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AGRICULTURE IN BARBADOS - PAST, PRESENT AND FUTURE
A BRIEF OVERVIEW

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HISTORICAL

Barbados is a small tropical island, some 34 kilometres (km) long and 22 kl wide at its widest point, and covering an area of 42,400 hectares (ha) of which approximately 24,000 ha are at present available for agriculture. It lies about 13° N and 59° W, some 90 miles east of the main chain of eastern Caribbean islands.

This island, once the home of Arawak Indians, was an uninhabited island when, in 1536, it was visited by the Portuguese navigator Pedro A. Campos, who left hogs to breed on the island so that sailors who visited the island would find a ready meat supply. During the remainder of the 16th Century and the early 17th Century the island was visited occasionally by the Portuguese and less frequently by the Spanish, who used the island as a stopping point for providing their ships' crews with a little relaxation and some fresh hog meat. But, as it had none of the gold or other precious metals coveted by the seafaring European nations, the island was not regarded as of much value.

Once Dutch sea captain who visited the island did however report favourably on it to Sir William Courteen, a London merchant, and when this report was later verified by the captain and crew of one of Courteen's ships which was blown ashore on the island, Courteen decided to establish a settlement.

On February 17, 1627, Sir William Courteen's ship (the William and John) which has anchored off what is now Holetown on the west coast of Barbados, sent ashore 50 settlers who had sailed from London, and 10 slaves who had been captured from an enemy ship during the voyage, and the agricultural development of Barbados commenced.

The settlers first planted and exported tobacco. Soon afterwards some 40 Arawak Indians from the Dutch Colony of Guyana offered to come to Barbados as free men and to instruct the settlers in tropical agriculture in exchange for some land, and more diversified production of crops commenced with the planting of cassava, sweet potato, cotton, maize and other tropical crops, in addition to tobacco. By 1634, cotton had replaced tobacco as the major export; other crops being grown for export being maize, indigo and ginger, with some tobacco.

With the introduction of coffee and tea into Europe during the 17th Century there was a great increase in the demand for sugar, and the growing of sugarcane, which had been introduced into Barbados from Brazil

in the early 1630s, became firmly established when, around 1644, some Dutch merchants and planters moved their sugar trade from Brazil to Barbados. By 1650, the growing of sugarcane and the production of sugar, molasses and rum, had been firmly established as the main agricultural pursuit in Barbados, and it has remained so to this day.

Even in these early days, some food crops, mainly starchy root crops and maize, were grown, but Barbados has always depended in part on an imported food supply and the growing population has multiplied the deficit over the years. In 1650, Barbados imported beef, meal, peas and fish in quantity, mainly from New England. One hundred years later, in 1750, fruit orchards and food gardens were rare, and although some local supplies of fresh meat, fish, poultry, fresh fruit and milk were available for the planters, and some starchy root crops were grown, mainly for feeding the slaves, considerable quantities of food items such as flour, maize and other grains, smoked and salted meat and fish, and malt liquors were imported, in addition to the items of clothing and other hardware which could not be produced in Barbados.

From the commencement of its settlement, therefore, agricultural production was the mainstay of the Barbadian economy, providing almost 100% of gross domestic exports in those days, but gradually reducing in importance to a situation where, in 1981, it provided 7.7% of Gross Domestic Product (GDP) (Tables 1 and 2) and 37% of total domestic exports (Table 3).

THE PRESENT AGRICULTURAL SITUATION

Despite the long succession of good, moderate and bad years, the growing of sugarcane and the manufacture of sugar, molasses and rum have remained the main agricultural pursuits in Barbados. There are several factors which, together, have created and maintained this situation.

Unlike the mountainous, volcanic, and relatively fertile islands lying in the main Caribbean island chain to the west, with their deep soils and high rainfall, Barbados is in the main, relatively flat, with thin soils of an average depth of between 0.5 and 0.75 metres, lying on agriculturally inert and unproductive coral limestone. Being thin, these soils are unable to store large quantities of water and therefore dry out quite rapidly in dry weather.

