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Crop diversification in the Eastern Caribbean: Will it help arrest declines in agriculture?

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This paper attempts to address the central issue of the future of agriculture in many small Caribbean islands, especially given long run declines for various agricultural products, including livestock, the declining contribution of agriculture to the GNP, the annual loss of arable land and the progressive deterioration in the agricultural production/consumption ratio. Forecasts are made with respect to the latter three. Given the dismal picture that emerges from these forecasts, numerous policy measures are suggested to arrest agricultural decline, including land reform, strict ordinances to prevent agricultural land from being taken out of use and crop diversification. Problems (transportation, marketing, economies of scale, etc.) associated with the latter are highlighted.

Keywords: Crop diversification; Small farm systems; Island economies; Agricultural development

Introduction

The decline of agriculture in the OECS, particularly in the Leeward Islands, has been persistent and thoroughgoing, due largely to the emergence of modern growth-intensive sectors, such as light manufacturing, tourism and government employment. These relatively high wage sectors, especially labour intensive tourism, have captured land and labour away from agriculture (de Albuquerque and McElroy, 1983; Richards, 1983), but have failed to truly diversify the insular economies. One of the more pernicious effects of sectoral wage imbalances has been the steady erosion of the small farm sector, which accounts for over 90 percent of all farms and produces most of the domestic fruit and vegetables in the region.

There have been scores of studies, task forces, and inquiries into the state of agriculture in the OECS, initiated by the respective governments, aid donor agencies, non-governmental organizations, and regional and international organizations. The reports, assessments, white papers, and policy pronouncements that have ensued, have all called for, in one way or another, the revitalization of agriculture. They have all pointed to the importance of agriculture in the region by stressing the following:

1. Although overall agricultural production has either stagnated or declined, the agricultural sector is still the dominant sector in a majority of OECS countries.

2. Agriculture provides employment and subsistence to a large number of people in the region.

3. Agriculture is still the major foreign exchange earner in the Windward Islands.

A concerted effort has therefore been made, particularly in the Windward Islands, to commercialize, modernize, and diversify the

agricultural sector, and since 1975 there have been in excess of 200 agricultural development projects in the OECS that have had one or more of these major components as their objective. Despite the expenditure of millions of dollars and the many successes, the major structural problems affecting agriculture still remain, and their continued existence raises important policy questions regarding the whole issue of agricultural viability, and consequently food security, in small islands undergoing tourism related economic restructuring.

The state of agriculture in the OECS

Table 1 shows changes in the percentage contribution of agriculture to the gross domestic product (GDP) over a 20 year period. Although the various islands vary considerably in size, resource endowment, climate, and level of development, they have all experienced major declines in the sectoral contribution of agriculture to the GDP.

Table 1 Percentage contribution of agricultural sector to Gross Domestic Product at factor cost for OECS countries: 1961 - 1986[1]

	Country [2]						
Year	Antigua/ Barbuda	Dominica	Grenada	Montserrat	St. Kitts/ Nevis	St. Lucia	St. Vincent/ Grenadines
1961	19.5	32.2	38.9	-	45.8	-	40.3
1962	15.9	32.3	37.8	38.8	43.5	-	38.2
1963	18.2	35.4	34.8	35.4	41.4	33.9	32.5
1964	14.7	35.7	33.5	31.4	40.2	33.9	31.6
1965	-	29.2	38.8	24.0	40.6	-	31.5
1966	4.9	29.2	34.7	19.9	39.3	-	29.4
1967	2.7	29.2	34.6	15.1	39.3	-	30.0
1968	-	28.2	33.1	17.3	37.8	-	28.1
1969	-	27.2	31.7	17.8	35.0	28.1	27.9
1970	-	26.4	21.4	16.9	29.7	22.0	25.0
1971	-	26.4	20.8	16.1	24.4	23.2	24.8
1972	-	28.8	21.3	13.7	24.6	17.2	22.2
1973	-	31.1	23.5	12.8	22.2	18.3	25.0
1974	-	-	24.9	-	-	-	-
1975	-	-	-	5.0	-	-	-
1976	-	-	-	5.1	-	-	-
1977	-	31.8	-	4.7	-	15.6	16.8
1978	-	34.1	-	4.6	-	17.4	18.0
1979	8.1	28.4	-	5.2	19.0	14.7	15.6
1980	7.5	25.5	22.1	4.0	20.4	11.6	13.8
1981	6.4	25.3	22.9	4.5	15.6	9.8	16.8
1982	6.7	24.0	19.1	4.6	20.0	12.6	15.7
1983	7.5	23.1	22.0	-	17.0	13.8	15.4
1984	6.5	22.7	21.3	-	17.2	-	-
1985	5.0	27.9	18.0	5.0	9.5	15.0	19.8
1986	4.6	30.2	18.2	4.5	9.8	16.6	19.5

