SMALL FARMER PRODUCTION AND MARKETING SYSTEMS STUDY

CARIBBEAN DEVELOPMENT BANK

St. Michael
Barbados, W.I.

PHASE I REPORT

Submitted by

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September 1, 1978.

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Wildey,
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Ref: Small Farmer Production and Marketing Systems Study

Gentlemen:

We are pleased to submit herewith the final Phase I study report. We appreciate the contribution made by CDB staff in reviewing the report draft. Their comments were taken into account in finalizing the document. In this connection, we are pleased that there were no significant differences on substantive issues indicated by the comments.

As agreed, emphasis in the Phase I study is concentrated on the significant information needs of the Phase II study. The findings are the result of an integrated analysis of the demand for and supply of small farmer commodities, related available facilities and resultant transport flows. Emphasis in the report is placed on those commodities which now, or might, represent significant production and export potentials for LDC small farmers.

We trust that you will find that the document, in addition to providing a sound information base for the Phase II study work, will represent a good basis for identification of other development potentials and projects.

Sincerely,

Donald C. Marsden

Donald C. Marsden
Project Director

DCM:mm

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I EXECUTIVE SUMMARY

A. INTRODUCTION

The objective of this Phase I study is the determination of the potential basis for the development of a regional market for small farmer (SF) commodities in the LDC's (Antigua, Belize, Dominica, Grenada, Montserrat, St.Kitts/Nevis, St.Lucia and St.Vincent). SF commodities are defined as fresh fruit, vegetables, root crops and small animals (including poultry), which are now, or might be, advantageously produced by small farmers. Small farmers are defined as those whose operations are on less than 25 acres of land. As agreed, emphasis in the Phase I study work is concentrated on the significant information needs of the Phase II study, the objective of which is the "provision of detailed operational designs of integrated production and marketing systems to realise the said potential". The principal element of the Phase II work is the study of three types of possible entities, namely, a model supply/service centre for LDC's, a transport entity to service LDC SF commodity trade, and a coordinating entity for the integrated system.

The study findings are the result of an integrated analysis of the demand for and supply of small farmer commodities, available facilities and resultant transport flows. Emphasis in research and analysis is directed to the commodities which now, or which might, represent significant production and export potentials for LDC small farmers; and for which small farmers' production is not already well organised. This would exclude, for example, bananas and sugar. Existing facilities for the established export commodities were investigated for subsequent evaluation of their potential utility for the expanded production and marketing of other crops. In general, the Phase I work was directed to produce a sound information base useful to the evaluations necessary in the conduct of the Phase II study work. Phase I project work was designed to build upon, but not repeat, work already carried out by others. In this context, this report is designed to be as concise and conclusory in nature as practicable. This is essential, if only due to the very broad scope of study; as well as the availability of lengthy documents such as country plans, sector studies and other statistical reports and specialised studies.

B. LDC SF COMMODITY EXPORT MARKET/SUPPLY POTENTIALS

1. Market Potentials

The effective market potentials for the export of SF commodities are defined by commodity and market, i.e. extra-regional and intra-regional. The extra-regional markets are the E.E.C., U.S.A. and Canada. The intra-regional markets are defined as including the CARICOM Member States, the French and Netherlands Antilles, Venezuela, Surinam, French Guiana, Puerto Rico and the Virgin Islands.

a) Comparative Export Potentials/Export Surplus

As detailed in Table I B - 1.01, the effective export potential for LDC source SF commodities is estimated to be a maximum of 143,000 tons of produce in 1982 and 148,000 tons in 1987, plus about 6,900 live sheep, goats andpigs in 1982 and 7,500 in 1987. These figures include intra-regional demand estimates for white potatoes since Dominica plans to grow them. However, Dominica potential export surpluses of these potatoes are relatively small; and production costs, and resultant market prices are expected to be high. The export potential for white potatoes is therefore deducted from the total, to leave a net maximum effective market potential of approximately 111,000 tons in 1982 and 115,000 in 1987. Total produce market potential is represented about 50% by fruit, 30% by vegetables, 10% by roots and 10% by pulses.

The intra-regional produce markets, at approximately 50 and 53,000 tons respectively in 1982 and 1987 account for about 45% of the total. The importance of fruit and vegetables is slightly lower in these markets, being about 37% and 24% respectively in 1982 and 1987. Proportional demand for roots and pulses is about double. Additionally, there is an estimated demand for export of close to 7,000 small animals in 1982 and 7,500 in 1987. The LDC's themselves represent about 25% to 27% of the intra-regional market potential.

Potential LDC export surpluses are estimated at 44,000 tons in 1982 and 63,000 tons in 1987. Most of the potential increase in 1987 is represented by non-citrus fruit and vegetables other than onions. Comparison of the forecast potential demand and supply estimates by category indicates potential market demand to exceed potential supply, except for roots whose potential supply could exceed maximum demand by about 6,000 to 8,000 tons. This reflects maximum LDC produce exports of about 38,000 tons in 1982 and 56,000 tons in 1987. However, seasonal demand/supply relationships also affect the level of effective export potentials. As detailed in section D, these seasonal factors reduce LDC export potentials to about 30,000 tons in 1982 and 41,000

TABLE 1 B - 1.01

LDC* Effective Market Potential Vs. Potential Export Surpluses of SF Commodities (in Thousand Metric Tons)

	Market Potential									LDC Potential Export Surplus	
	Intra-Regional						Extra-Regional	Total			
	Major Markets		LDC's		Sub-Total						
	1982	1987	1982	1987	1982	1987	1982/1987	1982	1987	1982	1987
Fruits											
Citrus	3.3	3.6	0.3	0.4	3.6	4.0	24.3	27.9	28.3	5.0	7.7
Other	8.2	9.1	6.7	7.7	14.9	16.8	12.8	27.7	29.6	13.3	22.4
Sub-Total	11.5	12.7	7.0	8.1	18.5	20.8	37.1	55.6	57.9	18.3	30.1
Vegetables											
Onions	4.1	4.4	1.1	1.2	5.2	5.6	-	5.2	5.6	0.2	0.6
Other	6.3	7.1	0.3	>	6.6	7.1	22.0	28.6	29.1	6.8	11.2
Sub-Total	10.4	11.5	1.4	1.2	11.8	12.7	22.0	33.8	34.7	7.0	11.8
Roots											
White Potatoes	29.2	30.9	2.5	2.6	31.7	33.5	-	31.7	33.5	0.1	0.3
Other	4.0	4.5	4.4	3.3	8.4	7.8	2.7	11.1	10.5	17.1	19.3
Sub-Total	33.2	35.4	6.9	5.9	40.1	41.3	2.7	42.8	44.0	17.2	19.6
Pulses	10.0	10.8	0.9	0.7	10.9	11.5	-	10.9	11.5	1.6	1.9
Total Produce	65.1	70.4	16.2	15.9	81.3	86.3	61.8	143.1	148.1	44.1	63.4
Total Excluding White Potatoes	35.9	39.5	13.7	13.3	49.6	52.8	61.8	111.4	114.6	44.0	63.1
Sheep/Goats (000's)	6.8	7.4	-	-	6.8	7.4	-	6.8	7.4	6.8	7.4
Pigs (000's)	0.1	0.1	-	-	0.1	0.1	-	0.1	0.1	0.1	0.1
Total	6.9	7.5	-	-	6.9	7.5	-	6.9	7.5	6.9	7.5
										(0.2)	(0.3)

( ) Equivalent Thousand Tons. *Excluding Belize. > Less than 10 Tons.

Sources: Tables VIII B - 1.01/2/3

tons in 1987. These market constraints apply principally to roots and non-citrus fruit. The increase in 1987 is due largely to increased fruit production in the first two quarters of the year.

b) Major Export Commodities

Fruit, vegetables, roots, pulses, sheep, goats and pigs were determined to be the SF commodities offering a prospect for significant LDC export, based on examination of the export potential for some eleven commodity groups. This examination included evaluation of these markets' commodity import levels and trade, LDC supply potential, and other factors such as product substitution, country self-sufficiency and markets' economic considerations. Cereal grains, such as wheat and rice were included in the commodity groups examined due to the large quantities consumed in the Caribbean; and to take into account both their possibile LDC production or substitution of other commodities produced in the region to fill some or all of that demand. Significant LDC production and export surplus potential for these grains is not found, except for rice in the case of Belize. Significant substitution of other commodities such as root crops for cereals is ruled out in market countries based on consumer preference and related marketing factors. Poultry and eggs are eliminated on the ground of planned self-sufficiency or economic considerations in market countries. Beef (cattl is not an SF commodity. Substitution of demand by other SF animals is ruled out based on country beef development programmes and market preference considerations.

c) Intra-Regional Markets

Based on evaluation of commodity imports and the impact of limiting factors to market penetration, the following countries/territories are determined to offer the best prospects for significant eastern Caribbean LDC exports of SF commodities:

1) Barbados
2) Trinidad
3) Netherlands Antilles
4) Martinique
5) Guadeloupe
6) Virgin Islands (U.S.)
7) Puerto Rico

These countries/territories all import significant quantities of the SF commodities considered to have an export potential; and relatively reasonable transport cost and timely delivery is a practical possibility. This possibility is strengthened by the current evaluation of means to improve LDC transport facilities and small farmer service facilities. Barbados and Trinidad are CARICOM member States and efforts to improve LDC export performance have a politically favourable starting point.

Effective market potential estimates are based on consideration of the forecast trends in total demand, the impact of plans for self-sufficiency and consumer food preference

as affecting the level of demand represented by imports. Estimates were then refined to reflect probable levels of LDC market penetration. This was assumed at 65% in the CARICOM states and 30% in non-CARICOM states, except for Puerto Rico where a maximum penetration level of 1% is assumed due to severe competitive factors. The other intra-regional markets are determined to hold little prospect for LDC exports based principally in the nature and levels of imports, competitive delivery time and cost factors, and other economic considerations. The LDCs' potential for inter-trading relationships are determined based on evaluation of net export surpluses or deficits after domestic demands are supplied. Belize is excluded both as a significant potential market for SF commodities for the eastern Caribbean LDCs, and as an intra-regional SF commodity supply source, other than for Jamaica. This is based principally on the nature and focus of its marketing and supply relationships with its nearer neighbours and trading partners, i.e. Mexico, Honduras and the U.S.A. which in good part, is a function of its physical separation and related separate transport links (see Chapters IV,V and VIII). While Belize is forecast to have sizeable seasonal export surpluses of fruits, root crops and pulses, and some surpluses of vegetables, its exports are expected to be principally extra-regional, with the possible exception of Jamaica for red kidney beans. Its export surplus periods coincide with those of the ECCM and distance/delivery cost factors would make it less competitive in the eastern Caribbean. Mexico is expected to continue as its major import source due to cost and delivery time factors as well as the existence of long established commercial relationships.

d) The Extra Regional Markets

Effective market potential is determined based on competitive quality and price considerations, and the level of imports of specific commodities by individual market. Detail can be found in Chapters III and VIII. Essentially, estimates are based on calculated market penetration during the seasons when competitive supply levels are weak.

2. Supply Potential

In Chapter VI a number of criteria, i.e. increased land area, intercropping, improved practices and irrigation, are used as a basis to estimate the potential increase in production in 1982 and 1987 over the estimated current 1977 production level by LDC source and for fruits, vegetables, roots, pulses and small animals.

The total available supply, which is the net figure after the domestic utilization in the non-food use categories (i.e. animal feed, seed, processing and waste) has been taken into account, is then estimated for 1982 and 198'. This available supply

may then be utilised for local food consumption. The supply (average monthly) estimates by quarter) is determined on a seasonal basis.

This information is compared with the potential LDC domestic demand estimates to forecast the export surpluses, which are in turn matched against the intra- and extra-regional market demand estimates as a basis for determining potential commodity flows.

In Chapter VII the commodity groups are disaggregated. The commodities, for which there is a comparative advantage on the basis of seasonality of production, expected market price, established trade flows, history of large surpluses and traditional production patterns, are identified by country.

a) Potential Available Supply

The distribution of the potential available supply for crops by territory is summarised on the basis of annual totals in Table I B - 2.01. Dominica is expected to remain the main ECCM supplier of citrus over the next ten years, not only for local consumption but also the non-traditional export market. Belize is a major producer also; but production is almost entirely converted to concentrates. For non-citrus fruit commodities, St. Lucia and St. Vincent have the greatest potential. Onions will be mainly produced by Montserrat, Antigua and St. Kitts within the next five years, with St. Kitts becoming the largest producer within 10 years. Dominica has the greatest potential to produce other vegetables. The potential for white potato production lies solely with Dominica, but is subject to the solution of the problem of high cost seed potato.

Dominica, St. Lucia, St.Vincent and Belize have the greatest potential for producing other root crops over the next decade, whereas Belize is expected to be the largest producer of pulses in the LDC's.

The potential available supply for LDC's (excluding Belize) in 1982 is represented by fruits (58%), vegetables (6%), roots (34%) and pulses (2%). After local consumption the total potential surplus for export (see Table I B - 1.01) is represented by fruits (41%), vegetables (16%), roots (39%) and pulses (4%). The percentages are similar for 1987.

The potential export surplus is 30% of the total available supply in 1982 and 36% in 1987. In 1982, the potential export surplus as a percentage of the available supply, by commodity group, is given by fruits (19%), vegetables (76%), roots(35%)

TABLE I B - 2.01

Potential Available Supply

Fruits		TOTAL ECCM (t)	% of Total ECCM							% of Total LDC		TOTAL LDC (t)
			ANT	DOM	GDA	MON	STK	STL	STV	TOTAL ECCM	BEL	
Citrus	1982	13,126	0.0	90.3	1.9	0.5	0.1	3.9	3.3	74.1	25.9	17,722
	1987	17,356	0.0	79.1	7.5	0.9	7.8	3.4	1.2	77.7	22.3	22,326
Non-Citrus	1982	71,441	12.1	13.2	9.3	1.8	9.7	27.0	26.9	92.8	7.2	76,979
	1987	85,602	16.1	15.1	10.3	2.2	9.6	23.3	23.4	92.2	7.8	92,814
Vegetables												
Onions	1982	418	31.0	0.0	0.0	44.5	24.4	0.0	0.0	100.0	0.0	418
	1987	854	37.8	0.0	0.0	22.4	39.8	0.0	0.0	100.0	0.0	854
Other	1982	8,784	8.6	42.0	18.0	3.7	8.2	16.6	2.9	81.0	19.0	10,845
	1987	15,883	14.1	32.3	12.7	2.3	9.6	11.3	17.6	87.6	12.4	18,131
Roots												
White Potatoes	1982	159	0.0	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	159
	1987	295	0.0	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	295
Other	1982	49,562	1.7	24.8	11.9	2.2	7.6	23.4	28.4	75.4	24.6	65,745
	1987	56,020	2.6	27.1	12.0	2.0	7.2	23.7	25.4	76.8	23.2	72,980
Pulses												
Pulses	1982	3,128	2.2	20.0	41.0	2.8	9.4	5.3	19.3	59.8	40.2	5,232
	1987	3,947	2.3	18.2	40.6	4.5	11.9	6.7	15.8	56.0	44.0	7,045

Source: Tables V C - 3.07 and V C - 3.08.

and pulses (52%). In 1987 the corresponding figures are fruits (29%), vegetables (71%), roots (36%) and pulses (47%).

The total potential available supply for Belize is represented by fruits (33%), vegetables (7%), roots (53%) and pulses (7%) in 1982; similarly for 1987. After local consumption the potential export surplus for Belize is represented by fruits (31%), vegetables (16%), roots (56%) and pulses (9%) in 1982; similarly for 1987.

The potential export surplus is 30% of the total available supply in Belize in 1982 and 28% in 1987. In 1982, the potential export surplus as a percentage of the available supply, by commodity group, is given by fruits (28%), vegetables (20%), roots (32%) and pulses (40%). In 1987 the corresponding figures are fruits (28%), vegetables (18%), roots (26%) and pulses (47%).

b) Comparative supply advantage

The basic criteria by which current comparative potential supply advantage is based are: seasonality of production, average market price expected by farmer, established trade flows, history of large surpluses and traditional production.

A summary of the commodities for which there is a comparative supply advantage is given in Table VII A - 1.01. The countries which have an advantage for fruits are the Windward Islands and Belize. However, Antigua and Montserrat are the countries with the greatest advantage for pineapples, although they are currently grown also (at higher cost) in St. Lucia and St. Kitts. Most countries show an advantage for producing green vegetables but this reflects to a large extent their history of large surpluses under rainfed conditions.

The root crops are mainly produced to advantage in the Windward Islands with sweet potato being traditional glut crops in Antigua, Montserrat and Belize.

Red Kidney beans is a staple pulse in Belize and there is a long tradition of production by small farmers. Peanuts have an advantage in St. Vincent and St. Kitts, whereas other pulses are at an advantage in countries where there is the prospect of irrigation.

C. LDC MARKETING/SUPPLY FRAMEWORK

1. Market Structure

a) Situation

The structure of the markets for SF commodities in the eastern Caribbean is unique in several important respects. There is a lack of strong identifiable wholesale trading organisations. Both wholesale and retail trade in produce are dominated by small private traders, who are principally women and known variously as hucksters, higglers, hawkers and traffickers (when engaged in export/import activities). In most of the States, small traders typically dominate the export and import of all SF commodities. Major exceptions are St. Lucia and St. Vincent where statutory marketing agencies control SF produce exports. All of the States have statutory marketing agencies (variously known as boards, corporations or marketing agencies), which are engaged, to varying degrees, in wholesale, retail and export/import functions. In no case are they major elements of the domestic trade in the States; nor are the supermarkets and small retail outlets. Belize has a relatively well organised wholesale trade structure for small farm commodities dominated by four private traders. The local marketing board controls the trade in rice, corn and kidney beans.

b) Problems

While the statutory marketing agencies in St. Vincent and St. Lucia are operating relatively efficiently in the export of certain SF commodities, overall the LDCs organisation of domestic wholesale and export marketing is very weak or almost non-existent. The many small private traders who typically dominate market channels in both the LDCs and their intra-regional markets lack the capital, technical expertise and facilities to improve matters. Produce is sold ungraded, inadequately packed and high produce losses due to spoilage occur because of the general lack of refrigerated storage at source or during transport, as well as the lack of reliable weekly transport services to markets from most LDCs. Even the more efficient marketing boards lack effective market intelligence and information exchange systems to provide a sound basis for planning production to match market demands. The lack of reliable supplies and delivery of at least standard quality produce, has deterred major intra-regional marketers of associated products and extra-regional marketers from significant greater involvement in the marketing of small farmer source commodities.

2. Supply Structure

a) Situation

The structure of the agricultural sector in the LDC's consist, on the one hand, of production of traditional export crops, such as citrus, bananas, sugar, cocoa and cotton and, on the other, by the production of food commodities such as fruits, vegetables, roots, pulses, cattle and small animals.

The small farmer has been primarily engaged in the production of food crops and small animals and, in many cases, has evolved from the level of subsistence farming in response to a programme of agricultural diversification away from the traditional crops. In Chapter VI, the structure and composition of the sector, including land and farm holdings, irrigation systems, institutional and private sector framework and farmer organisations, is discussed. Information is also provided on small farmer production and disposition, territory by territory.

The analysis of the agricultural sector in the LDC's shows that food crops have been traditionally produced primarily by a large number of small farmers, although more recently a few large farmers have emerged but usually to produce a specific crop for an external market. The structure of the sector includes credit facilities, available through Development Institutions, tractor, extension and research services provided by the Ministry of Agriculture, technical assistance from international organisations, and usually a marketing organisation which is strongly public sector oriented. There is very little assistance given with developing irrigation systems. There is little assistance provided to the small farmer in transporting his produce from the farm gate to the market. The services for agricultural inputs, e.g. fertiliser, chemicals and animal feed, is virtually non-existent and small farmer associations have not been developed in an effort to benefit from the economies of scale. Praedial larceny is rampant. Small animal production and marketing is limited by the size of market demand, stray dog attacks, excessive feed costs, poor veterinary services, a high mortality rate and the lack of good breeding stock. In addition, the processed animal industry has not been developed because of cheap imported processed meat.

In summary, the existing structure does not work well and needs to be modified in order to enhance the chances of developing SF agriculture in the LDC's.

b) Problems

Expanded SF commodity production is hampered not only by resource deficiencies, inadequate availability of technical expertise and farm services such as contract ploughing; but very importantly by the lack of market intelligence and related services to match supply with market needs. This has resulted in crop losses, recurring gluts, and demotivated farmers. Achievement of the supply potentials forecast will require the institution of systems to coordinate better the supply of needed inputs and the acquisition and exchange of information on markets and production, as well as related services necessary to improve the quality of produce delivered to markets.

D. LDC TRADE FLOWS, FACILITIES AND CONSTRAINTS

1. Trade Flows

a) Trade Links

The CARICOM LDC's have strong trading links to CARICOM MDC's and to the EEC in small farmer commodities. Belize is relatively isolated due to its geographical position and has no SFC* trade with the ECCM, and only with Trinidad and Jamaica of the MDC's, for processed foods. The remaining ECCM countries have strong trading ties to Trinidad and Barbados and weaker ties to Guyana and Jamaica. The Leeward Islands have strong trading ties to the U.S. Virgin Islands by both air and sea, and the same is true for the Windward Islands to the U.K., through the Geest transport and marketing organisation, which focuses on bananas, but has developed side interests in other LDC exports. Ties to Canada, the U.S.A. and Puerto Rico are weak, except for imports of SFC which arrive regularly from Miami and San Juan.

b) Past and Projected Flows

Small farmer commodities make up more than 80% of the total trade flows of the CARICOM LDC's. These commodities now account for approximately 27,000 tons per year of trade to all markets and 24,000 tons to the markets considered in this study (all intra-regional markets and 3 extra-regional markets). Eight thousand tons of this trade is between Belize and the three extra-regional markets, and one thousand between Belize and the MDC's, with no trade between Belize and the other LDC's. Of the remaining 15,000 tons for the seven ECCM states, almost half is exported to the EEC and the other half (8,000 tons) represents SFC trade between the LDC's and markets within the region. Trinidad dominates the intra-regional flows as the major intra-regional market, and a single flow from St.Vincent to Trinidad (3,500 tons) accounts for 40% of total intra-regional trade in these commodities. (See sections III B and IV B for the details).

* *Small Farmer Commodities*

Fresh grapefruit and other fruits from Dominica, and root crops from St.Vincent are the principal extra-regional flows in addition to exports of concentrated fruit juice (mainly from Belize). Intra-regional trade is composed mostly of fresh fruits, vegetables and root crops. Projected flows are expected to rise to 30,000 tons in 1982 and 41,000 tons in 1987 for the markets considered in this study, excluding Belize. This is the maximum ECCM export potential assuming planned production goals are met, and that transport and marketing constraints are eliminated. These maximum forecast flows represent 2.5 times the present level of ECCM exports by 1982 and 3.4 times present levels by 1987. These increases are mainly forecast in fresh fruits and vegetables and some root crops (See Section VIII C).

The forecast market distribution of these exports will depend on the marketing strategy adopted by the CARICOM LDC's. Two alternative marketing strategies are examined in Chapter VIII: a regional self-sufficiency strategy (Strategy 1) and a strategy of extra-regional market priority (Strategy 2). The difference between the strategies is the priority assigned by the LDC's to exports within the region or to extra-regional exports. Under Strategy 1, 64% of LDC exports would go to intra-regional markets and in Strategy 2, only 51-2% would go into intra-regional markets and 48-9% to extra-regional markets (See Table I D - 1.01) in 1982 and 1987.

The major increases in export tonnage are expected to come from Dominica, St.Vincent and St.Lucia. All the other islands become significant exporters starting from very low present levels.

2. Adequacy of Transport Facilities

The overall capacity of the present extra-regional sea and air lines is greater than demand in virtually all cases. In the LDCs, St. Lucia, St. Vincent, Grenada and Dominica have weekly refrigerated sea service to the U.K. on Geest Lines and there is capacity available, particularly in off-peak banana season. Additional unused export capacity exists in the CTMT trailers presently going back empty to Puerto Rico on a weekly basis from all the ECCM countries except Grenada. Air service to the U.K., Canada and the U.S. is available in Antigua and Barbados.

The schooner service handles 95% of the present inter-island flows of SFC, with WISCO and other lines occasionally picking up exports, mainly to Guyana. The schooner service lacks refrigeration and therefore is only satisfactory for short hauls with relatively long-lived products. Its rates, however, are the lowest available (if losses and spoilage are not included). The principal missing elements in the transport system are regular

TABLE I D - 1.01

Summary of Present and Forecast SFC Export Flows by CARICOM LDC's*

('000 tons)

	Antigua	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent	Total
1976								
Intra-Regional	-	2.1	1.0	0.2	-	0.6	3.9	7.8
Extra-Regional	-	4.0	0.5	-	-	0.7	2.1	7.3
Total	-	6.1	1.5	0.2	-	1.3	6.0	15.1
1982 - Strategy 1								
Intra-Regional	1.1	7.2	2.5	0.7	0.9	1.5	4.9	18.8
Extra-Regional	1.5	4.9	0.5	0.1	0.6	0.8	2.2	10.6
Total	2.6	12.1	3.0	0.8	1.5	2.3	7.1	29.4
1982 - Strategy 2								
Intra-Regional	1.0	5.1	2.3	0.6	0.8	1.3	4.2	15.3
Extra-Regional	1.6	7.0	0.7	0.2	0.7	1.0	2.9	14.1
Total	2.6	12.1	3.0	0.8	1.5	2.3	7.1	29.4
1987 - Strategy 1								
Intra-Regional	3.6	9.5	4.6	1.0	2.2	1.8	4.3	27.0
Extra-Regional	2.1	6.8	0.8	-	1.2	0.7	2.0	13.6
Total	5.7	16.3	5.4	1.0	3.4	2.5	6.3	40.6
1987 - Strategy 2								
Intra-Regional	2.5	7.0	3.5	0.9	1.6	1.6	3.6	20.7
Extra-Regional	3.2	9.3	1.9	0.1	1.8	0.9	2.7	19.9
Total	5.7	16.3	5.4	1.0	3.4	2.5	6.3	40.6

* to the 13 intra-regional and 3 extra-regional markets considered in this study, excluding Belize.

Source: Tables VIII C 1.10 and 1.13

scheduled feeder services between the islands for both sea and air cargo. These services would provide a necessary connection to the extra-regional carriers which would suit the transhipment needs of small farmer commodities to the islands not presently served. Additional refrigerated service between the islands and/or regularly scheduled air cargo services to the regional markets would allow greater flows of small farmer commodities.

Port facilities are generally adequate but additional facilities for refrigerated storage and container hookups would be required for marketing larger flows of small farmer commodities. Airport limitations on Dominica, Grenada, St.Vincent and Montserrat will also limit transport arrangements to small planes. This increases the need for better transhipment facilities for perishable commodities in Antigua and Barbados.

3. Trade Constraints

The important types of policies and constraints affecting LDC exports are:

(i) International trade policy and preferences
(ii) Packaging and health requirements
(iii) Marketing system constraints
(iv) Transportation constraints (covered above)

a) Intra-Regional Constraints

Within most Caribbean markets (and especially CARICOM countries) regulatory or legal barriers do not at present pose a serious threat to the expansion of LDC exports. Exceptions to this are the U.S. Territories of Puerto Rico and the U.S. Virgin Islands. The relatively strict U.S. regulations are not enforced as strictly in the Virgin Islands, but in Puerto Rico these are a significant barrier. Still the strong presence of the Dominican Republic and Haitian imports show that these regulations can be overcome with a suitable marketing system. On the other hand these imports show strong Caribbean competition on both price and quality. The relatively weak huckster marketing system of the LDCs lacks sufficient capital, marketing expertise and organisational capability to provide the integrated marketing operation necessary for expansion of LDC exports in the more competitive markets. The LDC marketing boards have been effective in only a few cases (e.g. St. Vincent to Trinidad). In addition, the price levels of Caribbean LDC products are now sufficiently high that they are a constraint to trade in some parts of the region (and particularly in extra-regional markets). (See section IVD for more details).

b) Extra-Regional Constraints

The legal and regulatory barriers in the EEC, USA and Canada differ considerably from country to country. The U.K. and Canada appear to offer the least regulatory obstacles to trade. The U.S. has the most stringent health and labeling regulations (although Canada requires bi-lingual labels) and this has been a major constraint on LDC trade. The success of Jamaican and Trinidadian exports to the U.S. indicates that CARICOM countries can in fact, overcome these constraints. All three extra-regional markets have preferential or zero import duties on imports of LDC commodities.

The marketing system in the extra-regional market exerts major constraints on imports from LDC's. First these markets generally require large reliable suppliers. Secondly the majority of smaller sales are on a consignment basis which places all the risk on the LDC supplier rather than the broker who handles the placement. In addition, most of the final market price (about 70%) is added by the marketing system which is beyond the control of the supplier.

Finally the CARICOM LDC transport costs are greater to these markets than those of the larger competitors. This places LDC's in a position where they are competitive only in certain restricted times of the year called "open periods" when competition is weakest and market prices highest. The exception to this is the immigrant or expatriate Caribbean populations who will identify and pay a premium for certain Caribbean products (e.g. sweet potatoes, mangoes and breadfruit). These populations represent a constant year around market for LDC produce in all three extra-regional markets, and there are separate marketing systems serving these markets.

4. Regional Cooperation and Coordination

a) Agricultural Marketing Protocol (AMP)

The principal coordinating element in CARICOM trade for the LDC's is the AMP which encourages the trading of selected agricultural commodities through periodic agreements on the allocation of prospective supplies among CARICOM countries, and on f.o.b. prices for these commodities. To supplement the AMP a Guaranteed Market Scheme (GMS) was created. The GMS purpose was to put a legal constraint on MDC's to reserve part of their markets for LDC exports. Only part of AMP products are covered by the GMS (e.g. carrots, onions, peanuts, plantains and oranges). In actual practice supply constraints have limited the success of the AMP (only 1/6 of the 3 million pounds of trade agreed in 1976 were actually shipped under the AMP) and spoilage intransit has also been a problem on occasion, as well as slow settlement of accounts by receiving countries.

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The AMP does not appear to have had much effect on increasing LDC exports (except possibly for St.Vincent). It has also done little or nothing to reduce situations of glut or shortage, and its pricing does not include seasonal factors. MDC's are also hesitant to commit major market shares to LDC's in the light of their programmes for agricultural self-sufficiency, and the availability of lower cost non-CARICOM source supply.

The AMP product list could be expanded to include additional fruits and root crops which are consumed in the MDC's and produced in volume in the LDC's.

A reliable market intelligence and information exchange system, as well as the establishment of procedures to monitor and coordinate relationships between supplier and buyer organisations, is necessary for the expansion of LDC exports. While the origin of the AMP was a concern for agricultural development, its implementation should be more commercially oriented with respect to recognition of the importance of producer and buyer reliability in meeting delivery and receipt obligations, as well as in the setting of prices. A stronger coordination mechanism is needed.

b) General Coordination

With few exceptions, the export marketing systems of the LDC's for SF commodities are not very effective. The inadequacies of the organisational arrangements for the implementation of the AMP/GMS also contribute to this situation. Neither the AMP organisational arrangements nor those of other CARICOM regional trade organisations, such as the Caribbean Food Corporation (CFC) include a direct responsibility for overcoming the LDCs' export system weaknesses. Furthermore, the AMP is focussed on CARICOM trade only, and provides no assistance to the LDC's with respect to their extra-regional marketing. The potential for such assistance exists. For example, the Trinidadian Sun Isle operation which promotes Trinidad's exports to Canada could be a source for Canadian market intelligence for use by the LDC's.

The CFC has not yet become operational; and its operational strategy and organisational structure have yet to be set. It could play a significant role in assisting the LDC's achievement of their export potential.

The framework and organisational approach to meet LDC export improvement needs will be covered in the Phase II study.

II INTRODUCTION

A. Objectives and Scope of Work

The objectives of the "Small Farmer Production and Marketing Systems" study, as expressed in the contract agreement between the Caribbean Development Bank (CDB) and the Consultant, are as follows:

"Phase I - the determination of the potential basis for the development of a regional market for farm commodities produced mainly by farmers in Antigua, Belize, Dominica, Grenada, Montserrat, St.Kitts/Nevis, St.Lucia and St.Vincent (hereinafter together called the LDCs) whose operations are on less than 25 acres of land (hereinafter called the Small Farmers) and for farm commodities which may be advantageously produced by a Small Farmer; and

Phase II - the provision of detailed operational designs of integrated production and marketing systems required to realise the said potential."

The small farmer (SF) commodities are defined in the contract work scope as fresh fruit, vegetables, root crops and small animals (including poultry).

This report contains the results of work carried out in Phase I of the study. The major elements of the scope of work for Phase I, according to the contract agreement, are as follows. More detail can be found in the contract agreement.

