

# A Rapid Assessment of Agriculture In Barbados for the Barbados National Biodiversity Strategy and Action Plan

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## **Introduction**

Agricultural production has been the primary occupation of early settlers to Barbados, not just for local consumption, but for export to England and for trade with other colonial territories. The first European settlers arrived in Barbados in 1627 and found much of the island covered with forests, however by 1700, most of this forest was cut down and replaced with agricultural crops (Watts, 1966). Much of the landscape therefore was transformed from natural ecosystems into agricultural ecosystems comprised of large monospecific plantations such as sugar cane, small scale vegetable, rootcrop and pastures with livestock.

The area under agriculture in Barbados has declined over the past two decades in comparison to the early part of this century, primarily through the demand for land for settlements and tourism development, such as, hotels and golf courses. Sugarcane has long been considered the major agricultural crop, accounting for about 75% of the arable land, but has continued to decline because of reduced sugar prices, labour shortages, inefficient management of plantations, and old and inefficient processing machinery.

There has been an increasing tendency towards agricultural crop diversification in order to reduce the dependency on sugar and to satisfy local demands for fresh vegetables and root crops. Research support, especially from a regional agency, has become increasingly important for crop production, development and pest control.

## **Utilisation of Species**

### **Agricultural Holdings**

The 1989 Agricultural Census recorded 17178 agricultural holdings with a total area of 21560 hectares, distributed among the 11 parishes in the country (Ministry of Agriculture, Food and Fisheries, 1992). These holdings were categorised as producing either of sugar, vegetables, root crops, fruits, livestock, poultry, mixed or other agricultural uses (Table 1). The land occupied by agriculture in Barbados is about 50% of the area of the island with holdings in six parishes being greater than 2000 ha. Arable land is considered as land capable of being cultivated and having some form of production. It is comprised of land under temporary crops (< 1 year), temporary pasture (< 5 years), temporarily fallow (< 5 years), permanent crops and all other arable land, which together occupies about 82% of holdings recorded in the 1989 agricultural census. The rest of the holdings were under permanent pasture, wood or forest, disused and potentially productive land and land with buildings and roads (Table 2).

### **Crops Grown**

Agriview 1995, the agricultural report of the Ministry of Agriculture and Rural Development for 1995, records some statistics for the following crops: sugarcane, cotton, root crops, corn, onions, other vegetables, bananas/plantains/figs, other fruits and cut-flowers and foliage. Production surveys done by the Ministry of Agriculture and Rural Development (Table 3) show an increase in the area under vegetable production (by about 53%) and a decrease in sugar production (by about 30%) between 1987 and 1996.

Table 1. Agricultural Holdings in Barbados Distributed by Parish and Principal Agricultural Category, as Reported in the Census of 1989 (Ministry of Agriculture, Food and Fisheries, 1992).

Parish	No. of Holdings	Size of Holdings (ha)	Principal category (ha)						
			Sugar	Vegetables	Root crops	Fruits	Livestock/poultry	Mixed	Other
St Michael	2950	837	116	33	2	93	183	401	2
Christ Church	2753	2536	815	47	7	154	46	1262	204
St George	1764	2295	350	27	2	59	39	1814	2
St Phillip	2091	3711	810	82	4	79	125	2498	113
St John	1277	2516	320	144	2	42	45	1963	0
St James	1315	1008	90	6	1	81	56	772	2
St Thomas	1122	2664	174	9	0	34	29	2411	6
St Joseph	928	1129	238	15	-	117	191	564	3
St Andrew	876	744	149	6	1	23	73	489	1
St Peter	991	2612	496	3	1	17	34	2059	1
St Lucy	1075	1507	362	48	3	221	113	760	0
TOTAL	17178	21560	3920	419	23	921	933	14996	334

Table 2. Area of Holdings in Barbados by Parish and Land Use, as Reported in the Census of 1989 (Ministry of Agriculture, Food and Fisheries, 1992).