1) Includes livestock, forestry and fishing. In current prices.

2) Sources: Chernick, (1978), World Bank, (1985), Government of Montserrat, (1985) United Nations, (1988).

As might be expected, the sharpest declines are observable for Antigua/Barbuda with its drier climate, and for Montserrat and St. Kitts/Nevis, the latter plagued by limited available arable land and steep topography. These declines coincided with the phase out of

sugar in Antigua and large-scale emigration in the 1960s and tourism growth of the 1970s, which affected all three island states. For the larger and wetter Windwards, these trends were less marked, but equally persistent. By 1986, agriculture's contribution for Grenada, St. Lucia, and St. Vincent/Grenadines had declined to slightly less than half the 1961 level (see Table 1). Only in Dominica, has agriculture's contribution to the GDP remained roughly the same.

Despite declines in Grenada, St. Lucia, and St. Vincent/Grenadines, agriculture still accounts for nearly 20 percent of GDP in the Windwards, mainly because of the continuing importance of traditional export crops.

Corresponding declines in the percent of the population working in agriculture are observable in Table 2.

Table 2 Percent of economically active population working in agriculture(1) in OECS States: 1960 - 1980

Country	Year(2) 1960	1970	1980
Antigua-Barbuda	35.3	10.7	9.3
Dominica	54.5	39.2	35.1(3)
Grenada	43.3	33.3	28.7(3)
Montserrat	50.0	20.1	13.6
St. Kitts-Nevis	48.0	34.1	28.8
St. Lucia	53.1	39.3	30.9
St. Vincent-Grenadines	42.7	29.0	31.8

1) By industrial group
2) Sources: Axline, 1986; Commonwealth Caribbean Census, 1970, 1980-81
3) Census was conducted in 1981.

I have argued earlier that sectoral imbalances in wages have had the net effect of siphoning off labour from the agricultural sector, and that this direct displacement is the single most important factor in the decline of agriculture in the OECS. Declines in the percent of the population working in agriculture were greatest for Antigua/Barbuda and Montserrat. Recent estimates for Antigua, place the economically active population in agriculture at less than 5 percent. While agriculture in the Windwards remains one of the principal sources of livelihood, trends in employment and other data suggest that agriculture might soon be eclipsed by other forms of economic activity such as trade and commerce, construction, or government employment.

Table 3 shows changes in arable and permanent crop land. The greatest changes between 1960-80 occurred in Antigua/Barbuda, Montserrat, and St. Lucia, the more heavily penetrated tourist destinations. Projected declines (1990 and 2000) in per capita arable and permanent crop land are a function of increased population growth, particularly in the face of declining opportunities for emigration. In addition, it should be noted that a lot of arable land, especially in the Leewards, is being diverted to residential and other non-agricultural uses. However, an estimated one third of the arable land in the OECS is not being used or is underutilized, so from the strict standpoint of land availability the potential to expand agricultural production exists.

