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THE BARBADOS VEGETABLE INDUSTRY

Present Position and Future Prospects

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INTRODUCTION

It is widely believed that an expansion of vegetable production in Barbados is feasible and could contribute significantly to agricultural diversification. Three aspects of this hypothesis are dealt with in this paper. The first section is concerned with the structure of the vegetable producing industry and the volume of domestic production. The second section deals with domestic vegetable consumption and the structure of the market including the shares held by domestic producers and overseas suppliers. The final section is concerned with the scope of import substitution and the development of a vegetable export business.

It must be stated at the outset that there is a dire shortage of reliable information on vegetable production and consumption in Barbados. The position with respect to overseas trade statistics is fortunately very much better though even here the commodity break-down is not so detailed as one would like in certain respects. However, in a country where it is desired that the pace of agricultural development should be stimulated by government action, the task of identifying problems and getting them into perspective, and the formulation of appropriate policies for their solution cannot be put off until all the information which, ideally, the economic planner would like to have, becomes available. I therefore freely acknowledge without apology that at several points in this paper where the necessary facts were lacking I have made what seemed to be the most reasonable assumptions on the basis of whatever information was ready to hand.

PRESENT STRUCTURE AND VOLUME OF DOMESTIC PRODUCTION

Numbers of Producers and Crop Areas

In analysing the structure of vegetable production in Barbados it is both necessary and convenient to divide producers into two classes. Firstly, there are the estates (agricultural holdings with more than 10 acres of arable land) which grow vegetables mainly on preparation land during the period leading up to, and sometimes overlapping with, the planting of sugar-cane (as on the estates), or in association with other crops such as ground provisions but without sugar-cane, or as a pure stand. Smallholders in the latter category are, in a sense, vegetable specialists.

Although there are about 250 estates in Barbados only about 60 to 65 of them grow vegetables.

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The views expressed in this paper are those of the author acting in a private capacity and do not necessarily coincide with the official view either of the Government of Barbados or of the Food and Agriculture Organisation of the United Nations.

The results of a recent survey¹ on about two-thirds of these estates suggest that in total the estates grow about 300 acres of vegetables each year. The major crop grown is tomatoes which occupies about 40 per cent of the total acreage. On average, estates growing vegetables plant a total of about 5 acres annually, but this conceals a range from as little as a quarter of an acre to as much as 17 acres of vegetables per estate.

Turning to the small farm sector, there is no up-to-date information about the number of smallholdings in Barbados. However, in 1961 there were approximately 18,500 holdings of 10 acres and less occupying a total of 10,650 acres of arable land, that is, 0.575 acres per holding. No direct information is available either on the total number of smallholdings where vegetables are grown or on the total acreage of vegetables planted on such holdings. Nevertheless, indirect estimates can be obtained by deduction from the known facts about the total number of producers, the total arable acreage and the acreages of other (that is, non-vegetable) crops.

In 1961 sugar-cane was grown on approximately 13,400 smallholdings and occupied a total of nearly 7,000 acres partly in pure stands and partly in mixed stands with other crops: in addition, nearly 2,200 acres of ground provisions were grown by an unknown number of smallholders. Thus it may be surmised that the majority of the 5,000 or so smallholders who did not grow sugar-cane, plus an unknown number of cane-growers, grew some vegetables in 1961. It seems likely therefore that at least 5,000 smallholders were growing vegetables at that time and, for the want of more up-to-date information, this is put forward as a best estimate of the current number of vegetable producers on small farms. Some of these will be "gardeners", that is, more or less specialist vegetable producers, whereas others will produce vegetables in association with other crops in varying proportions: no information exists at present on the numbers of producers in each of these categories.

It can also be deduced from our knowledge of the difference between the total arable acreage and the total acreage of non-vegetable crops that in 1961 at least 1,500 acres were available on smallholdings for vegetables grown in pure stands and fallow. If it is assumed that the area occupied by vegetables grown in mixed stands with other crops was at least equal to the area of any uncropped land (fallow) it can be further deduced that at least 1,500 acres of vegetables were grown on smallholdings at that time. Again, the 1961 estimate is also the best estimate we have of the current position. The data used in arriving at this conclusion are set out in Table 1.

¹

Ministry of Agriculture, Vegetable Production Survey, 1967-68 (unpublished)

No direct information exists on the aggregate areas of individual kinds of vegetable crops planted on smallholdings. However, indirect estimates have been made for selected crops on the basis of estimates of total production in 1965-66 (described in more detail in another section of the paper) and certain assumptions regarding the average yields per acre obtained by smallholders. Comparing the results with the pattern of vegetable cropping on estates, it is clear that tomatoes are much less important on smallholdings, both absolutely and relatively, and crops such as carrots, cabbage and string beans are correspondingly of greater importance. Smallholders also grow significant areas of lettuce, beet, shallots and other 'minor' vegetable crops (collectively designated "other vegetables") which are scarcely grown at all on the estates (Table 2).

Production and Gross Output

The present state of knowledge about production and prices of vegetable crops in Barbados is highly inadequate. As far as production is concerned there is a twofold problem. Not only have few if any attempts been made until very recently to collect information about crop yields per acre (or other unit of area) on a systematic basis; it also appears that most vegetable producers have very little knowledge of the yields that they obtain. The position regarding prices is a little better since some information has recently been collected and, furthermore, it seems that most producers both large and small, at least have some idea of the most usual prices which they receive for vegetables.