1. *Identification of existing and potential intra- and extra-regional markets for SF commodities which are or could be produced by the LDC's with primary emphasis placed on the potential intra-regional markets. Intra-regional markets are defined as including the CARICOM Member States, the French and Netherlands Antilles, Venezuela, Surinam, French Guiana, Puerto Rico and the Virgin Islands. The extra-regional markets are defined as the European Economic Community (EEC), the United States of America (U.S.A.) and Canada.*

   a) *The extra-regional market analysis includes:*

      - *quantification of imports over the last 5 years for which statistics are available of SF commodities and the percentage of CARICOM origin,*
      - *a description of the transport links between CARICOM and the extra-regional markets,*
      - *a description of extra-regional trade constraints affecting LDC SF commodity exports.*

   b) *The intra-regional market and demand analysis covers:*

      - *the evolution in intra-regional trade in SF commodities over the last 5 years for which statistics are available,*

- *identification of existing constraints (legal, regulatory and policy) to intra-regional trade,*
- *description of the operations of problems with the CARICOM Agricultural Marketing Protocol (AMP), and make recommendations, as appropriate, to make the AMP a more adequate instrument,*
- *description of intra-regional transport links and obstacles to improved services,*
- *quantitative determination of current intra-regional demand for SF commodities and the proportion of imports from CARICOM and non-CARICOM sources; and 10 year projections of demand,*
- *identification and description, to the extent possible, of the dominant marketing entities in each LDC territory/country and their relative importance.*

2. *The supply analysis of the LDC's covers:*
   - *quantitative determination of current SF production in each LDC,*
   - *disposition of production, i.e. on farm consumption, loss, exports, etc.,*
   - *estimated potential for increased SF commodity production and its basis in each LDC,*
   - *identification and description of any LDC which appears to have particular comparative advantage for SF production of particular commodities.*

3. *Commodity Flow Analysis.*

   Based on regional demand and supply information and other data, project, for a 10 year period, alternative levels of intra-regional trade flows in SF commodities.

During the initial stage of project work, a careful examination was carried out by the Consultant of the actual availability and quality of data necessary to meet the contract work scope requirements. This investigation was conducted both in Barbados and other countries. Estimates were made of manpower and time requirements to fill these gaps. An evaluation was made of the relative importance of overall work requirements, including that related to specific information elements, in the context of the project's basic objectives and priorities. The findings of this review were discussed with CDB officials in order to achieve agreement as to the relative emphasis to be placed on the various aspects of project field work, analysis and report presentation so as to best meet project objectives. These considerations took into account that a major element of the Phase II work is the study of three types of possible entities, namely a model supply/service center for LDC's, a transport entity to service LDC SF commodity trade, and a coordinating entity for the integrated system.

Based on this investigation, and resultant client discussions, CDB officials, on May 23, 1978, approved the following clarifications to the definition of the study work scope and relative study emphasis.

1) *Emphasis in the Phase I study work should be concentrated on the information needs significant to meeting Phase II study requirements. Collection and analysis of information not significant to Phase II needs should be minimized or eliminated. Report presentation should similarly be focused and should be concise. Detailed back-up data contained in project files and work papers would not be a part of the formal report. This file data will be turned over to the CDB on project completion as file material for subsequent reference, if desired.*

2) *Intra-Regional Trade Flows*

   a) *Historical analysis of trade flows will be confined to exports of CARICOM LDC's with a significant level of intra-regional export flows and their major trade partners.*

   b) *Fruits and vegetables flows will be covered as a single aggregate for annual flows in 1972, 1975 and 1976. Seasonality will not be examined on a historical basis.*

   c) *Flows will be examined in physical quantities.*

   d) *Commodity flow projections will be based on forecast country demand/supply surpluses and deficits. Non-CARICOM countries will be treated as potential markets similar to extra-regional markets. Flows between non-CARICOM markets will not be analysed.*

3) *Intra-Regional Markets*

   a) *Demand estimates will be shown in 11 commodity aggregations rather than by single commodities for reasons of commodity substitution and statistical compatability. These categories are:*

      Wheat
      Rice
      Pulses
      Root crops
      Vegetables
      Fruit
      Beef
      Sheep/goats
      Pork
      Poultry
      Eggs

   b) *Seasonality of imports will not be detailed, as significant consumption variations essentially reflect supply constraints.*

   c) *Non-CARICOM Caribbean markets will be estimated based on available secondary source data.*

   d) *A uniform approach will be used in reports. More detailed information on individual countries, as available, will be contained in the project papers turned over at project end.*

4) *Documentation of trade constraints will be limited to specification of significant barriers, constraints and requirements, and reports will not reproduce the exhaustive definition contained in countries' laws and regulations. Sources for these details will be indicated.*

5) *Supply Situation*

   a) *Production estimates will be shown in groups of similar commodities. Major commodities produced, particularly those for export, will be defined to the extent possible.*

   b) *A uniform report approach will be used in country analyses. Additional data, if any, contained in project files will be turned over at project end.*

6) *Phase II analysis of the proposed supply/service center will take into account both domestic and export market supply needs. However, detailed financial analysis and projections for the "model" will be confined to the prototypical supply/service center organisation and operations.*

7) *Belize*

   Lesser study emphasis will be placed on Belize. This is due primarily to its very different export market and transport orientation from the balance of the CARICOM LDC's.

B. Setting

The Less Developed Countries/Territories (LDC's) which are the focus of the study, are Antigua, Dominica, Grenada, Montserrat, St.Kitts/Nevis, St.Lucia and St.Vincent, which form the East Caribbean Common Market (ECCM), and Belize. The seven ECCM island states form a chain some 300 miles in length, dividing the Atlantic and Caribbean Seas. The chain also includes the French West Indies. Belize is located on the Caribbean coast of Central America adjacent to Honduras, Guatemala and Mexico, and is about 1,600 t 2,000 miles distant from the ECCM and other eastern Caribbean States.

Belize is significantly different from the ECCM States in that it is lightly populated (149 thousand) for the relatively large land area (8,866 square miles) of the country. Its economy, while classified as an LDC, is showing steady improvement, helped of course by infusions of foreign aid. Its agriculture has a significant degree of mechanization. Belize trading relationships for small farmer commodities are principally with Mexico and other extra-regional market countries. Its trade with the eastern Caribbean is very small and likely to remain so.

The ECCM States have a combined population of about half a million inhabitants. The islands vary considerably as to area and population. Montserrat is the smallest with only 39.5 sq. miles and a population of 12.3 thousand. St.Lucia has the largest

population (113 thousand) and Dominica the largest area (305 square miles). The ECCM States are divided into two groups, the Leeward Islands (Antigua, St.Kitts/Nevis and Montserrat) to the north of the chain, and the Windward Islands (Dominica, Grenada, St.Lucia and St.Vincent) to the south. The islands differ in topography, macro climate and vegetation. The Windward Islands generally possess more rugged topography, more abundant precipitation and lush tropical vegetation. The Leeward Islands are generally flatter and drier with lower and bushy vegetation.

There is an absence of reliable historical national income accounts data in the ECCM States. Based on recent studies by international agencies, ECCM economic growth in recent years has ranged from mediocre in a few countries to poor and slightly negative in the others. The ECCM economies are dependent upon exports of a few agricultural commodities, such as sugar, bananas, nutmeg and citrus, as well as tourism, remittance income from expatriates or emigrants, and foreign aid. Based on available data, gross agricultural output and tourism revenue in constant prices have declined in recent years. All ECCM countries rely heavily on imports to satisfy domestic demand for food; and all are understood to be currently emphasizing achievement of domestic self-sufficiency to the extent possible in food production. Except for the commodities mentioned, small farmer production is poorly organised and its expansion is hampered by lack of technical expertise, resource deficiencies, and marketing problems, particularly with respect to intra-regional transport facilities and services. These matters are more fully examined in the body of the report.

C. Methodology

The methodology employed in this study is detailed in the main body of the report as a part of each report Chapter and section dealing with individual elements of the findings, the derivation of estimates and related analyses and projections. The following comments are intended to place the study approach and methodology used in an overall perspective.

The approach used in this study is an integrated analysis of the demand for and supply of small farmer commodities, available facilities and resultant transport flows. Emphasis in research and anlysis is directed to the commodities which now, or which might, represent significant production and export potentials for LDC small farmers; and for which small farmers' production is not already well organised. This would exclude, for example, bananas and sugar. Existing facilities for the established export commodities were investigated for subsequent evaluation of their potential utility for the expanded production and marketing of other crops. In

general, the Phase I work was directed to produce a sound information base useful to the evaluations necessary in the conduct of the Phase II study work. Phase I project work was designed to build upon, but not repeat, work already carried out by others. In this context, this report is designed to be as concise and conclusory in nature, as practicable. This is essential, if only due to the very broad scope of study; as well as the availability of lengthy documents such as country plans, sector studies and other statistical reports and specialised studies.

The first step in study work was the review of all available documents and prior reports dealing with the subject of the study. The review took place both in Barbados and in the LDC States. The extent and quality of the available information was examined; and a preliminary identification and evaluation made of data inconsistencies and data gaps. Based on this evaluation, field research was planned and initiated. The field work focused on filling the information gaps and improving the quality and extending the scope of the initial information base. Research was carried out in an integrated fashion, with periodic inter-comparison of the results obtained in the various disciplines of research. Due to the lack of current published data in a number of countries/territories, researchers were employed in a number of LDC's to extract information from file documents; and field visits by Project Team members were planned to overlap sequentially to assist information acquisition. Data quality problems and apparent inconsistencies were discussed and/or reviewed with CDB officials and other informed sources during the course of the work. The foregoing was carried out during the months of April through June, 1978. In the latter part of this period, data synthesis, analysis and report preparation commenced.

The demand estimates are derived from per capita food consumption estimates, population data and estimates of future population and per capita income growth for the individual countries/territories under examination. The base source for the consumption esimates is the Provisional Food Balance Sheets recently produced by the FAO. These figures are cross-evaluated with the results of study field investigation of agricultural production and current trade statistics. The evaluation also compares estimated per capita consumption by the various countries in the Caribbean region. As a result of this analysis, appropriate adjustments are made in the base estimates for certain countries. Projections made based on forecast population and per capita income growth represent the first level of the demand estimates. The commodity groups for which the LDC's have a significant potential for export supply are then identified based on the level and nature of imports by market countries. This potential is then

further refined to reflect the impact of such limiting factors as domestic self-sufficiency, commodity substitution potential and market country economic constraints. The estimates of LDC potential exports to major intra-regional markets are then refined again to reflect judgements as to future possible LDC maximum market penetration. The estimates of market potential in extra-regional markets are based on available data on the markets and specific constraints, particularly LDC quality and price competitiveness and preferential market treatment, which affect seasonal LDC export potential. The potential of the LDC's as sources for inter-island exports is examined based on evaluation of seasonal commodity supply surpluses and deficits for each territory/country, taking into account national policies toward self-sufficiency in food production.

An integrated analytical technique is also applied in the derivation of the current production levels for the small farmer commodities. Crop production estimates vary from State to State among the LDC's in terms of both completeness and quality. The statistics available also tend to reflect only the larger scale commercially oriented production of commodities; and there are frequently substantial differences in opinion among concerned officials and technicians in individual States as to actual production and crop disposition. Little attention is paid to backyard or garden style production for personal consumption, which, to some degree, enters commercial channels. The estimates of current LDC commodity production are derived from cross-evaluation of available country/territory data and estimates, local authoritative opinion, the results of studies by other organisations and experts, estimated per capita commodity consumption and related judgements based on direct field research. This analysis takes into account also available trade data. Estimates of future agricultural production are based on available arable land, climatic and soil conditions, potential and plans for increased irrigation, and national plans for expanded production of specific commodities, as well as historical information on crop yields. The evaluation also includes examination of increased potential output based on improving farming practices, inter-cropping, and comparative production advantage within and between individual LDC's.

Current trade flow estimates are derived through analysis and cross comparison of country/territory trade statistics with the results of the recent ECLA Inter-Island Shipping Survey, and the results of direct field investigation among shipping and marketing organisations. Future trade flow projections are based on comparison of forecast demand and the LDC States export surpluses and deficits by commodity groups

in each quarter of the forecast years (1982 and 1987). Alternate flows are calculated from each LDC to 13 intra-regional and 3 extra-regional markets under assumptions of alternate marketing strategy towards intra-regional and extra-regional exports. These forecasts are based on the pattern of present flows, but follow a nearest market routing for additional future flows, with competing sources taken into account. These flows represent the maximum potential flows if production forecasts are achieved and suitable transportation is made available.

When the flow forecasts are applied in Phase II, they will be adjusted to take into account the specific marketing and transport constraints of each proposed system. The type and size of the entities and systems proposed and evaluated in Phase II will also be adapted to the level of flows to all significant destinations, and the level and type of service required to satisfy the future needs of small farmer commodities.

III. THE EXTRA-REGIONAL MARKETS IN SMALL FARMER COMMODITIES

A. Introduction

This chapter first analyses trade flows between major extra-regional markets and CARICOM LDC's (Antigua, Belize, Dominica, Grenada, St.Kitts, St.Lucia and St.Vincent) and their implications for potential markets for CARICOM LDC exports in small farmer commodities. This is followed by an analysis of transport links to extra-regional markets and the service presently offered by these links, their adequacy and their costs for small farmer commodities. Finally trade policies and practices in extra-regional markets are examined in terms of possible constraints or opportunities for CARICOM exports in these commodities.

For the purpose of this analysis, small farmer commodities are limited to live sheep, goats and pigs, and the meat of these animals, fresh fruit (excluding bananas) and vegetables, and processed fruit and vegetables. As specified in the Terms of Reference of the Study, only three major extra-regional markets are analysed: Canada, U.S.A. and the EEC countries.

B. Trend of Imports in Major Extra-Regional Markets

1.0 Overall Patterns of Extra-Regional Trade

1.10 Historic Patterns and Recent Trends in Trade

The total value of CARICOM LDC imports and exports over the period 1972-76 is shown in Table IIIB - 1.01. These values are given in current EC dollars and their growth rates are therefore adjusted for inflation to determine growth in real terms (constant dollars). The combined values of LDC imports show exactly 5% growth over this five year period in constant dollars. To the extent that total imports mirror overall performance of LDC economies, this low growth reflects basically stagnant economies, particularly in the ECCM states which show 1% growth in real value of imports. This indicates stagnant consumer expenditure and probably stagnant earning power over the last few years in the Eastern Caribbean. Belize is an exception among the CARICOM LDC's with a 19% per year average growth of import value in real terms during this 5 year period.

Total exports of CARICOM LDC's in this period, however, have grown 23% per year in real terms, or twice as fast as the average inflation rate (which is 13%) [1/]. The ECCM

1/ *The cost of living index (or index of retail prices, depending on local statistics) was used for an estimate of the inflation rate. It is not the best indicator of inflation, but it is the only available price index for most LDC's. Over a long period, such as the 5 year one used here, this index should roughly reflect change in local purchasing power.*

TABLE 111 B - 1.01

Value of CARICOM LDC Imports and Exports

(EC $'000)

IMPORTS	1972	1973	1974	1975	1976	1972 - 1975* Average Annual Growth Rate Current $	CLI	Constant
Antigua	90,976	94,504	143,750	145,141	NA	17%	11%	+ 6%
Dominica	32,880	32,293	38,918	45,038	49,832	11%	11%	0%
Grenada	42,811	42,487	38,114	52,818	62,215	10%	(13%)	- 3%
Montserrat	12,080	12,148	15,308	16,544	20,803	15%	13%	+ 2%
St.Kitts and Nevis	30,563	36,125	39,361	51,361	NA	19%	12%	+ 7%
St.Lucia	68,690	74,170	91,115	100,425	125,701	16%	14%	+ 2%
St.Vincent	35,240	38,103	52,300	53,352	62,290	15%	15%	0%
Total ECCM States	313,240	329,830	418,866	464,679	NA	14%	13%	+ 1%
Belize	83,108	86,788	131,018	191,072	NA	32%	(13%)	+19%
Total CARICOM LDC's	396,348	416,618	549.884	655,751	NA	18%	13%	+ 5%

EXPORTS	1972	1973	1974	1975	1976	Current $	CLI	Constant
Antigua	34,639	59,445	66,468	59,919	NA	20%	11%	+ 9%
Dominica	13,501	16,738	20,949	24,646	29,052	21%	11%	+10%
Grenada	10,530	14,512	19,364	26,915	34,121	34%	(13%)	+21%
Montserrat	370	686	1,048	1,019	1,122	32%	13%	+19%
St.Kitts and Nevis	12,117	16,576	24,971	46,841	NA	56%	12%	+44%
St.Lucia	15,118	19,234	32,909	34,453	51,450	36%	14%	+22%
St.Vincent	6,598	10,124	14,627	16,480	24,546	39%	15%	+24%
Total ECCM States	92,873	137,315	180,336	210,273	NA	31%	13%	+18%
Belize	37,228	50,604	75,086	115,114	NA	45%	(13%)	+32%
Total CARICOM LDC's	130,101	187,919	255,422	325,387	NA	36%	13%	+23%

*1976 used when available NA = not available

CLI = Cost of Living Index or Retail Price Index from each country's statist Yearbook converted to an annual inflation rate for 1972-1976

( ) = average used as an estimate

Sources: Digest of External Trade Statistics 1976, ECCM, Antigua; Trade Report For the Year 1975, Belize, Statistics Office in each country.

TABLE III B - 1.02

Comparison of CARICOM LDC and MDC Trade Growth

						1972 - 75 Average Annual Growth Rate		
		1972	1973	1974	1975	Current $	CLI	Constant $
Imports								
	CARICOM LDC's	396,348	416,618	549,884	655,751	18%	13%	5%
	CARICOM MDC's	3,199,463	3,533,398	6,627,714	6,201,467	25%	13%	12%
	Total CARICOM	3,595,811	3,950,016	7,177,598	6,857,218	24%	13%	11%
Exports								
	CARICOM LDC's	130,101	187,919	255,422	325,387	36%	13%	23%
	CARICOM MDC's	2,095,167	2,448,801	6,067,762	5,873,612	41%	13%	28%
	Total CARICOM	2,225,268	2,636,720	6,323,184	6,198,999	41%	13%	28%

Sources: Table III B - 1.01; A Digest of Trade Statistics of Caribbean Community Member States, 1976: Annual Overseas Trade 1975, Barbados Statistical Services; Overseas Trade 1975, Trinidad & Tobago Central Statistical Office; External Trade 1975, Department of Statistics, Jamaica; Monthly Accounts relating to External Trade 1975, The Statistical Bureau Ministry of Economic Development, Georgetown, Guyana; Economic and Financial Statistics, Central Bank of Barbados, June 1978.

states'exports have grown an average of 18% per year, with St.Kitts/ Nevis leading the way at 44% per year growth in real terms. Belize exports alone account for one-third of total LDC exports and its exports are growing at an average of 32% per year. (See Figure III B - 1.01) MDC export growth is slightly faster (see TableIII B-1.02)

Despite the relatively fast growth of LDC exports, they still account for only half of the value of imports. MDC import and export values are closer and 10 times larger.

The gap between the value of imports and the value of exports reflects the existence of important sources of foreign exchange earnings from tourism, transfers from overseas nationals, and a balance of payments deficit in most cases. This deficit has led to import restrictions in certain ECCM countries.

Extra-Regional trade presently accounts for between 70% and 95% of CARICOM LDC exports, except in the case of Montserrat whose trade is mostly in small quantities of food-stuffs within the region. The major items are bunker fuel* from Antigua (1/3 of total ECCM exports value) and bananas which account for about 30% of ECCM export value. Sugar, coconut oil and spices make up another 20% of ECCM export value. Belize has the highest proportion of extra-regional exports (94%) and this is dominated by raw sugar (78% in 1975). Since 1972 food items (SITC Category 0) have formed 60-65% of ECCM exports to extra-regional markets when the Antigua bunker trade is excluded.

Imports from extra-regional sources vary from 72-86% of CARICOM LDC import value, except for Belize which imports 94% from these sources. Food items have made up 25-30% of CARICOM LDC import value from extra-regional markets (excluding Antigua bunker trade) since 1972, and this proportion is slowly increasing. On average the value of food imports to the LDC's amount to about 60% of the value of their food exports, which is significant.

1.20 The Place of Small Farmer Commodities in Overall Trade Flows

The CARICOM LDC's have historically specialized in the production of tropical crops for export mainly to the U.K. This orientation has been modified over the years with some agro-processing: sugar, coconut oil and fruit juices. However, price-cost relationships have also changed and sugar has now been eliminated as an export crop in the Windward Islands and largely confined to St.Kitts in the Leeward Islands. Even bananas which have emerged as the major crop in the islands over the last 20 years, are now suffering from the competition of lower-cost producers in other areas.

**in 1975, Antigua refinery has been out of operation for several years.*

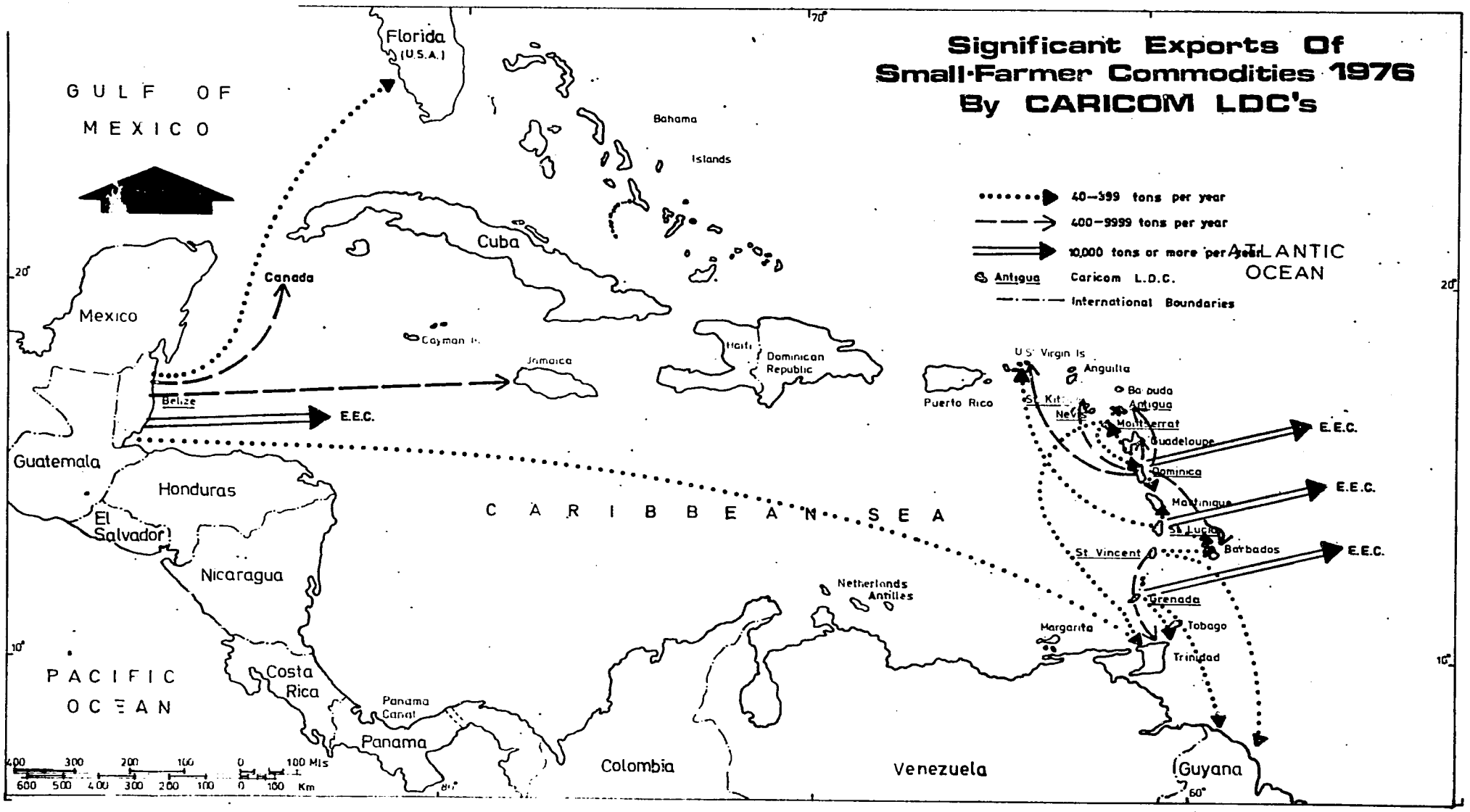
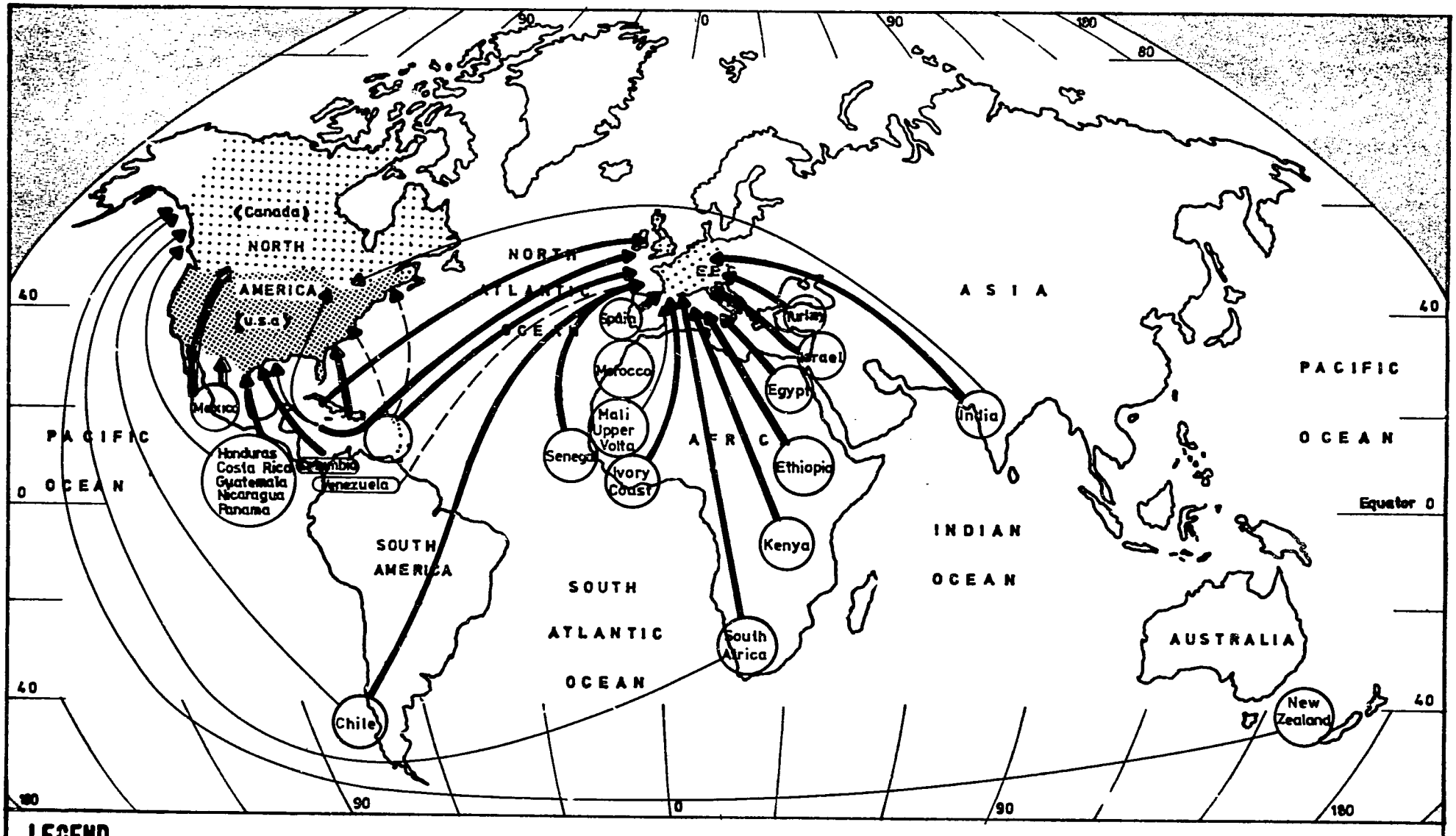


FIGURE III B 1.01



LEGEND

EXTRA REGIONAL MARKETS

- 100-500 tons per year shipped
- 500-1000 tons per year shipped
- 1000-10000 tons per year shipped
- Over 10000 tons per year shipped

Major Competing Countries In Off Season And Tropical Fresh Fruits (Excluding Bananas) And Vegetables To Extra Regional Markets

FIGURE III B-1.02

In general ECCM agricultural exports have declined from the early 1960's with the fragmentation of many large estates. However coconuts and coconut oil are still doing well, and both fresh and processed citrus and some vegetables are successfully entering the export markets., (except lime juice and lime oil exports which are down from 1970 levels). A broadening of the range and improving the quality of agricultural products has become the major hope of the future export trade in the CARICOM LDCs.

The significant flows of CARICOM LDC exports in small farmer commodities are shown in Table IIIB - 1.03 along with banana exports. The tonnage of bananas clearly dominates the exports of these commodities and bananas represent the only major flows of produce (over 10,000 tons per year) from CARICOM LDC's to any destination. Agricultural exports to the UK are encouraged by the special trade relationship that still exists between the UK and the CARICOM countries. (see discussion in section III D.)

It appears that Belize occupies a special trading position in small farmer commodities. Of the five countries with significant extra-regional exports only Belize and St. Vincent have established significant flows to the U.S. and only Belize has significant trade with Canada in small farmer commodities. Both Trinidad and Jamaica have also established markets of intermediate size in the U.S. and Canada and several CARICOM countries have minor flows to these markets, but the LDCs have not been generally successful in developing exports to the U.S. and Canada.

1.30 Position of CARICOM LDC's in Extra-Regional Markets

The market share of the present exports of the CARICOM LDC's in each extra-regional market is shown in Table IIIB - 1.04. CARICOM MDC (Jamaica, Trinidad, Guyana and Barbados) exports are also shown to indicate other possible markets for the LDCs. The definition of the market used here is restricted to the total imports of the countries concerned. A discussion of the LDC market shares in each market and the principal competition is given below along with a map of the competitive position of CARICOM LDC exports in the major extra-regional markets. Except for bananas, these exports represent a very small fraction of the extra-regional markets. This is due to a variety of factors including relatively high unit costs for average quality, and stiff competition from other countries. This has meant that LDC exports have been generally competitive only at times of the year when other supplies are scarce, except in the case of expatriate or immigrant populations which pay a premium for these products in "ethnic" stores. (See further discussion in Section D).

TABLE III B - 1.03

Trends in CARICOM LDC Exports to Extra-Regional Markets in Small Farmer Commodities and Bananas

(Tons)

Exports to:	Belize	Dominica	Grenada	St.Lucia	St.Vincent	Total
1972						
EEC Bananas	- (1)	36,494	(13,021)	45,230	25,682	120,427
EEC Other Products	6,965	3,792	(350)	57	861	12,025
Canada	1,075	43	NA	-	2	1,120
U.S.A.	3,997	8	NA	-	285	4,290
Other Extra-Regional	2,182	185	NA	4	10	2,381
Total Extra-Regional	14,219	40,522	(13,371)	45,291	26,840	140,243
Total SFC Export	14,919	42,649	(13,671)	45,752	29,023	146,014
(% Extra-Regional)	95%	95%	98%	99%	92%	96%
1975						
EEC Bananas	-	27,003	10,150 (2)	30,047	15,134	82,334
EEC Other Products	4,788	4,702	369	860	1,940	12,659
Canada	2,295	13	-	-	55	2,363
U.S.A.	722	-	-	-	317	1,039
Other Extra-Regional	827	9	-	10	2,537	3,383
Total Extra-Regional	8,632	31,727	10,519	30,917	19,983	101,778
Total SFC Export	9,659	35,423	10,812	31,481	23,005	110,380
(% Extra-Regional)	89%	90%	97%	98%	87%	92%
1976						
EEC Bananas	6,733	(32,000)	(15,625)	40,376	28,580	123,314
EEC Other Products	4,967	(4,000)	(500)	715	2,112	12,294
Canada	2,644	NA	NA	1	-	2,645
U.S.A.	269	NA	NA	-	-	269
Other Extra-Regional	2,779	NA	NA	1	333	3,113
Total Extra-Regional	17,392	(36,000)	(16,125)	41,093	31,025	141,635
Total SFC Exports	18,008	(39,700)	(16,425)	41,665	34,961	150,755
(% Extra-Regional)	97%	(91%)	(98%)	99%	89%	94%

(1) Belize figures represent 1970 exports
(2) Grenada figures represent 1973 exports.

NA = not available
( ) = unpublished figures from the Ministry of Agriculture or farmer association estimate

Sources: Countries' Annual Trade Reports: Belize, 1970; Belize, 1975; Grenada 1973; St. Lucia, 1972, 1975 and 1976; St.Vincent, 1972.
Unpublished Data: Belize Trade Report for the Year 1976, Belize Statistical Services; Dominica Annual Report on Trade Statistics, 1972 and 1975, Dominica Statistical Services; St.Vincent Trade Reports for 1975 and 1976, St.Vincent Statistical Department.

TABLE IIIB - 1.04

CARICOM LDC Market Share
in Extra-Regional Markets - 1975*

Market		Commodity Group	Import Market Size (tons)	MDC Market Share** (tons)	%	LDC Market Share (tons)	%
1. EEC	a)	Lemons, Grapefruit, fresh	711,000	2,610	0.37	2,920	0.41
	b)	Bananas, Plantains, fresh	1,916,000	76,600	4.0	113,470	5.92
	c)	Other tropical fruit,fresh	117,000	140	.12	640	.55
	d)	Fruit or Vegetable juice	712,000	2,730	.38	4,090	.57
	e)	Other Fresh Vegetables	2,342,000	70	.003	480	.02
	f)	Other Roots and Tubers	2,478,000	2,330	.09	960	.04
2. USA							
	a)	Bananas, Plantains, fresh	1,968,000	-	-	240	.01
	b)	Fruit or Vegetable Juice	296,000	210	.07	20	.007
3. Canada							
	a)	Fruit or Vegetable juice	173,000	230	.13	2,640	1.53

* The relative levels of market share have not changed appreciably since 1975.

** In addition to the MDC exports listed here, MDCs exported 850 tons to the EEC 828 tons to the USA, and 1941 tons to Canada in small farmer commodity groups not exported by the LDCs to these countries.

