on Working Capital	<u>32</u>
TOTAL VARIABLE COST	<u>2152</u>
FIXED COSTS:	
Land rent	200
Management	928
Depreciation	46
Interest on Fixed Investment	<u>39</u>
TOTAL FIXED COST:	<u>1213</u>

TOTAL COST:	3364
cost per lb.	0.28

SOURCE: Ministry of Agriculture, Food and Consumer Affairs
Agricultural Planning Unit

TABLE: 6 VEGETABLE CROPS - EXPECTED YIELDS
AND DURATION OF PRODUCTION PERIODS

Crop	Weeks to Harvest After Planting Date	Total Prod. Period Months**	Yield (kg per ha)		Main Harvest Months
			Irrigated	Rainfed ***	
Beetroot	10 - 13	3.5	7,800	3,300 - 4,400	All year
Beans (string)	7 - 10	3	8,900	3,300 - 4,400	All year
Cabbage	12 - 15	4½	15,600	7,800 - 8,900	Feb - Aug
Carrots	14 - 18	5	11,200	7,800 - 8,900	Sep - Jan
Carrots			11,200	3,300 - 4,400	Jan - Sep
Carrots			6,700	4,400	Oct - Dec
Cauliflower	10 - 15	4½	4,400	2,200 - 2,800	Feb - Aug
Cauliflower			3,300	2,2800	Sep - Jan
Cassava	30 - 50	8 - 12	-	4,400 - 13,400	Nov - Jan
Corn (field)	16	4½	-	2,600 - 3,100	All year
Corn (as cobs)	14	4½	3,300	2,800	All year
Corn (sweet)	14 - 16	4½	3,300	3,300 - 2,800	All year
Cucumber	7 - 15	4½	11,200	3,300 - 6,700	All year
Eddoes	18 - 24	6 - 7	-	5,600 - 8,900	Nov - Jan
Egg Plant	12 - 30	9	8,900	6,700 - 7,500	All year
Lettuce	8 - 12	3½	12,000	-	All year
Okra	9 - 10*	6½	6,700	3,300 - 5,600	Oct - Jan

TABLE: 6 CONT'D
VEGETABLE CROPS - EXPECTED YIELDS
AND DURATION OF PRODUCTION PERIODS

Crop	Weeks to Harvest After Planting Date	Total prod. Period Months **	Yield (kg per ha)		Main Harvest Months
			Irrigated	Rainfed ***	
Okra					
Onions	18	5	16,000	11,000-13,000	Feb - Sep
Peas (Rounceval)	12 - 15	4	-	560- 2,200	Feb - Apr
Peanuts	15 - 20	5	1,800	1,300- 1,600	Oct - Nov
Peppers (Sweet)	12*	5½	5,500	3,300- 4,400	All year
Peppers (hot)	10*	8 - 12	11,000	4,400- 8,800	All year
Potato, Irish	13 - 14	4	11,000	6,600- 8,800	All year
Potatoes, sweet	12 - 18	5 - 8	13,000	3,300-11,000	All year
Pumpkin	12 - 24	6	8,800	4,400- 6,600	All year
Radishes	6 - 8	2½	4,400	2,200- 3,900	All year
Squash (zucchini)	8	4	6,600	2,200- 4,400	All year
Squash (vine)	8*	4 - 6	6,600	2,200- 4,400	All year
Tomato	10 - 12	5½	8,800	4,400- 5,500	Feb - Aug
Tomato			3,900	3,300	Sep - Jan
Watermelon	6 - 8	4	8,900	4,400- 5,500	Sep - Jan
Watermelon	30 - 40	8 - 10	8,800	2,200- 3,300	Feb - Aug
Yams	30 - 40	8 - 10	8,800	4,400-13,000	Nov - Feb

* To start of harvest

** Giving time to complete harvest and refill the land for the next crop

*** Wide range depending upon zone and actual rainfall

SOURCE: Ministry of Agriculture Planning Unit/FAO Project 1977

TABLE: 7 FRUIT CROPS - EXPECTED YIELDS
AND SEASONALITY

Fruit Crop	Seasons		Yield (kg per ha)	
	Irrigated	Rain-fed	Irrigated	Rain-fed
Avocados	Aug - Dec	Aug - Dec	15,000	11,000
Bananas	All year	All year, peak in Aug - Sept.	33,000	17,000
Breadfruit	All year	Aug - Dec	-	30,000
Cashew	-	-	-	17,000
Cherry	Two or three peaks*	Main season Aug-Sept	-	7,500
Guava	All year	Rainy season	33,000	22,000
Grapefruit	Oct - Dec (March)	Early rains	22,000	11,000
Limes	May - Aug	May - Aug	15,000	11,000
Paw Paw	All year	All year	22,000	15,000
Plantains	All year	All year	27,000	14,000

* Irrigation allows two additional production periods.