An attempt was made very recently to collect information about vegetable crop yields and price expectations during the Ministry of Agriculture's Vegetable Production Survey, 1967/68 (referred to hereafter as the Ministry Survey). Although this survey covered vegetable production both on estates and on smallholdings, results are so far available only for the former. It is significant that nearly a third of the estates interviewed were unable to give yield information. Nevertheless, sufficient information was obtained from the remaining estates to enable a 'model' yield expectation to be roughly established for the major crops (that is, those listed in Table 2). Overall production estimates for these crops have been obtained by multiplying the model yield expectations (for a 'normal' season) by the corresponding total acreage estimates.¹ The results of these computations suggest that the aggregate production of vegetables on estates is normally about 1,400,000 pounds per annum and that two-fifths of this is accounted for by tomatoes (Table 2).

The distribution of normal price expectations for the main vegetable crops grown on estates was estimated from the survey on a similar basis. Nearly all the estates were able to give price information and despite variation within the sample the distribution of normal price expectations for the main vegetable crops was sufficiently 'peaked' to enable prices to be

roughly determined.¹ Tomatoes are the highest-priced crop though carrots, cabbage and beans are not far behind: the price of Irish potatoes (controlled at the wholesale and retail levels) is noticeably lower than the prices of other crops (Table 2).

The gross output of each vegetable crop is merely the product of estimated total production and the normal price. It is estimated that total gross output of estate-produced vegetables is in the region of \$280,000.00, nearly half of which is accounted for by tomatoes. The average gross output per acre, for all vegetable crops, is put at \$920.00: for individual kinds of vegetables the figure ranges from over \$1,000.00 per acre for tomatoes to less than \$600.00 per acre for Irish potatoes (Table 2).

These estimates of total vegetable production and gross output are substantially higher than those given by the results of a survey conducted by the British Development Division in the Caribbean in 1965-66.² This earlier survey puts the gross output of vegetables grown on estates in 1965-66 at only \$108,000.00 and the large discrepancy between this figure and the one derived from the Ministry Survey seems to be due to a major difference in the estimated level of production rather than to price differences. In fact, the B.D.D. survey put total estate vegetable production at less than 500,000 pounds, or not much more than one-third of the production estimate derived from the Ministry Survey. As far as can be ascertained, 1965-66 was not an 'abnormal' season for vegetable production in Barbados, so the discrepancy is difficult to explain. However, part of the difference may lie in the fact that whereas in the Ministry Survey estates were asked to state vegetable crop areas and yields per acre separately, in the B.D.D. survey they were only asked to estimate the total production of each crop. It is a matter of opinion as to which of these methods will elicit the most reliable response. Nevertheless, since the Ministry Survey was a specialist enquiry dealing only with vegetable production and respondents were questioned at length and in some detail about their vegetable crop areas and yield expectations, I am inclined to accept its results in preference to those of the B.D.D. survey.

When we turn to the question of overall production and gross output of vegetables produced on smallholdings we are on even more uncertain ground. The Ministry Survey covered about 90 small vegetable producers who were asked to answer questions about crop areas, expected yields and normal prices. However, the results have not yet been analysed and even

¹ The weighted average yield per acre of named crops was determined and the total production of 'other crops' was estimated on this basis.

¹ The price of 'other vegetables' was assumed to be equivalent to the weighted average price of the named crops.

² Current Estimates of Agriculture, Barbados, April-March, 1965-66.

In order to obtain direct comparability between the results of this and the Ministry Survey some adjustments of the published data, based on information supplied by the British Development Division, were found to be necessary. A parallel survey was conducted by the B.D.D. in 1964-65 also but for technical reasons the results cannot be made directly comparable with those obtained from the Ministry Survey.

if they had been it would scarcely be feasible to 'raise' the results since the proportion of the entire population of small vegetable producers which the survey sample represented is not known. The B.D.D. survey covered smallholdings as well as larger farms, and vegetable production and price estimates are obtainable from that source.¹ The results indicate that in 1965-66 smallholders in Barbados produced about 2,600,000 pounds of vegetables or nearly twice the estimated production on estates. But since the smallholders total vegetable acreage is believed to be at least five times the acreage grown on estates, it would appear that, on average, the smallholder's production per acre is much lower—less than 1,800 pounds—compared with nearly 4,700 pounds on estates. A similar relationship exists with respect to gross output per acre since, on average, the farm gate prices given by the smallholders in the B.D.D. survey were almost the same as those given by the estates which participated in the Ministry Survey. Thus, whereas it is estimated that the estates average vegetable gross output of more than \$900.00 per acre, smallholders apparently average no more than about \$350.00 per acre, or even less, since that figure is based on a minimum estimate of 1,500 acres devoted to vegetable production on smallholdings. I find so low an estimate of smallholders' average production per acre difficult to accept. In view of the much more detailed care and attention the small producer is able to give to his crops, compared with the estate, it is difficult to accept the suggestion that, in fact, smallholders average less than two-fifths of the already very low yields obtained by the estates.² It seems more likely that the smallholders covered by the B.D.D. survey seriously underestimated their production. This may have been inadvertent in some cases though probably not in all.³ In particular, there are grounds for believing that subsistence production may have been underestimated. Taking the B.D.D. survey figures at their face value, vegetable gross output per holding works out at little more than \$100.00 per annum which is just about the value of vegetables that a family of four persons in Barbados would be expected to consume (see the following section of this paper). This would suggest that the average small vegetable producer in Barbados has no marketable surplus at all which does not seem entirely plausible. On the other hand, if we allow an additional \$100.00 per holding to cover subsistence production, aggregate production and gross output of vegetables from small holdings will be virtually doubled. A further reason for doubt concerning the B.D.D. survey results is that only a small fraction of the total population of smallholdings was covered so