Average annual rainfall is approximately 1,500 mm (60") with three-quarters of this falling in the 'wet' season from June to December. The months of January to May are usually dry, with drying, salt-laden winds blowing from across the Atlantic Ocean at velocities of up to 36 kilometres per hour. For four months of the year there are occasional south-easterly gales, and hurricanes are a possible, although infrequent hazard. The average shade temperature is 26° C, with little diurnal or seasonal variation. There are few cloudy days, except in the middle of the 'rainy'

Table 1.—Gross Domestic Product by Sector of Origin 1976-1981
(Current Prices)
(BDS$'000)

Sector of Origin	1976	% of GDP	1977	% of GDP	1978	% of GDP	1979	% of GDP	1980	% of GDP	1981P	% of GDP
Sugar	48,112	6.1	54,655	6.1	51,658	5.2	64,028	5.3	94,195	6.3	70,752	4.3
Other Agriculture & Fishing	28,686	3.6	30,050	4.2	40,034	4.1	45,117	3.8	49,484	3.3	55,241	3.4
Mining & Quarrying	2,273	0.3	4,363	0.5	6,920	0.7	8,286	0.7	13,810	0.9	17,346	1.1
Manufacturing	84,793	10.8	102,621R	11.5	112,385R	11.4	139,563R	11.7	186,560R	12.5	201,933	12.3
Electricity, Gas & Water	11,180	1.4	14,074	1.6	15,674	1.6	18,320	1.5	21,999	1.5	23,249	1.4
Construction	55,600	7.1	60,119	6.8	75,113	7.6	88,124	7.4	104,508	7.0	130,383	7.9
Wholesale & Retail Trade	165,248	21.0	182,014	20.4	204,801	20.8	259,404	21.7	318,976	21.4	368,841	22.4
Tourism	65,477	8.3	87,728	9.9	109,674	11.1	143,967	12.0	174,970	11.7	194,439	11.9
Transport, Storage & Communication	55,902	7.1	60,053	6.7	64,231	6.5	70,100	5.9	86,924	5.8	99,128	6.0
Finance, Insurance, Real Estate & Business Services	109,822	13.9	110,192	12.4	115,593	11.7	135,010	11.3	162,512	10.9	191,082	11.6
General Services	33,101	4.2	34,975	3.9	37,773	3.8	46,120	3.9	57,650	3.9	69,410	4.2
Government Services	127,843	16.2	142,207	16.0	150,566	15.3	179,584	15.0	218,208	14.6	224,936	13.7
GDP at Factor Cost	788,037	100.0	890,051R	100.0	984,422R	100.0	1,197,623R	100.0	1,489,796R	100.0	1,646,740	100.0
Add Net Indirect Taxes	85,442		103,511		127,615		152,242		168,566		214,079	
GDP at Market Prices	873,479		993,562R		1,112,037R		1,349,865R		1,658,362R		1,860,819	
Population (000 Persons)	251.1		253.3		253.1		254.9		249.0		250.5	
Per Capita at GDP at Factor Cost	3,138		3,514		3,889		4,698		5,983		6,574	

Source: Barbados Statistical Service
P = Provisional
R = Revised

Table 2.--Gross Domestic Product 1980-1981 (Current Prices) Breakdown of Selected Sectors
(BDS$'000)

Sector of Origin	1979	% of GDP	1979 over 1978 % increase	1980	% of GDP	1980 over 1979 % increase	1981	% of GDP	1981 over 1980 % increase
Sugar	64,028	5.4	23.9	94,195	6.3	47.1	70,752	4.3	-24.9
Other Agriculture and Fishing	45,117	3.8	2.7	49,484	3.3	9.7	55,241	3.4	11.6
- Food Crops	19,598	1.6	33.3	21,558	1.4	10.0	n.a.		
- Livestock Rearing	14,984	1.3	14.5	16,632	1.1	11.0	n.a.		
- Miscellaneous Cultivation	730	0.1	4.0	920	0.06	26.0	n.a.		
- Fishing	9,805	0.8	31.5	10,374	0.7	5.8	n.a.		
Mining and Quarrying	9,324	0.8	30.4	13,810[R]	0.93	48.1	17,346	1.0	25.6
Manufacturing	139,563	11.7	24.2	186,560[R]	12.5	42.8	201,933	12.3	8.2
- Food Processing, Beverage and Tobacco	37,474	3.2	6.4	60,539	4.1	61.5	66,961	4.0	10.6
- Textiles & Wearing Apparels	28,263	2.4	39.2	42,043	2.8	48.8	44,390	2.7	5.6
- Wood & Wood Products	3,805	0.3	2.0	2,798	0.2	-26.4	3,433	0.2	22.7
- Paper & Paper Products, Printing and Publishing	10,989	0.9	36.8	17,164	1.2	56.2	19,638	1.2	14.4
- Chemicals, Petroleum Refining & Non-metallic Products	17,067	1.4	32.5	24,563	1.6	43.9	26,675	1.6	8.5
- Metal Products & Assembly Type Goods	24,418	2.1	19.6	26,663	1.8	9.2	27,766	1.7	4.1
- Miscellaneous Manufacturing	8,613	0.7	15.0	12,790	0.9	48.5	13,070	0.8	2.2
GDP at Factor Cost	1,197,623			1,489,796[R]			1,646,740		