Parish	Total Area (ha)	Arable Land					Permanent Pasture		Wood and Forest	Other Land	
		Temp Crops	Temp Meadows	Temp Fallow	All other	Permanent Crops	Cultivated	Natural		Potential Production	Roads Building
St Michael	871	320	39	61	44	94	116	92	1	9	95
Christ Church	2541	1742	45	185	104	74	10	109	6	11	255
St George	2259	1501	40	195	116	59	15	127	51	20	136
St Phillip	3772	2120	33	568	424	63	56	262	1	1	244
St John	2511	1933	28	143	62	51	14	116	32	3	128
St James	807	402	12	66	64	31	18	111	19	13	71
St Thomas	2248	1226	29	300	169	41	111	187	6	3	177
St Joseph	1180	425	76	120	169	48	16	195	10	100	120
St Andrew	747	251	48	149	112	26	6	88	11	5	50
St Peter	2350	1479	25	444	131	19	5	113	1	0	135
St Lucy	1304	746	24	172	110	20	7	154	1	1	69
TOTAL	20590	12144	399	2404	1506	525	374	1554	138	67	1476

Table 3. Crop Production for Barbados 1987-1996 (Source: Ministry of Agriculture and Rural Development, Graeme Hall, Christ Church)

Crop	1987 (ha)	1988 (ha)	1989 (ha)	1990 (ha)	1991 (ha)	1992 (ha)	1993 (ha)	1994 (ha)	1995 (ha)	1996 (ha)
Beans	88	93	84	72	134	166	120.9	145.8	301.2	323.2
Beets	58	33	51	14	47	24	19	20.8	40.5	58.1
Cabbage	67	58	35	28	42	37	63.3	65.5	222.3	184.7
Carrot	233	206	264	216	231	156	156.2	100.2	193.6	291.5
Cassava	50	27	15	18	138	234	77	91.5	90.8	55.2
Cauliflower	-	-	-	-	-	-	6.7	0.7	6.2	13.6
Corn	121	98	92	86	58	66	25.6	86.6	176.8	252.6
Cotton	422	482	402	296	411	183	106	89	302.5	69.9
Cucumber	61	55	59	48	69	67	92.5	109.1	195.3	172.7
Eddoe	73	39	33	34	26	24	68.1	21.3	23.2	23.2
Egg plant	-	-	-	-	-	-	1	1.2	9.8	20.8
Lettuce	-	-	-	-	-	-	34.8	63.5	166.2	155.5
Okra	62	14	25	23	62	55	170.2	89.3	99.3	221.3
Onion	68	60	56	53	73	75	56	68	53.1	68.9
Peanut	26	44	2	5	12	24	40.5	30	65.4	14.9
Pepper (hot)	6	15	27	8	8	7	18	48.5	52.3	108
Pepper (sweet)	20	14	12	19	14	17	50.5	25	47.4	171.2
Potato (sweet)	426	295	302	315	230	288	268	372.6	649.1	602.4
Pumpkin	83	59	24	26	15	21	68.4	132.8	161.5	139.8
Squash	-	-	-	-	-	-	19.3	21.2	20.7	46.5
Sugar	12776	11536	11131	10487	10347	9230	8722	10233	8127	8909
Tomato	89	96	93	54	69	71	77.9	156	180.9	201.3
Watermelon	41	22	47	21	22	14	21.4	23.8	70.5	106.8
Yam	273	182	268	195	222	174	214.1	261.6	285.3	160.3
TOTAL	15043	13428	13022	12018	12230	10933	10497	12262	11541	12371

## Fruit Trees

During the last decade over 200 ha of fruit trees have been planted mainly by private growers for local consumption. The productivity of these orchard crops has been varied due to the limitations of soil moisture and fertility, and the lack of understanding of the requirements of fruit trees (Skeete, 1995). The Soil Conservation Unit of the Ministry of Agriculture and Rural Development (MARD) produce seed and planting materials for a variety of orchard crops from its 4.2 ha nursery. The government also about 3.3 ha under fruit crops at the Codrington Agricultural Station. Citrus, mango and avocado are in greater demand by growers (Table 4).

## Cut-flowers and Foliage

An estimated 25.1 ha were under cut-flower and foliage production in 1995 as compared to 24.2 ha in 1994 (Agriview 1995). Cut flowers were sold mainly to hotels and florists during the tourist season. However, records at the Environment Unit, Ministry of Health and the Environment, indicated that 80 987 ornamental plants listed in Appendix I and II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) were imported into the country in 1996, primarily for trade and personal use. These plants were mainly species of orchids (about 83%) and of cactus (about 11%). In 1995, only 61812 plants under the CITES listing were imported, and were comprised of orchids (about 98%) and other ornamental species.