Source: World Trade Annual 1976 and 1975 or 1976 Export Statistics for each CARICOM country (see detailed breakdown of LDC exports in following tables in this chapter)

Potential markets for CARICOM LDC exports are identified in the following sections using two methods. In one method the present exports of products from other CARICOM countries (e.g. Trinidad and Jamaica) are used as an indicator of potential markets. In the second method special markets with a preference for products of Caribbean origin are identified (e.g. immigrant populations from the Caribbean) and the size of each potential market is estimated in reference to the competing suppliers and the "open" supply period, when supply is lowest and prices highest in each market. This "open" period is the time when LDC imports are most likely to be accepted in the market place.

After a preliminary analysis it was decided that small animals and their products would not be marketable in the three extra-regional markets. Therefore these were excluded from the analysis of potential markets.

2.0 EEC Market for Small Farmer Commodities

2.10 Present Markets

The nine countries of the EEC, with a population of 250 million are the largest single import market in the world for fruit and vegetable products, even though two of them, France and Italy are major fruit and vegetable producers. There is very extensive trade among the countries themselves, especially during the April/October period of peak production in Europe, but large quantities of tropical type products are imported the year around. Citrus and juice imports are over 3,000,000 m.t. annually, and bananas totalled almost 2,000,000 m.t. (see Table IIIB - 1.04).

The EEC has a wide variety of sources for its produce imports with the nearby Mediterranean region and Africa generally dominating on citrus and tropical fruits; Europe itself supplies most of the vegetables and the Far East leads by far in supplying root crops. Bananas are obtained from Central and South America as well as from Africa and the Caribbean. Within the EEC, the U.K. and France are unique in that they obtain important segments of their fruits and vegetables from the Caribbean region. Both countries have a significant level of immigrant population from former colonies and overseas departments and have continual strong political and social ties to these tropical areas. Consumers have a high awareness of produce origination from these sources.

The U.K. received almost 175,000 m.t. of bananas and other fresh fruits from the Windward Islands, Jamaica and Belize in 1975; France reported over 275,000 m.t. of these products from Guadeloupe and Martinique. Much smaller amounts (about 10,000 m.t.)of juice and preserved fruit were imported from the same sources by these two countries. Some 7,000 m.t. of fresh vegetables and root crops were among the imports from the Caribbean by both the UK and France. Aside from these imports by the U.K. and France, trading by Caribbean countries/territories with the EEC in

fruit and vegetable products has been minimal; Germany, Ireland, Italy and the Netherlands have bought small amounts but nothing significant.
CARICOM LDC's exported significant amounts (>10 tons) of fresh limes, grapefruit, plantains, pineapples, avacadoes, mangoes, other fresh fruit, grapefruit juice, orange juice, lime juice, perserved grapefruit, fresh pumpkins, okra and other fresh vegetables, dasheens, eddoes, sweet potatoes, tannias, yams and other rootcrops as shown in Table III B - 2.01. Jamaican and Trinidadian overseas exports are shown in Table III B - 2.02.

There is good reason for this trading pattern; the U.K. has given preferential treatment to Caribbean products, especially from the LDC's, and in the case of France, Guadeloupe and Martinique are overseas departments of metropolitan France so are treated as part of the EEC. Transportation from the Caribbean to both U.K. and France is also more readily available than to other EEC markets (see discussion in III C below). There is a minimum of formalities imposed on these particular shipments (see discussion in III D). In common with Canada and the U.S.A., timing of shipments to the EEC is extremely important; this is especially true of fresh vegetables which are produced extensively throughout Europe. During the periods of the year when local production is plentiful, prices tend to be relatively low and the need for outside supplies is not so great. Even with the tropical produce, demand declines when temperate-zone products are in season; thus the marketing of Caribbean fruits and vegetables requires careful timing - along with providing high quality at competitive prices.

2.20 Potential Markets for Small Farmer Commodities

Geest, the large banana exporter from the West Indies to the U.K., has identified a list of exotic fruits and vegetables which they feel have a good U.K. market potential. This is one basis for Table III B - 2.03. Geest has already accepted some small consignments of products other than bananas for transport on its weekly refrigerated banana boats for sale through their associated marketing companies in the U.K. Geest has also prepared a chart, which is summarised in Table III B - 2.03, which shows for each product the best timing for entry of West Indian produce into the U.K. market, i.e. the months when supplies from other producing countries are short because of their respective growing seasons. These products are each analysed below:

2.21 Mangoes

Mangoes have been sporadically supplied to European markets for several years. While principal demand has come from ethnic communities (Indians, Pakistanis, West Indians and Africans), Europeans have slowly started discovering and enjoying mangoes, particularly in the case of Germany where there is not a large expatriate community.

TABLE III B - 2.01

Significant Extra-Regional Exports from CARICOM LDC's[3/] in Small Farmer Commodities and Bananas - 1976 (tons)

	Belize	Dominica[1/]	Grenada[2/]	St.Lucia	St.Vincent
To the EEC					
Fresh Limes	-	11	-	12	*
Fresh Grapefruit	-	2,893	-	-	-
Fresh Plantains	-	*	*	23	603
Fresh Pineapples	-	-	-	14	-
Fresh Avacadoes	-	*	28	*	*
Fresh Mangoes	-	*	-	65	-
Other Fresh Fruit	-	*	-	80	459
Grapefruit Juice	996	368	-	-	-
Orange Juice	2,371	-	-	-	-
Lime Juice	-	147	*	-	206
Preserved Grapefruit	1,599	-	-	-	-
Fresh Pumpkins	-	39	*	96	-
Fresh Okra	-	-	-	13	-
Other Fresh Veg.	-	19	-	310	*
Dasheens & Eddoes	-	*	-	*	164
Sweet Potatoes	-	*	-	*	282
Tannias	-	30	-	*	179
Yams	-	65	*	24	179
Other root crops	-	-	-	*	*
Bananas	6,733	27,003	10,150	40,375	28,580
To the U.S.					
Orange Juice	22	-	-	-	-
Bananas	244	-	-	-	-
To Canada					
Grapefruit Juice	702	-	-	-	-
Orange Juice	1,939	-	-	-	-

* less than 10 tons, - no export recorded

1/ only 1975 figures available

2/ only 1973 figures available

3/ the other two CARICOM LDC's, Antigua and St.Kitts reported insignificant volumes of extra-regional exports.

Source: Same as Table III B - 1.03

TABLE III B - 2.02

Significant Extra-Regional Exports of Jamaica and Trinidad in Small Farmer Commodities and Bananas - 1976 (tons)

Product	EEC		USA		Canada	
	Jamaica	Trinidad	Jamaica	Trinidad	Jamaica	Trinidad
Fresh Ortaniques	1358	-	-	-	-	-
Fresh Grapefruit	44	207	-	-	*	-
Other Fresh Citrus	115	*	287	-	*	-
Fresh Plantains	29	*	-	-	-	-
Fresh Mangoes	26	12	*	*	*	57
Other Fresh Fruit	*	49	*	*	100	*
Marmalade	263	-	18	-	159	-
Guava Jelly	*	-	16	-	*	-
Grapefruit Juice	1142	306	-	*	-	*
Orange Juice	547	297	-	*	*	*
Lime Juice	211	98	12	22	*	29
Other Fruit Juices	38	-	169	*	146	-
Other Vegetable Juices	269	-	19	-	40	-
Other Pres. Fruits	58	-	*	-	*	-
Preserved Mangoes	98	-	34	*	*	-
Preserved Grapefruit	2364	126	-	-	-	*
Preserved Ackees	62	-	-	-	108	-
Pigeon Peas	-	*	-	*	20	*
Fresh Pumpkins	301	-	*	-	36	16
Fresh Okras	-	20	-	*	*	*
Other Fresh Vegetables	47	19	*	31	162	218
Dasheen & Eddoes	696	*	-	33	14	94
Sweet Potatoes	30	-	-	-	29	-
Fresh Yams	877	21	113	*	223	13
Other Root Crops	337	*	-	*	547	*
Pickled Fruit	10	-	42	-	*	-
Canned Pigeon qeas	-	14	-	-	-	-
Other Canned Vegetables	92	-	45	-	49	-
Bananas	76568	-	-	-	-	-

* Less than ten tons exported

\- No exports

Source: Overseas Trade 1976, Trinidad and Tobago Central Statistical Office, External Trade 1976, Bureau of Statistics, Jamaica.

TABLE III B - 2.03

Potential EEC Markets for Exotic Fruits and Vegetables

Product	Market Population	Open Period in U.K.	Estimated Market Size* in open period (metric tons)
1. Mangoes	All	Sept - March	800
2. Pineapples	All	Jan - March	1600
3. Breadfruit	Immigrant	All Year	400 **
4. Limes	Immigrant	All Year	200 **
5. Grapefruit (red)	All	All Year	10000 ***
(Other)	All	Sept - Oct	30000
6. Exotic Fruit (Guava, pawpaw, etc)	Immigrant	All Year	1000 **
7. Aubergines a/ (Egg plant)	All	Jan - March	13000
8. Green Beans (French)	All ****	Jan - March	3000
9. Okra	Immigrant	Oct - March	600 **
10. Capsicums (Sweet Pepper)	All	Jan - March	15000
11. Root Crops	Immigrant	All Year	2500 **

a/ And Courgettes (baby marrows)

* See Footnote on Table III B - 3.01

** Immigrant market size is estimated at total present imports from CARICOM sources plus 20% for unsatisfied demand.

*** 10% of total imports.

**** Mostly France.

Source: Geest Product Planning Chart Report; COLEAP-EEC Report on mission to ACP Producer Countries, March 1978; and Consultant estimates based on interviews.

Kenya and India are the largest regular suppliers to the U.K. by air. Israel ships by sea to all the EEC markets. The West Indies' share of the 1,200 m.t. annual U.K. market in mangoes has jumped from 2% to 22% in the past 3 years. The only LDC with a small piece of this market is St.Lucia which exported 20 tons in 1977. The open period for West Indian mangoes is September to March.

2.22 Pineapples

The Spanish and Queen varieties are the most widely consumed types of fresh pineapple in the EEC. The Cayenne variety is the preferred import. (Antigua and Montserrat grow the Antigua Black variety.) The Ivory Coast is the largest supplier with pineapples transported by banana boats to Marseilles from where they are distributed throughout Europe. The U.K. takes supplies from South Africa during summer months but these have not been successful on the Continent. Substantial supplies also come from Kenya and the Cameroons. Total EEC imports of fresh pineapple are estimated at 75,000 tons with France the leading importer, followed by Germany. U.K. fresh pineapple imports have grown at the rate of 17% per year 1974/77 and in 1977 totalled 4,736 tons. Imports are concentrated in the period Oct/May with a peak in December. There are no significant imports at present from the CARICOM LDC's. The open period in the U.K. is from January to March.

2.23 Root Crops

The LDC's grow a variety of root crops such as yams, sweet potatoes, tannias and eddoes which have a good demand among the immigrant populations; particularly in the U.K. It is thought by Geest that there exists considerable year-round potential for growth in U.K. imports of these products, principally in the immigrant community.

2.24 Limes

Limes tend to be lumped together with lemons by the majority of consumers so that demand and prices for limes are very dependent on the state of the lemon market. It is therefore difficult to get a premium price for limes. Most consumers are familiar with a larger variety of limes grown in Italy, Spain and Turkey and therefore there are problems in marketing the West Indian lime outside the immigrant community. Within this community demand is year round.

2.25 Capsicums (Sweet Peppers)

Annual imports into the main EEC consuming countries is estimated at about 100,000 T. and they are in great demand during winter and spring when Italian suppliers dry up. Ethiopia, until recent political disturbances, was a significant off-season supplier. Of the two

tropical sources Kenya supplies by air freight and Israel by sea. The period of shortest supply is January/March when only Israel and Kenya are shipping.

2.26 Grapefruit

The major variety marketed in the EEC is the White Marsh seedless. However there is a common appreciation of the sweet taste and high juice content of grapefruit grown in tropical areas in preference to say the temperate grapefruit supplied by Israel, Cyprus and South Africa. The Windward Islands in 1977 supplied about 1,000 T to the U.K. market a decline from 3,000 T in 1974. Although the major exporters between them can supply year round, it is believed that the Ruby Red grapefruit now being planted in Dominica, if delivered in good condition, can command a market.

2.27 Aubergines (Egg Plant)

The market for this product is similar to Capsicums, in supply patterns and sources, size and colour are critical as well. The "open" season market is estimated at only 13,000 T between January and March, for aubergines and courgettes, with aubergines representing the bulk of this demand. The principal market is France.

2.28 Breadfruit

This market in the U.K. is limited to the immigrant populations. Little is known about competing sources, but St.Lucia has recently established a regular supply of breadfruit to the U.K. which amounted to over 100 tons. This is a year round market.

2.29 Other Markets

Other markets can be identified by examination of Table III B - 2.02 which shows Jamaican and Trinidadian exports to the EEC. This indicates a market for exotic citrus fruits (i.e. other than oranges, grapefruit,limes, etc.) other exotic fruits (e.g. guava), orange and lime juice, other fruit and vegetable juices, preserved mangoes and grapefruits and canned specialty vegetables. Root crops from Jamaica are also a substantial import to the U.K. Of these markets the most pertinent to CARICOM LDC potential are exotic fruits and juices and preserved mangoes and grapefruit. The market potential for fresh pumpkins and root crops from the Caribbean is also reinforced by these export figures. The above products have been identified as the most promising markets for CARICOM LDC exports to the EEC. The estimated size of the EEC open period market for each is shown in Table III B - 2.03

3.0 U.S. Market in Small Farmer Commodities

3.10 Present Market

Although the U.S. is a large market in total, it is itself an important producer and even exporter of many fruit and vegetable products. For this reason, the U.S.A.'s imports of fresh citrus in particular are relatively limited; it imports only a few

TABLE III B - 3.01

Potential U.S. Market for Small Farmer Commodities

	Product	Market Population	Open Season	Estimated Open Market Size* (Metric tons)
1.	Green Beans	all	Mar - April	1,600 m.t.
2.	Carrots	all	Jan - Feb	6,600 m.t.
3.	Cucumbers	all	Mar - mid-April	14,000 m.t.
4.	Eggplant	all	Feb - June	10,000 m.t.
5.	Okra	all	Mar - May	3,000 m.t.
6.	Onions (fresh)	all	Jan - Feb	3,000 m.t.
7.	Onions (dry)	all	Mar - April	10,000 m.t.
8.	Peppers	all	mid-Mar - May	15,000 m.t.
9.	Tomatoes	all	Mar - April	70,000 m.t.
10.	Avocadoes	all	Jan - mid-Mar	600 m.t.
11.	Grapefruit (red)	all	All year	3,000 m.t.
12.	Limes	Immigrant	All year	100 m.t.**
13.	Mangoes	all	Oct - April	10,000 m.t.
14.	Papaya	all	All year	2,000 m.t.
15.	Pineapple	all	All year	1,000 m.t.
16.	Root crops	Immigrant	All year	1,000 m.t. **
17.	Breadfruit	Immigrant	All year	200 m.t. **

* For short open periods, the total imports were divided by the length of the period not open and multiplied by the length of the open period. For longer open periods an estimate was based on the present level of imports and the potential growth of the market. Only a fraction of this market can be supplied by the CARICOM LDC's.

** Estimate based on CARICOM imports to Canada's smaller immigrant population

Source: Statistics from U.S. Department of Agriculture, Western Hemisphere Agricultural Situation reports, and U.S. Trade Statistics.

thousand tons of root crops other than white potatoes. The root crops go principally to specialised markets for immigrant or expatriate populations. Banana imports, however, are very large with a total of almost 2,000,000 m.t. in 1975. Other items such as juice, off-season fresh vegetables and tropical fruit are substantial; they are estimated at over 600,000 m.t. for 1975. The overall market for fresh fruits and vegetables has grown only slightly in recent years, although there were small shifts in consumer preference between items. Processed fruit consumption is growing faster than fresh fruit consumption, in part due to the fact that fresh fruit and vegetable prices have consistently risen faster than other consumer prices over the last 15 years.

In general, the sources of fresh fruit and vegetable imports are largely Mexico, along with Central and South America. Some fruits and vegetables are received from the Caribbean, exported by the Bahamas, Haiti, Dominican Republic and Jamaica (Table IIIC-1.03) The only 1976 fruit or vegetable LDC import by the U.S. was 22 m.t. of fruit juice from Belize. Jamaica and Venezuela also exported fruit juice to the U.S. as well as fresh fruits and vegetables. (See Table IIIB - 2.02). Such imports totalled about 10,000 m.t. (2/3 fruit) in 1975. No imports of other small farmer produce items were reported from the LDCs (although 615 m.t. of processed roots/tubers (arrowroot) are shown from St. Kitts/Nevis and St. Vincent.) (See Section IIID for further discussion of import constraint).

3.10 Potential Markets

Each potential market for fruits and vegetables is discussed in turn below. Open market periods are given in Table IIIB - 3.01. These generally occur as Mexican imports decline and before Florida supplies enter the market.

3.11 Beans (green)

Bean imports to the U.S. in 1977 amounted to 8,000 metric tons or 6% of domestic consumption. The U.S. exported about the same amount. Mexico accounts for 97% of imports, with Dominican Republic, Canada and Portugal supplying between 10 and 200 tons each. December to March is the major import period.

3.12 Carrots

Total imports of carrots amounted to 33,000 metric tons in 1977 and 20,000 tons were exported. Imports are 4% of domestic consumption. Canada is the main supplier (74%) and Mexico has almost all the rest (26%). Small quantities were also imported from Europe and Central America. The open season as indicated by imports of chilled and frozen carrots is January and February.

3.13 Cucumbers

Imports of this product were 114,000 m.t. in 1977 and only 10% of this amount were exported from the U.S. Imports account for 32% of domestic consumption. Mexico is the principal supplier (94%) followed by the Bahamas (5%) Dominican Republic, Haiti

and Jamaica are Caribbean suppliers with a small share of the market (10 - 2000 tons). Major months for imports are November to May, and the open period from early March to mid-April.

3.14 Eggplant (Aubergines)

In 1977 the U.S. imported 15,000 metric tons of eggplant, or 34% of U.S. consumption. Mexico holds 99% of the market. The remainder comes from the Dominican Republic and the Bahamas. The major imports are between December and May and the open period between early February and the end of June.

3.15 Okra

Okra imports totalled 9,000 m.t. in 1977 and no okra exports were recorded. The main suppliers are Mexico (82%) Guatemala (9%) and Panama (7%). Several other Central American countries and the Dominican Republic supply small amounts. December to May is the major import season and March to May the open period.

3.16 Onions

Both fresh and dry onions are imported to the U.S. Fresh imports came to 15,000 m.t. and dry imports were 49,000 m.t. Exports were more than double the quantity of imports and imports only amount to 1% of consumption. Mexico is the major supplier of both categories (97% fresh and 58% dry). Chile, New Zealand and Canada supply major portions of the remaining onion trade. Trinidad is the only Caribbean country figuring with a small fraction of fresh onions.* Several Central and South American countries participate. The main import season is January to May, with an open season near the end of this period for dry onions. Fresh onions are only imported in January and February.

3.17 Peppers (Sweet)

Pepper imports in 1977 totalled 55,000 m.t. while exports came to 18,000 tons. Imports are 20% of domestic consumption. Mexico has 93% of the import market and the Dominican Republic has a significant share (7%). Small quantities also come from Trinidad and Haiti. Although the main import season is December to June, imports come in all year. There are two open periods: mid March to end of May and the month of October.

3.18 Tomatoes

The U.S. imported 359,000 m.t. in 1977 and exported 10% of this amount. Imports were 30% of domestic consumption. The dominant supplier is Mexico with 99% of the imports. The Dominican Republic contributes 2,000 m.t. and other participants are Canada, Central American countries and the Bahamas. The Dominican Republic supplies tomatoes throughout the year (as it does with pepper) but Haiti only exports in December to May. The open season is March to May.

* *Re-exports*

3.19 Avocadoes

Avocadoes are currently imported from the Dominican Republic, Haiti and the Bahamas with the first getting 99% of the market and the other two only a small fraction (under 5 m.t. each). 1977 data on consumption is not available but total imports of 2,000 m.t.appears to be only 1% of the domestic market. The open period is from January to early March.

3.20 Grapefruit and Oranges

The U.S. is a major producer and exporter of these two products. However exports between 300 - 500 tons per month are supplied all year from Mexico and Israel. A specialty product such as red grapefruit would be acceptable on a year round basis.

3.21 Limes

Import of limes amounted to 8,000 metric tons in 1977 with Mexico supplying 95%. Other suppliers were Latin American countries and the only Caribbean country was the Dominican Republic. Lime imports are fairly steady throughout the year and mostly go to special populations.

3.22 Mangoes

Mangoes are not produced in significant quantities in the U.S. and 1977 imports amounted to 10,500 tons. These came from Mexico (86%) Haiti (12%) Belize (2%) and the Dominican Republic. The open season for imports is October to April. This is a growing market in the U.S.

3.23 Papaya

This market is a new one in the U.S. but Hawaii is spending some money on market promotion. Imports in 1977 came to only 500 tons. This was mostly from Mexico (91%) but the Bahamas, Dominican Republic and Ecuador contributed as well. This has a year round potential.

3.24 Pineapple

This fruit is a major U.S. product but imports have been increasing, particularly from Honduras which supplies 90% of imports which totalled 1300 m.t. in 1977. Small amounts came from Mexico, the Dominican Republic and the Azores. The imports take place year round.

3.25 Root crops

The root crops from the Caribbean are not well known in the U.S. There is however some import potential in the immigrant community. This potential would be year round.

3.26 Breadfruit, Tannia and Christophenes

These items are virtually unknown in the U.S. and no general market exists. An export potential may exist for the immigrant and expatriate Caribbean community in Miami, Washington and New York.

3.27 Other Markets

Other potential CARICOM LDC exports to the U.S. can be identified by examining the present U.S. imports from Jamaica and Trinidad. (See Table IIIB - 2.02). This examination indicates a potential for exotic fruits and fruit juices, vegetables, and root crops which probably go the immigrant communities. There is a broader market for exotic fruits and fruit juices such as guava and passion fruit if they can be supplied.

The potential market in the U.S. for all the products discussed above is summarised in Table IIIB - 3.01.

4.0 Canadian Market in Small Farmer Commodities

4.10 Present Market

The Canadian market is smaller in total size than the U.S. and EEC markets, but its imports from the Caribbean falls between the U.S. and the U.K. due to its Commonwealth ties to CARICOM countries, and the proportionally large number of immigrants from the Caribbean, compared with the U.S. (40,000 estimated in Toronto alone).

Canada imports over 300,000 metric tons of citrus fruit and over 16,000 tons of tropical fruit, 600,000 tons of vegetables and 6,800 tons of root crops per year (Table IIIB - 2.01). Most of these imports come from the U.S. and Mexico, but Jamaica is a significant supplier of tropical fruit, fruit juices and yams (See Table IIIB - 2.02).

Exports of fruit and vegetables products from the Caribbean to Canada totalled about 5,000 m.t. in 1975. The important sources were Belize (citrus juices) Jamaica (citrus juice/ackee/yams) and Trinidad (citrus juice/mangoes/dasheen/eddoes) with half of the volume consisting of citrus juice from Belize. There were no significant imports of these commodities from the other CARICOM LDCs although a few such shipments have been made from time to time.

There are 25 large West Indian wholesale and retail companies which handle these shipments and other shipments via New York. These include Sunisle, a marketing outlet of the Trinidad and Tobago Central Marketing Agency which does test marketing of Trinidadian products and maintains a flow of marketing information back to Trinidad, in addition to promoting their products.

4.20 Potential Markets

The U.S. supplies a large part of Canadian imports in the off-season, which is longer than the U.S. due to Canada's more northern location and shorter growing season. This means that Caribbean imports compete with U.S. imports to Canada in essentially the same pattern as in the U.S. market. The seasonal effects are the same so that the open season is the same time of year but somewhat longer in duration. A summary of the potential market by extension of the analysis used for the U.S. markets in specific products is shown in Table III B - 4.01.

Other Canadian markets for CARICOM LDC's were identified through present Jamaican and Trinidadian exports to Canada. These include mangoes, marmalade, exotic fruits and fruit juices, fresh pumpkins, other fresh vegetables and root crops (for the immigrant community),

It can be seen for all extra-regional markets that the present LDC exports of small farmer commodities are so small, even when only the open period markets are considered, they can be doubled or tripled in size with very little effect on the markets.

TABLE III B - 4.01

Potential Canadian Market for Small Farmer Commodities

	Product	Market Population	Open Season	Estimated Open Market Size*
1.	Green Beans	all	Feb - May	200 m.t.
2.	Carrots	all	Jan - Feb	600 m.t.
3.	Cucumbers	all	Feb - April	1,300 m.t.
4.	Eggplant	all	Jan - June	900 m.t.
5.	Onions (fresh)	all	Jan - March	300 m.t.
6.	Onions (dry)	all	Feb - May	1,000 m.t.
7.	Okra	all	Feb - June	300 m.t.
8.	Peppers	all	Feb - June	1,400 m.t.
9.	Avocadoes	all	Jan - April	600 m.t.
10.	Tomatoes	all	Feb - May	6,000 m.t.
11.	Grapefruit (red)	all	All year	1,400 m.t.
	(other)	all	All year	4,000 m.t.
12.	Limes	Immigrant	All year	100 m.t. **
13.	Mangoes	all	Oct - May	1,400 m.t.
14.	Papaya	all	All year	1,200 m.t.
15.	Pineapple	all	All year	5,000 m.t. ***
16.	Root crops	Immigrant	All year	1,000 m.t. **
17.	Breadfruit	Immigrant	All year	200 m.t. **

* See Footnote on table III B - 3.01. Detailed Canadian estimate is based on total Canadian imports by category e.g.(fresh fruit,other vegetables)assuming the same relative importance within each category as in table III B - 3.01, except for all-year markets which were estimated separately.

** Immigrant market size is estimated at total present imports from CARICOM sources plus 20% for unsatisfied demand.

*** 1% of the market.

Source: Table III B - 3.01 Import Statistics and Consultant estimate.

C. Transport Links to Caricom LDC's

1.0 Overall Pattern of Transport Linkage

1.10 Transport Service Development

The principal shipping ties of the LDC's to extra-regional countries are with the U.K. which maintains a special relationship with her territories and ex-colonies. Canada and Australia have more limited trading links which developed from Commonwealth ties. The U.S. has established strong trading links based on exports to the Caribbean area and imports from certain countries, as described in Section B.2, particularly the Dominican Republic and Puerto Rico (which has special status) and Belize among the CARICOM LDC's.

The Netherlands, Germany and France also have shipping links to the Caribbean, particularly to the French West Indies and the Netherlands Antilles. All these countries have ties with the CARICOM MDC's (Jamaica, Barbados and Trinidad), which can serve as transhipment points for the LDC's. Barbados presently has a privileged position for transhipment due to its larger number of both air and sea services; but its rising costs and low container handling levels may change this position in the future.

Latin American countries have established some links to the CARICOM, especially Venezuela through its VIASA airline service. Mexico and Belize have special links due to their common border and road connections.

The general trend in transportation links for the LDC's has been a decline in service, as shipping has become more centralised and containers have taken over a major portion of the traffic. There has been a reduction of marine shipping services from the U.K. and Canada to the LDC's in recent years, in favour of a higher frequency of container service to the MDC's. Only transhipment services to the U.S., via Puerto Rico, appear to have increased.

Air traffic has grown in response to the tourism demand, but only 3 LDC's (Antigua, Belize and St.Lucia) have direct scheduled service to extra-regional markets. A number of small air cargo charter operations are now scattered through the islands, and these carry irregular shipments of exports principally destined to extra-regional markets. Attempts to create more regular air cargo service have not been successful.

Despite the general decline in LDC transportation services, those services which provide the necessary frequency and equipment for transport of small farmer commodities

have remained the same or improved, although they are still at a relatively undeveloped level. The majority of transport services have been organised around the shipment of general cargo which does not require special handling, refrigerated storage and short transport times. Only the well-organised banana trade has created the necessary conditions and service frequencies for extra-regional exports in perishable commodities, and only for certain LDC's (Grenada, St. Lucia, St. Vincent and formerly Belize) and for one extra-regional market (the U.K.). 1/

1.20 Port and Airport Development

Major port and airport development in the Caribbean islands has centered in Barbados, Jamaica, Trinidad and Puerto Rico. Puerto Rico and Barbados have become the main transhipment points to the LDC's. In the LDC's there is excess capacity in deep water ports that is worsening. St. Lucia and Grenada have had deep water ports for years and deep water ports have been recently constructed in Antigua,St. Vincent and Dominica. Two other LDC's, Belize and Montserrat, have improved ports under construction to handle container and Roll-on Roll-off (Ro/Ro) cargo. The St.Lucia port is being expanded, and St. Kitts is planning a deep water port construction in the near future. Airports on Dominica, St.Vincent, Grenada and Montserrat have major limitations on potential air service.

1.21 Port Development

a) Description of Major Ports

See Table III C - 1.01 for major characteristics.

It should be noted that all LDC ports are now accepting Ro/Ro traffic except Dominica and Grenada. Ro/Ro operation is expected at Dominica in the near future and at Grenada at some later date. The apparent shipping trend in the LDC's is ultimately to provide most liner cargo movement by Ro/Ro service from a transhipment port with infrequent liner calls at LDC ports, except for banana ships. This shipping development would indicate that outstanding port development projects should be reviewed to ascertain if there is a continuing requirement for the accommodation of liner traffic and to ensure that the ports are capable of accepting Ro/Ro traffic, including reefer containers and trailers.

b) Port Problems and Opportunities

(i) St. Kitts

The port of Basseterre is restricted by a water depth of 14 ft. at the pier. Large vessels anchor in the roadstead and are worked with lighters. The port is currently receiving Ro/Ro, dry and reefer

1/ *This condition may be temporary.*

TABLE III C - 1.01

Port Characteristics

Port	Berthing/Depth (feet)	Warehousing and Sheds (sq.ft.)	Cold Stores	Ro/Ro Capability	Equipment	Remarks
St. Kitts Basseterre	600/14	24,000	None	Barge now operating ramp (P)	Cranes 3T, 6T & 25T	(I) Power for reefer containers not available. (2) Port area is congested. (3) Pier loading limited to 40 tons. (4) Future construction will provide a deep water berth and Ro/Ro ramp.
Antigua St.John's	1200 ft/35	40,000	None (See remarks (I)	Barge now operating ramp available)	Crane 7T - I Forks - 10 Ro/Ro Tractor- I Container chassis	(I) Electric outlets are being installed for 6 Reefer containers. (2) Port capacity estimated at 250,000 tons annually.
Montserrat Plymouth	Pierhead 180 ft/ 28 Breasting dolphins (C)	10,000	None	Ramp(C) Barge now operating	Forks - 4 (C) Ro/Ro tractor (C) Tow Tractor(c) Cargo Trailers 15 (C) Trailers(20T) 2(C) Container Handler (c)	(I) Power for reefer containers not installed. (2) Port capacity estimated at 80,000 tons annually. (3) Facilities will be complete in six months.
Dominica Roseau/Wood-bridge	500 ft/36	30,000	None	Ramp (P) Barge ops. possible	Cranes 5T, 10T & 18T Forks - 5 Tractors - 4 Trailers - 3 Crane 30T (C)	(I) Power for reefer containers not installed. (2) New port capacity estimated at 300,000 tons annually.

Port	Berthing/Depth (feet)	Warehousing and Sheds (sq.ft.)	Cold Stores	Ro/Ro Capability	Equipment	Remarks
St. Lucia Castries	1735 ft/28 800 ft/35 to 38	60,000 40,000 (C)	80,000 cu.ft (C)	Barge now operating ramp (C)	Forks - 24 Container fork (C) Crane 5T - 1 Crane 20T -1(C) Large Tugs (P)	(I) New construction is near completion. (2) Provision made for 200 reefer containers (3) Port capacity estimated 1,000,000 tons annually
St. Vincent Kingstown	Pier head 900 ft/ 30	58,000	None	Barge now operating ramp (P)	Forks - 6 Crane (15T) - 1 (not operable)	(I) No container equipment available. (2) No provision for reefer containers. (3) Port capacity estimated 100,000 tons annually.
Grenada St. Georges	800 ft/30	38,000	None	Ramp (P)	Forks - 4 (operating) Crane (10T) - 1 Forks - 5 (P) Crane(25T) P Container Handler 1 (P) Tractors - 2 (P)	(I) Port area is congested. Reclamation required to provide container park. (P) (2) Power for reefer containers not planned. (3) Port capacity estimated 80,000 tons annually.
Belize	Lighter Port	37,000	None	Ramp (C)	Forks - 3 (P) Cranes - 3 (P) Ro/Ro Tractor - 1 (P) Tow Tractors - 6 (P) Cargo Trailers - 20 (P)	(I) New construction will provide one berth with 19 ft. depth and Ro/Ro berth, estimated completion January 1979. (2) Ships now anchor 1 to 3 miles off and discharge into lighters.

(C) Under construction or procurement

(P) Planned construction or procurement

Source: Berger Survey; WISCO Investment Planning Study; Caribbean Regional Transport Review - April 1978; Various CDB technical file documents.

cargo, from the CIMT barge out of San Juan, Puerto Rico. Basseterre, like other LDC ports, now has few direct liner calls. Most import cargo is landed at San Juan and transhipped by Ro/Ro barge on a ten day schedule. Port development, planned for execution in the immediate future, will provide one deep water berth, a Ro/Ro berth and support facilities in the southern reaches of Basseterre Bay. The new port will not be provided with cold stores.