1 Certain adjustments to the published data are again necessary to bring the survey results into line with the definition of a 'smallholding' and an 'estate' as used in this paper.

2 With the exception of Irish potatoes, none of the model yield expectations exceeded 2 tons (long) per acre.

3 The difficulties of obtaining reliable information from small farmers in the West Indies have been referred to frequently. See, for example, Nanton, W. R. E., "The Census of Agriculture and Related Surveys in the Eastern Caribbean Territories", *Proceedings of the First West Indian Agricultural Economics Conference*, U.W.I., Trinidad, 1966.

that large sampling errors could be expected especially for the less commonly grown crops such as vegetables.

In view of the foregoing considerations, it is assumed for the purposes of production and gross output estimates contained in this paper that, on average, smallholdings and estates produce the same gross output per acre of vegetables, that is, that smallholders as well as estates obtain an average gross output of \$920.00 per acre. Each of the gross output figures from the B.D.D. survey is accordingly scaled up by the ratio of the assumed gross output of \$820.00 to the 'apparent' gross output of \$350.00 per acre. But the relative levels of gross output from different crops remain based on the B.D.D. survey results. Estimated production levels, both in total and for individual crops, are derived from the adjusted gross output figures and the average farm gate prices given by the results of the B.D.D. survey. These latter differ to a limited extent from the prices obtained from the Ministry Survey and used in estimating estate gross outputs. Finally, total acreages of individual kinds of vegetable crops planted on smallholdings are estimated by assuming that yields per acre are approximately the same for the principal vegetable crops. Thus the total vegetable acreage is distributed between crops in the same proportions as total production.

All the estimates of vegetable production and gross output on smallholdings are brought together and placed alongside the corresponding figures for the estates in Table 2 where acreage estimates and farm gate prices are also shown. The total gross output of vegetables on smallholdings is estimated to be rather less than \$1,400,000.00 per annum, or nearly five times the value of vegetables produced by the estates. More than three-quarters of this total value is accounted for by carrots, cabbage and "other vegetables." Although these are only tentative estimates, which will have to be revised as soon as better information becomes available, it appears that, at present, smallholders are the major producers of all the vegetable crops listed in Table 2 with the exception of tomatoes and Irish potatoes.

Adding together the separate contributions of estates and smallholdings, it is estimated that a total of approximately 1,800 acres of vegetables are planted in Barbados each year, and that this area yields about 8,200,000 pounds of vegetables with a gross value (at the farm gate) of about \$1,655,000.00.

VEGETABLE CONSUMPTION AND STRUCTURE OF THE MARKET

Some information is available on household food expenditure in Barbados and an alternative approach to estimating the farm-gate value of domestic vegetable production is to work backwards from consumption expenditure, making due allowance for distribution costs and the value of imports. The data requirements for this approach are as follows:—

- (i) per capita expenditure on vegetables (at retail) by residents and by visitors;
- (ii) population data—residents and tourists;

(iii) size of the overall distributive margin covering the difference between the value of vegetables at the farm gate, or on the dockside, and their retail value.

(iv) landed or c.i.f. value of imported vegetables.

Consumption

No information exists at present to indicate the level of consumer expenditure on vegetables in absolute terms. However, in the Index of Retail Prices, green vegetables (that is, tomatoes, carrots, cabbage, onions, string beans and English potatoes) carry a combined weight of 38 units in an overall total of 1,000 units representing all forms of consumer expenditure.¹ In other words, expenditure on green vegetables accounts for rather less than 4 per cent of total consumer expenditure.

As regards the level of consumer expenditure, gross domestic product per head (at factor cost) in 1966 was \$654.20.² Since net savings are negligible in most years, private consumption expenditure per head is assumed to be equal to this figure.

There is no objective information on the quantity or value of vegetables consumed by tourists: the figure of 50 cents per head per day (at retail prices) is guesswork, but nevertheless appears reasonable.

The resident population of Barbados now exceeds 250,000 and tourist statistics show that there are currently approximately 100,000 visitors each year whose average length of stay is about ten days.³

Thus total expenditure on vegetables by residents and tourists (at retail prices) is estimated as follows:—

		\$ per annum
Residents,	250,000 x 654 x 0.038	— 6,213,000
Tourists,	100,000 x 10 x 0.50	— 500,000
Total		— <u>6,713,000</u>

Distributive Margin

Very little objective information exists on the size of distributive margins in the food trade in Barbados. However, some figures pertaining to the gross profits of the Barbados Marketing Corporation have been published,⁴ and these, together with my knowledge of the trading margins on which fruit and vegetables distributors in Western Europe and North America commonly operate, are used to justify the assumption that

¹ For further details, see Barbados Statistical Service, *A New Index of Retail Prices, October 1965 = 100: Method of Construction and Computation* (undated).