SOURCE: Ministry of Agriculture Planning Unit/FAO Project. 1977

SEASONAL PRICE TRENDS

IV. SEASONAL PRICE TRENDS

As a result of a number of factors such as rainfall, incidence of pests and disease, availability of labour as well as variations in the demand for fruit and vegetables, fairly marked fluctuations in both farm and retail prices often occur throughout the year. For many vegetable crops, prices often decline at the end of the year until the beginning of the rainy season in May or June and then show a fairly consistent upward trend until November or December. It is not possible to predict with great precision short run fluctuations in prices, particularly for crops showing large yield variations e.g. cucumber, cabbage; however the overall movement of prices during the year tends to show a somewhat consistent pattern.

The average trend in monthly prices over a number of years can be calculated and is termed a "seasonal price index" and this is illustrated for cabbage, carrots, green beans and tomatoes in Figures 3-6, together with actual farm gate and retail prices for 1980.

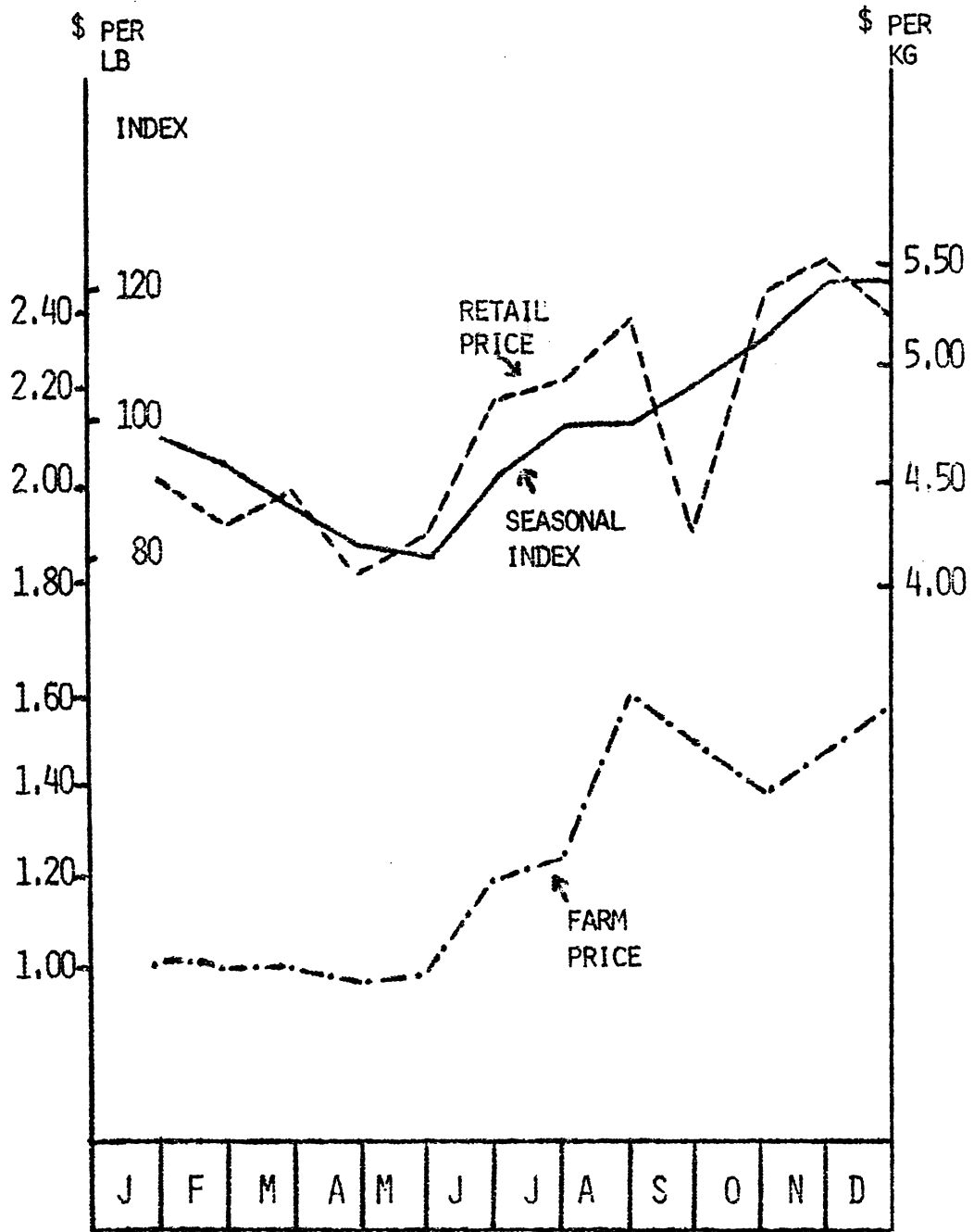


FIGURE: 4 MONTHLY SEASONAL INDEX (1974-80), FARM AND RETAIL PRICES, CARROTS, 1980.