(ii) Antigua

The port of St.John's, with 1,200 ft. of deep water berthing and ample shed/warehousing, is now capable of meeting anticipated needs for a considerable time in the future. The port is equipped for and has been handling Ro/Ro traffic for some time. The port is installing electric power outlets for reefer containers/trailers. Other cold storage is not available at the port. The port is capable of expansion should future growth support this action.

(iii) Montserrat

Construction at the deep water port of Plymouth is due to be completed within six months. The port will be capable of handling Lo/Lo and Ro/Ro traffic. Ample equipment is under procurement to support all operations. The use of reefer containers has not been anticipated, and cold storage for the port will not be provided. Primary power is available at the container park, making the provision of power points a relatively simple installation. This port, when equipped, will meet all shipping requirements for the foreseen future.

(iv) Dominica

New deep water port facilities at Woodbridge Bay are complete. The port has ample operating area and equipment inventory. Port construction did not anticipate the development of Ro/Ro traffic and decline of liner service. This deficiency has been recognised and a project has been prepared for the construction of a Ro/Ro ramp. Cold stores will not be available at the new deep water port. Barge Ro/Ro service is planned to start in the near future.

(v) St.Lucia

Major development of the port of Castries is near completion. The new port will be capable of providing complete handling services for

all types of cargo. The port of Vieux Fort is being developed primarily as a bulk cargo facility in support of the industrial development of the city. Plans are being finalised for the construction of a free port in Cul-de-Sac bay, located south of Castries. The free port project would cover 500 acres and provide five deep water berths.

(vi) St.Vincent

The port of Kingstown, with 900 feet of deep berthing is now being serviced for extra-regional traffic almost exclusively by a Ro/Ro barge. Liner calls are practically limited to the banana ships. Port equipment in support of the Ro/Ro operation is not available. Trailers are now placed by a Ro/Ro tractor supplied by barge. Port authorities are planning facilities to support the Ro/Ro operations. Cold stores are not available at the port.

(vii) Grenada

The port of St.Georges has 800 ft. of deep berthing with a very congested area surrounding the pier aprons. Under current conditions, containers must remain on the Pier or the apron until unstuffed. This operation worsens the difficult traffic and congestion problem. The existing minimal equipment maintenance facilities have resulted in an inordinate amount of cargo handling equipment being placed out of commission for long periods. Port development plans would provide a container park, Ro/Ro ramp and the necessary handling equipment. With the realisation of planned improvements the port of St.Georges could provide all required port services in support of the small farm sector, except cold storage space.

(viii) Belize

The existing port of Belize City is a lighter port. Vessels anchor off at 1 to 3 miles in 15 fathoms of water. Depth at the lighter wharf at Belize City is 3 to 5 ft. Construction now underway will provide one berth with a depth of 19 ft., a Ro/Ro berth, 5 acre operating area and a 20,000 sq.ft. transit shed. The future port will be constructed with the new berth 2,500 ft. offshore. This will necessitate transporting all cargo and containers on trailers or by fork lift, to the shore. Cold storage facilities are not provided at the new port.

1.22 Transhipment Ports

The advent of Ro/Ro traffic into the LDC's with the simultaneous reduction in liner calls at LDC ports, should focus attention on the nearby regional ports capable of providing transhipment services to the LDC's.

The barge Ro/Ro traffic, with transhipped American and European cargo, now originates at San Juan, Puerto Rico. This service currently is provided as far south as St.Vincent. Within the LDC's, Castries, St.Lucia will be capable, in the near future, of providing container, Ro/Ro and bulk-break transhipment services. The other port in proximity to the LDC's, Bridgetown, Barbados, will, after completion of construction now in progress, also be capable of transhipment service into the LDC's. Plans are now being considered, by shipping firms, for utilisation of Castries and Bridgetown as transhipment points.

The implications of cargo transhipment and Ro/Ro service on the movement of small farm commodities will be discussed in Phase II of this study.

1.23 Port Planning

With the possible exception of the port of Castries, St.Lucia, it would appear that the current port planning in the LDC's did not anticipate the future requirements for handling small farm commodities, other than bananas. The lack of cold storage and power for container reefers are the most noteable deficiencies. Planning evidently was based on the assumed indefinite continuation of the current schooner trade and practices as the sole means of transporting small farm commodities. The continued development of the small farm sector in the LDC's and the market quality demands both dictate a current need for improvements in the port facilities and services available to the LDC small farmer.

1.24 Airport Development

a) Description of Primary Airports

A summary of airport characteristics is shown in Table III C - 1.02. Major airport development in the MDC's (Jamaica, Barbados and Trinidad), and in the LDC's (Antigua, St.Kitts and St.Lucia), has closely followed the facility demand created by a growing tourist industry.

In the LDC's which do not possess major air facilities (Montserrat, Dominica, St.Vincent and Grenada), construction and improvements are provided almost exclusively to accommodate passenger traffic. The

TABLE III C - 1.02

Airport Characteristics

Airport	Runway (Length Feet)	Utilization Passenger - Cargo	Air Cargo Reefer	Facilities Shed	Remarks
Golden Rock St. Kitts	8500	International Service Aircraft	No	Yes	(1) Navaids and all support equipment Available.
Coolidge Antigua	9000	International Service Aircraft	No See remarks (3)	Yes	(1) Maj or International Airport (2) Navaids and all support equipment Available. (3) Planned for future construction.
Blackburne Montserrat	3400	HS748 - Passenger Service DC3 Cargo Service	Yes 260 sq. ft.	Yes	(1) Difficult approach and short runway limits airport operations. (2) No night operations.
Melville Hall Dominica	4000	HS748-Passenger Service DC3, DC4, C-46 Cargo Service	No	Yes	(1) Difficult approach and short runway limits airport operations. (2) No night operations.
Vigie St. Lucia	5700	HS748 - BAC 111 Passenger Service DC3, DC4, DC6, Cargo Service	No	No	(1) Approaches limit aircraft operations.
Hewanorra St. Lucia	9000	International Service Aircraft	No	Yes	(1) Navaids and all support equipment available.
Arnos Vale St. Vincent	4650	HS748-Passenger Service DC3, C-46 Cargo Service	No	No	(1) Difficult approaches and wind strength variable impose load limitations and restrict operations to daylight hours.
Pearls Grenada	5000	HS748 Passenger Service DC3, DC6 and C-46 Cargo Service	No	No	(1) Difficult approach limits operations. (2) No night operations.
Belize	6300	B707 and BAC 111 Passenger Service	No See remark (1)	Yes	(1) Cold storage for meat export is located near the airport. (2) Planned improvements will provide runway, extension, aprons, passenger and cargo terminals, lighting, navaids and safety equipment.

Source: Berger Survey; Western Hemisphere Supplement - AERAD, 102nd Edition - 11 Jan 1978

continuing search for means to provide new airport locations and improvements capable of jet service, is largely in response to the need to provide attraction and easy access for tourists. Although passenger traffic, tourists, are the immediate and most visible benefit to be derived from airport investment in the LDC's, means for greater utilisation of the facilities should be sought. The provision of small industrial structures, air cargo handling equipment, sheds and cold stores in support of light precision industrial development and the agricultural sector are two apparent possibilites.

b) Airport Problems and Opportunities

(i) St.Kitts

Golden Rock airport, with an 8,500 ft. runway, modern terminal and equipment, is capable of international carrier service. The airport is served by a good road system into the city of Basseterre. Cargo aircraft operate from Golden Rock with full payload. Two charter airlines now operate a cargo service from Golden Rock about once each week. A cargo shed is available. Cold stores are not available.

(ii) Antigua

Coolidge airport, formerly a military air base, has a 9,000 ft. runway, adequate terminal facilities and equipment. The airport is capable of handling all international carrier services. Coolidge airport is served by a good road system. The available flight facilities would impose no restriction on cargo payloads. A proposal for the construction of a parallel taxiway is now under consideration. The lack of cold storage at the airport makes transhipment of LDC farm commodities difficult. Construction of cold storage space is included in future plans.

(iii) Montserrat

Blackburne Airport, with a 3,400 ft. runway and a difficult approach over high terrain, limits cargo operations to the use of DC3 aircraft. The airport is equipped with a reefer, chill room, which is under repair. This plant is expected to be in operation by September, 1978.

Preliminary studies have shown that it would be possible to extend the existing runway by costly earth moving work. The low traffic volume and nearness of large airports on adjacent islands would indicate that the existing airport could serve for the immediate future. Highway access to the airport is over a well maintained 2 lane paved highway.

(iv) Dominica

Melville Hall airport, with a 4,000 ft. runway and a difficult approach over high terrain, limits cargo operations to the use of the DC3 and DC4 aircraft. The airport has limited shed space and no reefer facilities. Currently, 2 or 3 cargo flights operate each week carrying fruits to Antigua and Barbados. Road access to the airport is through mountainous terrain. The road is single lane in some locations and in urgent need of repair. Cargo traffic would be limited to light trucks.

Several alternative airport sites have been examined and rejected due to cost and operating limitations. One site, located in the north-east of the island, has been located and would appear to have possibilities for development into an airport capable of handling medium range jets. The impetus for further construction is a planned expansion of tourist trade.

(v) St.Lucia

Vigie airport is located in the immediate vicinity of the city of Castries. The airport has a 5,700 ft. lighted runway. Air cargo is handled by DC3, DC4 and DC6 aircraft. No reefer or storage sheds are available at the airport. However, these facilities are available in the adjacent city.

Hewanorra airport, located at Vieux Fort, on a former military air base, has a 9,000 ft. runway, modern terminal facilities and equipment. The airfield is capable of handling international carrier services. The available flight facilities would impose no restrictions on cargo payloads. A cargo shed is available at Hewenorra, but there is no provision for cold storage. The airport is linked to the city of Castries by an improved 22 mile road.

(vi) St.Vincent

Arnos Vale airport, with a 4,650 ft. runway, steep terrain on three sides and variable wind strength, which can stop flight operations, is limited to cargo service by DC3 and C-46 aircraft.

Runway lengthening by extending into the sea has been considered. However, the above mentioned limitations would also apply to the lengthened runway. Other possible airfield sites, in the north of the island, are remote and pre-empted by current farm utilisation.

Arnos Vale is in the immediate vicinity of the city of Kingstown, and is joined by a reasonably maintained 2 lane road.

(vii) Grenada

Pearls airport, with a 5,000 ft. runway and difficult approach due to surrounding high terrain, limits cargo operations to the use of DC3, DC6 and C-46 type aircraft. The airport has neither shed nor reefer space available.

Access to Pearls is over a difficult mountain road. Cargo traffic would be limited to light trucks.

Various possibilities for improving Pearls have been suggested. Each, because of cost or physical limitations, has been viewed as not feasible.

(viii) Belize

Belize City International airport, with a 6,300 ft. runway and clear approach, would not limit cargo operations except for the largest jets requiring additional runway for takeoff. The airport is located ten miles from Belize City and is connected by a good 2 lane road. Planned improvements will provide a runway extension, passenger and cargo facilities. Cold storage, in support of meat export operations, is available near the airport.

A review of airport facilities in the LDC's reveals no existing or planned construction for support of air shipment of small farm commodities, with the exception of Montserrat.

Runway length and other flight restrictions on some LDC's, while limiting aircraft

types, do not place insurmountable restrictions on the movement of the current low volume, short haul air cargo. The lack of cargo terminal facilities will limit future expansion of this transport link, especially for high value, perishable produce destined for extra-regional markets.

Future airport improvements or construction of new facilities should anticipate the requirements for the shipment of small farm commodities.

2.0 Major Carriers Routes and Frequencies

2.10 Marine Transporters

There are more than 150 shipping lines serving the Caribbean area, providing, a wide variety of vessels and services from modern 24,000 DWT container ships to aging 1,000 DWT Dutch Coasters, to Roll on-Roll off trailers on huge barges pulled by sea-going tugboats. Twenty of these lines provide regular service on a monthly or better frequency to the CARICOM LDC's from outside the region, as shown in Table III C - 2.01. The routings followed by these lines are illustrated in Figure III C - 2.01.[1/]

There are six major lines providing bi-weekly or weekly service to the CARICOM LDC's. These are Atlantic, Booker, CAROL, Geest, Saguenay and TMT/CTMT. In addition United Brands serves Honduras with a feeder service to Belize. The CAROL line combines two traditional Caribbean carriers (Harrison and KNSM) in a container service with two other companies. The services provided by each of the seven lines is described below in relation to the transport needs of small farmer commodities.

2.11 Atlantic Lines

Atlantic lines is a New York-based company with eight vessels operating in the Caribbean, six of which are small coasters of 1,000 to 1,200 DWT. The coasters are equipped with reefer space of approximately 26,000 cu. ft. per ship. They carry chicken parts south and return with frozen fish and shrimp from Guyana and Belem, Brazil. At present they pick up some cargo south-bound from the LDC's, largely destined for New York. Their focus on frozen cargo and present routing is not compatible to providing a service for chilled LDC export products.

The other two ships are container ships which stop at Barbados and Trinidad. In September,1978, they expect to add St. Lucia, Martinique and Guadeloupe to their container route with a turn-around at St. Lucia. They expect to deliver 10 to 15 reefer containers [2/] into St. Lucia every 18-21 days, loaded largely with chicken parts for transhipment to Trinidad by a small containership. They have not obtained return cargo for these containers and small farmer products could be a possible cargo.

1/ *All LDC routes of these lines are shown but only a partial indication of other routes in the region is provided.*

2/ *Containers which rent for $12-13 U.S. per day.*

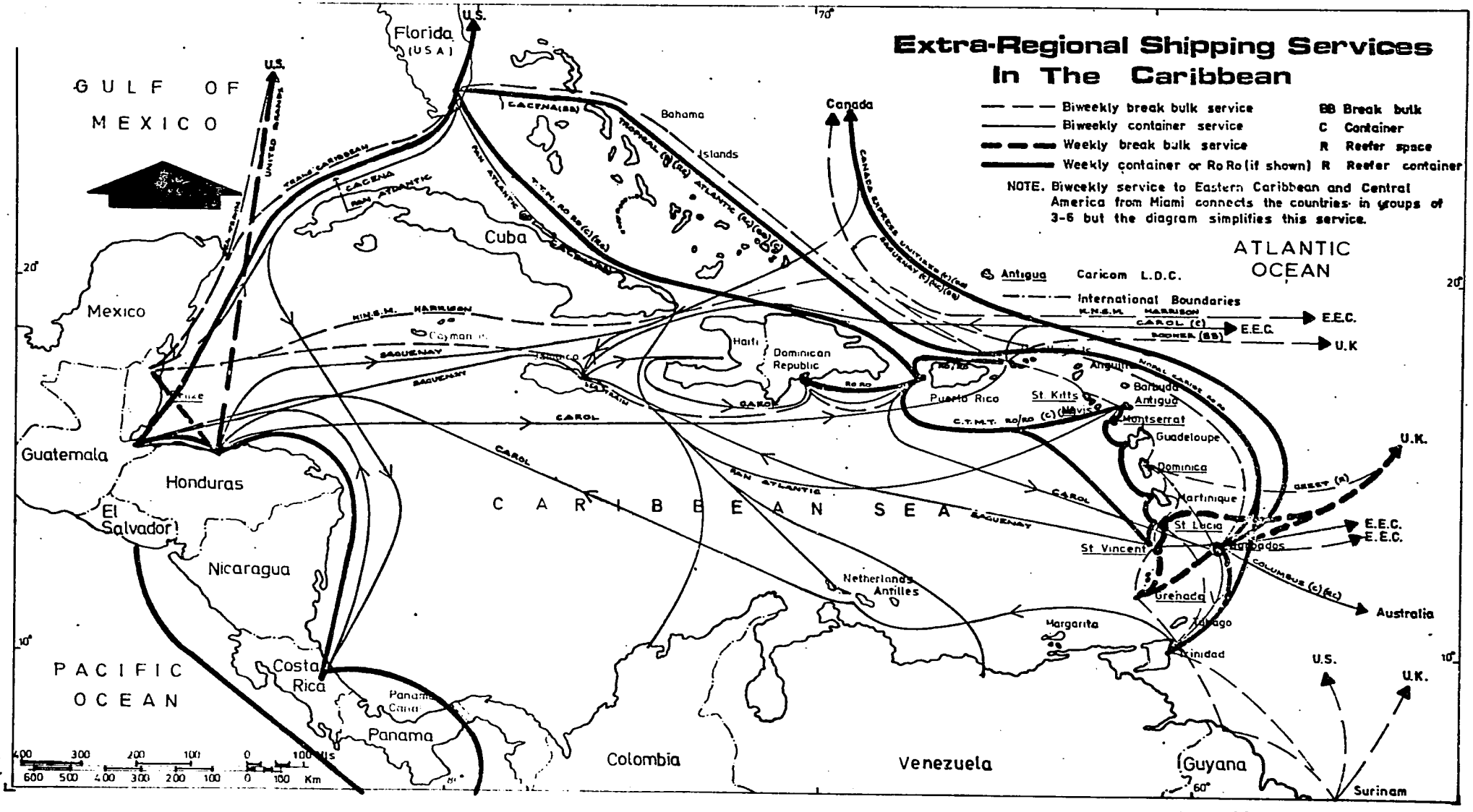


FIGURE IIIC 2.01

TABLE IIIC - 2.01

Frequency of Extra-Regional Shipping Service to CARICOM LDCs

Line	Extra-Regional Base	Antigua	Belize	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent	CARICOM MDCs
1. Atlantic	(US)+	B	B	B	B	B	B	B	B	B
2. Belize Maine	(Holland)	-	B	-	-	-	-	-	-	-
3. Booker	(UK)+	B	-	T	T	T	B	B	T	B
4. Buccaneer	(US)	-	M	-	-	-	-	-	-	-
5. Canada Express	(Canada)	T	-	T	T	T	T	T	T	W
6. Canada, Jamaica	(Canada)	-	M	-	-	-	-	-	-	-
7. Caribe Trading	(US)	-	M	-	-	-	-	-	-	-
8. CAROL*	(EEC)+	T	T	T	T	T	T	T	T	B*
9. Columbus	(Australia)	T	-	T	T	T	T	T	T	B
10. Geest	(UK)+	T	-	B	W	T	T	W	W	W
11. Germany-London Holland Service	(EEC)	T	-	T	T	T	T	T	T	B
12. Harrison*	(UK)	T	B	T	T	T	T	T	T	B*
13. K-Line	(Japan)	-	M	-	-	-	-	-	-	M
14. KNSM*	(Holland)	M	B	M	M	T	M	M	M	B*
15. Nopal Caribe	(US)	T	-	T	T	T	T	T	T	W
16 Pan Atlantic	(US)	B	WT	T	T	T	T	T	T	M
17. Saguenay	(Canada)+	B	T	B	B	T	B	B	B	B
18. TMT/CTMT	(US)+	W	-	W	-	W	T	W	-	-
19. Tropical	(US)	T	-	T	T	T	T	T	T	W
20. United Brands	(US)+	-	W	-	-	-	-	-	-	-

* CAROL is a combined service including Harrison and KNSM

T = Transhipment only W= weekly B= Bi-weekly M= Monthly or triweekly

\+ = Major Shipping Line

Atlantic has a sister company, Pan Atlantic, with similar container services from Miami to Antigua. This is a non-conference line with relatively low rates, and could be attractive for backhaul cargo to the U.S.

2.12 Booker Line

This is an U.K. based line which serves St. Lucia, St. Kitts and Antigua, as well as Trinidad,Surinam and Guyana. The company uses medium-sized breakbulk vessels and stops at the LDC's first on its outbound trip to Guyana. The type of ships and routing are not readily adaptable to the export of small farmer commodities.

2.13 Geest Line

The Geest Line has four fast medium-sized (5,800 DWT) vessels with 343,000 cu. ft. of reefer space each, especially designed for the banana trade. Geest is also a fruit and vegetables importer to the U.K., and has established close liaison with the producers and the retail markets in the U.K. It has organised its service for an 8-day trip and has continuous radio contact with its ships to match their routes with the latest production information in the islands. There is usually excess reefer space on the outbound voyage and Geest is actively looking for marketable exports of fruits and vegetables to carry, particularly in the off-peak of the banana season. This is an excellent opportunity for future small farmer commodity transport.

2.14 Saguenay Line

This line provides the only shipping link between the ECCM islands and Canada (although there is another Canadian container service to Barbados). Saguenay provides a regular bi-weekly service with large ships which handle breakbulk and containers southbound, and return mainly with bulk bauxite loads. Since the boats' schedules are geared to the bauxite cargo, they are not well adapted to perishable cargoes and precise market service. However, there are refrigerated containers of imported goods handled in Barbados, Trinidad and Antigua which could be available for potential exports.

2.15 TMT/CTMT Lines

The Trailer Marine Transport Corporation is a Ro/Ro operation which uses five 180-trailer barges and several small barges which are hauled by large tugboats on three feeder lines into Puerto Rico (from the Windward and Leeward Islands, U.S. Virgin Islands and the Dominican Republic) connecting to weekly TMT vessels to Miami and Jacksonville, Florida in the U.S. TMT has arrangements with Sealand, Seatrain, GCML (Texas), CAROL Lines, and CGM to tranship containers arriving in

the U.S. or Puerto Rico to the Eastern Caribbean. The TMT feeder service (CTMT) to the Eastern Caribbean is a weekly barge service that stops at Montserrat, Antigua, St. Vincent, St. Lucia [1/] and the French West Indies. St. Kitts is also served frequently on inducement, and they are expected to include Dominica soon.

Presently all the cargo is southbound and none goes north from the LDC's, despite the availability of reefer trailers in the ports. CTMT also has considerable experience with chilled and frozen cargo shipped from the Dominican Republic to the U.S. This offers an excellent opportunity for both export and inter-island shipments of chilled small farmer products.[2/]

2.16 CAROL Lines

This line is a consortium of 4 companies' lines (Harrison, KNSM, CGM, Hapog-Lloyd) which are based in 4 countries in Europe. They have long experience in the Caribbean; and wish to shift their business from traditional breakbulk small-island service to a fast container service to the main islands. This service is significant even though it does not touch the LDC's.

CAROL operates on a 10-day schedule with six large (24,000 DWT) ships. The present routing, as shown in figure III C - 2.01, is Europe, Jamaica, Haiti, Puerto Rico, Barbados, Trinidad, Curacao, Guatemala, Honduras, U.S. Virgin Islands, Europe. This is a long routing, but reefer containers are available [3/] and some transhipment would be possible although difficult for perishable products.

Harrison has cut off its traditional breakbulk service to the ECCM islands in early 1978 as a consequence of its successful CAROL service. The cargo will now come to the LDC's by container to Puerto Rico and be transhipped from there. KNSM will probably follow suit in the future, although it is sensitive to potentially lower service, and may establish its own feeder service. CAROL may also break its service into two shorter routes if they can keep up the 10 day frequency, and add new ports to its route.

1/ *Note that Tropical Lines also has a Ro/Ro service from the U.S. At present it calls only in the MDC's but is considering a transfer point at St. Lucia to avoid port congestion at Trinidad.*

2/ *The CTMT management cautions against exports until chilled storage is in place on the islands, and reefer repair facilities are available. Trailer units cannot initially chill the packed produce but only maintain it at chilled temperature.*

3/ *Conair containers only, which require blown air from an external unit and require expensive port installations.*

2.17 United Brands

United Brands formerly provided a weekly reefer service from Belize to the U.S., as part of the Central American banana trade. This service now goes directly from Honduras, with only a feeder barge service to southern Belize. There is a possible linkage here for small farmer commodities, but only from southern Belize with transhipment in Honduras.

C. 2.20 Air Transporters

The Caribbean is served by many extra-regional airlines as shown in Figure III C - 2.02.[1/] Virtually every country has an airline which connects at least with the United States, and frequently with Europe as well. Ten Caribbean countries including Belize have a daily air service to the U.S. The U.K. and Canada are connected several times a week to five Caribbean countries but the most frequent connection of these markets to the CARICOM countries is 6 flights per week to Barbados and Guyana from the U.K. and three flights per week from Canada to both Barbados and Antigua[2/].

The major hubs for the eastern Caribbean are Trinidad, Barbados and Puerto Rico. As a result of colonial tradition, the U.K. is best connected to CARICOM countries, France is connected daily to the French West Indies and the Netherlands to the Netherlands Antilles. Latin American countries and Puerto Rico are best connected to the U.S. and Spain.

The only CARICOM LDC's served by extra-regional airlines are Antigua, Belize and St.Lucia. (The other LDC's are connected by LIAT, a regional carrier discussed later in section IV C - 2.0 Service to Montserrat, Dominica,St. Vincent and Grenada is limited to smaller aircraft due to airport characteristics, and this limitation also affects charter air cargo operations. Belize is directly connected only to Central America and the U.S.A.

1/ *Scheduled airline service is shown to CARICOM countries, but only partial service is shown for other Caribbean countries in order to simplify the diagram.*

2/ *See Table III C - 2.02.*

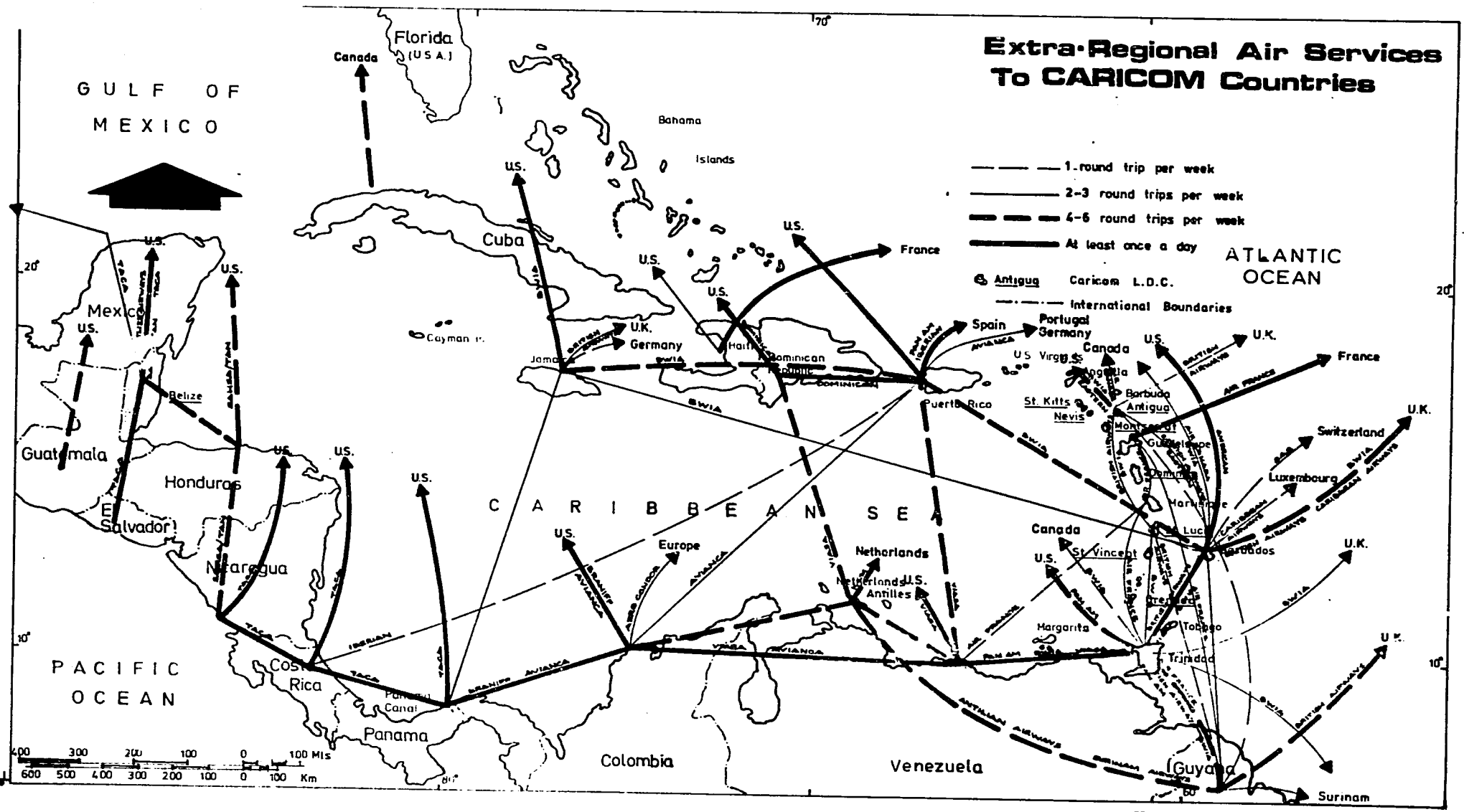


FIGURE IIIC 2.02

TABLE III C - 2.02

Frequency of Extra-Regional Airline Services to CARICOM LDC's

(trips per week)

Airline	(Extra-Regional Base)	Antigua	Belize	St.Lucia	All Other CARICOM LDCs*	CARICOM MDCs (range)
Air Canada	(Canada)	2	-	-	-	0 - 4
Air Jamaica Ltd.	(U.S.A.)	-	-	-	-	0 - 5
American Airlines	(U.S.A.)	-	-	-	-	0 - 9
Belize Airways Ltd.	(Honduras)	-	4	-	-	-
" " "	(El Salvador)	-	4	-	-	-
" " "	(U.S.A.)	-	8	-	-	-
British Airways	(U.K.)	3	-	2 via Antigua	-	0 - 3
B.W.I.A.	(U.K.)	-	-	-	-	0 - 2
"	(U.S.A.)	4+	-	-	-	0 - 7
"	(Canada)	2+	-	-	-	0 - 2
Caribbean Airways	(U.K.)	-	-	-	-	0 - 1
" "	(Luxemburg)	-	-	-	-	0 - 2
" "	(Canada)	-	-	-	-	0 - 1
Eastern Airlines	(U.S.A)	4**	-	-**	-	0 - 7
KLM - Royal Dutch Airlines	(Portugal)	-	-	-	-	0 - 1
Lufthansa German Airlines	(U.S.A.)	-	-	-	-	0 - 1
Pan American World Airlines	(U.S.A.)	-	-	-	-	0 - 7
SAHSA/TAN	(U.S.A.)	-	5	-	-	-
"	(Honduras)	-	5	-	-	-
Taca International	(U.S.A.)	-	10	-	-	-
" "	(Mexico)	-	3	-	-	-

+ As of August 1978.

* Dominica, Grenada, Montserrat, St.Kitts & Nevis, St.Vincent

** Other flights to the U.S. are possible with a transfer in Puerto Rico

Source: Official Airline Guide, Worldwide Edition, April 1978

The airlines providing extra-regional service for the CARICOM LDC's are Belize Airways, SAHSA/TAN, British Airways and BWIA[1/]. These airlines are principally oriented to passenger traffic, but they do handle some air cargo shipments to the U.S., Canada, and the U.K. There are no scheduled air cargo flights to the LDC's from outside the region, although Guadeloupe has air cargo connections to France, and charter flights are also available from British Airways and others. Each of these airline services are discussed briefly below in relation to their potential for transportation of small farmer commodities.

2.21 Belize Airways Limited

BAL operates out of Belize to Honduras, El Salvador and Miami. It flies Boeing 707's to all destinations, four times a week to neighbouring countries and twice a week to Miami. Its flights to the U.S. are complemented by TACA and SAHSA/TAN so that a daily service is achieved. In addition BAL has 2 scheduled air cargo flights a week to the U.S. Most cargo is south bound and therefore there is substantial excess capacity to the U.S. for exports.

The airline operates its 707's as charter air cargo for the export of beef and fish to the French West Indies. Exports of mangoes and dehydrated papaya are shipped by the air cargo service to Miami. Incoming cargoes are largely frozen goods, apples and grapes. Further use of the air cargo service for export of small farmer commodities represents an excellent opportunity.

2.22 SAHSA/TAN

This airway is the National Honduras Airline with a long history in Central America for both passenger and cargo operations. The Belize route uses Boeing 737's and provides essentially a passenger operation with some extra cargo capacity north bound. It also uses Lockheed Electras, Convair 580's and DC3's for local service and charter arrangements. SAHSA/TAN also offers an optional stop in Belize on its twice-weekly air cargo flight up the coast of the U.S. This serves as a possible complement to scheduled air cargo service out of Belize for perishable commodities.

1/ *It should be noted that BWIA has had major organisational problems and several of the scheduled routes flown are temporarily out of service.*

2.23 British Airways

This major international airline provides substantial service to the eastern Caribbean with flights from Antigua, Barbados and Georgetown to the U.K. They also stop at St.Lucia, Trinidad and Jamaica. At present they fly both 707's and 747's on passenger runs with no air cargo flights, although charter arrangements are available. The 707's can carry 5 tons of cargo and the 747's 14-15 tons, in addition to passengers. The capacity of the 747 flight through Antigua, however, is further limited by airport characteristics to 6-8 tons depending on the passenger load.

Return traffic to the U.K. in fruits and vegetables on BA has risen sharply in the last year, mainly due to breadfruit and mango shipments to the U.K. from St. Lucia. This cargo is normally shipped on its Tuesday 747 flight from Barbados via Antigua. It is flown from St. Lucia on a Carib West charter to Barbados and off-loaded directly into a BA container. The 707 flights to the U.K. via St. Lucia and Antigua are full to cargo capacity. The Tuesday 747 flight cargo space is normally full but there is still space available on the Saturday 747 flight which flies directly to the U.K.[1/] Consequently there remains a good opportunity for further exports of small farmer commodities to the U.K. and Europe.