² Barbados Economic Survey, 1968

³ Ibid

⁴ Smith, Henry, *Study of the Cost and Structure of Distribution in Barbados*, University of the West Indies, Institute of Social and Economic Research (Eastern Caribbean), September 1966

vegetables carry a combined wholesale, retail and (where applicable importer's margin of 50 per cent of the final retail price.

On this basis the total distributive margin is put at one-half the total expenditure on vegetables by residents and tourists as estimated above: this amounts to \$3,356,500.00.

Imports

The total cost of vegetables imported into Barbados in 1967 was approximately \$1,700,000.00 c.i.f. (Table 4).

Consumption of Locally Produced Vegetables

The farm-gate value of vegetables which are produced and consumed in Barbados can be estimated from the foregoing data on consumption, distributive margins and imports, as follows:—

		\$ per annum
Total expenditure, at retail		6,713,000
Less: Distributive margin	\$3,356,500	
Imports	<u>1,700,000</u>	
		<u>5,056,500</u>
Total Consumption of Locally Produced Vegetables		
(at farm gate prices)		\$1,656,500

Three points arise from these results. Firstly, there is very close agreement between the estimated total consumption expenditure on locally produced vegetables at farm gate prices, as shown above, and the estimated total gross output of vegetables produced on estates and smallholdings as shown in Table 2. In fact, the difference between these two large aggregates is only \$1,500, though the significance of this should not be exaggerated in view of the indifferent quality of much of the basic data and very rough and ready methods of estimation employed. Nevertheless, the fact that two alternative approaches to gauging the size of the Barbados vegetable producing industry give approximately the same answer is reassuring and enables both sets of results to be viewed with greater confidence.

The second point of interest is that, at present, domestic vegetable producers and overseas suppliers have approximately equal shares of the market.

Thirdly, it seems probably that despite the growing importance of the tourist industry more than 90 per cent of all vegetables consumed in Barbados at present are consumed by residents.

Prospective Rate of Growth in Vegetable Consumption

The resident population of Barbados is growing at the rate of about one per cent per annum and the tourist population at the rate of about 20 per cent per annum. The gross domestic product per head appears to be growing at the rate of approximately 4 per cent per annum and it is assumed that in Barbados the income elasticity of demand for vegetables (at the farm)

is around unity. It must be supposed that tourist incomes are also rising, but since the majority of tourists visiting Barbados are thought to belong to the higher income groups it seems reasonable to assume that their income elasticity of demand for vegetables, at the farm, is effectively zero.

Working on the basis of these facts and assumptions, together with current levels of vegetable consumption by residents and tourists as already estimated, it can be deduced that vegetable consumption by residents is growing at the rate of around 5 per cent, or by an absolute amount of just over \$300,000.00 per annum. Tourist consumption appears to be growing at a rate of about 20 per cent or by an absolute amount of approximately \$100,000.00 per annum. These separate rates are the equivalent of a composite rate of growth in consumption of just over 6 per cent, worth rather more than \$400,000.00 per annum (all values at constant retail prices). With the market about equally divided between domestic and overseas suppliers as it is at present, and with distribution costs absorbing approximately half the retail value of vegetables, the share of the annual increment in vegetable consumption going to domestic producers is likely to be worth around \$100,000.00 per annum. At the current rate of productivity, as estimated in this paper, the total area planted in vegetables would need to be increased by more than 100 acres each year to enable domestic producers to retain their present share of the market.

SCOPE FOR IMPORT SUBSTITUTION AND THE DEVELOPMENT OF EXPORT MARKETS

Import Substitution

Fresh vegetables account for about 80 per cent by value of all vegetable imports. Two particular categories of vegetables, Irish potatoes and onions, together account for approximately 80 per cent (by value) of total fresh vegetable imports (Table 3). Taking a purely static view of the opportunities for import substitution, the scope is obviously greatest with respect to these two commodities which together offer a potential import bill saving of more than \$1,000,000.00 per year. The Government's current campaign of encouraging the local production of onions—approximately 70 acres are thought to have been planted this season—is therefore soundly based as an import saving measure. The scope for reducing the import bill by producing Irish potatoes locally is even greater than it is with onions, but due to a combination of technical and economic factors which are inimical to economic success the crop is not at all widely grown in the island at present. If it is desired to grow more Irish potatoes locally to replace imports the research effort must be intensified on at least two fronts: firstly, there is a need for the development of production techniques, which can be relied upon to give much higher and more consistent yields per acre than are generally obtained at present; secondly, the economic attractions of the crop to the producer would be increased if some means could be found of reducing the present very high cost of seed without adversely affecting the yield per acre.

Taking a more dynamic view of the import situation, it is worth noting that although Irish potato and onion imports are both very large, in quantitative terms they appear to be growing only rather slowly or, in the case of Irish potatoes, perhaps not at all. This conclusion is based on a comparison of the average quantities imported during the 3-year periods 1957-59, 1961-63 and 1965-67 (Table 4). There is no evidence of a consistent upward trend in Irish potato imports during this period, despite the relatively high level of imports in 1967. In the case of onions, imports were rising fairly rapidly up to 1964 but have since tended to level off.