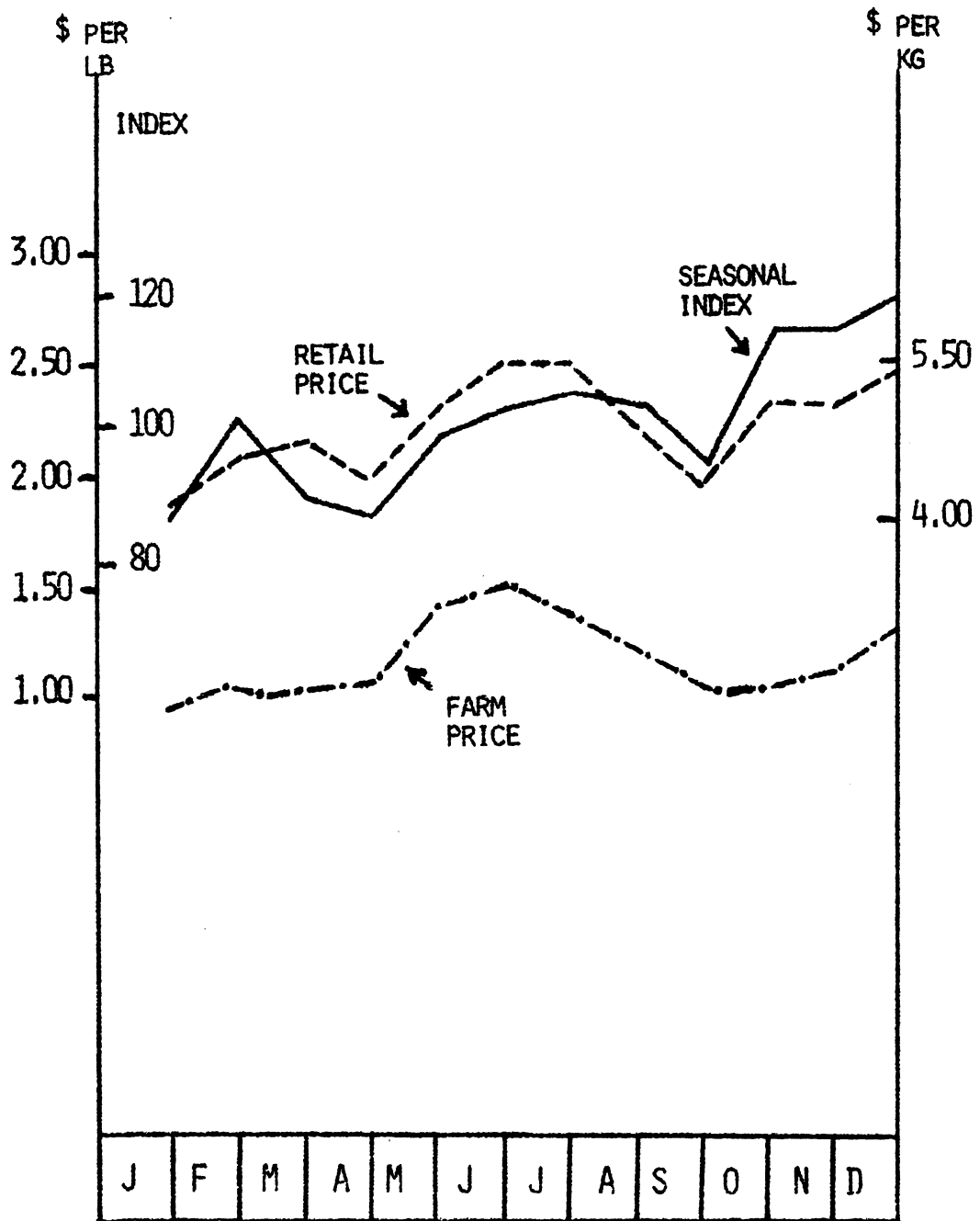


FIGURE: 5 MONTHLY SEASONAL INDEX (1974-80), FARM AND RETAIL PRICES, GREEN BEANS, 1980.