## Livestock

Livestock production consists mainly of chickens, turkey, cattle, sheep, goats, and pigs. Large scale poultry production is done by private farmers with a stocking density of about 1 ft<sup>2</sup> per bird, however, backyard or domestic rearing of chickens and ducks is common in rural areas. Free range and semi-intensive system is practiced for ruminants, so stocking density varies according to access to grazing land and number of animals. Dairy production however, is not likely to increase because local demands are already satisfied and export is not price competitive (Michael Hunte, pers. comm.). Local production of beef meets about 20% of consumption demand. About 3% of lamb consumption is from local production. Barbados is virtually self sufficient in terms of fresh pork demand. Poultry production could expand because of preference for fresh meat and because of increased demand by the tourism sector. Estimated production of livestock products is generally increasing (Table 5), however, importation (which is cheaper than local production) is still required to satisfy local demand.

## Germplasm Conservation

### Sugarcane

The West Indies Central Sugar Cane Breeding Station (CBS), located in Groves, St George, is funded by Caribbean sugarcane growers and is responsible for producing disease resistant, high yielding commercial varieties of sugarcane. Its Genetic Base Broadening programme runs concurrently with its Commercial Crossing programme, utilising *Saccharum officinarum* and *S. spontaneum* as the main donor species, and to a lesser extent, *S. robustum* and *Erianthus arundinaceus*. About 30,000 varieties have been bred and are being tested for commercial application by the Agronomy Research and Variety Testing Unit of the Barbados Agricultural Management Company Limited.

Over the past 21 years sugarcane breeding has produced about 20 million genotypes, samples of which are kept in cold storage. About 2600 accessions are kept in field plots, of which 12 varieties have found commercial application in Barbados over the past decade (Table 6). The trend to reduce dependence on one variety of sugarcane for commercial production has considerably lessened the risk of crop failure from pest and diseases, without negatively affecting the yield of sugar; a major concern among growers.

Table 4. Number of Fruit Trees Sold to Public 1993-95 (Source: Agriview 1995).

<b>Fruit Crop</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>
Avocado	1119	1205	797
Breadfruit	38	38	47
Carambola	389	580	305
Cherries	711	790	173
Citrus Rootstock	30	13	10
Citrus (not stated elsewhere)	1514	1383	1695
Golden Apple	285	273	242
Grapefruit	1323	1385	1295
Guava	555	566	580
Limes	1899	1801	1828
Mandarines	1336	1297	860
Mango	1491	1483	3300
Orange	2155	1864	1716
Passion Fruit	469	693	174
Paw-paw	858	-	41
Plantain	305	563	1
Soursop	281	428	237
Other fruit	2899	2250	2731
<b>TOTAL</b>	<b>16655</b>	<b>16614</b>	<b>16032</b>

Table 5. Estimated Production of Livestock Products 1993-95 (Source: Agriview 1995).

Commodity	Output ('000 kg)		
	1993	1994	1995
Pork	1890.4	1688.1	1928.3
Beef	861.8	866.4	861.8
Mutton	49.8	55.3	66.6
Chicken meat	8524.6	9791.6	10457.3
Turkey meat	215.0	360.3	387.2
Eggs	1247.8	1322.3	2130.0
Fresh milk	7668.1	7296.9	7869.4
Veal	12.2	13.0	12.1

Table 6. Percent area occupied by sugarcane varieties in Barbados from 1987-1996 (Source: Rao and Gardiner, 1997).

Sugar cane Variety	Year of Cultivation									
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
B 62163	84	82	77	67	55	43	29	30	24	25
B 80689	0	1	2	2	7	15	20	22	20	17
B 77602	0	1	2	2	8	11	14	12	15	16
B 74541	4	5	9	9	13	15	17	17	17	13
B 80251	0	0	0	0	0	1	2	4	6	6
B 82238	0	0	0	0	0	<1	1	<1	2	4
B 79474	0	0	0	1	2	3	6	5	4	2
B 63118	7	5	4	4	5	4	4	4	3	3
B 85764	0	0	0	0	0	0	0	<1	1	2
B 78436	0	0	0	0	0	<1	2	2	2	2
B 71383	1	1	1	1	1	1	1	<1	2	2
B 73382	1	2	1	1	1	<1	0	0	0	0
Others	3	3	4	6	8	5	4	2	4	8

#### Other crops

There is no national programme for conserving plant genetic resources in Barbados (Wickham, 1995), however, other than the activities at the CBS, sweet potato conservation is done by both the Ministry of Agriculture and Rural Development and the Caribbean Agricultural Research and Development Institute (CARDI). Cassava, yam, pineapple, onion, pigeon peas, and maize germplasm are also conserved by CARDI. Fruits and cut flowers conservation is done by the Ministry. Table 7 provides further details on the number of accessions in germplasm collections, most of which are *in situ*.