The import situation with respect to other kinds of fresh vegetables, such as beets, cabbage, carrots and string beans, contrasts strongly with the situation for Irish potatoes and onions. The position with these minor vegetables is that although the total volume of imports is still relatively small it is rising rapidly year by year. For example, the average quantity of beets, cabbages, carrots, string beans and tomatoes imported during 1965-67 was over seven times as great as the quantity imported during 1957-59: imports of "other vegetables" increased more than three times during the same period. Moreover, close examination of the figures suggests that the rate at which the minor vegetables are being imported may be accelerating.

Due to the absence of information about trends in the local production of vegetables it is not possible to state with certainty whether imports of some kinds of vegetables are rising to satisfy a rapidly increasing total demand, or whether, due to a decline in domestic production, increased imports are coming in to replace vegetables which were previously produced locally. But a tenable hypothesis is that the demand for certain kinds of vegetables has increased in step with the number of tourists visiting the Island and that imports have increased to meet this extra demand. Certainly there appears to have been some correlation between tourist arrivals and the volume of vegetable imports (excluding Irish potatoes and onions) during the past ten years or so (Table 5); but whether this is a casual relationship has not been investigated. Certainly the importation of fresh vegetables is not confined to the main tourist season (which roughly coincides with the first quarter of the year). Indeed there is no evidence that vegetable imports are any higher than during the remainder of the year (Table 6). Clearly increased tourist demand is not the only reason for rising vegetable imports though it is probably one of a number of contributing factors.

Whatever its explanation, the upward trend in minor vegetable imports is so pronounced that it can confidently be expected to continue during the next few years unless some special effort is made to boost local production. But progress with import substitution is unlikely to be achieved unless two critical conditions are met. Firstly, domestic producers will have to demonstrate their ability to supply vegetables continuously throughout the year instead of only in certain seasons as at present. With crops that cannot be stored, such as tomatoes and cucumbers, this will mean more out-of-season production. With other crops such as Irish potatoes and onions suitable long-

term storage techniques will have to be developed and applied. An industry consisting, on the one hand, of non-specialist estate-scale producers who only grow vegetables as a side-line for a few months each year on land which is being prepared for sugar-cane and, on the other hand, of a large number of very small-scale producers, many of whom grow vegetables only as a part-time or a spare-time occupation, will have to undergo substantial adaptation to meet this condition.

Secondly, for import substitution to be effective it will be necessary for producers in Barbados to compete with overseas suppliers both on quality and price; otherwise consumers will not regard local produce as an acceptable substitute for imported produce, and the demand for imported produce will continue at the same level as before.

As regards crop quality, the main overseas suppliers who set the standard at present are predominantly developed countries, such as Canada, the U.S.A. and the U.K., where vegetable growing technologies are generally more advanced than in the West Indies. The only Caribbean territory which ranks as a major supplier is Trinidad, which is an important source of tomatoes and other vegetables (Table 3). Although Trinidad may not enjoy the same technological advantages as the other major suppliers it might be expected that she will claim a measure of continued access to the Barbados market under the Carifta Agreement, whatever treatment may be accorded to imports from third countries.

As regards prices, it is noticeable on the one hand that where there is substantial competition between imports and domestic production, as in the case of beets, cabbages, carrots and beans, there is a close similarity between the average import price and the local farm-gate price (Tables 2 and 3). This is, of course, the expected situation where there is effective competition between domestic supplies and imports. On the other hand, in lines where domestic producers are not yet firmly established, such as Irish potatoes and onions, import prices tend to be below the level which a majority of local producers would probably regard as being adequately remunerative at present. If it is desired to stimulate the domestic production of these commodities in order to replace imports, it may be necessary to set an 'incentive price' for local producers which is somewhat above the current import price. There is possibly a third category of vegetables, of which tomatoes may be an example, where the average import price appears to be substantially above the price normally received by domestic producers. Such a price differential might be expected where there is a marked difference in quality between domestic and imported produce, or where imports tend to be concentrated in the local off season when domestic supplies are scarce.

All in all, the impression gained is that as far as supplying the domestic market is concerned, locally produced vegetables are reasonably competitive with imports in lines where domestic producers are already firmly established, such as beets, carrots and beans. It seems likely that in these particular lines of production import substitution would not be costly to

consumers. But a different competitive situation prevails with respect to crops which have only recently begun to be produced in Barbados, such as Irish potatoes and onions, and also in relation to most kinds of out-of-season production. In these cases it is doubtful whether local producers can compete on equal terms with overseas suppliers at present and the pursuance of a policy of import substitution, backed by appropriate import controls, might be very costly to consumers.