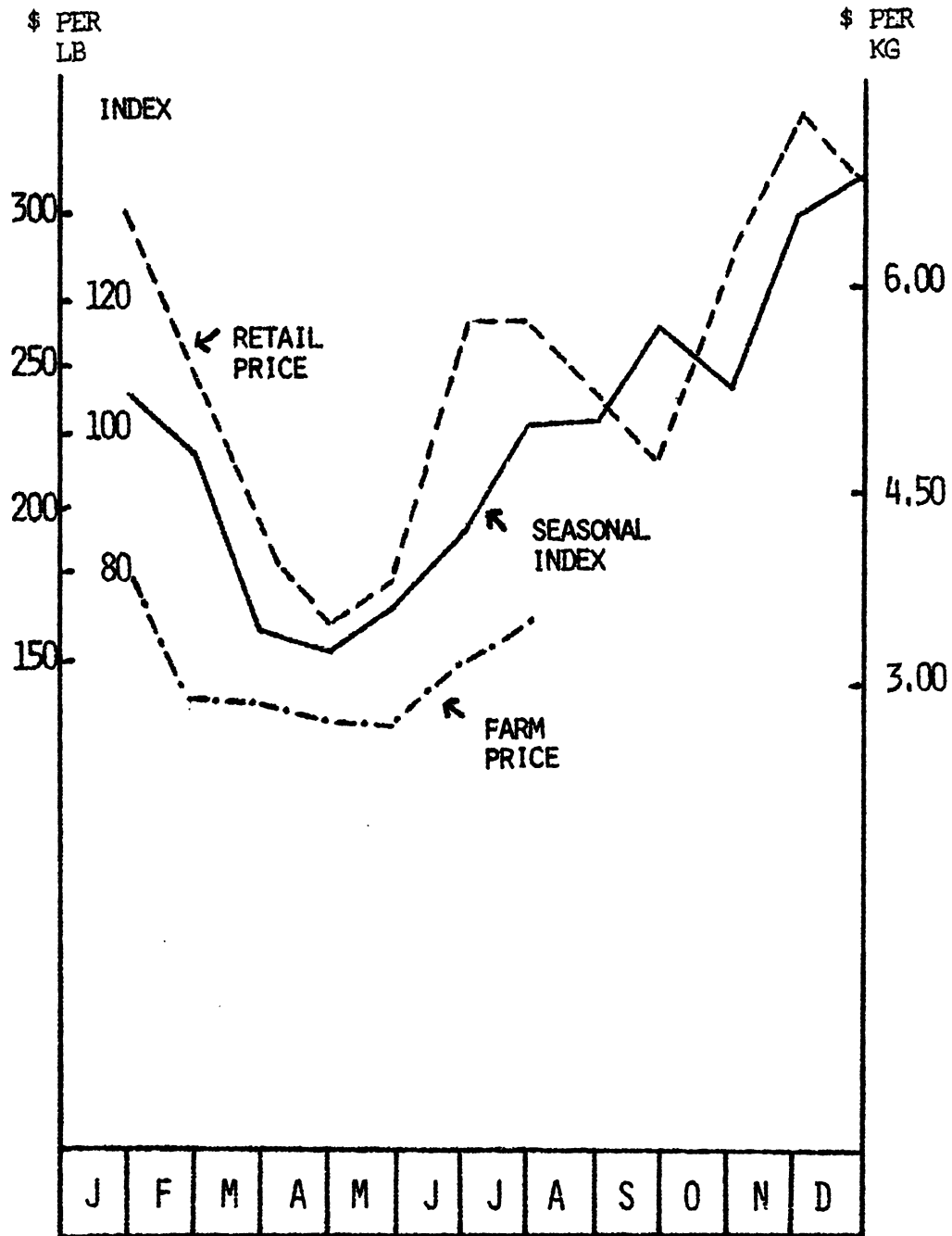


FIGURE:6 MONTHLY SEASONAL INDEX (1974-80), FARM AND RETAIL PRICES, TOMATOES, 1980.

TABLE: 8

ESTIMATED MARKET SHARES 1/
BY MARKET SECTOR AND PER CAPITA CONSUMPTION 2/
FOR MAJOR ITEMS OF FRESH PRODUCE IN 1980

<u>COLUMN 1</u>	<u>COLUMN 2</u>	<u>COLUMN 3</u>	<u>COLUMN 4</u>	<u>COLUMN 5</u>	<u>COLUMN 6</u>
Items	HRI ^a and Supermar- ket Share	Huckster and small shop Share	Home Grown and con- sumed Share	Per Capita consump- tion Estimates	Per Capita consump'n - Est. from previous Study 3/ Kg
	%	%	%	Kg	Kg
Cucumber	70	20	10	5.5	6.3
Carrots	55	35	10	6.5	6.6
Tomatoes	60	30	10	4.9	3.2
Cabbage	60	30	10	4.5	3.1
Onions	75	15	10	8.5	8.7
Beans	65	25	10	3.2	1.3
Pumpkins	70	20	10	3.0	1.1
Beets	70	20	10	2.0	-
Lettuce	90	5	5	1.5	-
Christophene	80	15	5	1.5	-
Plantains	80	15	5	1.4	3.4
Egg Plant	75	15	10	1.2	-
Marrow	80	5	10	0.7	-
Sweet Peppers	70	20	10	0.8	1.0
Cauliflower	85	10	5	0.6	-
Breadfruit	40	15	45	1.1	-
Okra	60	30	10	0.7	-
Squash	75	20	5	0.5	-
Fresh Peas	75	10	15	0.1	-
Parsley	80	10	10	0.1	-
Hot Peppers	50	20	30	-	-
<u>Total Vegetables</u>	-	-	-	48.9	37.0