#### Livestock

Stock for many of the breeds of commercially important animals have been imported, however, for cattle and goats much of the local stock are considered as “creole”, which resulted from uncontrolled cross breeding and having no easily determined major pedigree. The following commercial breeds of livestock are available in Barbados:

Chicken:	Layers - White Leghorn, Rhode Island Red Broilers - Commercial hybrids from imported eggs, hatched locally
Cattle:	Dairy - Holstein, Jersey, Creole Beef - Red Poll, Holstein, Red Poll/Holstein
Sheep:	Barbados Black Belly, Black Belly types
Goats:	Creole, Sanaan, Toggenberg, British Alpine, Anglo-nubian, French Alpine
Pigs:	Large White, Landrace, Duroc

### **Major Impacts of Agriculture on Biodiversity**

Agricultural plantations over the last 300 years have reduced the extent of natural terrestrial ecosystems to relatively small isolated patches and created several monospecific agroecosystems, the most persistent of which has been sugarcane. Of the 25 food crops monitored by the MARD, only 15 of these occupied arable land greater than 100 ha by 1996. This long history of intensive agriculture has contributed to erosion of topsoil, decrease in soil fertility, and subsequent large inputs of agrochemicals, particularly, pesticides and chemical fertilizers as a means of maintaining productivity (Table 8). Due to the coralline nature of most of the soils in Barbados, percolation of water and subsequent discharge into subsurface water bodies as well as overland runoff, eventually reaches the sea in a relatively short timeframe. Agrochemical contamination of underground water supplies, nearshore waters and biota are not well documented for Barbados but presents a serious risk to human and animal health.

Table 7. Germplasm Collections in Barbados (Source: Wickham, 1995).

Crop	No. of Accessions	Location	State of Collection
Sugarcane	2567	SCBC	In field
Cotton	52	MARD	Seed
Sweet potato	59	CARDI	In vitro
Sweet potato	63	MARD	Field
Cassava	31	CARDI	In vitro & Field
Yam	24	CARDI	In vitro & Field
Pineapple	10	CARDI	In vitro
Pineapple	2	MARD	Field
Onion	1	CARDI	Seed
Pigeon pea	2	CARDI	Seed
Mango	13	MARD	Field
Avocado	9	MARD	Field
Carambola	7	MARD	Field
Lime	3	MARD	Field
Mandarin	2	MARD	Field
Tangerine	1	MARD	Field
Tangelo	1	MARD	Field
Orange	3	MARD	Field
Grapefruit	4	MARD	Field
Cherry	2	MARD	Field
Pawpaw	2	MARD	Field
Passion fruit	2	MARD	Field
Plum	1	MARD	Field
Ginger lilies	3	MARD	Field
Guava	2	MARD	Field
Orchids	18	MARD	Field
Heliconia	35	MARD	Field
Anthurium	14	MARD	Field
Bird of paradise	1	MARD	Field
Tube roses	2	MARD	Field

Table 8. Imports of Fertilizers and Other Agrochemicals into Barbados in 1995 (Source: Agriview 1995).

Fertilizers	Quantity (kg)	Other Agrochemicals	Quantity (kg)
Ammonium Sulphate	2725001	Fungicides	16043
Ammonium-based Fertilizer	24948	Herbicides	445085
Urea	1288305	Insecticides	22061
Other Nitrogenous Fertilizers	27029	Plant Growth Regulators	44588
Superphosphate	1232734	Rodenticide	37388
Potassium Chloride	39280		
Other Potassium Fertilizers	1540702		
Other Fertilizers	1949939		
TOTAL	8827938	TOTAL	565165

Agricultural research is contributing to an increase in the number of genomes of selected food crops for commercial exploitation, grasses for pasture improvement, and the propagation of helpful parasites for biological pest control. The MARD is conducting research focused on finding solutions to a number of pests and disease problems in fruits and vegetables, breeding and crop improvement of the Sea Island Cotton cultivars, and the utilisation of pasture grasses such as Pangola, African Star, Coastal Bermuda, and Coast Cross 1.

The Agronomy Research and Variety Testing Unit currently do not use any insecticide for the control of the sugarcane moth borer (*Diatraea saccharalis*), in its sugarcane fields. Instead, biological control through the release of the moth's larval parasitoid, *Cotesia flavipes* and *Lixophaga diatraeae* has become the preferred option.