The foregoing remarks are concerned only with the replacement of fresh vegetable imports. What of the remaining 20 per cent (by value) of total vegetable imports consisting of frozen, dehydrated and canned vegetables? Frozen and dehydrated vegetable imports are of negligible importance at present (Table 3), and although they may grow quite rapidly, they are ignored for the purposes of the present discussion of import substitution. Imported canned vegetables present a quite different situation: the current cost of these is around \$300,000.00 per year, with a rather rapid upward trend in quantity as well as in value. However, it must be recognised that the feasibility of import substitution in this area would tend to depend on the local vegetable producing industry's ability to supply vegetables of a suitable quality for processing in sufficient volume and at a low enough cost to enable an adequate sized local canning plant to compete effectively with canners in countries which now supply the Barbados market. It cannot be stressed too often that it is scarcely ever economic to install processing facilities solely for the purpose of relieving the fresh vegetable market during periods of glut or of utilising produce which falls below the minimum quality standards in the fresh market. Quite apart from the supply problems, it is doubtful whether the present sized market for canned vegetables in Barbados is large enough to sustain a viable canning industry. The same restraints would obviously not apply to an export-oriented canning industry, but such an undertaking would have to face many additional problems. In view of these considerations it seems most unlikely that a viable vegetable canning industry can become established in Barbados in the near future. There may nevertheless be a good case for the establishment of an experimental plant to look into the technical problems of canning under local conditions. Such a plant could be owned and operated either by Government or by the vegetable producers themselves, but in any case it should not be expected to show a commercial profit.

Development of Export Markets

Apart from the shipment of yams, mainly to the U.K. and the U.S.A., domestic exports of food crops from Barbados are very small at the present time. In 1967, the only significant vegetable exports were \$5,600.00 worth of tomatoes, mainly to Bermuda and Guyana, and \$4,600.00 worth of "other fresh vegetables" mainly to the U.S.A., Canada and the U.K. Thus, in considering the possibilities for developing a vegetable export business in Barbados, we are discussing something which scarcely exists at present.

The main advantage of producing for the export market is obvious: access to the much larger market

which export outlets may provide is especially attractive to a small country like Barbados where the domestic market is narrow and somewhat unstable. However, building up a successful vegetable export business will not be easy for a number of reasons.

Firstly, it has to be recognised that except in very limited preferential markets such as Carifta, exports from Barbados would have to compete with exports from other countries some of which are already firmly established in the vegetable export business or enjoy other advantages. For example, in offering out-of-season vegetables to North American markets Barbados would be likely to find herself in competition with producers in Florida, California and Mexico, to name only a few. Each of these competitors enjoys the advantage of closer proximity to the market, and it is difficult to visualise what counteracting competitive advantage Barbados might have with the possible exception of a cheaper labour supply. However, even if the cheaper labour supply was an established fact, it might not be decisive since the advantages of lower labour costs might be outweighed by other factors in which competing suppliers held the advantage. Moreover, if the vegetable export industry was dependent on "cheap labour" for its continued prosperity it is not difficult to visualise the conflicts which might arise with certain overall objectives of national economic policy such as the attainment of higher living standard through a rising level of real income per head and a more equitable distribution of the national income. Thus it is likely that any permanent labour cost advantage which the Barbados vegetable industry might wish to retain vis-a-vis its competitors in export markets would have to be based upon high productivity per worker and not upon low wages.

Secondly, there are the difficulties of finding and maintaining contact with distant overseas markets, of discovering precisely what those markets require which it would be feasible for Barbados to supply, and of persuading local producers to cater for foreign tastes when these differ from the requirements of the local market. The solution to these difficulties would be likely to involve a complete re-orientation of at least part of the Barbados vegetable industry to cater specifically for the export market, possibly along co-operative lines. But in whatever form the industry was re-structured, the experience of other vegetable exporting countries strongly suggests that a stringent export grading control scheme would have to be enforced. The most satisfactory method of maintaining contact with overseas markets might be through the establishment of permanent agencies in the major metropolitan markets. Nevertheless, the costs of maintaining such agencies have to be borne by the exporting industry and a small country like Barbados is at an obvious disadvantage in this respect compared with a large exporting country able to spread its selling costs over a much larger volume of sales. This is an area in which regional co-operation, possibly through Carifta, would be beneficial.

Finally there are the twin problems of high transport costs to distant markets and the risks associated with shipping perishables over long distances. It is widely held in Barbados that the air-freight rates for

vegetables are too high. However, it may be suspected that lying at the root of this problem there is a vicious circle of high freight rates on the one hand, and small and intermittent consignments of produce on the other. If local exporters were in a position to offer to the airlines regular consignments of produce large enough to justify the provision of a special vegetable transport service, much lower rates could probably be obtained. But here are the makings of another vicious circle: air freight charges will not come down until a larger volume is offered whilst a larger volume will not be offered until the charges come down. Skilful negotiation or even action at the political level may be needed to break this vicious circle.

Regarding the problem of the deterioration of produce in transit to the market, the prime requirement seems to be regular, rapid and reliable transport facilities. It is also desirable that a sellers' representative should be available to inspect produce promptly when it arrives in an overseas market and that there should be adequate provision for independent arbitration in cases of dispute. It is also worth observing that selling "on consignment" is generally more risky than selling in fulfilment of a contract, especially where the consignment sales are irregular. Thus, despite the advantages of not being bound by a contract when the market is under-supplied and prices are high, there is much to be said for entering into contractual arrangements for disposing of at least a proportion of the expected supplies in order to give a firm floor to the export market. However, the fulfilment of marketing contracts imposes certain disciplines on an industry, regarding such matters as the volume, quality and timeliness of crops. It might be seriously questioned whether the Barbados vegetable industry, as at present constituted, is capable of submitting to these disciplines.