Oranges	50	20	30	4.4	5.2
Grapefruit	50	20	30	2.4	3.8

TABLE: 8 CONT'D

ESTIMATED MARKET SHARES
BY MARKET SECTOR AND PER CAPITA CONSUMPTION
FOR MAJOR ITEMS OF FRESH PRODUCE IN 1980

<u>COLUMN 1</u>	<u>COLUMN 2</u>	<u>COLUMN 3</u>	<u>COLUMN 4</u>	<u>COLUMN 5</u>	<u>COLUMN 6</u>
Items	HRI ^a and Supermar- ket Share	Huckster and small shop Share	Home grown and con- sumed Share	Per Capita consump- tion Estimates	Per Capita consump'n - Est. from previous Study 3/ Kg
	%	%	%	Kg	Kg
Limes	50	20	30	1.5	1.0
Apple	65	35	-	2.4	-
Bananas	65	25	10	2.9	-
Mangoes	65	20	15	1.4	2.2
Avocado Pears	50	25	25	1.4	2.5
Pineapples	90	10	-	0.1	-
Paw Paw	55	30	15	0.6	-
Lemon	70	10	20	0.1	-
Water Melon	85	10	5	2.4	-
Cantaloupe	85	10	5	0.6	-
Musk Melon	85	10	5	0.3	-
Honeydew	85	10	5	0.2	-
All Melon	85	10	5	3.5	-
<u>Total Fruits</u>	-	-	-	20.6	18.1
English Potatoes	80	20	-	30.9	33.4
Sweet Potatoes	30	25	45 <u>4/</u>	18.1	18.0
Yams	30	25	45 <u>4/</u>	18.5	28.4
Eddoes/Tannias	30	25	45 <u>4/</u>	1.9	1.9
Cassava	-	50	50	0.2	-
<u>Total Roots</u>	-	-	-	69.6	81.7
TOTAL ALL PRODUCE	-	-	-	139.1	136.8

.../...