2.24 B.W.I.A.

British West Indian Airways has an important role in linking the Eastern Caribbean to extra-regional markets. They connect to the U.S.A., Canada and the U.K. out of Antigua, Barbados and Trinidad, and to Venezuela from Trinidad (along with VIASA). There is some uncertainty as to the future routes of BWIA due to major organisational problems which halted many of their services in the first six months of 1978, but they will probably be similar to those they have taken in the past (See Figure III C - 2.02). In August they are flying half of their 1977 flights to Canada and the U.S. BWIA is not flying air cargo flights at present, but they are considering the possibility of 707 cargo flights to the U.S.A. and Canada.[2/]. Their present flights to the U.K., U.S.A. and Canada have some excess cargo capacity, but these are 707's and DC9's with limited cargo space. There remains some opportunity on BWIA flights for LDC exports, if the BWIA resumes its former schedule and the marketing constraints are overcome. If aircargo flights are inaugurated, and LDC feeder service is improved, this will become a major opportunity for LDC exports to the North American market from the eastern Caribbean.

1/ *This is primarily due to problems in receiving cargo on the weekend in London.*

2/ *Joint discussions are taking place between the Governments of Trinidad and Barbados on this topic, but no decision has been reached at this time. Both BWIA and Carib West operations are affected.*

3.0 Adequacy of the Transport System for Extra-Regional Trade

3.10 Maritime Transport Adequacy

The overall capacity of the present sea transport lines is greater than the present demand in virtually all cases. There has even been a dip in export tonnage from the LDC's, and imports are holding constant in recent years, contributing to the recent reduction in local service by the ocean lines.

The adequacy of the linkages for small farmer commodities such as fruits and vegetables must be judged by the availability of fast weekly service with short routes and reefer space or reefer containers. Using these criteria, it is clear that St.Lucia, St. Vincent and Grenada have this type of service to the U.K. via Geest Lines. St. Lucia, St.Vincent, Montserrat and Antigua have this service via CTMT/TMT to the U.S., and Belize has this service to the U.S. via United Brands (although space is limited on these ships).

If CTMT and Geest were coordinated at St. Lucia, a transhipment on a weekly basis to the U.K. from the islands served by CTMT would also be available.

The Canadian market service cannot meet this criteria. A feeder service would be required to Barbados or Trinidad to connect with the weekly container service to Canada. Similarly, Belize does not have weekly service to Canada or the EEC although a feeder service to CAROL containers in Honduras would give it a 10-day schedule to the EEC.[1/]

In summary, there are adequate links for all islands, to at least one extra-regional market, which are all below capacity (or even unused in the case of CTMT) at present. Further links could be formed by the coordination of transhipment schedules. It is a weak system, depending on only one transporter in each case, but it exists with excess capacity, and could be strengthened by adding a few key links, or additional service on present links.

The Ro/Ro system with containers on chassis such as that offered by CTMT seems particularly well-suited to most aspects of this service, although breakbulk is still suitable for adding cargo on the two banana boat lines with reefer holds (Geest and United Brands) in the territories presently served by these lines. Efficient transhipment is hampered by the use of breakbulk loading rather than containers

1/ *Assuming that the feeder and storage system could be set up for Conair containers. They would however entail a significant investment in port equipment*

Port storage and equipment to support refrigerated containers is woefully lacking in the LDC ports. Also coordination on container use and with other parts of the production and marketing system are clearly required to make the transportation element fit in to the system efficiently.

3.20 Air Transport Adequacy

The present air transport system has good connections between Belize and the U.S. and between Antigua, St.Lucia, Barbados and the U.K. Both Antigua and St.Lucia experience cargo constraints on shipments to the U.K. More could be shipped out by air if more flights and space were available. Also Antigua would experience constraints if demand for exports increased from its present low level. There is still capacity available on outward flights to the U.S. and Canada from Antigua and Barbados, but the total is limited due to the aircraft type. (707's and DC9's with max. 5 tons capacity and 2 tons average available capacity per flight).

The islands of St.Kitts, Montserrat, Dominica and St.Vincent are not served by the extra-regional lines, and must rely on charter connections for air freight. There is no regular feeder service from these islands for air freight. Airport limitations are also a major problem in Montserrat, Dominica and Grenada.

Air cargo services from Belize to the EEC is a weak link in the system (although connections through the U.S. are good). But there exists some excess air cargo capacity for the Eastern Caribbean to all three extra-regional markets. The weak link in the Eastern Caribbean is the lack of a regular or scheduled feeder service to Antigua and Barbados, and the resulting higher freight rates. Air cargo flights to the U.K. would also increase capacity and lower costs to this major market, if sufficient export cargo could be generated and two way cargo flows assured.

4.0 Shipping Costs by Mode

4.10 Ocean Shipping

Shipping to European ports is governed by the WITAS Shipping Conference which sets rates that the major carriers agree to utilize. In the case of the CARICOM LDCs the major carriers are Geest and the CAROL line group. Shipping rates between these islands and U.S. Atlantic and Gulf ports are set by the Windward Islands Shipping Conference. The rates charged by both of these conferences are shown on Table 111 C-4.01. One can immediately see that the rates charged by WITAS to Europe are substantially lower than those to the USA even though distances to the latter are shorter. This is true even though volumetric rates to the USA are measured as 40 cu.ft. whereas WITAS measures by M^3 or about 35 cu.ft. For pumpkin and peppers for example the measurement unit is metric ton in the case of WITAS and short ton in the case of services to the USA, so that comparison of these rates slightly understates the relative cost of shipping to the USA.
The WITAS conference gives a 9.75% rebate which is deducted from Tariffs for WITAS conference lines. A bunkering adjustment is added to all cargo rates at US$6.30 per metric ton. A 2% currency adjustment charge is also added to tariffs and this may be changed fortnightly.

There has been very little use of containers to ship fruits and vegetables from the CARICOM LDCs. WITAS has a rate of $57.50/$M^3$ or $86.40/ton for less than container load cargo shipped in containers. These rates however, are not for reefer containers, and therefore would not be applicable to fruit and vegetables.

Some indication of the costs of reefer container service can be gained from CTMT services. On their high-volume refrigerated trailer service from the Dominican Republic to New York with transhipment in Puerto Rico, tariffs range between US$70 - 90/ton shipped in refrigerated 40 ft. trailers with capacity of approximately 20 ton loads of fruit and vegetables. This load factor may appear low but is limited by volumetric measurement of packed produce which also requires significant space for circulation of cool air. 1/

1/ Forty foot trailers have a nominal capacity of 2000 cu.ft. but for produce a useful capacity of say 1600 cu.ft. For vegetables properly packed the weight is 20-25 lbs/cu.ft. giving a capacity of 32-40,000 lbs. For some fruits and root crops the weight is somewhat higher.

TABLE III C - 4.01

Transocean Freight - Selected Rates Between CARICOM LDC Ports and Foreign Destinations

Item	Conference Rates in U.S. Dollars			
	USA 1/		UK 2/	EEC 2/
	Regular	Reefer	Regular	Storage
Pumpkin	115.00	148.00	103.20	130.85
Sweet Peppers	NA	148.00	120.25	NA
Avocado 3/	NA	126.00	53.60	65.90
Limes 4/	98.00	212.50	55.45 5/	65.90 5/
Grapefruit	NA	162.00	41.80	50.15
Root Crops	117.00	148.50	42.50	51.90
Ginger	167.50	NA	86.30	101.15
Okra	NA	164.00	53.60	65.90

1/ Windward Islands Shipping Conference

2/ WITAS Conference

3/ For WITAS include aubergines, pineapple, plantain and squash

4/ For WITAS include mangoes.

5/ This rate only is for reefer

Note: Tariffs are generally by volume 40 cubic feet to the USA and one cubic meter to Europe for most fruits and vegetables since volume measurement produces the higher revenue. If weight is greater as in the case of pumpkin and roots then tariff is by weight, short ton 2000 lbs. in the case of rates to the USA and metric ton 2240 lbs in the case of WITAS.

CTMT also provides Ro/Ro trailer service to several of the LDCs from Puerto Rico. For foodstuffs in dry trailers the rate is $4.05 per cu.ft. or 100 lbs in a 20 ft. trailer. This is equivalent to about $162 per 40 cu.ft. or $81 per short ton. Reefer service from the USA to St. Kitts is about US$140/ton assuming 20 tons in a 40 ft trailer. Since there is no reefer container service offered for exports of fruits and vegetables from the LDCs no rates exist. Since reefer containers/trailers are expensive equipment, owners must use them to maximum efficiency. The level of potential utilisation,which depends on availability of two-directional traffic, fast turn-around time, and point to point volume, is likely to restrict the level of the service offered.

From Belize to the U.S.A there are no conference rates and most shipping is by tramp vessels. Cargo rates are in the order of US$60 - 70/T to U.S. Gulf ports.

4.11 Air Freight

Air freight may be carried by scheduled airlines or charters. Air charters are invariably more expensive because the shipper must pay for the complete aircraft round-trip costs and the volume and value of SFC commodities are normally too low to support this cost. Regular air freight rates are likely to be more competitive with sea rates. Representative rates specified for fruits and vegetables established by IATA are shown on Table 111 C - 4.02.

Products that have a low density, i.e. low weight to volumetric ratio are more suited to air freight because rates are based on weight. Assuming a commodity weighing 300 Kg/M^3 airfreight from say Antigua to London would cost EC$670 or US$257 per M^3 as compared to rates of US$40 - 60 by sea.

For an equivalent shipment from Antigua to New York the air cargo rate would be EC$357 or US$137 as compared to US$100 - 200 by sea. When one accepts that air - freight permits other savings in terms of packing material, documentation, insurance, warehousing and inventory costs, and the financing costs associated with these savings one may conclude that airfreight to US and Canadian markets may be very competitive with ocean shipping. However, to Europe the tariff differentials between air and sea are so substantial that these savings cannot affect the advantages of sea transport.

TABLE III C - 4.02

Air Cargo Commodity Rates for Fruit and Vegetables from LDC's

		Min. of	EC $ Per Kg.
Antigua	To Barbados	100 kgs	$ .73
		1000 "	.44
	To Bermuda	250 "	.57
		500 "	.45
		1000 "	.42
		2500 "	.34
	To Detroit, U.S.A.	300 "	.69
	To London, England	250 "	1.72
	To London, England	500 "	1.61
	To London, England	1000 "	1.58
	To London, England	2000 "	1.53
	To Montreal, Canada	300 "	.69
	To New York, U.S.A.	200 "	1.19
	To Ottawa, Canada	300 "	.69
	To Trinidad	100 "	.92
	To Trinidad	500 "	.79
	To San Juan, Puerto Rico	300 "	.92
	To San Juan, Puerto Rico	500 "	.73
	To Toronto, Canada	300 "	.69
	To Windsor, Canada	300 "	.69
Dominica	NIL		
Grenada	NIL		
Montserrat	NIL		
St. Lucia	To Bermuda	1000 "	.45
	To London, England	250 "	1.72
	To London, England	500 "	1.61

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		Min. of	EC $ Per Kg.
St. Lucia	To London, England	1000 kgs	$1.58
	To Ottawa, Canada	500 "	.97
	To Toronto, Canada	500 "	.97
St.Kitts/Nevis	NIL		
St.Vincent	NIL		
Barbados	To Amsterdam, Netherlands	200 "	2.35
	To Amsterdam, Netherlands	500 "	2.20
	To Bermuda	500 "	1.12
	To Bermuda	1000 "	.96
	To Brussels, Belgium	200 "	2.35
	To Brussels, Belgium	500 "	2.20
	To Georgetown, Guyana	200 "	.86
	To Hamburg, Germany	200 "	2.40
	To Hamburg, Germany	500 "	2.23
	To London, England	200 "	2.23
	To London, England	500 "	2.13
	To London, England	1000 "	1.94
	To Montreal, Canada	300 "	1.26
	To New York, U.S.A.	1000 "	1.09
	To Ottawa, Canada	300 "	1.26
	To Port-of-Spain, Trinidad	100 "	.49
	To Port-of-Spain, Trinidad	1000 "	.38
	To Toronto, Canada	300 "	1.26
	To Antwerp, Belgium	200 "	2.35
	To Antwerp, Belgium	500 "	2.20
	To Rotterdam, Netherlands	200 "	2.08
	To Rotterdam, Netherlands	500 "	1.94

Source: IATA

Except for St.Lucia, Antigua and Belize, the LDC's do not have scheduled air services to extra-regional markets and therefore air cargo originating in these countries would have to be transhipped through an island having this type of international service at additional cost of US$0.25 - 0.50/Kg. Some produce, however, does arrive at EEC markets by airfreight, particularly from South Africa, Kenya and India, so the possibility cannot be ruled out, particularly for the LDC's with international air services, and even low cost per volume breadfruit is airfreighted from St.Lucia to the U.K. However, market prices must be very high for this mode to be considered.

Belize Airways Ltd. provides twice weekly all-jet cargo service from Belize to Miami. There is no specific commodity rate on this route for fruits and vegetables, so a general cargo rate is applied. The general cargo rate is US$0.19/lb. up to 1,100 lbs., and $0.16 for shipments greater than 1,100 lbs. TACA and TAN also have twice weekly passenger jet service to Miami from Belize City with some cargo space up to 32,000 lbs. (capacity) generally available at comparable general air cargo rates. IATA lists TACA as offering a 0006 rate (foodstuffs) of US$0.15 per Kg. to Miami on minimum shipments of 500 Kg. As can be seen in Table III C - 4.03, this gives Belize a significant cost advantage on air cargo to Miami over the other LDC's. However, the air cargo rates from Antigua to Miami and from both Antigua and Barbados to New York City are quite low.

TABLE III C - 4.03

Comparative Air Cargo Rates for SFC to the U.S.A.

	U.S. Dollars Per Kilogram TO: N.Y.C.	Miami
From:		
Belize		
BAL		
Minimum 45 Kg.	-	0.42
Minimum 500 Kg.	-	0.35
IATA (TACA only)		
Minimum 500 kg. (0006)	-	0.15
Barbados		
IATA		
Minimum 1000 Kg. - (0007)	0.41	-
Minimum 500 Kg. - (Gen. Cargo)	0.89	0.83
Antigua		
IATA		
Minimum 200 kg.	0.44	-
Minimum 500 Kg.	-	0.33
St. Lucia		
IATA		
Minimum 500 Kg.	0.85	0.78

Sources: IATA Rates for 1978; Belize Airways Ltd. (BAL) 1978.

D. Trade Policies and Constraints on CARICOM LDC Exports of Small Farmer Commodities

1.0 Overall Patterns

The important types of policies and constraints affecting LDC exports are

(i) international trade policy and preferences,
(ii) packaging and health requirements for imports,
(iii) marketing system constraints, and
(iv) transport constraints.

A general discussion of each type of policy of constraint is given below, followed by a discussion of specific considerations in each market.

1.10 Trade Policy and Preferences

There is a traditional preference in international trade of the U.K. for imports from Commonwealth countries, and the CARICOM nations benefit from this tradition. The same is true for the Canadian market, which has close ties to the CARICOM countries, and these ties are reinforced by the existence of large immigrant and expatriate communities in Canadian and U.K. cities, and the side effects of tourism.

On the more formal side, there are two systems of tariff preference; the Generalised System of Preferences (GSP) which was set up by the U.S., and part of the Lome Convention which is an agreement between the EEC and certain LDC's. Both systems specifically give tariff preferences to developing nations, and exports of LDC's that qualify have no import duties.

Imported produce is subject to varying degrees of regulations before being permitted entry or sale in extra-regional markets. These are reasonably uniform for EEC countries but differ for the USA and Canada and are often specific for each commodity and may vary depending on time of year. These regulations may include outright prohibitions, quotas, tariffs, sanitary restrictions, grading, packaging and labeling. They are normally more exacting than those applied to intra-regional marketing. The producer and shipper must be thoroughly familiar with these requirements and this is clearly beyond the capacity of the unorganized small farmer.

1.20 Marketing System Constraints in the Extra-Regional Markets

Each potential purchasing country has its own marketing system (which may be regional or national), array of potential consumers, patterns of purchase from traditional suppliers, and preferences with respect to size, colour and variety of a particular product. The more successful exporters of fruits and vegetables have established marketing agencies in the importing countries to promote sales of their products, to

provide up-to-date marketing information, and to expedite the marketing process. They often have national or ethnic loyalties to the producer countries. These marketing agencies can be very helpful in dealing with the marketing problems cited previously.

1.21 Size of Markets

The quantity of produce demanded by extra-regional markets is relatively large as compared to the supply capacity of the LDC producers and particularly small farmer agriculture, especially when one considers the demand peaks. This means that extra-regional buyers seek reliability of supply in relatively large quantities. Experience demonstrates that this is most often achieved where large farming units plant and produce specifically for an export market or where a Marketing Board exists which, through backward integration into the farming enterprise, producer contracts or other exclusive or monopolistic purchasing arrangements, can give reasonable certainty of a specific quantity and quality of produce at specific delivery later. Export markets cannot be developed as outlets for irregular surpluses of products normally produced for a national or intra-regional market.

1.22 Product Perishability

With the exception of a few root crops, the SFC commodities destined for extra-regional markets must be protected against deterioration in the interval between picking and purchase by the consumer. This involves rigorous standards of refrigeration and humidity, packing and packaging, and handling which must be planned and controlled throughout the marketing process. The technology and financial resources required are well beyond the capacity of the small farmer and even present difficulties for a marketing organization trying to standardise the handling of production from many independent small producers. Fruits and vegetables are normally purchased on consignment. Therefore if the product arrives in the port of destination in poor condition, the risk is largely borne by the seller. Even the shipping companies are reluctant to insure these cargoes against perishability because they do not control the handling prior to their acceptance of the cargo. Assuming that the shipping firm provides the proper chilled space where necessary and delivers on schedule, it can be presumed that the product deteriorated for reasons beyond the control of the shipping firm. Air-shipment of course reduces these risks.

1.23 Consignment Pricing

The consignment buyer does not guarantee the price at which he buys the product. Prices in extra-regional markets vary from day to day and week to week depending on supply and demand. Payment is made only after the cargo is received and sold by the

the wholesale buyer and profit or losses are then determined. Therefore, not only has the producer to wait more than a month before receiving payment, but he does not know how much he will be paid. He may even be presented with an invoice for payment, if prices have declined below costs or there is high spoilage. Small farmers have difficulty financing their production even when paid ex-farm and must have available an intermediary credit facility to ensure ex-farm payment and to insure against risk of losses. Airfreight can reduce the time gap between production and payment, enable more precise scheduling and reduce risk of spoilage. Even the relatively sophisticated farmer in extra-regional countries frequently experiences negative returns on production of a particular crop in one year. This is cushioned by returns in good years, diversification of crops, availability of credit and, in some cases, government price supports. The small LDC producer is subject to the same risks but has less protection.

The supplier must know exactly where his consignment risk terminates, i.e. where he ceases to be owner of the goods. The importer never becomes the owner but acts only as agent or broker for the supplier.

1.24 Marketing Cost Structure

The normal marketing costs of fresh fruit and vegetables (all costs incurred beyond the farm gate) account for about 70% of the retail value in extra-regional markets. This is a relatively high proportion compared to other food categories, despite the fact that no value is added through processing. This percentage may be even higher where produce must be imported at substantial transport cost. The supplier has relatively little control over the price at which his product will be finally marketed. The price is most determined by transport costs, commercial mark-ups (import brokers, wholesalers and retailers) and the availability of alternate sources of supply. The consignment system places the risk of these uncertainties and product losses on the producer.

1.30 Transportation

Shipments of fresh fruits and vegetables are presently made by both sea and air transport. Although air is generally more expensive than sea freight, air shipments have lower losses due to spoilage. Shipping schedules are normally established for the requirements of the majority of non-perishable general cargo, and not for the fruit and vegetable trade. This trade requires reefer space which is only a small portion of cargo space on most vessels and is not available at all on others.

The volume of produce and the shipping revenue produced must be relatively large for a liner company to seriously consider scheduling to meet produce requirements. Even for refrigerated carriers, there is a preference for frozen cargoes rather than chilled as handling and temperature/humidity control is less critical with frozen food.

For most perishables, weekly service is a minimum requirement for commodities which require frequent and regular picking. If transportation service is less frequent, produce must be held in chilled storage at additional cost and risk of spoilage while awaiting the vessel. The ocean shipping services which have been most successful in the Caribbean, the Geest Lines banana boats and CTMT's reefer trailer RoRo service out of the Dominican Republic, are both specialised for transport of fresh fruits and vegetables, at large volume with weekly service.

Truck transport is required at both ends of the transport system. Although highway systems in many of the LDC's are poor and ill-suited to use of trailers, there is the advantage that distances from farm to port are relatively short and can be accomplished in a few hours permitting same day delivery as ship loadings. In the extra-regional markets, produce is normally reefer trucked to a major produce market. Where the produce is already being transported in a reefer trailer or container, transhipment is simplified and the cargo never leaves the controlled temperature environment.

Seasonality at relatively high volumes tends to have a detrimental effect on costs of transport. A transport company is not likely to be willing to organise capacity and schedule on seasonally fluctuating traffic.

Where produce can be scheduled to fill what would be otherwise empty back-haul space of a transporter, attractive rates may be negotiated. However, the shippers must match up with the delivery point for the fruits and vegetables.

Airfreight by a scheduled carrier can be attractive for fruits and vegetables, particularly if back-haul space can be offered at attractive rates. Nevertheless, because of the perishability and seasonal peaking, it may be necessary to make firm bookings of space well in advance of shipment, and this requires accurate picking and shipment forecasting. Since airfreight is charged by weight, the lower the density of the product, the more attractive is airfreight. For example, eggplant, okra and pepper run between 20-25 lbs/cu. ft. and would have a comparative airshipment advantage over say cucumbers at about 35-40 lbs./cu. ft. Maximum storage time, fragility in terms of handling, sensitivity of the extra-regional market to delivery dates, and availability of alternative reefer shipping services are other considerations in the selection of air vs. ocean shipping.

2.0 EEC Policy and Constraints

2.10 Trade Policy

The EEC is not a uniform group of countries in the exercise of trade policies, despite the uniform tariff arrangements. The U.K. has long had traditional trade ties with CARICOM countries, and it has actively promoted imports from these countries. France has very little trade with the CARICOM countries, except through Guadeloupe and Martinique which are legally part of France and therefore part of the EEC. The Netherlands has traditional ties with Curacao, Aruba and Bonair of the Netherlands Antilles, and conducts some trade with CARICOM countries as a nearby market. The other EEC countries have little or no trade ties to the CARICOM States.

The Customs Unions of the EEC presents a united external tariff wall to non-member countries. This is modified by certain timely and preferential arrangements. The Lome Agreement extends preferential treatment to all APC countries (world-wide LDC's) which include Grenada. The same preference is accorded to the other CARICOM LDC's as EEC associated states (OCT). There are also similar trade treaties with North African countries, Israel and Spain. The majority of the tropical products entering the EEC are thereby free of tariff restrictions. Most produce, from whatever source, is subject to VAT (Value Added Taxes).

2.20 Packaging and Health Requirements

There are minimum legal requirements laid down by EEC authorities in connection with documentation, labelling and health requirements for produce entering the market. In addition, certain produce imported from any non-EEC source must satisfy the requirements for Class I or Class II EEC standards of quality and packaging and be marked accordingly. The only tropical products so designated are citrus, capsicums and beans.

2.30 Marketing Systems Constraints

Methods of marketing vary among EEC member countries. The trend toward self-service supermarket shopping, where stores work on small margins, is continuing and now dominates retailing in Germany. On the other hand, particularly in France and to a significant extent in the U.K., special green grocers are heavily patronized. These smaller outlets, frequently owner-operated, do not demand the large quantity lots that supermarket chains demand. The small outlets can serve a specialty market for a particular product from a particular country, whereas in the supermarket the produce must sell to a general market or considerable promotional expense must be borne to develop or expand demand. Consumers are more discriminatory but willing to pay higher

prices for quality at specialty stores, especially in France where households spend a larger proportion of income on fresh fruits and vegetables than in Germany or the U.K. and where a system of price controls mitigates against price cutting.

All major foreign suppliers to the EEC are working on the basis of consignment. The Marketing Boards of Morocco, Israel, South Africa and New Zealand have been in this market for years and are generally accepted as having the most effective and dynamic marketing systems. They have appointed salesmen in all major markets whom they entrust exclusively with sales of their produce. The Boards normally have their own administrative office in the import market from which they control salesmen, coordinate supplies and conduct promotion activities.

2.40 Transportation Constraints

At present, only the U.K., out of nine EEC countries, has direct air and sea connections to certain CARICOM LDC's (see Section III C) suitable for small farmer commodity exports. France can be reached through transhipment at Guadeloupe or Martinique. Indirect connections to the EEC through transhipments on the CAROL Lines to France, Germany, Holland and the U.K. are also possible, but are not ideally suited for perishable goods transport due to longer trip times and special refrigeration equipment for their containers which limits their use off the ship.

Transport costs to other fruit and vegetable suppliers, such as Kenya, are cheaper per ton-Kilometer than for the CARICOM countries, due to larger volumes of trade. This is a competitive disadvantage for CARICOM LDC's.

3.0 U.S. Policy and Constraints

3.10 Trade Policy and Preferences

U.S. trade policy has traditional links to several Caribbean territories and countries, including Puerto Rico, the Dominican Republic and Haiti, all of which have substantial exports to the U.S. Of the CARICOM LDC's only Belize has any significant U.S. ties and that is only as an adjunct to the Central American banana trade. Mexico has a dominant trade position as a supplier of fruits and vegetables and this position has been reinforced in recent years.

Tariff preferences are granted to developing nations, including CARICOM LDC's, under the generalised System of Preferences (GSP), upon presentation of an internationally agreed Certificate of Origin. Among the products exempt from tariffs under GSP are mangoes, pineapples, eggplant, capsicums, okra, fresh hot pepper, various tropical citrus juices

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and ginger. Pumpkins, sweet potatoes, yams and breadfruit are subject to a 25% tariff on value and papayas 8½%. Grapefruit and limes are charged a 0.8¢ to 1.3¢ tariff per pound of weight.

3.20 Packaging and Health Requirements

Measures applicable to imports of tropical fruits and vegetables include:

(i) marking and labelling of goods,
(ii) quantative restrictions,
(iii) quarantine regulations; and
(iv) standards.

The marking and labelling requirements are not difficult but must be followed exactly. Quantative restrictions are intended to protect domestic agriculture but there is no indication that these restricitons will be applied to the SFC export items under review.

Quarantine regulations are quite rigid. All fresh fruits and vegetables are required to be free from plants or portions thereof. All of the SFC commodities in question are restrictive, i.e. must be imported under permits issued to resident importers in the U.S.A. who are responsible for carrying out entry requirements in compliance with quarantine regulations concerning insect infestation and chemical treatment. Products are subject to inspection or disinfection (or both) on arrival and may be re-inspected at destination. Avocado, citrus and mangoes are only admissible at North Atlantic ports, and are subject to either prolonged cold treatment or ethylene dibromide gas treatment at an approved facility at the expense of the importer. The entire shipment may be refused entry if found in non-compliance. There are specific instructions to be followed in method of treatment of yams, mangoes and okra.

The Agricultural Marketing Agreement of 1937 empowers the Secretary of Agriculture to issue orders regulating the size, grade, quality and maturity of fruits and vegetables produced in the U.S.A. The Act requires that any imports of such commodities should conform to the specifications established for domestic produce. Imported commodities potentially affected include avocadoes, cucumbers, eggplants, green peppers, limes, mangoes, grapefruit and tomatoes. Of these, avocadoes, grapefruit, limes and tomatoes are currently regulated. In addition, the Federal Food Drug and Cosmetic Act places tolerance limits of the residue of pesticides allowable on all raw agricultural products, requires that such products be free from filth, and that any food additives or colouring be judged safe before use.

3.30 Marketing System Constraints

The U.S. import market is dominated by Mexico which has easy truck access to most of the U.S. In addition, the U.S. itself produces most tropical products in Florida and California. In spite of this competition, the size of the market is such that Caribbean countries such as the Dominican Republic have significant year-round exports to certain U.S. markets such as Miami and New York City. Most imports of fresh produce to the U.S. from the Caribbean represent a short-term response to unpredictable shortages. The principal receiving point market for Central America and Caribbean produce is located at Pompano Beach, Florida. There are only 4 or 5 importers handling supplies and these typically also act as selling brokers to produce terminal markets or, though less frequently, to retail chains. With one exception, the brokers have no financial commitment to growers. Sales are on a consignment basis and settlement is often long delayed to permit final accounting for product losses. Products are trucked from Florida ports to Pompano Beach and held in chilled warehouses for the twice-weekly market sales. These brokers operate on a relatively low margin and are reluctant to deal with small and potentially unreliable sources of supply.

3.40 Transportation Constraints

Most of the CARICOM LDC's have good weekly shipping connections to the U.S. except Grenada, although these are virtually unused at present. Air service is limited to Antigua and Barbados, with charter air cargo available at a relatively high price.

4.0 Canadian Policy and Constraints

4.10 Trade Policy and Preferences

Canada has close ties to the CARICOM countries traditionally. This is reflected in larger imports to Canada from Jamaica and Trinidad than to the U.S. which is a larger market. Still the major import source to Canada for fruits and vegetables is the U.S. which has close links with Canada as well. All member states of CARICOM are beneficiari of the General Preferential Tariff and therefore the only SFC commodity subject to duty e aubergines.

4.20 Packaging and Health Requirements

There are legislative stipulations concerning marking of packages, preparation of invoices, marking and labeling of products and standards. Standards are prescribed in the Food and Drug Regulations and includes such things as the use of preservatives and the addition of artifical colouring. Foods are also subject to Sanitary Certificates and Inspection requirements of various Canadian laws. So far as has been reported, no

serious obstacles exist in the way of regulatory or quarantine requirements. The LDC's, along with Canada, are attached to the Commonwealth, which should simplify some procedures. Health regulations are stringent but not as difficult as in the U.S.A. Basically, these limit the use of toxic sprays before picking, certain post-harvest treatments and the use of unhygienic packing materials. For certain fruits and vegetables, phytosanitary certificates must accompany the consignment, together with the certificate of origin and other documents. Inspections are normally made on entry for which a small fee is charged.

4.30 Marketing System Constraints

As in the EEC and the U.S., most imports are brought in on a consignment basis, with its attendant problems in risk and loss for the exporter. All goods which claim the preferential tariff must be shipped directly to a consignee in Canada, and if passing through another state, be shipped on a through bill of lading. Competition in the Canadian market system is less intense than the U.S. and the smaller market allows greater access to small producers.

4.40 Transport Constraints

Shipping connections to Canada are weak, with only one sea connection on a bi-weekly basis. Air connections are somewhat better with flights several times per week from Barbados and Antigua.

IV. INTRA-REGIONAL TRADE IN SMALL FARMER COMMODITIES

A. Introduction

This chapter analyses trade flows as a foundation for the intra-regional market analysis in chapter V. This is followed by an analysis of intra-regional transport links, the flows on these links and their adequacy, including the influence of frequency of transport service, and transport costs. The third section summarises constraints and opportunities for intra-regional trade. Finally there is a discussion of regional cooperation and coordination as it affects small farmer commodities.

The analysis centers on CARICOM LDC's, and their relation to the other CARICOM countries as well as other Caribbean countries. The non-CARICOM states selected for analysis[1/] were: Venezuela, Netherland Antilles, St.Martin, French West Indies, Puerto Rico, Surinam and the U.S. and British Virgin Islands. A further reduction in the trading partners to be studied was obtained by a selection of significant flows as described in the following section.

B. Trends in Intra-Regional Trade

1.0 Overall Patterns in Intra-Regional Trade

1.10 Historic Patterns and Recent Trends in Trade

Total CARICOM LDC trade was described in the preceding chapter and illustrated in Table III B -101. Significant features were the stagnation of import value in constant dollars, and significant growth in real export value during the period 1972-76.

Total export value is still only half of import value and, despite recent growth, is now at a lower level than it attained in the 1960's due to shifts in the market for sugar and other Caribbean exports.

Intra-regional trade amounted to an average of 18% of CARICOM LDC imports in 1974, and 14% of the exports. This means that the trade deficit with other Caribbean countries is even larger than that for extra-regional countries. Belize has the smallest amount of intra-regional imports (only 6%) and the lowest amount of intra-regional exports (also 6%). Clearly Belize is not well integrated with the other CARICOM LDC's, and this seems natural due to its isolation from the Eastern Caribbean and close contact with Central American neighbours and Mexico. Without Belize CARICOM LDC imports and exports are close to 20% of their respective totals.

The CARICOM MDC's only imported 8% of their import value from the region in 1974 while they exported 15% of their export value to other countries in the Caribbean, giving them

1/ *French Guiana omitted due to absence of trade flows from LDCs.*

a substantial surplus of trade with their Caribbean partners. The total value of CARICOM LDC trade represents only 16% of CARICOM imports and 4% of exports.

Half of the CARICOM LDC's have food imports (SITC Group 0) of 30-35% of intra-CARICOM import value and increasing. The remainder are close to 25% of intra-CARICOM import value and have experienced a decline in food imports in the late 1960's followed by an increase in recent years. In the MDC's, both Guyana and Trinidad are decreasing the food portion of their CARICOM imports (which is already low). Both Barbados and Jamaica food imports in CARICOM are now increasing after experiencing a dip (possibly due to import restrictions).

The food portion of intra-CARICOM exports of the LDC's is very high (80-90%) and rising as a percent in most cases. Only St.Lucia has a lower proportion (73%) than in the 1960's as a percent of export value. Food amounts to only 10% of Jamaica and Trinidad exports to CARICOM and about 60% of Barbados and Guyana exports to CARICOM countries.

It appears that, in recent years, the LDC role in CARICOM is increasingly that of a food supplier, while the MDC's are an increasing market for LDC food production. Guyana and Barbados also require some food imports while exporting food products of their own. Regional coordination and cooperation will be a main determinant of trade in food, and in small farmer commodities in particular (see discussion below).