All things considered, it seems likely that the problems of building up a successful vegetable export industry will take longer to overcome than the problems of replacing imports on the domestic market. It is generally easier to beat competitors on your own ground than upon theirs, or even on neutral ground. A policy of concentration upon import substitution and upon invisible exports to tourists, therefore has much to commend it, especially in the short term. Nevertheless, due to the inevitable limitations imposed by what is now, and what is likely to remain, a small domestic market, and despite the present rapid growth of the tourist industry, producing for export ought to remain as an important long-term objective. I therefore take the view that no time should be lost in re-aligning the industry in ways which will enable it eventually better to meet the requirements and challenges of the export market.

In the meantime, three kinds of vegetable export activity appear to offer the greatest promise of early success. Firstly, there is the possibility of selling tropical specialities, such as sweet peppers, egg plants, okras and (although not strictly speaking a vegetable crop) avocado pears to North American and European markets. Secondly, there is the possibility of supplying vegetables such as carrots, cucumbers and beets to non-tropical countries during the season when their

own growers are unable to produce which, broadly speaking, is the first quarter of the year in the northern hemisphere. Thirdly, there may be opportunities for selling vegetables to other Caribbean territories within the Carifta framework. This latter possibility may seem especially attractive because of shorter lines of communication and lower transport costs. However, the advantages of exporting within Carifta are likely to be nugatory unless member territories are prepared to grant each other reasonable access to their agricultural markets. It seems to me that despite a certain amount of lip-service being paid to the advantages of agricultural trade within the framework of the Agricultural Protocol, most territories are bent on greater agricultural self-sufficiency rather than on greater specialisation and trade. Thus the omens for rapid build-up of vegetable export business within the Region do not seem particularly bright at present. Consequently, I believe that undue concentration on the Carifta market would be a poor export strategy and for this reason I also believe that Barbados, together with the other Carifta territories, would be wise to avoid any precipitate action in the matter of imposing controls upon agricultural exports to third countries. To give up big export opportunities outside the Region in order to facilitate a small amount of residual trading within the Carifta Area could well prove to be a costly mistake in the long run.

SUMMARY

1. The amount of land used for vegetable production in Barbados each year is probably less than 2,000 acres.
2. Although estates make some contribution to the Industry's output and are dominant in the production of one particular crop, tomatoes, most of the remaining vegetables are grown by small producers and it is thought that at least 5,000 households derive some cash or subsistence income from this source.
3. The gross value of domestic vegetable production (at the farm gate) is thought to be about \$1,700,000.00 per annum: imported vegetables cost approximately the same amount (c.i.f. value).
4. Consumers are currently spending more than \$6,000,000.00 per annum on vegetables (at retail prices): despite the rapid growth of the tourist industry it is believed that residents still account for

more than 90 per cent of all the vegetables consumed.

5. It is estimated that the combined resident and tourist demand for vegetables in Barbados is growing at a rate of about 6 per cent per annum. In order to retain its current share of the market (approximately 50 per cent) the domestic vegetable industry will need to plant more than 100 acres of vegetables extra each year, given the current levels of production per acre.
6. Irish potatoes and onions together account for about 80 per cent of total vegetable imports, but imports of these commodities are growing less rapidly than those of other vegetables such as beets, cabbage, carrots and beans.
7. Rapidly rising imports of certain kinds of vegetables appear to be associated with the growth of tourism though this may not be the main causal factor.
8. Judging from the relationships between average import prices and the prices normally expected by domestic producers, the domestic industry's competitive position on the home market appears to be most favourable in relation to the supply of "minor vegetables" such as carrots, cabbage, beans and tomatoes. The competitive position appears much less favourable in respect of Irish potatoes and onions which, whilst constituting an important part of the local diet, have not been produced in Barbados until recently. Thus, in the case of these crops, an "incentive price" for local producers, somewhat above the current import price, might be a pre-requisite to import substitution on a significant scale.
9. Import substitution is likely to be easier than the development of a vegetable export industry but, due to the limited size of the domestic market, re-alignment of the vegetable industry to meet with the requirements and to comply with the disciplines of export marketing should be adopted as a long-term aim.
10. Despite the obvious attractions of exporting vegetables to buyers within the Carifta Area, export opportunities outside the Region should not be overlooked. It is therefore recommended that the present arrangements whereby each Carifta territory is free to decide whether it will export vegetables to markets inside or outside the Free Trade Area should continue indefinitely.

Table 1 *Utilization of Arable Land by Holdings of 10 acres and less: Barbados, 1961*

	Acres in pure stands	Acres in mixed stands	Total acres
Sugar cane	3,915	3,040	6,955
Ground provisions	408	1,753	2,161
Total non-vegetables	4,323	3,793	9,116
Vegetables and fallow (by difference)	n.a.	n.a.	1,535
Total arable and	n.a.	n.a.	10,651

Source: West Indies Census of Agriculture, 1961.