TABLE 8 CONT'D

- 1/ *Estimated from survey results and discussions with the fresh produce trade.*
- 2/ *Estimated from survey results, best guesstimates developed with the fresh produce trade of the volume of business accounted for by hucksters, estimated spoilage, losses, and import statistics.*
- 3/ *Stevenson and Kellogg: The Horticultural Subsectors in Antigua, Barbados, Belize and Dominica, Volume 11 of 1V, January 1980, Caribbean Community Secretariat Report.*
- 4/ *Includes Plantation grown produce which is given/sold to workers.*
 - a - Hotels, restaurants and institutions.*

SOURCE: IICA, Survey of the Hotel, Restaurant, Supermarket and Institutional Markets for Fresh Produce in Barbados, Report by Systems Ltd., September 1981.

MARKETING OPPORTUNITIES

V. MARKET OPPORTUNITIES

A frequent problem facing producers of fruit and vegetables is the difficulty of ensuring that there are adequate outlets for their produce after it has been harvested. This problem can be reduced if before production commences, consideration is given to potential purchasers of the crops to be planted. This involves viewing "production as the first stage of the marketing process" rather than "marketing as the final stage in the production process".

Alternative Outlets

It is necessary for producers to consider the alternative outlets for their produce rather than assuming that customers will be available when the crop is harvested. The importance of the various outlets for produce varies depending on the particular commodity. A recent survey has provided more information on the relative importance of the various outlets for root crops, vegetables and fruit. The results of the survey are summarised in Table 8.

.../...

Tourist Demand

Another important element affecting the demand for horticultural produce in Barbados is the number of tourists on the island. Although the number of visitors seldom represents more than a 5 percent increase in the population at any one time, their consumption of fruit and vegetables is relatively high and therefore can be a significant factor affecting the overall market situation. Tourist demand is particularly important in the case of such crops as lettuce, tomatoes, paw paw, melons. The availability of commodities in demand by hotels and restaurants can assist producers in obtaining sales for the major vegetables e.g. beans, carrots, cabbage.

Although the number of tourists arriving in the summer months has increased, these visitors tend to stay for a shorter period. As a result there continues to be a seasonal peak in the number of tourists in the December to April periods (Figure 7). Fortunately this coincides with the most favourable production period for vegetables and some fruit.