Table 3 Arable and permanent crop land (hectares per capita) for member OECS Countries, 1960 - 2000[1][2]

	Arable Land and Permanent Crop Land									
	Hectares Per Capita					Percent Change				
Country	1960	1970	1980	1990	2000	1960-80	1970-80	1980-90	1960-2000	1980-200
Antigua-Barbuda	.15	.12	.11	.09	.08	-26.7	-8.3	-18.2	-46.7	-27.2
Dominica	.27	.24	.24	.20	.19	-11.1	0.0	-16.7	-29.6	-20.8
Grenada	.18	.17	.15	.14	.13	-16.7	-11.8	- 0.7	-27.8	-13.3
Montserrat	.25	.17	.09	-	-	-64.0	-47.1	-	-	-
St. Kitts-Nevis	.31	.31	.32	.31	.29	3.2	3.2	-3.2	-6.5	-9.4
St. Lucia	.24	.21	.14	.12	.11	-41.7	-33.3	14.2	-54.2	-21.4
St. Vincent/ Grenadines	.21	.21	.17	.15	.13	-19.0	-19.0	-11.8	-38.1	-23.5
Average	.23	.20	.17	.17	.16	-25.1	-16.6	10.8	-33.8	-19.3

1) Sources: Bouvier (1984), FAO, Production Yearbook (1966, 1970, 1982 & 1984)

2) Comments: Arable and permanent crop land was assumed to remain at 1983 levels for 1990 and the year 2000. Since most of the OECS member countries have recently recorded declines in arable and permanent crop land and will continue to do so, such an assumption yields extremely conservative estimates. There is little hope of reversing the downward trend as the OECS countries have exhausted their ability to develop new agricultural lands. If at all, population increases will have the net effect of diverting arable and permanent crop land to non-agricultural use. Actual and projected declines in per capita arable and permanent crop land are due to increases in population.

Population projections were made by the Population Reference Bureau using the PIV PIV/SIM Sim projection package. For assumptions underlying the particular scenarios see Bouvier (1984). Data for 1990 and the year 2000 were based on scenario "A" for Antigua-Barbuda, "C" for Grenada, and "B" for Dominica, St. Kitts-Nevis, St. Lucia and St. Vincent. In all cases these scenarios assumed declining fertility and emigration.

Although crop diversification has long been proposed as one way to rehabilitate agriculture in the OECS, and there have been major thrusts in this direction, the data in Table 4 indicate that the traditional export crops remain dominant, and in fact, have been reasserting themselves. For example, banana production in the Windwards began to decline in the mid 1960s, but continued to dominate exports until the late 1970s when production began to fall more rapidly (some of this due to the temporary effects of hurricanes David and Allen). Since 1983/84, the Windwards have experienced a banana boom, stimulated by protected and price-supported markets in the United Kingdom and an increase in the real international price of bananas. So, from 1984 onwards, we have seen an increasing shift of productive resources into bananas, or in the case of Grenada, nutmeg. Indeed, farmers in the Windwards did not need much encouragement to increase their plantings of bananas or go back into bananas, as they have always shown a preference for proven cash crops for which well developed extension and marketing systems exist. The dominance of agriculture and of the traditional export crops, in the export picture of the Windwards, is apparent in Table 4. Seventy percent or more of Grenada's and St. Lucia's domestic exports are accounted for by agriculture, and over 90 percent for Dominica. The picture is very different in the Leewards. In Antigua/Barbuda and Montserrat, agriculture's contribution to domestic exports is marginal and all indications are that this will be further eroded. St. Kitts, on the other hand, is experiencing a gradual phase out of sugar production and a boom in tourism, such as occurred in Antigua in the 1960s and

1970s. Labour shortages in the St. Kitts sugar industry, because of sectoral wage imbalances, have necessitated the importation of cane cutters and the use of mechanical harvesters, and at times, a significant portion of the sugar crop has been left unharvested.

Table 4 Value of total and leading exports for OECS member countries, 1976 - 1986 (% of all domestic exports)[1]