Table 2 *Estimated Gross Output of Vegetables from Estates and Smallholdings: Barbados, 1967/68*

	Estimated acreage.			Estimated production			Est. farm gate price			Est. gross output		
	(acres)			('000 lb.)			(c./lb.)			(\$'000)		
	E	S	T	E	S	T	E	S	T	E	S	T
Tomatoes	123	35	158	551	161	712	23	18	22	127	29	156
Cucumbers	33	89	122	148	404	552	16	25	23	24	101	125
Cabbage	30	206	236	134	936	1070	21	25	24	28	234	262
Irish Potatoes	24	—	24	161	—	161	8	—	8	13	—	13
String Beans	22	191	213	99	870	969	21	20	20	21	174	195
Carrots	21	231	252	94	1052	1146	21	25	25	20	263	283
Other Vegetables	47	748	795	211	3394	3605	21	17	17	44	577	621
Total	300	1500	1800	1398	6817	8215	20	20	20	277	1378	1655

E — Estates, S — Smallholders, T — Total producers

Source: Ministry of Agriculture Vegetable Production Survey 1967-68 (unpublished)

Food Crops Inspector's Reports (unpublished)

Current Estimates of Agriculture, Barbados, 1965-66. British Development Division

Table 3 *Vegetable Imports : Barbados, 1967*

	Quantity	Value (c.i.f.)	Av. import price (c.i.f.)	Main Suppliers	
	('000 lb.)	(\$'000)	(c./lb.)		
Irish Potatoes	11,287	733	6.5	1. Canada	2. Netherlands
Tomatoes	118	51	43.0	1. Trinidad	2. U.S.A.
Onions	3,607	361	10.0	1. Canada	2. Netherlands 3. U.S.A.
Beets, Cabbages, Carrots and String Beans	616	120	20.0	1. Canada	2. U.S.A. 3. Trinidad
'Other' Fresh Vegetables	285	24	33.0	1. Canada	2. Trinidad 3. U.S.A.
Total Fresh Vegetables ¹	15,922	1,365	8.6	1. U.S.A.	2. Netherlands 3. U.S.A.
Frozen Vegetables	55	31	56.0	1. U.S.A.	2. U.K.
Dehydrated Vegetables	7.8	8.8	113.0	1. U.S.A.	2. U.K.
Canned vegetables	797	303	38.0	1. Canada	2. U.K. 3. U.S.A.

¹ Includes garlic.

Source : *Overseas Trade, 1967* (in press)

Beets, cabbages, carrots

Table 4 *Vegetable Imports : Barbados, 1957 - 1967*

Year or Period	Irish Potatoes		Onions		Beets, Cabbages, Tomatoes, Carrots, String Beans		Other Vegetables (excl. pulses)		Canned Vegetables		Total	
	('000 lb.)	(\$'000)	('000 lb.)	(\$'000)	('000 lb.)	(\$'000)	('000 lb.)	(\$'000)	('000 lb.)	(\$'000)	('000 lb.)	(\$'000)
1957	8,721	414.1	2,803	237.8	76	12.4	58	13.5	264	83.5	11,927	761.3
1958	9,486	512.3	3,037	232.0	125	21.7	109	17.1	379	106.7	13,136	889.8
1959	3,962	501.9	3,169	248.7	103	18.3	186	23.8	254	78.1	12,674	870.8
1957-59	9,053	476.1	3,005	259.5	100	17.5	118	18.1	299	89.4	12,575	840.6
1960	8,406	446.0	3,220	243.4	115	22.4	104	18.4	307	101.0	12,152	831.2
1961	9,986	497.0	3,501	301.6	174	41.2	103	20.9	455	148.2	14,219	1,008.9
1962	10,130	531.9	3,153	316.6	244	48.5	134	38.4	409	132.4	14,070	1,067.8
1963	10,843	626.1	3,611	347.8	376	62.0	184	58.0	420	133.2	15,434	1,227.1
1961-63	10,320	551.7	3,422	322.0	265	50.6	140	39.1	428	137.9	14,575	1,101.3
1964	11,089	629.8	3,500	294.9	570	99.1	485	107.0	554	174.2	16,198	1,305.0
1965	9,123	590.6	3,567	326.7	495	104.8	468	114.2	635	208.2	14,288	1,344.5
1966	9,374	666.6	3,791	351.2	945	231.0	447	118.8	750	267.4	15,307	1,635.0
1967	11,288	733.3	3,607	361.0	734	171.0	285	94.1	797	302.1	16,711	1,662.6
1965-67	9,928	663.5	3,655	346.3	725	168.9	400	109.0	727	259.6	15,435	1,547.4

Source : Overseas Trade Reports, 1957-1967

Table 5 *Vegetable Imports and Tourist Arrivals : Barbados, 1957 - 1967*

Period	Tourist arrivals	Fresh Vegetables Excluding Irish Potatoes & Onions	Canned Vegetables	Total
1957-59 ¹	100	100	100	100
1961-63	180	186	143	161
1965-67	325	516	243	358

¹
1957-59 — 100

Source : Abstract of Statistics, 1965
Overseas Trade Reports
Economic Survey, 1968

Table 6 *Seasonality of Fresh Vegetable Imports : Barbados, 1967*

	Jan.- Mar.	Apr.- June	July- Sept.	Oct.- Dec.
	(.....thousand pounds.....)			
Irish Potatoes	2285	2463	3382	3158
Tomatoes	38	27	38	
Onions	893	803	1011	900
Beets, Cabbages, Carrots and String Beans	158	67	199	198
'Other' Fresh Vegetables	83	56	87	57

Source : Quarterly Overseas Trade Reports, 1967