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SELECTED REFERENCES

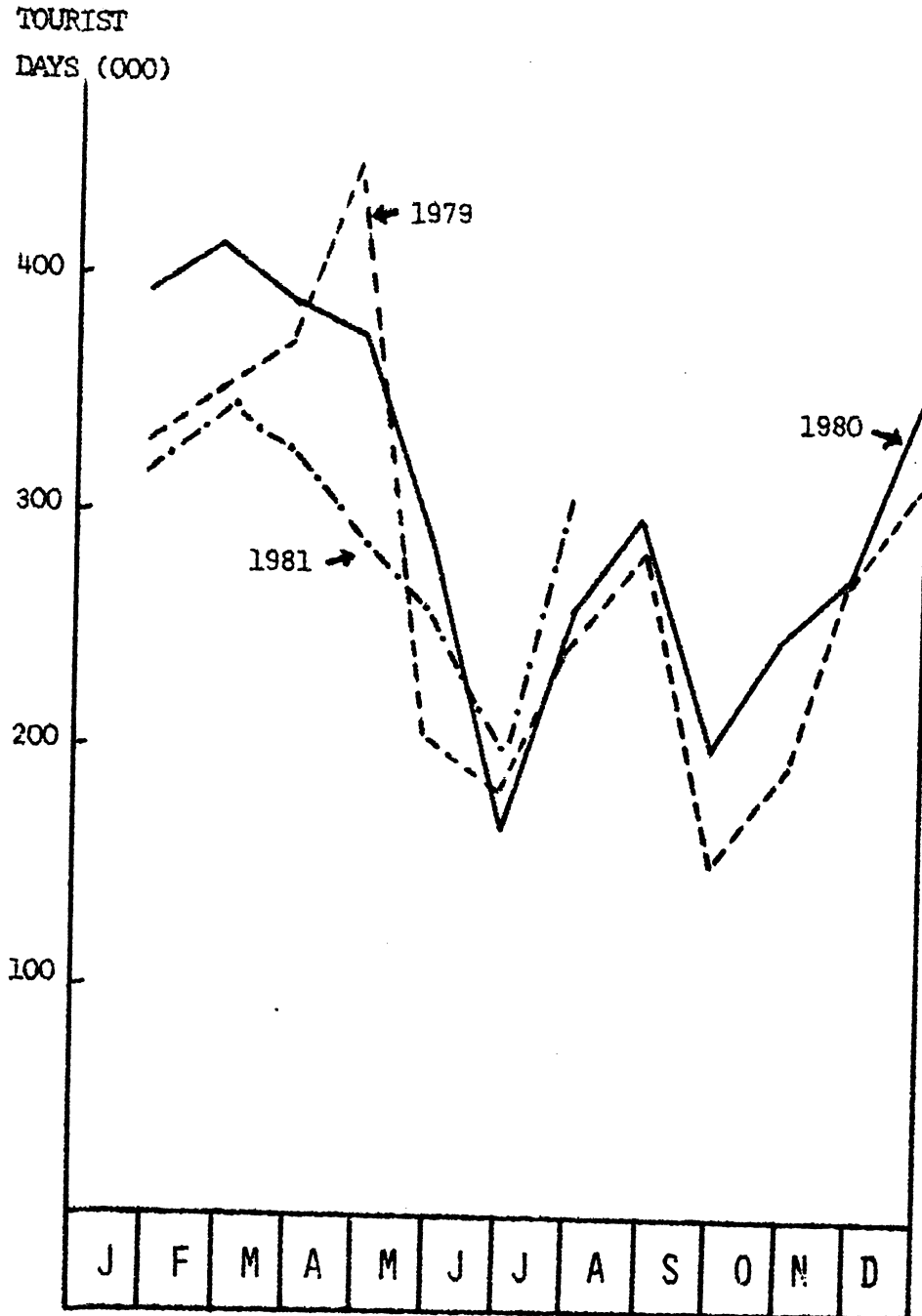


FIGURE: 7 NUMBER OF DAYS SPENT IN BARBADOS BY TOURISTS,
BY MONTH, 1979-81.

SOURCE: Central Bank of Barbados, Economic and Financial Statistics.

VI.

SELECTED REFERENCES

1. Ministry of Agriculture, Vegetable Production in Barbados, Bulletin N^o 3, December 1969.
2. E.G.B. Gooding, Food Production in Barbados with particular reference to tourism, Barbados Sugar Producers Association, 1970.
3. Ministry of Agriculture, Pricing of Agricultural Products in Barbados, OAS Report, September 1974.
4. Gloria Francis, Food Crop Production in Barbados and its Response to CARIFTA/CARICOM and the Agricultural Marketing Protocol, Institute of Social and Economic Research, UWI, Occasional Paper N^o 2, July 1975.
5. Barbados Marketing Corporation (BMC), Relocation and Expansion of Facilities, Report by Halcrow Caribbean Ltd., June 1977.
6. Ministry of Agriculture, Planning Unit, Agriview 1980.
7. A Survey of Small Scale Agricultural Marketing Enterprises in the Eastern Caribbean, Systems Ltd., Report for FAO, 1980.
8. Barbados Agricultural Society (BAS), Agriculture in Action, various issues.
9. Attlee H. Brathwaite, Small Scale Farming in Barbados: Scope

and problems, Paper prepared for UNESCO Conference in Mexico, August 1980.

10. IICA, An Analysis of Food Self-Sufficiency in Barbados, Misc. Publication N^o 277, April 1981.
11. IICA, A Survey of the Hotel, Restaurant, Supermarket and Institutional Markets for Fresh Produce in Barbados, Report by Systems Ltd., September 1981.

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