CARDI has had a large research and development component over the years, which contributed to improved crop selection and production in Barbados. Recent research and development activities include the following (CARDI 1996):-

Animal Production: Pasture establishment with green panic (*Panicum maximum cv trichoglume*), Klein grass (*Panicum coloratum cv klein*), cv Trifton 68 (*Cynodon plectostachyus*) cv Coast Cross 1 (*C. dactylon*), Siratro (*M. atropurpureum*) and glycine (*N. wightii*).

Crop Production: The use of micropropagated yam plants - *Dioscorea alata*, (as a source of disease free planting material and an economical means of establishing tissue cultured material).  
 Yam yield and characterisation trials - to record and monitor yield and foliage characteristics of 16 yam varieties.  
 Sweet potato yield evaluation and characterisation trial - to compare yield, vegetative and tuber characteristics of 18 varieties from the International Potato Centre in Peru.  
 Evaluation of performance of 7 varieties of hot peppers.  
 Evaluation of performance of 40 varieties sweet pepper.  
 Micropropagation of papaya (*Carica papaya*) - to adapt and improve micropropagation protocols.  
 Improvement in papaya production -to select disease free, elite lines.  
 Characterisation of 10 pineapple varieties for potential growers.  
 Characterisation of 14 varieties of *Musa* spp. for potential growers.  
 Determination of media formulations for *Anthurium andreanum*, *Heliconia* sp., *Agave angustifolia striata* cv 'Common' and 'Variegated' (in conjunction with Andromeda

Botanic Gardens).

Crop Development: Maintenance of yam, sweet potato, and cassava germplasm *in vitro* collection.  
Integrated pest management of Oriental thrips (*Thrips palmi*) and the whitefly (*Bemisia tabaci*) using Confidor 350 SC (imidacloprid) - a low toxicity systemic nitroguanidine, and Admiral 10 EC (pyridoxyfen) - an insect growth regulator, and the commercially available Applaud.  
Integrated pest management of the pests, diamondback moth (*Plutella xylostella*), whitefly (*Bemisia tabaci*) and cabbage aphid (*Brevicoryne brassicae*) on cabbage, using Match 50 EC - an insect growth regulator, Regent SC - a phenyl pyrazole and Chess 25 WP a pymetrozine.  
Production of good quality seeds of pigeon peas (UW 10 and ICPL 289), West Indian hot peppers, sorrel and spawn of oyster mushroom for farmers.  
Maintenance of germplasm collection of 9 pineapple varieties.  
Commercial production of banana, fig banana, plantain, anthurium and orchid on contract.  
Selection of sugarcane varieties tolerant/resistant to sugarcane moth borer (*Diatraea saccharalis*), strengthen biological control through mass breeding and release of its larval parasitoid, *Cotesia flavipes* and *Lixophaga diatraeae*.  
Mass breeding and release of parasites, *Telenomus remus* and *Trichospilus diatraeae* for the biological control of armyworms *Spodoptera* spp.

Cultivation by farmers of a few new crop varieties with traits that appear more appealing to consumers, has caused traditionally cultivated genomes of some crops to become endangered through lack of stocking and replacement. Of particular concern is the Barbados Finger Squash (*Curcubita* sp), the Red and the White Sorrel (*Hibiscus sabdariffa*). CARDI is currently trying to purify and stabilise these genomes before producing seeds for farmers.

### **Institutional Capacity**

The Ministry of Agriculture and Rural Development has overall responsibility for agricultural development in Barbados. Its function is carried out through two divisions, Livestock and Crop, as well as through several specialised sections, such as the Agricultural Planning Unit, Plant Pathology Unit, Central Agronomic Research Station, Entomology, Land and Water Use Unit, Animal Nutrition Unit, Agricultural Stations, Soil Conservation Unit, and Veterinary Services.

The Barbados Agricultural Management Company Ltd.(BAMC) was set up by the government of Barbados and given a 12 year lease to manage sugarcane farms and factories which had become indebted to the banks. BAMC manages 40% of all lands under sugarcane, is the largest producer of cotton in Barbados and cultivates some root crops and hot peppers for export. The BAMC also operates the Agronomy Research and Variety Testing Unit (ARVTU) which is geared towards the improvement of sugarcane cultivars and sugar yields and the reduction of production costs. BAMC is managed by a General Manager, Crop Diversification Manager, 2 Area Managers, 3 Agronomists, 16 Farm Managers, 16 Supervisors, support staff for machinery and workshop services, and labourers.