Source: Barbados Statistical Service
R = Revised
n.a. = not available

Table 3.--Contribution of Agricultural Exports to Gross Domestic Exports, 1977-1981 (BDS$'000)

Year	Agricultural Exports	Gross Domestic Exports	Percentage Contribution of Agriculture
1977	67,382	151,055	44.6
1978	66,247	187,816	35.2
1979	78,375	234,795	33.3
1980	134,343	300,720	44.7
1981	80,738	297,004	27.0
		5-Year Average	36.9

Source: Barbados Statistical Service.

season. Day length varies by only an hour or two in the different months of the year, and monthly averages of daily sunshine range from 6 to 10 hours.

Under the conditions of soil and climate just indicated, Barbados is most suited, by nature, to grassland development. The sugarcane is merely a large grass, and therefore its persistence as the mainstay of Barbadian agriculture can be readily understood. Further, it is a grass which has prevented any serious erosion of our shallow soils - very different from the tobacco and cotton which it replaced and which created serious erosion problems - and which has provided employment for our rural labour force. The fluctuations in the fortunes of its products - sugar, molasses and rum - on the markets of the world over time, although substantial, have been less than for most of the other major traditional Caribbean export crops such as coffee, cocoa and sea island cotton and it has produced a reliable income year after year through the annual variations in weather, pest, disease and market, for over 300 years.

It was for these reasons that the Ministry of Agriculture, some 10 years ago, realizing the challenge being posed to cane sugar by other sugars and artificial sweeteners, and after taking a good look at some 600 varieties of 40 other tropical crops, was in favour of a gradual reduction in cane acreage from 26,000 to 20,000 ha and the utilization of the agricultural land in Barbados somewhat along the following lines:

Sugarcane	20,000 ha
Grass (for cattle/sheep)	1,600 ha

Sorghum/Cotton	1,800 ha
Fruit Trees (including coconuts)	800 ha
Vegetables (continuous cropping)	800 ha
Starchy Root Crops (in sugarcane land)	800 ha

THE STRATEGY FOR THE IMMEDIATE FUTURE

The search continues for crops which could replace sugarcane, and for non-traditional uses for the sugarcane, of which the production of ethanol, hardboard, livestock feed and electrical energy spring readily to mind. In the short term, however, Barbados has no crop which could be grown with any degree of certainty on the 20,000 ha which were allotted to sugarcane and would provide gross returns to the farmer of $4,700 per hectare and gross revenue to Barbados from the sale of sugar and molasses only (and omitting rum) of $6,760 per hectare of land under cultivation, as sugar did in the relatively poor crop year of 1979/1980.

Barbados has, at present, a guaranteed market for some 96,000 tonnes of sugar, comprised as follows:

53,000	tonnes to the EEC
20,800	tonnes to the USA
15,500	tonnes consumed locally
7,000	tonnes sold as fancy molasses, mainly to Canada
96,300	tonnes (Total)

To be certain of producing this amount of sugar, even in a 'bad' year, some 14,000 ha of harvested cane from 17,000 ha of land available for sugarcane will have to be provided, and it is suggested that this be done. Of this acreage, approximately 3,000 ha will be available each year for planting starchy root crops and vegetables.

The present drive to produce sufficient vegetables to supply the total annual requirements of Barbados should be continued and intensified. Irrigation water would have to be provided to ensure such production, and it is fortuitous that the total volume of underground water at present available for irrigation purposes will service approximately 1,200 ha which is just about the area of land required to supply the needed vegetables.

Other aspects of the production strategy should embrace:

- The expansion of fruit production to cover all suitable land in the Scotland District, and certain selected areas elsewhere, to a total of some 3,700 ha.

- The production of non-irrigated grain and other seed crops on some of our mechanically cultivable land which is marginal for sugarcane mainly because of low rainfall. Approximately, 1,800 ha mainly in the far south and north.