Country	Year										
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Antigua-Barbuda											
Total Ag. Exp.				6.7	4.3	4.2	3.1	4.7	5.4	3.7	-
Leading Ag. Exp.											
Dominica											
Total Ag. Exp.	96.2	88.9	83.1	73.7	43.3	55.5	56.0	56.5	56.6	61.1	73.5
Leading Ag. Exp. (Bananas)	61.7	59.0	57.5	46.3	30.9	47.2	47.2	41.3	44.6	50.8	64.8
Grenada											
Total Ag. Exp.				93.4	89.0	80.1	76.5	83.8	92.1	91.7	95.8
Leading Ag. Exp. (Cocoa to 1983 then spices)				48.6	40.1	37.9	25.9	22.0	23.7	25.6	44.3
Montserrat											
Total Ag. Exp.	85.4	35.6	19.1	53.5	25.1	21.5	17.2				
Leading Ag. Exp.											
St. Kitts-Nevis											
Total Ag. Exp.			77.2	71.3	63.0	64.5	66.7	59.9	56.9	44.8	45.5
Leading Ag. Exp. (Sugar)[2]			77.2	70.7	62.6	64.1	66.1	59.9	56.8	44.8	45.5
St. Lucia											
Total Ag. Exp.[3]		57.2	58.7	60.1	41.1	47.9	50.5	57.5	59.7[5]	67.0	74.1
Leading Ag. Exp. (Bananas)		45.9	48.8	48.3	31.2	39.9	41.5	49.8	52.2	63.5	69.7
St. Vincent-Grenadines											
Total Ag. Exp.[4]		66.0	72.4	74.1	76.2	72.3	56.5	54.0[5]	41.2	48.3	48.4
Leading Ag. Exp.		56.0	42.0	31.9	31.2	34.9	27.0	24.4	22.4	27.2	27.4

1) Sources: Government of Montserrat, (1984 & 1987), World Bank (1985 & 1988)
2) Includes molasses.
3) Includes unrefined and refined coconut oil.
4) Includes flour and mill feed.
5) Preliminary estimates.

The ratio of the value of imports to exports (Table 5) provides some rough measure of food security. OECS countries like Antigua/Barbuda and Montserrat, with ratios greater than 1.0, are importing more agricultural products than they are exporting, and the level of dependence on food imports in these two territories appears to be increasing.

Table 5 Ratio of value of agricultural imports to agricultural exports for OECS member countries, 1969 - 1986[1][2]

Year	Country						
	Antigua/ Barbuda	Dominica	Grenada	Montserrat	St. Kitts/ Nevis	St. Lucia	St. Vincent/ Grenadines
1969	38.4	0.3	0.7	52.0	0.5	0.4	0.9
1970	3.7	0.4	1.0	61.0	0.8	1.0	0.9
1971	2.8	0.4	1.5	39.5	1.0	1.0	1.2
1972	30.2	0.5	1.3	49.0	0.8	0.9	1.3
1973	28.1	0.6	1.1	26.8	0.7	1.0	1.6
1974	30.4	0.7	1.2	32.5	0.5	0.9	1.8
1975	13.8	1.1	0.8	11.6	0.4	1.1	1.3
1976	24.3	1.1	0.7	8.7	0.4	1.1	1.0
1977	23.1	1.0	0.6	191.0	0.5	1.2	1.1
1978[3]							
1979	24.1	1.0	.7	222.0	0.6	1.0	1.3
1980	29.5	2.9	1.0	264.0	0.5	1.2	1.4
1981	19.0	1.4	1.0	46.9	0.6	1.3	0.9
1982	29.2	0.9	1.3	277.0	0.7	1.1	0.9
1983	29.7	0.7	1.1	277.0	0.9	1.0	0.7
1984	29.4	0.8	1.3	284.0	0.8	0.8	0.7
1985	59.3	0.8	1.3	-	1.3	0.9	0.5
1986	46.6	0.5	1.0	-	1.0	0.6	0.4

(1) Sources: FAO, (1971, 1977, 1984, & 1987)

(2) Imports and exports of total agricultural products (food and animals, beverages and tobacco, crude materials, animal/vegetable oil, fish and fishery products, forest products, and agricultural requisites). A ratio greater than 1.0 indicates that a country is importing more agricultural products that it is exporting.

(3) Data for 1978 are not comparable.

The banana producing Windwards, by contrast, have seen recent declines in this ratio to below 1.0, primarily because they are flush from the so called "green gold" windfall. The eventual loss of the protected UK market will leave these islands extremely vulnerable, since they will be unable to compete with more efficient banana producers. One cannot think of a greater impetus towards agricultural diversification, and especially non-traditional export crops, than the threatened loss of the protected UK market for bananas, yet all indications are, that farmers are still rushing to cash in on the windfall. Clearly, the uncertainty associated with agriculture as a livelihood in the OECS, is prompting farmers to invest in short term quick cash crops as opposed to long term non-traditional crops of unproven market value.