Statistics on trade for certain Caribbean countries are either non-existent in recent years or of doubtful quality, particularly for non-CARICOM countries. However, some significant trade is recorded with the French West Indies and the U.S. Virgin Islands, and this is discussed in Section 2.0 below.

1.20 Identification of Significant Trade in Small Farmer Commodities

In order to separate out significant flows of small farmer commodities from negligible flows, a table was made of all the intra-regional CARICOM exports in the last year for which statistics could be obtained (usually 1976). From this table flows were found to fall in four size groups: (1) minor intermittent flows (less than 40 tons/yr.), (2) minor regular flows (40 to 399 tons/yr.), (3) intermediate flows (400 to 9,999 tons/yr.), and (4) major flows (over 10,000 tons/yr.)[1/] Only the first three levels are found in intra-regional trade, as shown in Table IV B - 1.01, for the CARICOM LDC's. The seventeen flows identified as either minor regular flows or larger, were then analysed in more detail. These flows, derived from trade statistics, were cross-checked with the results of the ECLA inter-island shipping survey of 1976 which confirmed the identification of significant flows (although the flows differ, as discussed below).

1/ *As shown in Figure III B - 1.01.*

TABLE IV B - 1.01

Analysis of CARICOM LDC Exports to Intra-Regional Markets in Small Farmer Commodities and Bananas
(tons)

	Origin							
Exports to	Antigua	Belize	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent
Antigua	x	-	671	8	64	-	1	-
Barbados	5	-	1,029	5	7	-	276	317
Belize	-	x	-	-	-	-	-	-
Dominica	1	-	x	5	61	-	-	-
Grenada	7	-	-	x	27	-	-	4
Guyana	-	-	-	128	11	-	-	70
Jamaica	-	610	1	4	-	-	-	-
Montserrat	10	-	95	-	x	-	1	2
St.Kitts & Nevis	5	-	522	2	16	x	1	-
St.Lucia	-	6	8	2	14	-	x	7
St.Vincent	-	-	2	16	2	-	-	x
Trinidad & Tobago	-	653*	-	123	120	-	-	3,461
Total CARICOM	28	1,269	2,328	293	322	-	279	3,861
French W.I.	-	-	652	-	1	8	165	15
Neth. Antilles	2	-	28	-	5	16	-	-
Puerto Rico	-	-	-	-	-	-	-	-
St.Martin	1	-	-	-	-	-	-	-
Surinam	-	-	-	-	-	-	-	-
Venezuela	-	-	-	-	-	-	-	-
Virgin Is.(UK)	-	-	-	-	-	-	-	-
Virgin Is.(US)	4	-	688	-	7	12	129	1
Total Other Carib.	7	-	1,368	-	13	36	294	16
Total Intra-Regional	35	1,269	3,696	293	335	36	573	3,877

* This figure is shown in Trinidad & Tobago imports but not in Belize exports in 1976

Sources: Countries' Annual Trade Reports: Antigua, 1975; Grenada, 1973; Montserrat, 1976; St.Kitts, 1973; St.Lucia, 1976.
Unpublished Data: Belize Trade Report for the Year 1976, Belize Statistical Department; Dominica Annual Report on Trade Statistics, 1975, Dominica Statistical Services; St.Vincent Trade Report for 1976, St.Vincent Statistical Department.

TABLE IVB - 1.02

Analysis of Imports to CARICOM Countries in Small Farmer Commodities

(tons)

Origin Country	Destination											
	Antigua	Barbados	Belize	Dominica	Grenada	Guyana	Jamaica	Montserrat	St.Kitts	St.Lucia	St.Vincent	Trinidad & Tob.
Antigua	x	28	-	1	-	-	-	1	-	-	-	4
Barbados	-	x	-	3	9	7	162	-	-	7	13	189
Belize	1	-	x	-	-	1	16	-	-	6	-	653
Dominica	16	690	-	x	1	-	-	11	4	1	-	-
Grenada	6	3	-	194	x	-	-	-	1	-	-	373
Guyana	3	148	-	3	-	x	1	-	-	-	-	21
Jamaica	85	360	3	5	56	554	x	5	-	46	-	355
Montserrat	13	15	-	21	-	-	-	x	-	-	3	120
St.Kitts & Nevis	-	-	-	-	-	-	-	2	x	-	-	1
St.Lucia	3	216	-	3	-	-	-	1	-	x	-	3
St.Vincent	-	548	-	-	-	3	-	-	-	5	x	3,595
Trinidad & Tobago	92	2,920	-	6	158	547	408	1	1	158	112	x
Total CARICOM	219	4,928	3	236	224	1,112	587	21	6	223	128	5,314
French W.I.	7	-	-	4	6	-	-	-	-	1	-	-
Neth. Antilles	-	-	-	-	-	-	-	-	-	-	-	1
Puerto Rico	275	68	-	45	-	-	-	9	142	11	-	35
St.Martin	-	-	-	-	-	-	-	-	-	-	-	-
Surinam	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	-	-	-	-	-	-	-	-	-	-	-	1
Virgin Is. (UK)	-	-	-	-	-	-	-	-	-	-	-	-
Virgin Is. (US)	3	-	-	1	-	-	-	-	-	-	-	-
Total Other Caribbean	285	68	-	50	6	-	-	9	142	12	-	37
Total Intra-Regional	504	4,996	3	286	230	1,112	587	30	148	235	128	5,351

Source: See Table III B 1.01

The CARICOM LDC exports to Caribbean countries in small farmer commodities made up 35% of all CARICOM exports to these countries. Ninety percent (90%) of CARICOM intra-regional exports were to other CARICOM countries. Only two CARICOM LDC's (Dominica and St.Lucia) have significant trade with Caribbean countries outside CARICOM, and this trade is with only two countries (French West Indies and U.S. Virgin Islands). It makes up only 13% of CARICOM LDC exports in small farmer commodities, but it represents a third of the intra-regional exports of Dominica and half of those for St.Lucia.

Of the CARICOM MDC's, only Trinidad has significant exports to other Caribbean countries in small farmer commodities. Trinidad trades with the Netherland Antilles, French West Indies, and Puerto Rico. This trade only amounts to 4% of Trinidad's intra-regional exports.

2.0 Significant Intra-Regional Trade Flows

2.10 CARICOM LDC Exports

Three annual sets of data on the nineteen signficant export flows of the CARICOM LDC's in small farmer commodities are shown in Table IV B - 2.01. The years 1972, 1975 and 1976 were selected to provide data on recent growth, as well as a 5-year trend. The 1975-76 growth rates and the 1972-76 average annual growth rates are shown to facilitate comparison, when available.

A description of the composition of each significant flow is shown for each country in the following tables. Major commodities are noted individually, while smaller components of the flows are grouped by type.

2.11 Antigua

Antigua had no significant exports in small farmer commodities in the region as of 1976. Only exports of less than 10 tons were made to other islands in the Caribbean.

2.12 Belize

The only significant export from Belize in 1976, recorded in export statistics, was a shipment of 610 tons of orange juice to Jamaica (Table IV B - 2.02). There was also a large shipment of rice in 1976 which was not classified as a small farmer commodity, because it came from a large rice farm organised for the export trade. Import statistics to Trinidad show a flow of 653 tons from Belize. It is not clear whether these are two different shipments or whether it is a case of transhipment via Jamaica. It is assumed here that these are two separate flows.

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TABLE IV B - 2.01

Trends in Significant CARICOM LDC Export Flows to Intra-Regional Markets in Small Farmer Commodities

	Origin - Destination	(Tons) 1972	1975	1976	Average Annual Growth 1972-76	1975-76
1.	Belize - Jamaica	432	790	610	9%	-23%
2.	Belize - Trinidad	-	238	(653)	-	174%
	Total Belize Intra-Regional	432	1028	1263	31%	23%
3.	Dominica-Antigua	675	671	(75)	-42%	-89%
4.	Dominica-Barbados	394	1029	(1455)	39%	41%
5.	Dominica-Montserrat	17	95	(5)	-26%	-95%
6.	Dominica-St.Kitts & Nevis	109	522	(26)	-30%	-95%
7.	Dominica-Fr. West Indies	344	652	(425)	5%	-35%
8.	Dominica-U.S. Virgin Islands	553	688	(137)	-29%	-80%
	Total Dominica Intra-Island	2092	3657	(2123)	0%	-42%
			(1973)			(1973-76)
9.	Grenada - Guyana	NA	128	(110)	NA	-5%
10.	Grenada - Trinidad	NA	123	(897)	NA	93%
	Total Grenada Intra-Regional	NA	251	(1007)	NA	58%
11.	Montserrat - Antigua	2	65	64	138%	0%
12.	Montserrat - Dominica	5	23	61	87%	165%
13.	Montserrat - Trinidad	26	37	120	47%	224%
	Total Montserrat Intra-Regional	33	125	245	65%	96%
14.	St.Lucia - Barbados	166	282	276	14%	-2%
15.	St.Lucia - Fr. West Indies	-	71	165	-	132%
16.	St.Lucia - U.S. Virgin Islands	231	190	129	-14%	-32%
	Total St.Lucia Intra-Regional	397	543	570	9%	5%
17.	St.Vincent - Barbados	62	517	317	50%	-39%
18.	St.Vincent - Guyana	5	-	70	93%	-
19.	St.Vincent - Trinidad	2058	2477	3521	14%	42%
	Total St.Vincent Intra-Regional	2125	2994	3908	16%	31%
	Total Significant Intra-Regional Flows*	5079	8347	8109	12%	-3%
	Total Intra-Regional Flows (% Significant Flows)					

* without Grenada

( ) 1975-76 sea transport data only based on shipping survey, except for Belize & Trinidad where the figure is from Trinidad & Tobago imports.

Sources: Export Statistics for each country

2.13 Dominica

Dominica flows have declined sharply in recent years. Only 1975 detailed data on flow composition is available (Table IV B - 2.03). The major flows are composed of bananas, plantains, citrus and some root crops.

Dominica has the largest number of flows of small farmer commodities of the LDC's. The largest flows are to Barbados, the neighbouring islands of the French West Indies, and the U.S. Virgin Islands.

2.14 Grenada

ONly 1973 detailed export figures were available from Grenada. These showed flows to Guyana and Trinidad. Fruit pastes and vegetable juices are major items for Guyana, and fresh fruit and vegetable juices for Trinidad (see Table IV B - 2.04).

The inter-island shipping survey indicates much larger flows of fruits and vegetables to Trinidad in 1975-76 and the same level to Guyana. These are not detailed.

2.15 Montserrat

Flows of small farmer exports from Montserrat to Antigua, Dominica and Trinidad were significant at low levels up to 1976. White potatoes were dominant to Trinidad and Antigua (these have recently been discontinued). Lime juice was the major export to Dominica (see Table IV B - 2.05).

2.16 St.Lucia

St.Lucia exported significant amounts of fruits and vegetables in 1976 to Barbados, the French West Indies, and the U.S. Virgin Islands. Mangoes, bananas and plantains were the major exports to Barbados, coconuts to the French West Indies and bananas and other fruits to the U.S. Virgin Is. (see Table IV B - 2.06).

2.17 St.Vincent

Significant export flows in small farmer commodities were found for St.Vincent to Trinidad, Barbados and Guyana, with Trinidad the largest intra-regional flow for all the CARICOM LDC's (3,520 tons). The main components were sweet potatoes, dasheens and eddoes and carrots. Smaller but significant elements were live animals, plantains, avocadoes and other root crops.

Despite their size, these flows have grown substantially since 1972, as indicated in Table IV B - 2.07.

In general, intra-regional exports have substantially increased for the CARICOM LDC's over the last 5 years. Only the sharp decline of Dominica in 1976 shows a break with the pattern. Many of the smaller flows are quite variable in their growth, and this is probably due to supply problems, as discussed later.

TABLE IV B - 2.02
Significant Flow Composition for Belize Exports
in Small Farmer Commodities - 1976

	Belize - Jamaica		Belize - Trinidad	
Commodity	Tons	(Percent)	Tons	(Percent)
Orange juice (concentrated)	609.8	(100%)	652.9	(100%)

Source - Belize 1976 Trade Report (unpublished data), Belize Statistical Services and Annual Overseas Trade 1976, Part A, Trinidad and Tobago Central Statistics Office.

2.20 Historic trends in types of export flows by LDC's.

Additional tables showing the historic trends of significant LDC exports in three major categories are provided below. (Tables IV B - 2.08 - 2.12). These tables cover five countries; all countries with significant flows except Grenada which did not have historical data available in the period 1972 - 1976. Three years are provided for comparison purposes. These years are 1972, 1975 and 1976 where this data is available. The next most appropriate year available is used to fill in for missing data.

These figures show a regular flow of Belize exports to Jamaica and in processed fruit (mostly fruit juices) with fluctuating exports of fruit juices to three other destinations. These last exports fulfil a short-term need and cannot be accurately forcasted.

Dominica shows growth of fresh fruit and vegetable exports which dominate trade to 1975. These have apparently dropped off substantially in 1976, except for Barbados, but only partial data is available from the inter-island shipping survey for the other destinations and air transport may have filled part of this gap. However recent data on air transport show little air freight out of Dominica except as accompanying baggage on passenger flights which may be significant for the French West Indies. This may reflect the decline in marketing board activities.

TABLE IV B - 2.03

Significant Flow Composition for Dominica Exports
in Small Farmer Commodities - 1975

Commodity	Export Flow to: Antigua Tons	Antigua (Percent)	Barbados Tons	Barbados (Percent)	Montserrat Tons	Montserrat (Percent)	St.Kitts Tons	St.Kitts (Percent)	Fr.West Indies Tons	Fr.West Indies (Percent)	US Virgin Is. Tons	US Virgin Is. (Percent)	Intra-Regional Total Sig.Flows Tons	Intra-Regional Total Sig.Flows (Percent)
Bananas	350.1	(52.5)	108.5	(10.5)	39.1	(41.0)	252.0	(48.1)	10.7	(1.6)	150.9	(21.9)	911.3	(24.7)
Plantains	139.9	(20.8)	265.9	(25.8)	18.6	(19.5)	126.6	(24.3)	28.5	(4.4)	114.2	(16.6)	693.7	(19.0)
Oranges	42.8	(6.4)	294.5	(28.7)	6.4	(6.7)	28.7	(5.5)	154.2	(23.6)	28.8	(4.2)	555.4	(15.2)
Grapefruit	15.3	(2.3)	141.3	(13.7)	4.1	(4.3)	13.5	(2.6)	162.9	(25.0)	10.6	(1.5)	347.7	(9.5)
Limes	14.4	(2.1)	72.7	(7.1)	1.2	(1.3)	3.0	(0.6)	180.8	(27.8)	19.0	(2.8)	291.1	(8.0)
Coconuts	4.2	(0.6)	8.8	(0.9)	2.6	(2.7)	6.6	(1.3)	38.9	(6.0)	5.7	(0.8)	66.8	(1.8)
Avacadoes	9.6	(1.4)	6.1	(0.6)	1.0	(1.0)	3.1	(0.6)	24.9	(3.8)	12.2	(1.8)	56.9	(1.6)
Mangoes	26.9	(4.0)	59.0	(5.7)	0.5	(0.5)	25.7	(4.9)	12.2	(1.9)	31.2	(4.5)	155.5	(4.3)
Other Fruits	2.3	(0.3)	19.8	(1.9)	1.3	(1.4)	1.4	(0.3)	1.3	(0.2)	22.1	(3.2)	48.2	(1.3)
Pumpkins	1.6	(0.2)	34.5	(3.4)	0.6	(0.6)	2.1	(0.4)	2.8	(0.4)	5.8	(0.8)	47.4	(1.3)
Dasheen & Eddoes	23.8	(3.5)	4.6	(0.4)	11.2	(11.7)	21.2	(4.1)	15.0	(2.3)	195.1	(28.5)	270.9	(7.4)
Tannias	31.2	(4.6)	5.1	(0.5)	8.4	(8.8)	36.3	(7.0)	16.4	(2.5)	32.5	(4.7)	129.9	(3.6)
Other vegetables and root crops	8.8	(1.3)	8.5	(0.8)	0.4	(0.4)	1.5	(0.3)	3.4	(0.5)	60.2	(8.7)	82.8	(2.3)
Other	0.1	*	0.1	*	0.1	(0.1)	0.1	*	0.1	*	-	-	0.5	*
Total	671.0	(100.0)	1029.4	(100.0)	95.5	(100.0)	521.8	(100.0)	652.1	(100.0)	688.3	(100.0)	3658.1	(100.0)

* = Less than 0.1%

Source: Dominica 1975 Annual Report on Trade Statistics (unpublished data), Dominica Statistical Services.

TABLE IV B - 2.04

Significant Flow Composition for Grenada Exports in Small Farmer Commodities - 1973

(percentage of tonnage)

Commodity	Export Flow to: Guyana Tons	Guyana (Percent)	Trinidad Tons	Trinidad (Percent)	Intra-Regional Total Significant Flows Tons	(Percent)
Live sheep and goats	-	-	27.6	(22.5)	27.6	(9.8)
Fresh Fruit	-	-	43.9	(35.8)	43.9	(15.6)
Fruit Pastes	78.6	(49.5)	8.1	(6.6)	86.7	(30.9)
Fruit Juices	12.8	(8.1)	4.6	(3.8)	17.4	(6.2)
Vegetable Juices	50.9	(32.1)	30.7	(25.0)	81.6	(29.0)
Tomatoes	16.4	(10.3)	5.4	(4.4)	21.8	(7.7)
Other Vegetables	-	-	2.3	(1.9)	2.3	(0.8)
Total	158.7	(100.0)	122.6	(100.0)	281.3	(100.0)

Source: Annual Trade Statistics 1973

TABLE IV B - 2.05

Significant Flow Composition for Montserrat Exports in Small Farmer Commodities - 1976

(percent of tonnage)

Commodity	Export Flow to: Antigua Tons	Antigua (Percent)	Dominica Tons	Dominica (Percent)	Trinidad Tons	Trinidad (Percent)	Intra-Regional Total Sig. Flows Tons	Intra-Regional Total Sig. Flows (Percent)
Live sheep	0.2	(0.3)	-	-	-	-	0.2	(0.1)
Lime Juice	-	-	33.4	(55.2)	-	-	33.4	(13.7)
Fresh Fruit	4.5	(7.0)	-	-	-	-	4.5	(1.8)
White Potatoes	29.9	(46.5)	8.9	(14.7)	107.3	(89.7)	146.1	(59.8)
Tomatoes	18.7	(29.0)	8.5	(14.1)	-	-	27.2	(11.1)
Onions	0.6	(0.9)	8.8	(14.5)	-	-	9.4	(3.8)
Carrots	4.4	(6.8)	0.8	(1.3)	12.3	(10.3)	17.5	(7.2)
Other Vegetables	6.1	(9.5)	0.1	(0.2)	-	-	6.2	(2.5)
Total	64.4	(100.0)	60.5	(100.0)	119.6	(100.0)	244.5	(100.0)

Source: Annual Trade Statistics 1976

TABLE IV B - 2.06

Significant Flow Composition for St.Lucia Exports in Small Farmer Commodities - 1976

Commodity	Export Flow to: Barbados Tons	Barbados (Percent)	Fr. West Indies Tons	Fr. West Indies (Percent)	U.S. Virgin Is. Tons	U.S. Virgin Is. (Percent)	Intra-Regional Total Sig.Flows Tons	Intra-Regional Total Sig.Flows (Percent)
Live goats	-	-	0.4	(0.2)	-	-	0.4	(0.1)
Bananas	25.7	(9.3)	-	-	34.9	(27.0)	60.6	(10.6)
Plantains	58.2	(21.1)	-	-	1.7	(1.3)	59.9	(10.5)
Coconuts	13.6	(4.9)	164.1	(99.8)	-	-	177.7	(31.2)
Mangoes	153.4	(55.7)	-	-	3.9	(3.0)	157.3	(27.6)
Other Fresh Fruit	15.8	(5.7)	-	-	31.8	(24.6)	47.6	(8.4)
Dried Fruit	6.4	(2.3)	-	-	-	-	6.4	(1.1)
Dasheen & Eddoes	0.7	(0.3)	-	-	25.9	(20.1)	26.6	(4.7)
Yams	-	-	-	-	20.5	(15.9)	20.5	(3.6)
Other vegetable & root crops	1.8	(0.7)	-	-	9.9	(7.7)	11.7	(2.1)
Frozen Vegetables	-	-	-	-	0.5	(0.4)	0.5	(0.1)
Other	0.1	*	-	-	-	-	0.1	*
Total	275.7	(100.0)	164.5	(100.0)	129.1	(100.0)	569.3	(100.0)

* = Less than 0.1%

Source: Overseas Trade of St.Lucia 1976. Government of St.Lucia Statistical Section of the Development Planning and Statistical Division.

TABLE IV B - 2.07

Significant Flow Composition for St.Vincent Exports in Small Farmer Commodities - 1976

Commodity	Export Flow to Barbados Tons	(Percent)	Trinidad Tons	(Percent)	Guyana Tons	(Percent)	Intra-Regional Total Sig.Flows Tons	(Percent)
Live animals	-	-	49.1	(1.4)	-	-	49.1	(1.3)
Bananas	12.5	(3.9)	0.3	*	-	-	12.8	(0.3)
Plantains	20.3	(6.4)	60.1	(1.7)	-	-	80.4	(2.1)
Oranges	37.1	(11.7)	0.3	*	-	-	37.4	(1.0)
Grapefruit	32.7	(10.3)	0.1	*	-	-	32.8	(0.8)
Apples 1/	-	-	65.3	(1.9)	-	-	65.3	(1.7)
Coconuts	34.6	(10.9)	2.3	(0.1)	-	-	36.9	(0.9)
Avacadoes	6.9	(2.2)	45.2	(1.3)	-	-	52.1	(1.3)
Fruit Juices	19.2	(6.0)	-	-	-	-	19.2	(0.5)
Other fruits	13.8	(4.3)	1.5	*	-	-	15.3	(0.4)
Carrots	0.4	(0.1)	659.7	(18.7)	51.5	(73.7)	711.6	(18.2)
Pumpkins	43.7	(13.8)	4.3	(0.1)	-	-	48.0	(1.2)
Dasheen & Eddoes	28.1	(8.8)	660.7	(18.8)	-	-	688.8	(17.6)
Sweet Potatoes	35.5	(11.2)	1,512.9	(43.1)	-	-	1,548.4	(39.7)
Tannias	23.9	(7.5)	216.4	(6.1)	-	-	240.3	(6.1)
Yams	1.8	(0.6)	209.0	(5.9)	-	-	210.8	(5.4)
Other vegetables & root crops	7.4	(2.3)	33.1	(0.9)	18.4	(26.3)	58.9	(1.5)
Other	0.1	*	0.1	*	-	-	0.2	*
Total	318.0	(100.0)	3,520.4	(100.0)	69.9	(100.0)	3,908.3	(100.0)

1/ Non-deciduos

* = Less than 0.1%

Source: Trade Report for the Year 1976 (unpublished data), St.Vincent Statistical Department.

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TABLE IV B - 2.08

Historic Trends in Major Categories of Significant Export Flows from Belize in Small Farmer Commodities

From Belize To:	(tons) 1970	1975	1976	Average Annual Growth Rate 1975-76	1970-76
1. Jamaica					
Fresh Fruit & Veg.	-	-	-	-	-
Proc. Fruit & Veg.	432.3	790.4	609.8	-23%	5.9%
Sheep, Goats & Pigs	-	-	-	-	-
2. Trinidad & Tobago					
Fresh Fruit & Veg.	-	-	-	-	-
Proc. Fruit & Veg.	-	237.5	652.8	-	-
Sheep, Goats & Pigs	-	-	-	-	-
3. Antigua					
Fresh Fruit & Veg.	-	-	-	-	-
Proc. Fruit & Veg.	127.1	-	-	-	-
Sheep, Goats & Pigs	-	-	-	-	-
4. Barbados					
Fresh Fruit & Veg.	-	-	-	-	-
Proc. Fruit & Veg.	127.2	-	-	-	-
Sheep, Goats & Pigs	-	-	-	-	-

Source: Belize Annual Trade Reports, 1970 and 1975; Belize Trade Report for 1976 (unpublished data), Belize Statistical Services.

TABLE IV B - 2.09

Historic Trends in Major Categories of Significant Export Flows from Dominica in Small Farmer Commodities

From Dominica to	(tons)			Average Annual Growth Rate	
Antigua	1972	1975	1976*	1975-76	1972-76
Fresh fruit & vegetables	673.7	669.6	76.1	- 89%	- 42%
Proc. fruit & vegetables	1.6	1.4	0.2	- 86%	- 41%
Sheep, goats & pigs	-	-	-	-	-
Barbados					
Fresh fruit & vegetables	388.8	1,016.2	1,378.6	36%	37%
Proc. fruit & vegetables	5.3	13.2	76.3	478%	95%
Sheep, goats & pigs	-	-	-	-	-
Montserrat					
Fresh fruit & vegetables	9.8	94.4	4.3	- 95%	- 19%
Proc. fruit & vegetables	7.6	1.0	1.1	10%	- 38%
Sheep, goats & pigs	-	-	-	-	-
St.Kitts					
Fresh fruit & vegetables	107.1	520.4	14.9	- 97%	- 39%
Proc. fruit & vegetables	2.3	1.5	10.9	627%	48%
Sheep, goats & pigs	-	-	-	-	-
French West Indies					
Fresh fruit & vegetables	388.1	652.0	421.6	- 35%	2%
Proc. fruit & vegetables	5.4	-	2.8	-	- 15%
Sheep, goats & pigs	-	-	-	-	-
U.S. Virgin Islands					
Fresh fruit & vegetables	547.2	686.4	135.5	- 80%	- 29%
Proc. fruit & vegetables	5.6	1.9	2.1	11%	- 22%
Sheep, goats & pigs	-	-	-	-	-

* Only data on marine transport for the period Oct. 1975 - Sept. 1976.

Source: Unpublished data: Dominica Trade Reports for the Years 1972 and 1975, Dominica Statistical Department; and Inter-Island Shipping Survey 1977, U.N. Economic Commission for Latin America, Office for the Caribbean.

TABLE IV B - 2.10

Historic Trends in Major Categories of Significant Export Flows from Montserrat in Small Farmer Commodities

From Montserrat To	(tons)			Average Annual Growth Rate	
Antigua	1972	1975	1976	1975-76	1972-76
Fresh fruit & veg.	1.7	65.2	64.3	1,4%	148%
Proc. fruit & veg.	-	0.1	-	-	-
Sheep, goats & pigs	-	-	0.1	-	-
Trinidad & Tobago					
Fresh fruit & veg.	25.6	36.6	119.6	227%	73%
Proc. fruit & veg.	-	-	-	-	-
Sheep, goats & pigs	-	-	-	-	-
Dominica					
Fresh fruit & veg.	4.8	12.1	27.1	124%	54%
Proc. fruit & veg.	-	11.2	33.4	198%	-
Sheep, goats & pigs	-	-	-	-	-

Source: Overseas Trade 1972; 1975; 1976, Government of Montserrat.

TABLE IV B - 2.11

Historic Trends in Major Categories of Significant Export Flows from St.Lucia in Small Farmer Commodities

From St.Lucia to Barbados	(tons) 1972	1975	1976	Average Annual Growth Rate 1975-76	1972-76
Fresh fruit & veg.	162.8	278.2	269.2	- 3%	13%
Proc. fruit & veg.	-	4.0	6.6	65%	-
Sheep, goats & pigs	-	-	-	-	-
U.S. Virgin Islands					
Fresh fruit & veg.	224.9	189.6	129.2	- 32%	- 13%
Proc. fruit & veg.	1.2	-	-	-	-
Sheep, goats & pigs	-	-	-	-	-
French West Indies					
Fresh fruit & veg.	-	70.7	164.1	132%	-
Proc. fruit & veg.	-	-	-	-	-
Sheep, goats & pigs	-	-	0.4	-	-

Source: Overseas Trade of St.Lucia 1972; 1975; 1976; Government of St.Lucia Statistical Section of the Development Planning and Statistical Division.

TABLE IV B - 2.12

Historic Trends in Major Categories of Significant Export Flows from St.Vincent in Small Farmer Commodities

From St.Vincent To	(tons)			Average Annual Growth Rate	
Barbados	1972	1975	1976	1975-76	1972-76
Fresh fruit & veg.	62.1	504.2	296.4	- 41%	48%
Proc. fruit & veg.	0.2	12.6	20.3	61%	217%
Sheep, goats & pigs	-	-	-	-	-
Guyana					
Fresh fruit & veg.	5.2	-	51.5	-	77%
Proc. fruit & veg.	-	-	18.3	-	-
Sheep, goats & pigs	-	-	-	-	-
Trinidad & Tobago					
Fresh fruit & veg.	1,976.6	2,311.8	3,444.2	49%	15%
Proc. fruit & veg.	81.4	45.1	27.6	- 39%	- 24%
Sheep, goats & pigs	-	119.8	49.1	- 59%	

Source: Annual Trade Report St.Vincent 1972; St.Vincent Statistical Department. Unpublished data: Trade Report for the year 1975; 1976; St.Vincent Statistical Department.

Montserrat exports to Trinidad rose sharply in 1976. The white potato part of these shipments however, was recently discontinued due to high production costs and a negative market reaction in Trinidad. St. Lucia's exports increased sharply to the French West Indies in 1976 but declined to the U.S. Virgin Islands. Exports to Barbados remained about the same. St. Vincent exports are growing rapidly to Trinidad and Tobago but fluctuating to other destinations. The Trinidad flow include flows of live animals which appear to fluctuate significantly from year to year.

2.30 Distribution of exports by destination and commodity category

A third set of tables was prepared to show the distribution of present small farmer commodity exports by major category (fruit, citrus and non-citrus); vegetables, onions and other; root crops, white potatoes and other; and pulses) and by destination. These tables are presented below (Tables IV B - 2.12 to 2.18) for all the LDC's except Belize which had no fresh fruit, vegetable or small animal export (when the organised banana trade is excluded). These tables are used as one of the bases for the trade flow forecast in Chapter VIII.

TABLE IV B - 2.13

Distribution of SFC Export Flows
by Major Category and Destination for Antigua
(Average Monthly tonnage)

Destination	Fruits		Vegetables		Root Crops		Pulses	Total
	Citrus	Non-Citrus	Onions	Other	Potatoes	Other		
1. Barbados	-	76%	-	-	-	-	-	13%
2. Dominica	-	-	14%	0.5%	-	-	-	2%
3. Jamaica	-	4%	-	-	-	-	-	1%
4. St.Kitts	-	6%	86%	-	-	-	100%	13%
5. St.Martin	-	6%	-	1.8%	-	-	-	2%
6. U.S.Virgin Is.	-	2%	-	15.5%	-	-	-	11%
Total Intra-Regional	-	94%	100%	17.8%	-	-	100%	42%
EEC	-	-	-	-	-	-	-	-
USA	-	-	-	-	-	-	-	-
Canada	-	6%	-	82.2%	-	-	-	58%
Total Extra-Regional	-	6%	-	82.2%	-	-	-	58%
Total All SFC Destinations	100%	100%	100%	100%	100%	100%	100%	100%
Present Average Monthly Tonnage	-	0.54	0.43	2.2	-	-	0.01	3.18

Source: Annual Trade Statistics 1975

TABLE IV B - 2.14

Distribution of SFC Export Flows
by Major Category and Destination for Dominica
(Average Monthly tonnage)

Destination	Fruits		Vegetables		Root Crops		Pulses	Total
	Citrus	Non-Citrus	Onions	Other	Potatoes	Other		
1. Antigua	2.0%	28%	-	7%	-	10%	-	10.0%
2. Barbados	12.0%	24%	-	31%	-	2%	-	15.1%
3. French West Indies	12.0%	4%	-	3%	-	6%	-	9.2%
4. Montserrat	0.3%	3%	-	1%	-	4%	-	1.4%
5. Netherland Antilles	1.0%	-	-	-	-	-	-	0.4%
6. St. Kitts	1.0%	22%	-	2%	-	11%	-	7.7%
7. U.S. Virgin Is.	1.0%	18%	-	10%	-	49%	-	10.1%
Total Intra-Regional	29.3%	99%	-	54%	-	82%	-	53.9%
EEC	70.7%	1%	-	46%	-	18%	-	46.1%
USA	-	-	-	-	-	-	-	-
Canada	-	-	-	-	-	-	-	-
Total Extra-Regional	7.07%	1%	-	46%	-	18%	-	46.1%
Total All SFC Destinations	100%	100%	100%	100%	100%	100%	100%	100%
Present Average Monthly Tonnage	344.2	154.5	-	10.8	-	46.4	-	555.9

Source: Annual Trade Statistics 1975.

TABLE IV B - 2.15

Distribution of SFC Export Flows
by Major Category and Destination for Grenada
(Average Monthly tonnage)

Destination	Fruits		Vegetables		Root Crops			
	Citrus	Non-Citrus	Onions	Other	Potatoes	Other	Pulses	Total
1. Guyana	-	-	-	15%	-	-	-	3.3%
2. Trinidad	100%	10%	-	82%	-	-	-	26.3%
Total Intra-Regional	100%	10%	-	97%	-	-	-	29.6%
EEC	-	90%	-	3%	-	-	-	70.4%
USA	-	-	-	-	-	-	-	-
Canada	-	-	-	-	-	-	-	-
Total Extra-Regional	-	90%	-	3%	-	-	-	70.4%
Total All SFC Destinations	100%	100%	100%	100%	100%	100%	100%	100%
Present Average Monthly Tonnage	0.07	33.4	-	9.41	-	-	-	42.88

Source: Annual Trade Statistics 1973.