- The continued and intensified use of other marginal land, not suitable for annual cropping for pasture development for cattle and sheep. Approximately 1,500 ha.

- The continued and intensified local production of poultry and pigs to satisfy local demand.

The allotment of the present 24,000 ha of agricultural land to these various enterprises would therefore be somewhat as follows:

Sugarcane	harvested annually	14,000 ha
Food Crops	A. Non-irrigated root crops/ vegetables on 'thrown out' sugar lands	1,800 ha
	B. Irrigated vegetables on similar land	1,200 ha
Grain/Seed Crops	(Sorghum, pigeon peas, etc.) (non-irrigated)	1,800 ha
Fruit Trees	Mainly in Scotland Area	3,700 ha
Pasture	For cattle/sheep	1,500 ha
	Total	24,000 ha

Barbados is already producing the sugarcane, and is moving towards expansion of production of fruit and vegetables. To achieve adequate utilization of all available land, however, it will be necessary to provide for the non-sugar crops the kind of certain and orderly marketing which is already available for sugar. Both the Ministry of Agriculture and the farming community through the Barbados Agricultural Society have recently taken some commendable steps in this direction. We are still, however, a very long way from having a system which could effectively market the production from some 6,700 ha of fruit, vegetables and root crops. Further, to stimulate this production, praedial larceny of food crops and the depredation caused by birds and monkeys will have to be brought under effective control. A substantial research and extension infrastructure will also have to be developed.

It is further suggested that, starting immediately, Barbados should make a serious attempt to modify its present system of producing sugar in such a way that the industry will gain greater acceptance from the

general public and, in particular, the sugar labour force. Sugarcane cultivation does not lend itself readily to traditional Caribbean small farming. It is therefore suggested that at least two modifications should be given a full and fair trial:

1. The introduction of a more satisfactory system of profit sharing within the industry whereby all contributing parties will receive a certain basic return on capital and labour, with further remuneration in any one year being dependent on the performance of the industry in that year.

2. The introduction of sugarcane family farms of an intermediate size range of say, 25 to 35 ha, on which a farm family, with adequate mechanical assistance, can operate a viable unit. Here, the experience of countries such as Australia could be of great assistance.

THE LONGER-TERM STRATEGY

This will be based on the degree of success achieved in:

(a) Finding satisfactory new uses for the sugarcane and its products; and/or

(b) Finding agricultural enterprises which can satisfactorily replace the sugar industry on the lands which it now occupies.

Research work on the former approach is already being intensified in many sugarcane growing countries, and it is expected that Barbados, along with the other cane growing countries of the Caribbean area, will continue to assist in this work to the limit of available resources.

In considering the latter approach, it is suggested that Barbados, because of its small size, should concentrate firstly on determining what markets are now available or can be developed for such non-sugar crops as Barbados can satisfactorily produce, and then on developing the product to supply the market. The first essential, here, is a marketing intelligence system which will provide accurate, adequate and timely information, and act initially as a link between producer and consumer; this to be supported by a farming complex which has the capacity to respond in a timely and efficient manner to such marketing opportunities as may be found.

The production of exotic tropical plants and blooms, and of off-season fruit and vegetables, mainly for the markets of North America and Europe, would seem at this point in time to hold considerable promise for Barbadian farming. However, expansion of production of these crops beyond the acreage limitation imposed by available irrigation

water would necessitate the provision of a supplementary - and probably a major - source of water. It is suggested that, if and as this type of agriculture develops to a stage where substantial acreages of present sugar land are required, it will become necessary for Barbados to provide additional water by the desalination of sea water. As such water is likely to be higher priced than the natural ground water supply, it may become advantageous to use the desalinated water for domestic purposes and for industry, thus leaving the cheaper ground water for use in agriculture.

Finally, in any operation which might involve a substantial reduction in the size of the present sugar industry, the problem of critical mass must be taken into account. In the operation of any industry there is a volume of production which is minimal for offsetting the inescapable fixed costs and other overheads, and permitting the operation to remain viable. In the case of the Barbados Sugar Industry, estimates of this critical point centre around the annual production of approximately 100,000 tonnes of sugar. Production of less than this volume, for any prolonged period, is likely to result in the collapse of the industry, and in the sudden need for replacing sugarcane on the acreage which it occupies at that time. Planners and the farming community must be ready with the answers to this problem if, or when it arises.

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