With the rapid modernization of the OECS economies, food imports as a percentage of total imports are decreasing (Table 6), mainly because of the increasing importance of high value imports such as consumer durables and automobiles. Yet until the mid 1980s, food imports remained the single largest item in the import bill for Dominica, Grenada, and St. Vincent and the Grenadines. However, the absolute value of food imports in the OECS is growing every year and this drain on the treasury of the individual governments, has prompted periodic calls for food import substitution policies. Such policies can only be based on comprehensive and successful agricultural diversification programmes. However, as I have observed in this paper, Antigua/Barbuda, Montserrat, and St. Kitts/Nevis have been diversifying out of agriculture into tourism and to a lesser extent assembly type manufacturing, while in the Windwards there has been a

greater concentration of effort in the production of the traditional export crop.

Table 6 Percentage of food imports in the total import bill for OECS member countries, 1976 - 1986[1][2]

Year	Country						
	Antigua/ Barbuda	Dominica	Grenada[3]	Montserrat	St. Kitts/ Nevis	St. Lucia	St. Vincent/ Grenadines
1976		36.3	32.3	25.0			
1977		32.9		27.3		22.1	30.7
1978		34.0		23.2	24.4	20.7	37.9
1979	35.0	17.5	30.6	21.3	20.9	19.1	36.9
1980	19.9	21.5	28.9	20.9	18.9	18.9	35.0
1981	23.0	25.2	28.2	19.7	19.5	20.4	31.8
1982	19.6	26.5	27.5	18.5	19.6	21.1	32.4
1983	22.4	24.4	24.2	19.9	19.6	22.8	29.0
1984	15.1	25.1		24.3	20.5	20.9	28.3
1985	13.8	21.9	24.8	20.8	21.4	24.8	26.5
1986	11.8	25.1	21.9	20.5	17.9	23.1	22.6

(1) Sources: Gov't of Grenada, (1981); Gov't of Montserrat, (1984); World Bank, (1985 & 1988)
(2) Includes beverages and tobacco for Dominica and St. Vincent, and for St. Lucia for 1985-86.
(3) Food imports represented the single largest item in the import bill, but have been supplanted by manufactured goods since the mid 1980s.

Further evidence of the progressive marginalization of agriculture in the OECS can be gleaned by comparing selected indicators from the various agricultural censuses (the 1946 and 1961 West Indies Census of Agriculture, the 1972 and 1985/86 census for St. Vincent/Grenadines, the 1975 and 1986 census for St. Kitts/Nevis, the 1972 Montserrat census, the 1981 Grenada census, the 1976/77 Dominica census, the 1984 Antigua/Barbuda census, and the 1986 St. Lucia census). Invariably, comparisons across time of various indices, demonstrate the declining importance of agriculture as a livelihood: the increasing fragmentation of holdings, increases in the percentage of holdings without land, a greater percentage of part-time farmers (69% of all farmers in Antigua in 1984 reported themselves as part-time farmers), a greater number of days spent annually on off-farm labour, diversification into less labour intensive activities (livestock and tree crops), the increasing median age of farmers (in Grenada in 1981, 22 percent of the farmers were above age 65), and so on.

Constraints facing agriculture in the OECS

How do we explain the relatively poor performance of the agricultural sector in the OECS and the progressive marginalization of agriculture in the Leewards? Any explanation must inevitably adumbrate the structural/institutional and other constraints facing agriculture in the OECS. It is a familiar litany: the Moyne Commission Report (1938 -39), O'Loughlin (1968), and the First World Bank survey (Chernick, 1978).

I have attempted to outline these constraints below, but in reviewing them one must keep in mind that these constraints are not discrete or isolated from each other, but interact and affect each other in numerous ways.

Resource constraints

These include steep topography, heavily deforested hillsides, eroded soils, shallow soils, limited arable land (Leewards), problems related to rainfall reliability (droughts are common in the Leewards), long dry seasons in the Leewards (effects availability of forage for livestock), inadequate surface and ground water, etc.

Land constraints

Problems relating to secure tenure, excessive fragmentation of holdings, small uneconomic holdings, land distribution, the rising cost of land as it is competed away to other uses (residential developments and tourism), etc.