TABLE IV B - 2.16

Distribution of SFC Export Flows
by Major Category and Destination for Montserrat

(Percent Average Monthly Tonnage)

Destination	Fruits		Vegetables		Root Crops			
	Citrus	Non-Citrus	Onions	Other	Potatoes	Other	Pulses	Total
1. Antigua	24%	23%	2%	54%	-	82%	-	34.3%
2. Barbados	59%	-	-	6%	-	-	-	7.0%
3. Dominica	-	-	28%	21%	-	-	-	18.2%
4. French W.I.	8%	-	-	2%	-	-	-	1.4%
5. Guyana	-	-	36%	-	-	-	-	11.2%
6. Netherland Antilles	-	13%	2%	3%	-	5%	-	3.7%
7. St. Kitts	6%	10%	9%	12%	-	-	-	9.6
8. St. Lucia	-	-	15%	-	-	-	-	4.5%
9. St. Vincent	-	-	8%	-	-	-	-	2.3%
10. U.S. Virgin Is.	3%	52%	-	2%	-	13%	-	7.6%
Total Intra-Regional	100%	98%	100%	100%	-	100%	-	99.8%
EEC	-	2%	-	-	-	-	-	0.2%
USA	-	-	-	-	-	-	-	-
Canada	-	-	-	-	-	-	-	-
Total Extra-Regional	-	2%	-	-	-	-	-	0.2%
Total All SFC Destinations	100%	100%	100%	100%	100%	100%	100%	100%
Present Average Monthly Tonnage	0.62%	0.98	2.53	3.79	-	0.39	-	8.31

Source: Annual Trade Statistics 1976

TABLE IV B - 2.17

Distribution of SFC Export Flows
by Major Category and Destination for St. Lucia

(Percent Average Monthly Tonnage)

Destination	Fruits		Vegetables		Root Crops			
	Citrus	Non-Citrus	Onions	Other	Potatoes	Other	Pulses	Total
1. Barbados	41%	35%	-	0.4%	-	1%	-	21.5%
2. French W.I.	-	23%	-	1.4%	-	-	-	13.3%
3. Montserrat	1%	-	-	-	-	-	-	*
4. U.S. Virgin Is.	7%	10%	-	-	-	56%	-	9.5%
Total Intra-Regional	49%	68%	-	1.8%	-	57%	-	44.3%
EEC	51%	32%	-	98.2%		42%	-	55.7%
USA	-	-	-	-	-	-	-	-
Canada	-	-	-	-	-	1%	-	*
Total Extra-Regional	51%	32%	-	98.2%	-	43%	-	55.7%
Total All SFC Destinations	100%	100%	100%	100%	100%	100%	100%	100%
Present Average Monthly Tonnage	2.94	60.8	-	35.84	-	7.51	-	107.09

* = less than 0.1%

Source: Annual Trade Statistics, 1976

TABLE IV B - 2.18

Distribution of SFC Export Flows
by Major Category and Destination for St. Vincent

(Percent Average Monthly Tonnage)

	Fruits		Vegetables		Root Crops			
Destination	Citrus	Non-Citrus	Onions	Other	Potatoes	Other	Pulses	Total
1. Barbados	100%	15%	-	6%	-	-	100%	6.3%
2. Guyana	-	-	-	6%	-	-	-	0.9%
3. Trinidad	-	12%	-	74%	-	74%	-	57.4%
Total Intra-Regional	100%	27%	-	86%	-	74%	100%	64.6%
EEC	-	73%	-	14%	-	25%	-	35.2%
USA	-	-	-	-	-	-	-	-
Canada	-	-	-	-	-	1%	-	0.2%
Total Extra-Regional	-	73%	-	14%	-	26%	-	35.4%
Total All SFC Destinations	100%	100%	100%	100%	100%	100%	100%	100%
Present Average Monthly Tonnage	6.7	121.6	-	74.3	-	268.6	0.1	471.3

Source: Annual Trade Statistics 1976

C. Intra-Regional Transport Links and Flows

1.0 Overall Pattern of Transport Linkage

The transport system within the Caribbean region itself has traditionally depended on local stops of the international ocean lines and airlines for a major part (30-40%) of intra-regional shipping (see Section III C above for their frequency and routes). In the last 20 years, however, two regionally owned shipping lines, WISCO and NAMUCAR, (which does not serve CARICOM LDC's), and one regionally-owned airline (LIAT) commenced operations. Several national airlines of the region are now playing a larger role (e.g. VIASA of Venezuela) and small air cargo companies in several islands have maintained a hand-to-mouth existence with irregular shipments.

In the schooner trade there is still a thriving business, particularly in the fresh fruit and vegetable trade between the eastern Caribbean Islands. This type of transport has remained the same for many years.

All the CARICOM territories are linked by WISCO and LIAT, except for Belize which is not a member of these regional associations.[1/] The schooner linkages to Jamaica and Guyana are weak, due to the longer distances, but they dominate the short-distance links in the eastern Caribbean. Belize is relatively physically isolated from the rest of the CARICOM LDC's. Its trading patterns reflect this isolation.

The port and airport development of the CARICOM LDC's is described in Section III C 1.3. The port data is not applicable to many smaller vessels in the schooner trade, as they frequently have separate berthing from the larger vessels in the larger ports. In some cases, such as Grenville in Grenada, only schooners can use the port because of its shallow water. Also, the smaller schooners seldom use the main ports and load their cargo at small docks at other locations. Most ports have excess capacity.

Some of the principal airports, on the other hand, cannot take cargo airplanes larger than a DC3 and must be limited to small plane operations and only a few flights per day. The road links of airports to the other parts of the island are sometimes very restricted, as in the cases of Grenada and Dominica.

2.0 Carriers, Routes and Frequencies

2.10 Maritime Transporters

The routes and frequencies of WISCO, NAMUCAR and CTMT are shown in Figure IV C 2.01[2/]

1/ *St.Vincent is also partially excluded by WISCO since it has never officially joined.*

2/ *CTMT was also shown on the extra-regional transport map because it is a feeder service to the TMT line.*

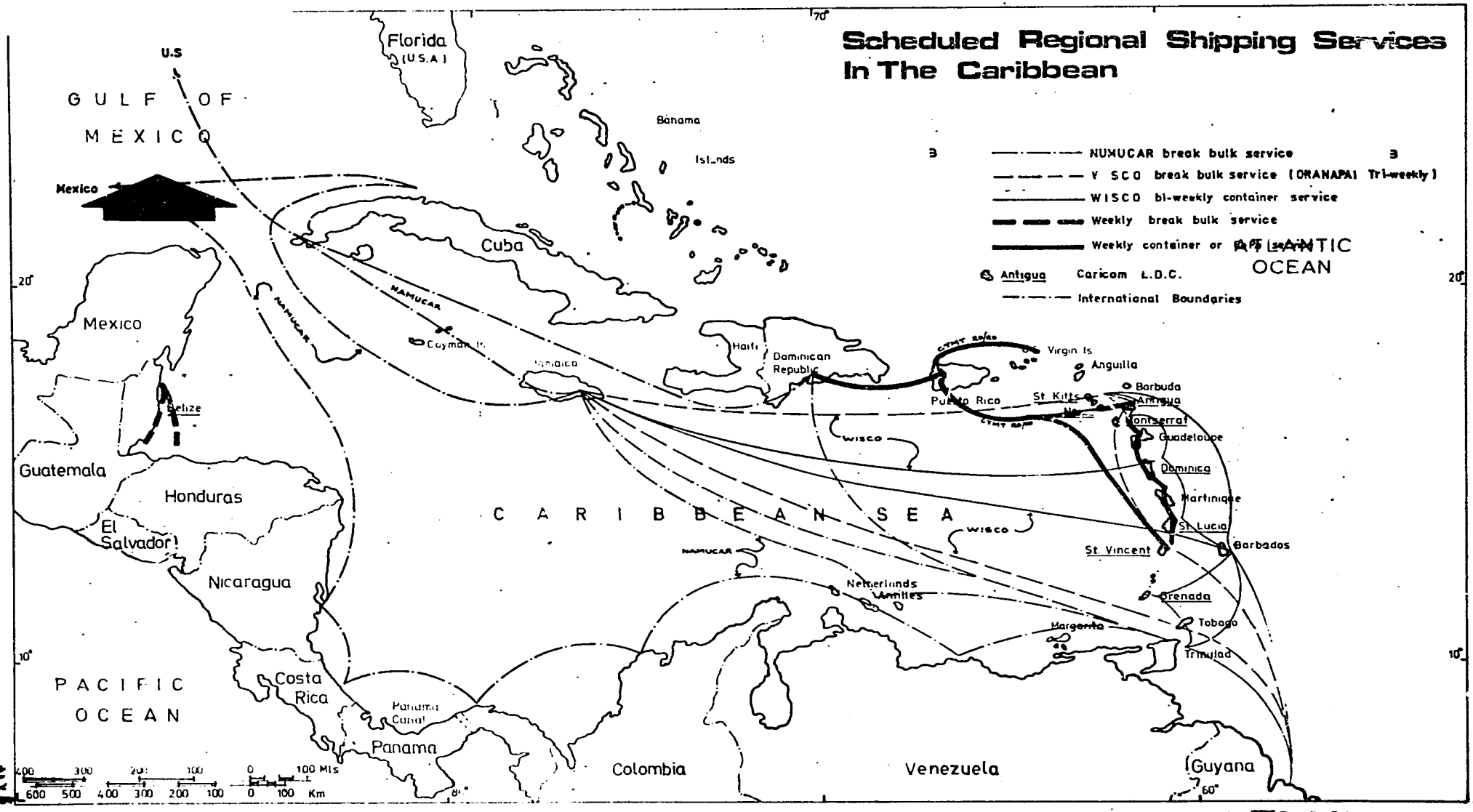

FIGURE IVC- 2-01

It is clear from this diagram that NAMUCAR and WISCO services do not overlap. This is by design, and they have a mutual transhipping agreement.

It is also clear that the only regional weekly service at present is the CTMT Ro/Ro service to Puerto Rico and four of the CARICOM LDC's. This is competing with a bi-weekly or monthly WISCO service in a breakbulk and container ship. In addition, WISCO ships are not replaced when they are temporarily out of order. This creates variability in the WISCO schedule and uncertainty in the eyes of the shippers. Clearly CTMT is the most frequent and reliable service in the region at present

2.11 WISCO's Plans for the Future

The present WISCO service is carried out by four ships: two container ships, one leased and one owned, of 1,400 and 1,548 DWT (CARICOM I and CARICOM Enterprise), one leased combination breakbulk-container ship of 2,600 DWT (Lago Izabal), and a breakbulk ship of 1,070 DWT (Oranapai) leased and managed by the Government of Guyana, with all paperwork and schedules provided by WISCO under the name West Indian Shipping Services

WISCO plans to replace the CARICOM I and the Oranapai with two Ro/Ro vessels of special design of 1,000 DWT. They have submitted a proposal to this effect to the Caribbean Development Bank for review, prior to submission to other financing sources.

WISCO is planning to lease another ship, the M.V. Mor of 2,800 DWT, to replace the Lago Izabal in August 1978. This vessel will be leased at a relatively low rate due to the present over capacity in the ship market, and it will increase both speed and capacity on the MDC route.

The proposed Ro/Ro ships will follow a "figure 8 route" with St.Lucia at the common point. One ship will visit the following ports in order: San Juan (Puerto Rico), Basseterre (St.Kitts), St.John's (Antigua), Plymouth (Montserrat), Roseau (Dominica), Castries (St.Lucia), Bridgetown (Barbados), Kingston (St.Vincent), St.George's (Grenada), Port-of-Spain (Trinidad), Georgetown (Guyana), Port-of-Spain (Trinidad), Castries (St.Lucia), San Juan (Puerto Rico). Each port is to receive a call every 15 days from sailings in opposite directions. The other WISCO ships will be travelling the "MDC route" of Jamaica, Barbados, Guyana, Trinidad, Jamaica, with a stop at St.Lucia between Jamaica and Barbados for transhipment.

This proposed schedule will provide service to San Juan, Puerto Rico which will put WISCO in a position to receive transhipment of containers from CAROL Lines and other carriers. It will also compete directly with CIMT, but at a lower level of service (once every 15 days at best compared with CIMT's weekly service). WISCO has arranged for agreements in principle by several lines for transhipment, if it provides a "reliable" service. It is not clear whether this proposed service will be considered reliable by these lines, but it will still lack the weekly frequency needed to match the competition.1/

One of the CAROL Lines, KNSM, is planning to start its own feeder service, and possibly pass it over to WISCO, if WISCO shows the management capability. Another CAROL Line, CGM, has just started a feeder service going to Guadeloupe and Martinique from the MDC's on a small container ship. They would cooperate with WISCO to tranship to the other islands.

The proposed WISCO vessels would use a large forklift to handle containers on and off the ship in a modified Ro/Ro operation which eliminates the use of trailers or chassis. It would place the containers in the port for unstuffing, and the empty containers would be handled by normal port equipment, or loaded in place for export.

This plan has several novel aspects, it minimises initial investment costs and is workable in principle, but there may be problems in making it operational. The large forklift is a clear weak point in the operation. It may be prone to failure and it will also require considerable room for manoeuvre on the ship, which will reduce carrying capacity. The advantage of stacking containers on the ship may be lost in the potential risk of a disabled forklift and the reduced capacity required for its operation. Also the requirement to stuff chilled or frozen food in a container at the port is not an optimum situation, especially for an LDC port without container handling equipment.

The proposed routing for the new vessels are clearly not the optimum for effective competition with CIMT, which offers the same port stop on each run. The proposed WISCO service would apparently alternate its port sequence every 15 days, so that each port routing would only appear once a month. In actual operation WISCO may overcome these obstacles but its competitive position will clearly be weak, particularly for perishable cargoes.

1/ *CAROL Lines can tranship on the "figure 8" route at four points: San Juan (Puerto Rico), Bridgetown (Barbados), Port of Spain (Trinidad), and Georgetown (Guyana) so that potential connections to the LDC's are between bi-weekly and weekly, which will give WISCO an added advantage for transhipment on this particular line.*

2.12 Schooner Operations

The schooners are small vessels (under 500 NRT) which are privately owned, non-scheduled cargo carriers that operate primarily among the islands of the Eastern Caribbean and from the Guyana coast to Trinidad and Barbados. They carry 40-50% of the intra-regional traffic.

In 1975 there were 149 schooners operating in the CARICOM region[1/]. These were divided about equally between wooden-hulled (53%) and steel-hulled vessels (47%), The wooden-hulled ships are generally smaller (all under 100 NRT) sailing ships, less than 10 years old, with an auxiliary engine that is used much of the time. The steel-hulled ships are usually larger (60% over 100 NRT) and older (93% over 15 years) and have been generally purchased second-hand in Europe. Seven vessels have refrigerated capacity and these are all fishing boats. Ninety percent of the schooners are owned by CARICOM nationals and half are registered in CARICOM countries. Of these, three quarters (48) were registered in Grenada, St.Vincent or Guyana.

Most small vessels do not operate on any regular schedule, although they tend to keep to a single route. Most vessels operate out of Port-of-Spain, Trinidad or at least call there, and 26.4% of all small vessel trips start or end at Trinidad. (See Figure IV C 2.02). Almost half the total tonnage of small vessels operates between Guyana, Trinidad and Barbados, while only four large schooners sailed to Jamaica in 1976 from the Eastern Caribbean, due to the long trip (over 900 nautical miles). After Trinidad the most frequent small boat service is to the US Virgin Islands from St.Kitts, and between St.Kitts, Antigua and Montserrat. The remaining higher frequency service is between Dominica and the neighbouring islands of Martinique and Guadeloupe.

In addition to habitually plying certain routes, some schooners specialize in the transport of small farmer commodities, while others only add these commodities as deck cargo which accompanies passengers. In four of the significant trade flows of small farm commodities to Barbados and Trinidad one or two ships carry an average 66% of the trade. These ships are normally smaller ships (36-56 NRT) except on the St.Vincent - Trinidad run where somewhat larger vessels can be used (73-117 NRT).

This trade is quite seasonal with some months when little or no commodities are shipped, and loads are low, and some months thathave 2-3 times the average ship-

1/ *According to the CARICOM secretariat "Study of CARICOM Small Vessel Fleet", October 1976.*

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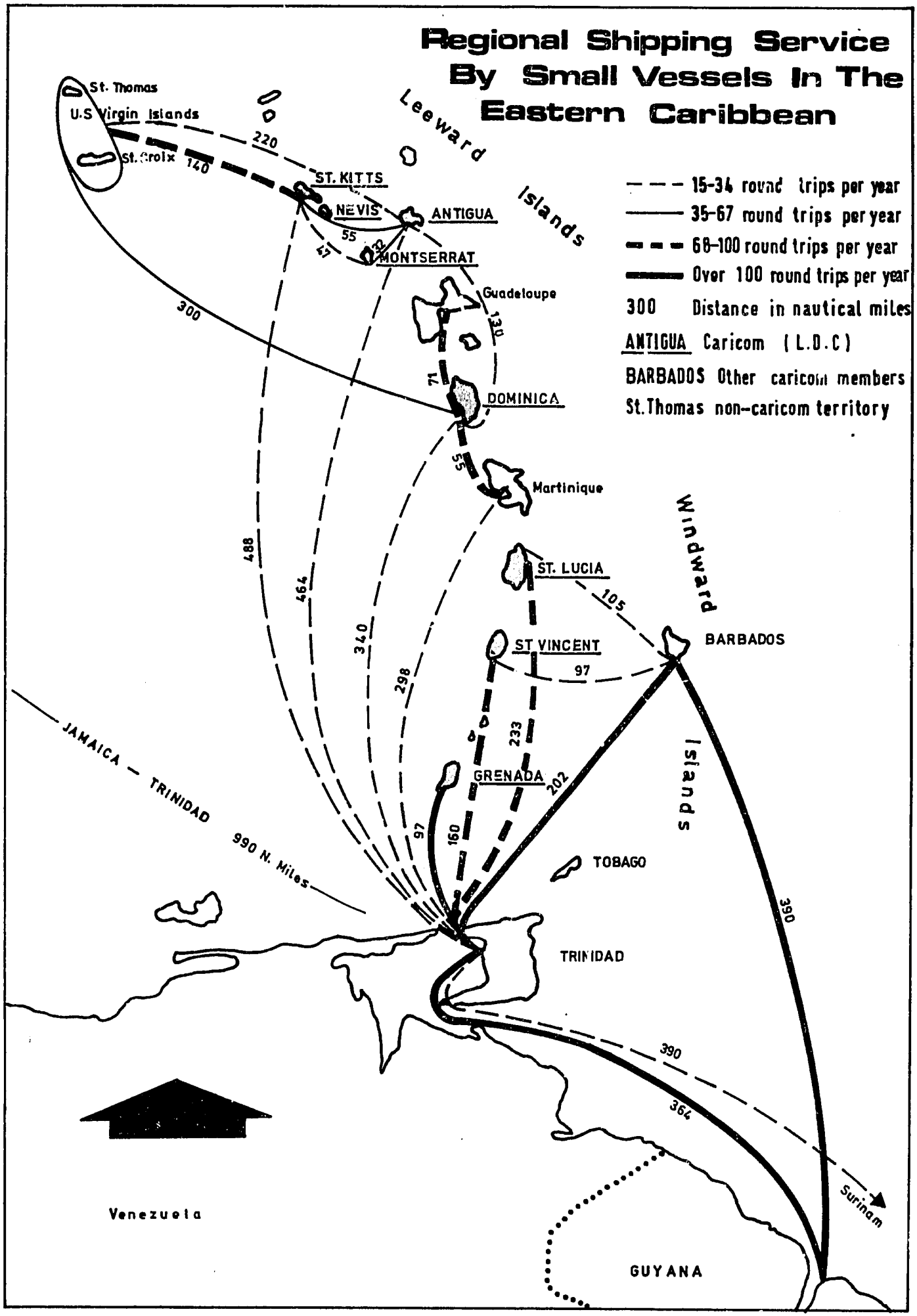


FIGURE IVC 2.02

ments and ships are filled to capacity. The high and low periods vary from island to island.

The condition of schooner service for small farmer commodities is not the best, as many boats are slow and unsafe, and spoilage and losses are frequently high on longer trips. The schooners, however, fill a gap in providing a low-cost, low-quality service, which is usually available for small shippers.

2.20 Air Transporters

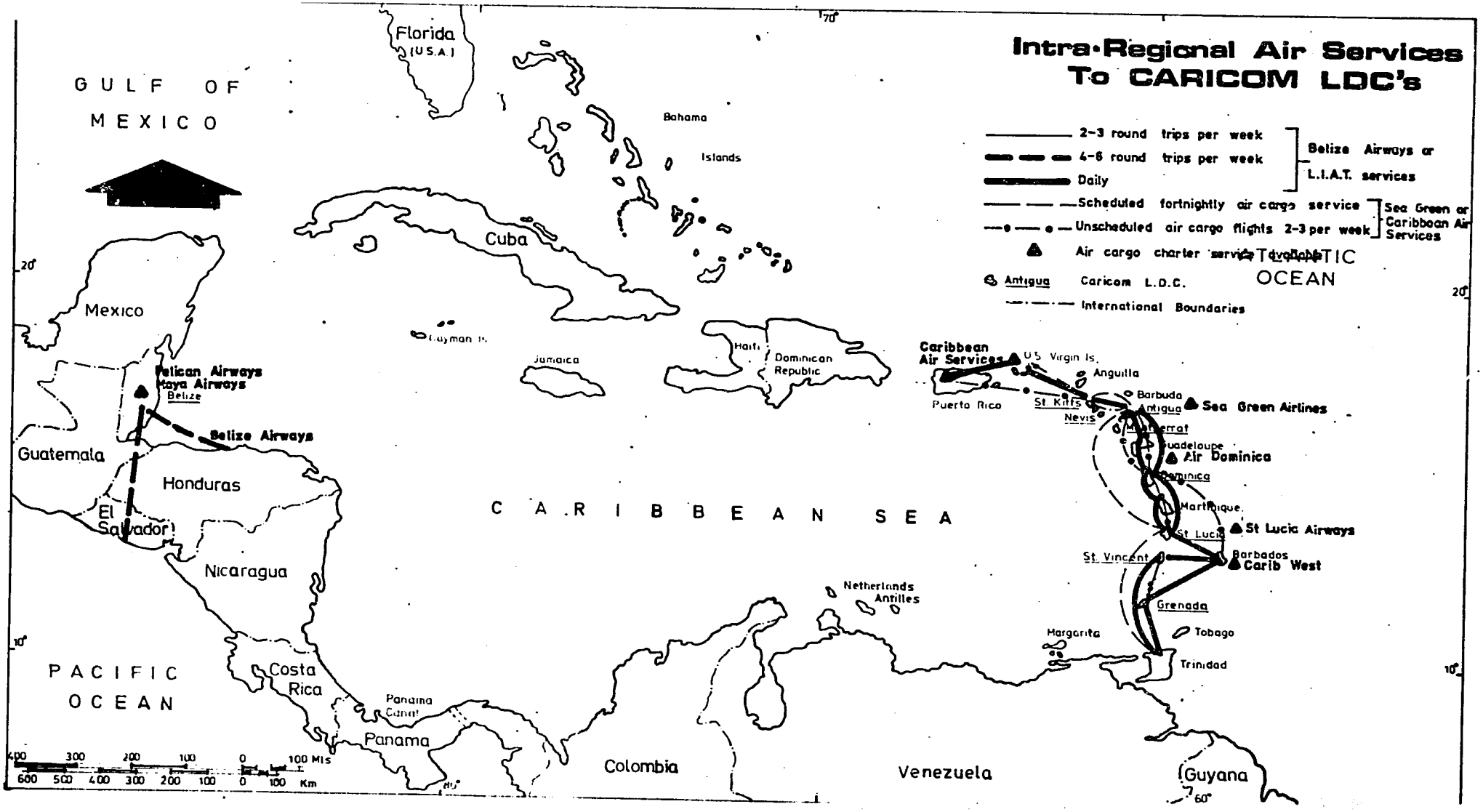
The only regionally-owned local airline in the Caribbean is Leeward Islands Air Transport (LIAT). This company provides daily passenger service to the eastern Caribbean as shown in Figure IV C - 2.03. The equipment used for this service (Hawker Siddley 748's and Norman Islanders) does not allow for air cargo space in addition to passenger baggage (although this baggage frequently contains one or two bags of produce carried by traders). In fact LIAT must occasionally resort to chartering a small plane to carry passenger baggage to compensate for the lack of air cargo potential with its present equipment.

The other airline with scheduled operations serving a CARICOM LDC is Belize Airways which has limited regional service to two neighbouring countries. Belize is geographically isolated from the rest of the CARICOM LDC's.

It is the charter airlines that fill a part of the gap for air cargo operations. Seven of these are identified in Figure IV C - 2.03. The three major operators serving the eastern Caribbean, Caribbean Air Services, Sea Green Airlines and Carib West Airlines, are described below.

2.21 Caribbean Air Services

This is a cargo service based in Puerto Rico and the U.S. Virgin Islands, using C46 aircraft. Its main business is bringing in general cargo from Puerto Rico and the U.S. Virgin Islands to the other islands. Total freight hauled by CAS is about 1,500 tons per year. It carries 30 tons per week on a regular basis every Tuesday to three islands, St.Lucia, Antigua and St.Kitts (principally St.Lucia) with little back-haul freight. It also carries freight regularly to the French West Indies, and is willing to stop at other islands, or charter planes for any inter-island shipment. In addition, it has a scheduled airfreight service between Puerto Rico and the U.S. Virgin Islands, and will serve Haiti, Dominican Republic, Tortola and St.Martin on demand. It has authorised agents on most islands, and serves as a transhipper and freight consolidator for trunk airlines.


Intra-Regional Air Services
To CARICOM LDC's
2-3 round trips per week
4-6 round trips per week
Daily
Belize Airways or
L.I.A.T. services
Scheduled fortnightly air cargo service
Unscheduled air cargo flights 2-3 per week
Sea Green or
Caribbean Air
Services
Air cargo charter service
Antigua Caricom L.D.C.
International Boundaries
GULF OF MEXICO
Florida (U.S.A.)
Bahama Islands
Cuba
Cayman Is.
Jamaica
Haiti
Dominican Republic
Mexico
Belize
Pelican Airways
Maya Airways
Belize Airways
Guatemala
Honduras
El Salvador
Nicaragua
Costa Rica
Panama
Panama Canal
PACIFIC OCEAN
CARIBBEAN SEA
ATLANTIC OCEAN
Caribbean Air Services
US Virgin Is.
Anguilla
Puerto Rico
St. Kitts
Nevis
Barbuda
Antigua
Sea Green Airlines
Montserrat
Guadeloupe
Air Dominica
Dominica
Martinique
St. Lucia
St Lucia Airways
St. Vincent
Barbados
Carib West
Grenada
Tobago
Trinidad
Margarita
Netherlands Antilles
Colombia
Venezuela
Guyana
70°
20°
10°
60°
400 300 200 100 0 100 MIS
600 500 400 300 200 100 0 100 Km

Frozen food and vegetables are shipped in from Puerto Rico by CAS and some fruit and vegetable cargo is shipped back to the Virgin Islands, mainly from St.Lucia. This cargo is most commonly bananas and breadfruit. There is clearly room in CAS service for greater shipments of small farmer commodities from the LDC's to the Virgin Islands (although the space must be booked in advance at St.Kitts as the aircraft may be already loaded with St.Lucia exports).

2.22 Sea Green Airlines

Sea Green, based in Antigua, operates a charter service with a regular fortnightly run to St.Lucia and Trinidad. It also comes 2-3 times per week to Dominica for trade with Barbados and Antigua. They operate both DC4's and DC6's, although DC4's are usually used in the inter-island trade. In addition they will arrange a charter on 48 hours notice.

Sea Green shipped 1820 short tons in 1977 and 30% of this cargo was perishables coming from Puerto Rico into the Leeward Islands, including 427 tons to Antigua and 82 tons to Montserrat. A typical load is 1 to 1½ tons of fruit and vegetables into St.Kitts with a return load of TV sets and textiles to San Juan. Many flights however, have empty back-hauls to San Juan.

Sea Green has attempted several times to organise the inter-island cargo trade in fruits and vegetables, and schedule a regular air freight service, with no success. Its present export of fruits and vegetables are carried only by charters.

2.23 Carib West Airways

This operation is based in Barbados under government ownership and runs two types of service. There is a long haul service from Miami to Trinidad and Barbados, and an island service, feeding mainly into Barbados. They use a Lockheed Electra on the long haul and a C46 on the island route, (with capacities of 35,000 and 15,500 lbs. respectively). They are planning to switch to a DC8 or a 707 (51,000 and 68,000 lb. capacity) for the long haul route in the future.

The long haul accounts for two thirds of the Carib West total freight of 41,000 tons hauled in 1977. This was virtually all (97%) south bound cargo of textiles, hatching eggs, dairy products from Miami and some oil equipment from Houston to Trinidad. Some vegetables were also brought in from Miami for the Barbados Marketing Corporation. They are looking for exports to the U.S. as back-haul traffic.

The island operation is presently strictly on charter, but there are three regular flights, Monday the planes comes down from San Juan (where it is based for maintenance purposes) to Barbados and Port-of-Spain with a back-haul of drilling mud from Trinidad (BWIA takes most of the high value freight because it is a scheduled airline which attracts shippers). Tuesday there is a charter from St.Lucia to Barbados with breadfruit and other fruits, feeding into the British Airways flight to the U.K. Wednesday there is a regular charter for Playtex to San Juan and back with 2-way cargo. There is sometimes an additional feeder flight from St.Lucia on Saturday.

The Carib West Board of Directors is pushing for a scheduled cargo run in the islands. The Carib West management has resisted this move because the airline has operated successfully as a charter operation, while an initial island scheduled service in 1971-72 was not profitable. They are presently losing business to BWIA in cargo service which they would probably get with a scheduled run, although some of this business they get on charter through LIAT.

If this scheduled air cargo service is made available it will increase the value of Carib West services to the marketers of small farmer commodities, as long as the present charter capacity is maintained.

3.0 Present small farmer commodity flows by mode

The present flows of small farmer commodities from CARICOM LDC's to intra-regional markets are transported primarily by sea, although some flows handled by traders are carried as accompanying baggage. Also certain produce is transported by air cargo within the region during the off season when prices are high (e.g. oranges to Barbados), but the air cargo volume is very limited.
The extra-regional markets in perishable specialty products are supporting air shipment costs in some cases (e.g. breadfruit from St. Lucia to the U.K.) where marketing arrangements have been made. Otherwise the larger overseas markets are price competitive, and sea shipment is used (e.g. grapefruit from Dominica to the U.K.) when suitable transport is available (Geest reefer ships).

3.10 Maritime transport flows

Data on maritime transport flows are available from the Inter-Island Shipping Survey carried out by ECLA in 1975-76. This data is divided into flows by size of vessel, and by WISCO and other large vessels. This distribution for the 19

significant export flows from the CARICOM LDC's are shown in Table IV C - 3.01. Of the total 5785 tons recorded in the survey year [1] only 353 or 6% were carried on large vessels, and 94% on small vessels. Only in transport to Guyana were large vessels dominant. The small vessels dominate the larger flows on the short runs into Barbados and Trinidad, although WISCO has a minor foot hold on shipments from Dominica (8% of flows to other Windward or Leeward Islands).

3.20 Air transport flows

The available data is very weak concerning air transport flows, and this is complicated by the fact that these flows tend to fluctuate substantially with the health of the marketing arrangements in the LDC's. For example the Dominica air cargo exports have fallen to almost nothing in the last two years, as the Dominica Marketing Board has experienced major problems. At the same time St. Lucia exports of breadfruit started in late 1976 and now amount to over 100 tons per year to the U.K.

Within the region air cargo shipments account for the majority of flows to the U.S. Virgin Islands, and some of the flows between islands served by regular air cargo flights (Antigua, St. Kitts, St. Lucia, French West Indies). Estimates were made of air shipments from differences between trade figures and shipping survey figures. However some of these differences are due to lack of data on some small vessel movements (although some of these flows probably escaped both the survey and trade statistics).[2] Table IV C - 3.02 shows the estimated air cargo flows of small farmer commodities within the region. These flows do not include imports from Puerto Rico which are much larger in volume. The total 450 tons amount to only 5% of total shipments in the region. Seventy eight percent of estimated air cargo flows are to the U.S. Virgin Islands and the French West Indies.

It is clear that the major role in the present transport of small farmer commodities is firmly in the hands of the small vessel operators. The high service level of air cargo is not sufficient to offset the costs for most of these commodities in the eastern Caribbean. The same is true of the WISCO and other large ship service which lacks the frequency and the low tariff rates to compete effectively with the schooners in the existing marketing and transport system.