The West Indies Central Sugar Cane Breeding Station (CBS) also located at Groves in St George, is operated by the Sugar Association of the Caribbean and is responsible for the production of seed each year for distribution to participating variety testing stations such as the ARVTU. The CBS maintains on 16 ha of land, a working collection of over 1000 commercial clones from 900 species and early-generation interspecific hybrids. The CBS is managed by a Director, 2 senior staff members, a field manager, administrative, technical and field staff.

The Caribbean Agricultural Development Institute (CARDI) sub-regional office located on the Cave Hill Campus of the University of the West Indies conducts research on animal production and development, and crop production and development. CARDI also provides technical assistance to farmers and government agencies. Its operation is managed by a Programme Leader, 6 professional, 9 technical and 4 office support staff.

## List of Legislation Relevant to Agriculture

Cultivation of Trees Act (Cap. 390)  
 Tree (Preservation) Act (Cap. 397)  
 Town and Country Planning Act (Cap. 240)  
 Soil Conservation (Scotland District) Act (Cap. 396)  
 Plant Pest and Diseases Eradication Act (Cap. 266A)  
 Pesticides Control Act (Cap. 395)  
 Agricultural Holdings (Options to Purchase) Act (Cap. 221)  
 Security of Tenure of Small Holdings Act (Cap. 237)  
 Irrigation Act (Cap. 263)  
 Barbados Agricultural Development Corporation (Cap. 254)  
 Cane Fires (Prevention) Act  
 Barbados Marketing Corporation Act (Cap. 255)  
 Exportation of Fruit Act (Cap. 333)  
 Agricultural Aids Act (Cap. 252)  
 Livestock (Control of Strays) Act, 1990  
 Animal Act (64 of 1980)  
 Land Development Duty Act

## Benefits of Agrobiodiversity

The production of sugar and non-sugar crops has contributed an average of about 7% of the total GDP of Barbados over the past decade (Table 9), and provided employment for 6500 persons in 1996 or about 5.7% of the labour force (Economic Report 1996). The Agricultural sector's contribution to real GDP stood at BD\$64.7 million in 1996 with increased production from both the sugar and non-sugar components over the previous year's outputs.

Table 9. Estimated Real Contribution of Agriculture to the Gross Domestic Product, 1978-96 (Constant Prices).  
Source: Central Bank of Barbados.

Year	BD\$ Million				
	Sugar	Non-Sugar	Total Agriculture	Total GDP	Agriculture as % of Total GDP
1987	33.4	34.6	70.0	848.1	8.3
1988	34.1	31.8	65.9	877.5	7.5
1989	28.2	28.2	56.4	909.1	6.2
1990	29.5	35.6	65.1	880.9	7.4
1991	28.0	34.1	62.1	844.3	7.4
1992	23.0	33.4	61.4	791.9	7.8
1993	20.9	32.9	53.8	803.9	6.7
1994	22.2	31.2	53.4	836.8	6.4
1995	16.6	33.6	50.2	856.6	5.9
1996	26.4	38.3	64.7	897.1	7.2

Other benefits of agrobiodiversity include:

- Source of germplasm for breeding improved crop varieties e.g. sugarcane and cotton.
- Introduction of different varieties of the same crop so as to minimise the risk of crop failure due to pests and diseases, e.g. the sugarcane varieties currently being grown in Barbados.
- Increased biological pest control and reduction in the use of pesticides, particularly in the case of sugarcane.

### **Policy on Agrobiodiversity**

There is currently no national policy on agrobiodiversity or plant genetic resources, however the 1996-1999 Medium Term Macro-economic Strategy for the agriculture sector is to increase its contribution to the economic development of Barbados, taking into account the domestic and external constraints and the opportunities. The achievement of this goal will depend on the following conditions:

- making optimum use of arable land;
- diversification of agricultural production through promotion of sugarcane by-products, and non-sugar crops; and
- strengthening agricultural sector institutions, through improvements in internal efficiency, and better coordination between them.

A policy on Plant Genetic Resources (PGR) rather than agrobiodiversity is needed. The formulation of this policy should participatory and take into consideration the following issues:

1. Enabling activities (legislation, capacity building) for national institutions to collect, identify, characterise, store and document PGRs available in the island.
2. Development of a national seed programme, including certification and standards for seed exchange regulations.
3. Coordination of PGR conservation, evaluation and utilisation.
4. National collections be freely available to bona fide users.

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