Demographic constraints

These include the increasing average age of farmers and the corrosive impact of external migration and rural to urban migration.

Agricultural and socio-economic constraints

Low yields, high cost of production because of high cost of inputs, declining government expenditure on agriculture, overburdened and underfunded extension services, poor availability of subsidized inputs (seeds, fertilizers, tractor services, etc.), little involvement of farmers in the planning process, rudimentary marketing structures for non-traditional crops, marketing boards that have become inefficient or unviable, lack of adequate storage, processing and packaging facilities, predominance of small farms making mechanization and diversification difficult, the increasingly part-time nature of farming, poor to non-existent agricultural reporting systems, inadequate market information, poor transportation services, inadequate rural infrastructure (feeder roads etc.), economies of scale problems, competition from low cost imports, increasing resource competition from more profitable higher wage sectors, uneconomic pricing policies, limited access to capital markets, etc.

Political constraints

Political considerations in the distribution of government land, politicians who are less responsive to farmers than they are to other occupational groups (taxi drivers, teachers, government employees), lack of truly coordinated local and regional agricultural policies, little control over external markets, nepotistic and highly personalistic politics, etc.

Is crop diversification the answer?

Given the above constraints, which have historically plagued caribbean agriculture, is crop diversification the answer? Crop diversification is nothing new, indeed inter-cropping has been widely practiced in the Windwards and the whole structure of production is quite diversified. What is perhaps more correct to say, however, is that diversification has taken on a new urgency, and that it often means different things in different OECS countries. Currently (1987), there are three generally agreed upon definitions of diversification in the OECS. The first involves intensification/rehabilitation of traditional export crops. The second sets as its goal, production for local

consumption including the growing tourist market. The third, focuses on the production of non-traditional exports.

If diversification is not new, has it really helped? The data presented in this paper would indicate not. Practitioners in the field would argue that this is because diversification has been approached the wrong way. The arguments are familiar: efforts have concentrated on the production rather than on the marketing side; projects have not been implemented in a consistent manner and; the appropriate political commitments have not been made. Apart from these arguments, there are some even more fundamental problems that take us back to the aforementioned constraints on agriculture in the OECS.

First, most diversification schemes have been based on the mistaken assumption that all that was necessary was the provision of a critical quantum of inputs and farmers would do the rest. In the absence of the necessary structural/institutional changes for diversification to succeed, farmers have been unwilling to give up traditional cash crops for crops with untried market potential. This is not to suggest that farmers in the OECS are not responsive to diversification efforts, since they would like to distribute their market exposure, but as realists, they are concerned about the future of agriculture in the region. Accordingly, they have been diversifying out of agriculture.

Second, the economies of scale problem, the bane of the OECS countries, is exacerbated by diversification.

Third, the predominance of small farms makes diversification doubly difficult, as there is a lack of concentration in certain crops in certain areas.

Fourth, many of the nontraditional crops that are being tried, do not enjoy captive markets, and in some cases may encounter restrictions (mangoes) or stiff resistance from local growers (flowers) in metropolitan markets.

Fifth, most diversification schemes have generally been short term donor driven projects. Each new project adds an additional drain on the already overburdened personnel and other resources of Ministries of Agriculture, etc. In addition, when a project is completed, there is seldom any follow-up since most of the effort is now devoted to new projects.

Sixth, there has been a general inability to marry successfully the various stages/processes (transportation, storage, packaging, processing, marketing) that are necessary to move agricultural produce from farmer to consumer, higglers and agricultural marketing boards notwithstanding.

Undoubtedly, there are many more reasons that might explain the general failure of diversification to redress some of the fundamental issues concerning the long-term viability of agriculture in small tropical islands. These reasons aside, the search for technological and production/marketing solutions should not blind us to the consideration of such public policy initiatives as restrictive legislation to promote rural retention, the permanent zoning of prime agricultural land, rural protection legislation, tax benefits for farmers, higher tax rates for unproductive/idle farm land, import substitution for selected food items, etc., since fundamentally, agriculture in the OECS will have to be retained on other than commercial profitability criteria.

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