1/ *Unrecorded small vessel shipments appear to add 30% to shipping survey figures.*

2/ *In some but not all cases the ship manifests are used as a data base for both trade statistics and the ECLA survey. In other cases trade statistics are based on import and export licenses or customs data.*

TABLE IV C - 3.01

Distribution of Intra-Regional Maritime Flows of Small Farmer Commodities by Type of Transport Service 1975-76
(tons per year*)

	Flows	Small Vessels	WISCO	Other Large Vessels	Total Flow
1.	Belize - Jamaica **	-	-	(610)	(610)
2.	Belize - Trinidad **	-	-	(653)	(653)
3.	Dominica - Antigua	48	28	-	76
4.	Dominica - Barbados	1,367	88	-	1,455
5.	Dominica - Montserrat	3	2	-	5
6.	Dominica - St. Kitts	26	-	-	26
7.	Dominica - Fr. W. Indies	425	-	-	425
8.	Dominica - U.S. Virgin Is.	137	-	-	137
9.	Grenada - Guyana	-	12	98	110
10.	Grenada - Trinidad	850	-	41	891
11.	Montserrat - Antigua	45	15	-	60
12.	Montserrat - Dominica	82	1	-	83
13.	Montserrat - Trinidad	40	11	-	51
14.	St. Lucia - Barbados	211	23	10	244
15.	St. Lucia - Fr. W. Indies	3	-	4	7
16.	St. Lucia - U.S. Virgin Is.	-	-	-	-
17.	St. Vincent - Barbados	318	-	-	318
18.	St. Vincent - Guyana	-	-	19	19
19.	St. Vincent - Trinidad	1,877	1	-	1,878
		(1,651)***			(1,651)***
Total Shipping Survey Flows		5,432	181	172	5,785
Total including all other Trade Flows		7,083	181	1,435	8,699

* Fresh and processed fruits and vegetables (categories 3, 4, and 8 in the ECLA Survey).

** Not measured in the survey, probably due to unrecorded transhipment.

*** Difference between the average of import and export figures for St. Vincent and Trinidad in 1976 and shipping survey results for this flow. This difference appears to indicate that half of the small vessel trade for this flow was not measured in the shipping survey. No estimate is made of this difference for other flows but this flow is probably the largest portion of unrecorded small vessel flows.

TABLE IV C - 3.02

Estimated Intra-Regional air cargo flows of Small Farmer Commodities - 1976

(tons per year)

1.	Dominica	- Antigua	30 tons
2.	Dominica	- Montserrat	10 tons
3.	Dominica	- St. Kitts	30 tons
4.	Dominica	- French West Indies	50 tons
5.	Dominica	- U.S. Virgin Islands	20 tons
6.	St. Lucia	- Barbados	30 tons
7.	St. Lucia	- French West Indies	150 tons
8.	St. Lucia	- U.S. Virgin Islands	130 tons
		Total -	450 tons

Source - Consultants estimates based on interviews and differences between shipping and total trade statistics.

4.0 Adequacy of Transport Linkages

4.10 Sea Transport Adequacy

It is clear from figures IV C - 2.01 and 2.02 that certain links are provided with high service frequencies and others are not. In the larger vessels only CTMT provides a weekly service between islands, and then only to Antigua, Montserrat, St. Lucia and St. Vincent, (although Dominica will be added soon) and this is oriented to incoming cargo. It is therefore, quite evident why the bulk of the small farmer commodity trade between the islands of the eastern Caribbean is carried by schooners, which are readily available for small cargo loads between the islands.

The schooner service is less than adequate, however, in the handling of produce, and the unscheduled nature of the business (although some de facto schedules exist such as the Tuesday run from Grenada to Trinidad). The lack of reefer space also results in spoilage on longer trips, and reduces the quality of produce even on shorter trips.

There will always be a need for the smaller load capacity on schooner ships and this service is probably the lowest transport cost possible. However, this cost advantage may be significantly offset by product losses and high insurance costs, when insurance can be purchased. For the larger flows of commodities on the higher quality end of the market, however, there is a missing level of service with the intra-regional markets, particularly for longer trips between the islands, where the present schooners take too long to make the trip with perishable cargos. This is the case for major regional markets in Trinidad, Barbados and the U.S. Virgin Islands, which could be much better linked to the producing islands. The present sea transport system is not oriented at all to the small farmer commodity market except through a minor part of the schooner trade, and a major service gap remains to be filled, despite the relatively small quantities of commodities involved. The WISCO service, even as planned, is too infrequent to act as an effective form of transport for commodities which must be marketed weekly and transported speedily to the intra-regional markets. There is a major gap represented by the lack of the provision of a weekly scheduled service between the producer and consumer islands on which the traders and marketing boards can rely. There is also a lack of reefer space or container service to handle chilled commodities and prevent spoilage.

An intermedi·e service between the schooners and WISCO is needed, if it can be provided ec mically, with rapid weekly service as the schooners provide, but with improved ree. r storage space to cut down spoilage.

4.20 Air Transport Adequacy

The internal air cargo services to the LDC islands are seriously deficient because the daily scheduled carrier, LIAT, has virtually no cargo capacity. There is also a definite need for a feeder service into Barbados and Antigua, and possibly Guadeloupe, for exports to the extra-regional markets.

This gap is filled presently by the three charter carriers (Caribbean Air Services, Sea Green and Carib West), but the charter service is more costly and less reliable in the eyes of small shippers than a regular cargo service. A scheduled air cargo feeder operation with charter back-up, would improve the reliability and may decrease the cost of present air shipments between the islands. Of course, scheduled service is dependent on a sustained level of cargo availability which does not yet exist.

Belize is also isolated from the Caribbean islands, except for charter air service, and additional links to Jamaica, Trinidad and the French West Indies could improve its market potential for small farmer commodities.

5.0 Shipping Costs by Mode

5.10 Sea

Intra-regional shipping of fruits and vegetables by sea is completely dominated by schooner vessels. Rate schedules are shown on table IV C - 5.01. One notices that all fruit and vegetable rates are set by units such as bags and boxes. These bags and boxes are not weighed, and in fact the weight per unit may vary considerably. There is no refrigerated service offered.

In fact, there is no enforcement of rates and individual schooner captains may set rates as they wish. However, the rates shown in the table are fairly typical. Fruits and vegetables are a relatively low revenue earner for most schooners, which obtain their principal revenue from the movement of manufactured products. Fruits and vegetables do produce additional marginal revenue as a back-haul to the MDC's from which the manufactured products have been transported. Tariffs will vary seasonally depending on supply and demand conditions and competition for business. Fruits and vegetables are normally delivered free from alongside (FFA) the wharf at berths not used by larger ships. Therefore port charges are minimal and there are no separate charges for handling of products. Bunkering surcharges are not applied to these vessels.

TABLE IV C - 5.01

Selected Freight Rates for Schooners - Area A 1/

Commodity	Unit	EC$	US$
Sweet Potatoes	per sack 87 lb.	1.95	0.75
Carrots, etc.	" " " "	1.95	0.75
Pumpkins	per bag	3.60	1.40
Peanuts	" " 90 lb.	3.60	1.40
Other Ground Provision	" " 175 "	3.60	1.40
Plantains	per bunch	1.20	0.45
Fruit Juices	per carton	2.00	0.77
Sheep, Goats	each	6.00	2.30
General Cargo	per ton FFA	48.00	18.50
Citrus Fruits	Sacks 50 lb.	2.00	0.77

1/ These are rates quoted for Area A which includes Barbados, Dominica, Grenada, Trinidad, St.Lucia, Martinique, and St.Vincent. The rates for Area "B" Leeward Islands and Area "C" Guyana are 50% higher. Rates effective from February 1977.

Wharf Dues: EC$1.50/ton or 15 cents per package.

WISCO also provides inter-island service but carries little fruits and vegetables because of its higher tariffs and low frequency of service. WISCO's rates for fruits and vegetables, however, are shown on table IV C - 5.02. To these tariffs must be added the LSD charges (landing, storage and delivery) shown on table IV C - 5.03 which would not apply were cargo delivered FFA as is the case of the Schooners [1]. One should note that:

1) The LSD charges are particularly high in Antigua, St.Kitts and Montserrat
2) St.Vincent, not being a member of WISCO, pays higher freight rates than the other LDC's.
3) The surcharge for transhipment is about 40% of the applicable inter-island rates.
4) Reefer service is about double the cost of ordinary stowage

It is difficult to make direct comparisons between WISCO and schooner rates. However, if we assume that the average cubic measurement of the bag or sack of vegetables loaded by schooners is 3 cu.ft. then about 13 units would equal 40 cu.ft. or 1000 kgs. Assuming a tariff of EC$2.60 or US$1.00 per unit, the schooner charges about US$13.00 per ton or 40 cu.ft. WISCO's lowest charge is US$27.90 to which one would probably have to add the various port charges shown. Even taking schooner charges of EC$2.60 per 50 kgs. of oranges, the per ton charge would be EC$44.00 or US$16.90 as compared with WISCO's US$27.90 plus port charges. Moreover schooner service is normally provided overnight between say Grenada/St.Vincent or St.Vincent/Barbados. WISCO's scheduled services would generally require cargoes to be aboard for longer periods thus necessitating refrigerated service at much higher tariffs.

5.20 Air Freight

The airline with the most frequent service to the LDC's, LIAT, is heavily booked for passenger service and often cannot even carry the full complement of passenger baggages and small parcel airfreight. Nonetheless LIAT cannot be depended upon to reserve cargo space for perishable cargoes. For service between Barbados and the LDC's, tariffs are B$0.45 - 0.63 per kg for loads of 45 - 500 kg. and B$0.35 - $0.45 per kg for loads larger than 500 kg. For 300 kg, the charge would therefore be an average US$0.20 per kg as compared with about US$0.04 per kg by schooner.

1/ *Schooner service is used largely by hawkers. Schooners pick up and land cargo at wharfs where large numbers of hawkers can congregate for loading and delivery. WISCO ships use port facilities where hawkers are unlikely to be allowed access for security reasons. Moreover, FFA freight must be taken direct from vessel's tackle.*

TABLE IV C - 5.02

WISCO Freight Tariff (Jan 1, 1978)
($ US m.t. or 40 cu.ft)

Product	Column A	Column C	Column D
Fresh Fruits (Ordinary stowage)	38.51	32.08	27.90
Vegetables (Ordinary stowage)	38.51	32.08	27.90
Fruit & Vegetables (reefer)	69.23	57.76	50.23
Meat on Carcass	179.94	149.94	130.39
Meat (Cartons or crates)	141.96	118.32	102.88

Column A: Applicable on all transhipment cargoes except for consignments to Montserrat & St.Kitts where Column D rates apply.

Column C: Applicable to all break bulk cargoes from Guyana or Jamaica to the Islands* Also applies from St.Vincent to all ports and vice versa.

Column D: Applicable to all break bulk cargoes from Barbados or Trinidad to the Islands* and vice versa.

* Islands are: Grenada, St.Lucia, Dominica, Montserrat, Antigua and St.Kitts.

Source:

TABLE IV C - 5.03

Landing, Storage & Delivery Charges

	U.S.$/Ton
Grenada	8.30
St.Vincent	4.50
St.Lucia	6.10
Dominica	7.56
Montserrat	18.75
Antigua	10.10
St.Kitts	13.88
Guyana:	14.50
plus stevedoring	2.80
Livestock	5.76/head
Barbados:	
General	11.18
Refrigerated	18.40
plus stevedoring	1.00
Trinidad:	
West Indian produce	7.33
plus stevedoring	1.18
plus basin due	0.20
Jamaica:	4.96
plus security charge	0.36
plus bunkering	5.00
Belize:	
General	0.40-0.50/ton
Wharf use <31 tons	1.00/ton/Day
3-10 tons	2.00 " "
10-20 tons	4.00 " "
20-30 tons	5.00 " "
>30 tons	6.00 " "
Light & Nav. Aids	0.25/ton

ource: WITAS

The major charter operators in the CARICOM area, including Tropic Air, Carib West, and Sea Green, have a range of equipment capacities including the DC-3 (7,000 lb), Convair (11,000 lb), DC-4 (20,000 lb) and DC-6 (30,000 lb). Sea Green charges US$0.11/lb. ($0.24/kg) from St. Kitts to San Juan on its weekly trip for loads in excess of 1,000 lbs. (455 kg). Planeload rates are negotiated but would be cheaper. Carib West C46 charter rates are shown in Table IV C - 5.04.

Tropic Air rates from Barbados to Trinidad are US$0.27/kg. and to Antigua US$0.40/kg. and to St. Kitts US$0.49/kg.

Caribbean Air Services, based in the U.S. Virgin Islands and Puerto Rico uses IATA rates for its regular but unscheduled service. These rates from San Juan to various destinations are given in Table IV C - 5.05. Although charter rates are subject to many variables besides distance, one can generalize that they are higher than the LIAT scheduled freight rates and that they are high by comparison with the costs of airfreight, on a per ton-km basis, as compared with the IATA rates to Europe, the USA and within the CARICOM area.

TABLE IV C - 5.04

Carib West C46 Charter Prices ex Barbados

	Barbados Dollars	
	Existing Rates	Proposed Rates
Barbados - Grenada	2,720.00	2,992.00
Barbados - St. Lucia	2,014.00	2,215.00
Barbados - Dominica	3,404.00	3,744.00
Barbados - Fort-de-France	2,684.00	2,952.00
Barbados - Point-a-Pitre	4,160.00	4,576.00
Barbados - Trinidad	3,564.00	3,920.00
Barbados - San Juan	7,220.00	7,942.00
Barbados - Antigua	5,022.00	5,524.00
Barbados - Guyana	6,940.00	7,634.00
Barbados - St. Vincent	2,120.00	2,332.00
Barbados - St. Kitts	5,490.00	6,039.00

New Rates Effective August 1, 1978.

Note: Maximum uplift on C46 is 14,000 lbs. from all stations except St. Vincent and Dominica - which are 6,000 lbs. and 12,000 lbs. respectively.

Source: Carib West, July 1978.

TABLE IV C - 5.05

Caribbean Air Service
Cargo Tariff Rates

From San Juan To	Min.	Min. Lbs.	0 - 999	1000 - 1999	2000 - 4999	Over 5000
Antigua	$25.00	96	.26	.24	.22	.21
Dominica	25.00	69	.36	.32	.27	.26
Guadeloupe	25.00	78	.32	.29	.24	.23
Martinique	25.00	62	.40	.35	.28	.27
St.Kitts	25.00	100	.25	.22	.20	.19
St. Maarten	25.00	96	.26	.20	.15	.14
St.Lucia	25.00	62	.40	.36	.30	.29
St.Thomas	13.00	92	.14	.14	.12	.10
St.Croix	14.00	100	.16	.16	.14	.12

Note: Minimums are stated in U.S. dollars, poundage rates are U.S. cents per lb.

Source: Caribbean Air Services.

D. Constraints on Intra-Regional Trade

1.0 Introduction

The free flow of trade among countries in any given area can be inhibited by various types of constraints that prevent or discourage the movement of products from one location to another. Under the original CARICOM agreement, it was intended to remove substantially all artificial barriers to trade among the 12 member States. Removal of such impediments does not assure trade because there are basic obstacles that agreements by themselves will not remove. Lack of suitable transportation and marketing facilities, for example, will still restrict the free movement of fresh produce from, say, Dominica to Barbados even though no legal barriers exist. Consequently, the review of constraints in this section deals with both aspects of the problem. The AMP system is described later in Section IV E.

2.0. Regulatory or Legal Barriers.

Movements of small farmer products from the LDC's to the MDC's of CARICOM are generally not subject to artificial barriers in the form of quarantine regulations, quotas, embargos etc. This is particularly true of those commodities included in the AMP list where it is specifically agreed by the CARICOM membership that there is to be free movement of such items under the allotment system. A number of the LDC's themselves have licensing requirements covering especially commodities that are produced locally or that are prime targets for import substitution. Within the trade, dealers who export/import fruits, vegetables and root crops, which are the principal small farmer products from the LDC's report no problem in the form of regulatory controls within the CARICOM region, although this trade has not reached significant proportions in most cases (an exception would be the movement of sweet potatoes and carrots from St. Vincent to Trinidad). Whether constraints of this type would be invoked and/or enforced if the traffic from the LDC's encroached importantly on local producers in the importing areas is an open question. If, however, the movement was under the AMP, then there should be little scope for interference. The fact of the matter is that if a receiver wants a product, the trading will take place with a minimum of control; if the reverse is true, there are other ways of discouraging the imports. It is of interest to note that a number of the Caribbean countries/territories require import licenses on commodities covered by the AMP; these regulations are obviously aimed primarily at non-CARICOM competition[1/].

1/ *Export licenses are sometimes required on certain products of the LDC's but they are little more than a formality, except on occasion, when a commodity is in short supply domestically.*

Within the Caribbean intra-regional area, as defined in this study, but outside of CARICOM, there are more technical barriers to shipments from the LDC's. The U.S. territories of Puerto Rico and the Virgin Islands are subject to stringent quarantine and pure food regulations; this is especially true of Puerto Rico where enforcement is much more strict than in the Virgin Islands. Some produce has moved from the LDC's to the Virgin Islands but trade with Puerto Rico has been almost nil. It should be noted, however, that both of these markets receive large quantities of perishables from the Dominican Republic and Haiti. This would indicate that the regulations can be met where the volume of trade justifies compliance. The French territories of Martinique and Guadeloupe also have sanitary regulations and technical requirements, but being an integral part of France, they give some concessions to the LDC's under the Lome Convention[1/]. Both of these territories have been receiving moderate quantities of LDC products. In the Netherlands Antilles, which also receive some produce from the LDC's, there are virtually no technicalities that would be considered as trade barriers. Among the other major countries in the region (Venezuela, Surinam and Fr. Guiana) there has been no trade with the LDC's and the possibility of such trading becoming significant is almost non-existent; thus, the question of regulatory controls is of academic concern only and they were not investigated. In general, however, a sanitary certificate is required for meats and fresh produce.

With the few exceptions noted, regulatory or legal barriers do not at present pose any serious threat to expansion of trade between the LDC's and most of the Caribbean markets. Special concessions are made to this particular trade in a number of cases, especially through CARICOM agreements. The more basic and difficult barriers are of another type which is discussed briefly in the following section.

3.0 Other Trade Barriers

In addition to the legal or regulatory requirements that in some cases operate as constraints to trade, there are other barriers that are in fact more serious obstacles to trade between the LDC's and other intra-regional countries/territories. These types of trade constraints are not so readily overcome, however, because they involve such basic elements as infrastructure, industry organisation, public policy, etc.

Of prime importance as an impediment to the movement of small farmer products from the LDC's is the general lack of an adequate transportation system. Trade has taken place, as is evidenced by the movement of sweet potatoes and carrots from St. Vincent

1/ *See Chapter III for discussion of EEC regulations.*

to Trinidad, but this type of trade is clearly hampered by the limited sea transport now available. Schooners that now transport produce provide a regular service between some islands but can not cope with production peaks. Transport is reviewed in detail elsewhere in this report; the purpose here is only to identify the shortcomings as a trade constraint to the LDC's.

Most countries/territories in the Caribbean, the AMP notwithstanding, subscribe to a policy of local production to displace imports. To the extent that this policy produces results, the scope for trade between the LDC's and other markets will be reduced. Regardless of policy, however, some islands will continue to import certain products, largely because growing conditions are not favourable or other areas have a distinct competitive advantage. Pursuit of self sufficiency will no doubt tend to discourage the movement of products from the LDC's.

To a considerable extent, the natural production pattern in the Caribbean is sufficiently similar from place to place to result in a tendency for periods of glut and scarcity to occur at the same time in the LDC's. In these circumstances, trading of LDC products such as fruits, vegetables and root crops would certainly be affected adversely. Some effort is being made to overcome this obstacle through such measures as irrigation. Marketing organisations and growers in most LDC's are not geared to the intra-regional trade, partly because of the numerous uncertainties associated with activity. As has been noted, forward planning has been difficult and even where a market is assured, production has not been forthcoming. A successful export trade normally requires a high degree of integration and coordination which is currently lacking in the LDC's.

Fresh produce, domestic and export marketing in most the LDC's and Barbados is dominated by very small private traders known as hucksters. Their role is described in detail in Chapter V. In summary, the hucksters lack sufficient capital, expertise, and organisational capability to provide the integrated marketing operation necessary to a significant expansion of LDC produce exports.

Importers are becoming more quality conscious and this tendency will make it increasingly difficult for the LDC's to export ungraded produce. In addition to grading at source, there is the problem of proper handling to maintain quality while products are enroute to markets. In the past, most Caribbean markets have accepted the ungraded, odd lots of poorly packed produce that the hucksters and some others have moved from the LDC's, but this tolerance is likely to decline; continuation of the practice will be a barrier to trade expansion.

Price levels in the Caribbean LDC's are now sufficiently high that they are a constraint to trade in some parts of the region; it is in regard to extra-regional trade that this problem is more severe. In relation to such countries as the Dominican Republican and Haiti which are large exporters of SFC, the LDC's are at a competitive disadvantage cost-wise in such markets as Puerto Rico and the Virgin Islands, as well as in the USA proper. The pressure of rising costs in the LDC's is evidenced by constant pressure on the part of growers for price guarantees of various kinds.

In the MDC's, there are normally various price control measures that may apply to commodities exported by the LDC's. Often, however, these controls aimed at restraining prices are not enforced strictly; if they were really effective, then intra-regional trade might be discouraged. For example, recent press reports from Trinidad indicate that dry onions were being sold at 14 times the fixed price; the logical assumption would be that the controlled price is unrealistically restricted. The effect of price controls on trade with the LDC's would depend entirely on the relationship of the fixed price to the f.o.b. price considered satisfactory to the exporters.

Prospects for overcoming or lessening the impact of these barriers to increased trade between the LDC's and other Caribbean countries/territories vary considerably. Some, such as the production pattern and price/cost levels, are deep seated and difficult to alter. In other cases, including transport and market organisation, the situation can be altered but at considerable cost. Industry practices and public policy can be changed more readily if the determination for change is present. In any event, these constraints must be accorded important weight in evaluating the prospects for increased trade in the region.

E. Regional Cooperation/Coordination

1.0 Agricultural Marketing Protocol (AMP)

As one manifestation of their desire to stimulate trade among the countries/territories of the Caribbean, the negotiators involved in drafting the agreements creating the Caribbean Free Trade Area (CARIFTA) in 1968 included in their programme an Agricultural Marketing Protocol, commonly known as AMP. The AMP was continued as an integral part of CARICOM when the free trade structure was revised and renamed in 1973. Basically, the purpose of the AMP is to encourage the trading of selected agricultural commodities by area members through periodic agreements on allocation of prospective supplies of selected commodities that may be available for export and/or required as imports; there are 22 items in the AMP list[1/].

Under the AMP, country representatives now meet semi-annually (initially there were annual meetings) to review the supply and demand situation in the region for the listed products. At these meetings, delegates draft a schedule of "surpluses" and "deficits", by country, and attempt to match up the plus and minus sides on a trading quota basis. Along with this exercise in setting up the prospective trading schedules, by month, there is agreement on f.o.b. prices that are technically based on cost of production. Such prices are in effect minimum levels for those importing and maximum for the exporters.

To supplement the AMP programme, the CARICOM organisation introduced a Guaranteed Market Scheme (GMS) in 1972. The purpose of the GMS is to provide some measure of advantage to the LDC's[2/] in their trading with the MDC's (Barbados, Guyana, Jamaica and Trinidad & Tobago). Through the GMS, it was hoped that the LDC's would be assured of an outlet in the MDC's for certain of their agricultural products at AMP prices. The rationale in this case revolved about the contention that the MDC's should curb their potential for increasing output where this would tend to shut the LDC's out of their markets; also, this would be one way of giving the LDC's some opportunity to even their balance of trade with the MDC's. The "guarantee" in this scheme would involve an obligation by the MDC's to purchase a fixed quantity

1/ *Carrots, peanuts, tomatoes, red kidney beans, black peppers, sweet peppers, garlic, onions, potatoes (not sweet), sweet potatoes, string beans, cinnamon, cloves, cabbage, plantain, pork and pork products, poultry meat, eggs, okra, fresh oranges, pineapple and pigeon peas.*

2/ *Antigua, Belize, Grenada, Dominica, Montserrat, St.Kitts/Nevis, St.Lucia and St Vincent are the LDC's within CARICOM.*

of AMP products at set prices during a specified period of time; the surpluses of the LDC's would have priority status. Only a part of the AMP products are covered by the GMS; among the major items are carrots, onions, peanuts, plantains and oranges.

1.10 Operations of the AMP

Meetings prescribed by the AMP have been held regularly and delegates have gone through almost a ritual of setting up schedules of anticipated trade, together with f.o.b. prices for a forward period of 6 months. Generally, however, allocations are actually made for only a part of the 22 commodities included in the AMP list; for example, in the list for November 1976/April 1977 there were 13 commodities (See Table IV D - 1.01) on which action was taken and 4 of these items were under 1% of the value of the total allocations. Also, it should be noted that pork which is currently an unlikely trading item made up alomst half of the total value of allocations. The coordinating agency in arranging these meetings is the CARICOM Secretariat, but at the country/territory level there is no uniformity in the local affiliation of delegates; for example, they may be from the Ministry of Agriculture, the marketing agency or the Ministry of Trade, but do not include producers or private buyers.

Although the formalities prescribed by the AMP are generally observed, the actual performance as evidenced by the deliveries made on the import allocations is not at all impressive. In 1976 the import/export quotas set up under the GMS totalled 3.1 million pounds for the region, but only 0.55 million pounds of produce was actually shipped 1/. In a more recent example, Antigua was committed to provide 310,000 pounds of carrots and onions to the MDC's from November 1976 to April 1977 but deliveries were nil; lack of transport and/or production shortfall were given as reasons. The performance in this case was only a little better then with AMP allocations with one difference: one receiving territory was unable to absorb its purchasing commitment. Antigua itself fared no better on the import side with no deliveries because supplies were short in the selling countries. There are some notable exceptions to this pattern; St. Vincent particularly, has had a good record of meeting its AMP export commitments, with Trinidad the major receiver of products such as carrots and sweet potatoes (almost 950 m.t. in 1977). St. Vincent had a surplus of these two crops in 1976 and is now attempting to adjust production to match market requirements.

1/ *Profiles on Agricultural Development in Barbados, Ministry of Agriculture, Food and Consumer Affairs, Barbados, Dec. 1977.*

TABLE IV D - 1.01

Allocated Commodities and Relative Value,
AMP List for November 1976/April 1977

Commodity	Relative 1/ Value Percent
Carrots	7.26
Peanuts	14.22
Tomatoes	0.47
Onions	16.37
Potatoes (not sweet)	4.88
Sweet Potatoes	3.12
Cinnamon	1.92
Cloves	0.28
Cabbage	0.06
Pork & Pork Products	44.66
Oranges	4.66
Pineapple	0.35
Plantain	1.75
Total	100.00

1/Based on quantity allocated and price fixed.

Source: *Profiles on Agricultural Development in Barbados, Ministry of Agriculture, Food and Consumer Affairs, Barbados, Dec. 1977.*

Aside from its function of scheduling an exchange or flow of commodities within the CARICOM region, the AMP is responsible for establishing f.o.b. prices for the 22 commodities now included in the protocol. These prices are set up for each 6-month forward period during the regular meetings. Only limited cost information is available to the individual delegates with the result that prices are said to be set by only a part of the group and even then there is heavy reliance on the levels that have prevailed previously; in short, there is no real assurance that the price structure is completely realistic. Prospective forward supplies apparently have little influence in the price determination process. It is reported that from time to time certain participating countries have taken exception to AMP AMP/GMS prices and that, as a result, there has been a tendency to circumvent the protocol through unilateral actions. Generally speaking, however, the performance on the supply side has been so limited that there has been little cause for concern on import commitments.

There has been virtually no effort made to organise either production or marketing specificially to acheive a higher level of participation in the AMP/GMS programme. This is especially true on the production side except in the few instances such as St.Vincent where an effort is being made to tailor output to meet the market demand. Reliance in large part on numerous small producers tends to accentuate this problem. In the marketing sector, a number of countries/territories channel the AMP/GMS commodities through marketing boards or corporations. In handling the shipments, even if transport is available, the receiving countries often object strongly to settlement on an f.o.b. basis because of the prevalence of damage intransit at present. Another problem noted is the tendency at times for receivers to be very slow in settling their accouts.

1.2 Evaluation of the AMP

After having been established for 10 years, the AMP and the more recent GMS programmes have yet to make any substantial impact on the intra-regional trade in the affected commodities. On the positive side, however, the AMP has provided a forum where country representatives can meet and at least go through the motions of furthering intra-regional trade relationships. Allocations of both exports and imports do not appear to have been based on a sound footing of factual information on probable output and export availability. On the supply side, only St.Vincent has a record of performance.

It is pure conjecture to speculate on what might have happened had all suppliers been able to provide their quota; the ability of receivers to honor fully their commitments has never been tested extensively. The lack of performance by suppliers has forced even the AMP to go along with the importation of extra-regional products where local supplies are inadequate.

Once allocations are made, there is no follow-up to determine the probability that the commitments will be met and to make adjustments where necessary. There does not appear to be any real stigma or censure attaching to failure to meet AMP/GMS allocations. Communications among participants in the programme are very limited. This stems in large part from the absence of local staff charged with direct responsibility for operation of the programme. Between meetings the AMP country delegates have little direct involvement in the fulfilling of commitments. It is said that delegates often attend meetings on short notice and are not well prepared in terms of information relating to either supply of or demand for the commodites to be allocated. There is also a lack of reliable data on production costs and a few delegates appear to be providing the base for price setting.

Prices set under AMP/GMS are not particularly realistic because they are based on cost of production and not enough is known about such costs; furthermore, this approach ignores completely the other elements in price-making such as seasonality, competition and shifts in supply/demand. Costs may be about the same country to country and by using a uniform price, an unintentional advantage may be given to producers in the importing MDC's; i.e. after adding on the transportation, handling, etc., the value is then high enough to be attractive to producers in the importing countries 1/. In any event, production of AMP products in the LDC's does not appear to have increased greatly. On a fairly broad front, the seasonal pattern of production is similar among the countries/territories of the CARICOM region. AMP has done little or nothing to encourage specialised production that would tend to counter the uniformity in periods of glut and scarcity. Also, only limited efforts have been made to gear both production and marketing to the objectives of the AMP and GMS.

Some commodities included in the AMP list are considered to have little immediate scope for export from the LDC's of the region; e.g. white potatoes, garlic, poultry meat, pork and eggs. Concurrently, other important commodities such as root crops are omitted.

1/ Conversely, of course, if prices are set too low, then there is less incentive for the LDC's to participate in Intra-regional trade.

There is some indication that the MDC's may be reluctant to make a long range commitment on which the LDC's could base an aggressive production programme. Virtually all countries/territories subscribe in greater or less degree to the principle of import displacement; there is at present only limited acceptance of the sometimes suggested goal in which individual countries/territories would specialise and thus enhance intra-regional trade.

1.3 Recommendations

It is generally recognised in the CARICOM region that the AMP/GMS programme has failed by a considerable margin to meet the expectations of those who designed and ratified the agreement. At the same time, however, most observers agree that the mechanism is theoretically useful. In light of the serious shortcomings that are apparent, only decisive and determined action by the participants can alter the presently low level of performance. Numerous suggestions have been or might be made concerning ways in which the AMP/GMS may be improved; some of the more practicable are listed below in summary form:

a) The central body concerned with AMP/GMS in the CARICOM complex should be measurably strengthened so as to provide the administrative support including information services needed for proper coordination of program activities. This would imply a staff capable of maintaining effective communications with participants with the purpose of stimulating a better record of performance; this would include making more realistic allocations and stimulating actual deliveries. The need is to provide continuity that is now lacking, especially with the tendency to forget about the programme from meeting to meeting.

b) Consideration should be given to the place of AMP/GMS in the Regional Food Plan that is being formulated by CARICOM. Under this plan it is contemplated that country specialisation will be encouraged; this is also one objective of AMP/GMS. It is suggested that the new Caribbean Food Corporation may be an appropriate vehicle for improving the performance of AMP/GMS; this could be directly through transfer of appropriate responsibility from the CARICOM Secretariat to CFC or indirectly through a firm CFC commitment to AMP/GMS activities.

c) At the local level, a coordinating body made up of government officials, primarily in trade and agriculture, and representatives from the business and farming community, is one means of achieving a higher level of continuity in the AMP/GMS program[1/]. Another approach is to assign to an appropriate unit in government the full and continuing responsibility for AMP/GMS activities with the understanding that this is a continuous assignment. The purpose here is obvious; it is to overcome the present tendancy to let AMP take care of itself between meetings and to build a higher level of participation in the program.

d) The list of commodities included in AMP has been static for a decade despite the fact that some items are insignificant from the trading standpoint. Other commodities that have a greater trading potential are not covered; e.g.fruit and root crops other than potatoes which are now included. If AMP becomes a significant element in intra-regional trade, there will be an urgent need to review and perhaps revise the commodity list; at its present level of activity the AMP has little real impact in any event.

e) If the AMP/GMS program is to succeed, the allocations of commodities and the price schedule must be as realistic as possible; to date, these essential elements of the program have not had an adequate factual base. In strengthening the organization and operation of AMP/GMS, one major requirement is the collection of data on costs, production and market requirements, and the maintenance of such records on a continuing basis. This function would logically be coordinated by the central agency responsible for the program in the CARICOM context.

f) By expanding the list of AMP commodities covered by the GMS, it may be possible to provide an added element of assurance that would give needed production incentive to the LDC's. It must be recognized, however, that setting prices unrealistically high would over time encourage production in the MDC's as well as in the LDC's.

1/ *See "Critical Evaluation of the ECCM Countries under the Agricultural Marketing Protocol (AMP) and the Guaranteed Market Scheme (GMS)" by Louis L.Smith of the ECLA (Dec. 974) for a detailed proposal.*

g) Under the Oils and Fats Agreement, the allocations among the participants are viewed more in the light of contractual obligations; this may be one reason why OFA has been more successful than AMP. The very practical difficulties of establishing AMP/GMS allocations as firm obligations are apparent where the agreements are themselves subject to so many mitigating circumstances. There is need, however, to overcome the present tendency to simply overlook failure to supply or to purchase; in other words, the participants must take their obligations to perform more seriously if AMP is to become an effective mechanism.

2.0 Other Regional Activities

There are several regional programs other than AMP/GMS that are now in operation or proposed for the CARICOM area. Because of their possible bearing on the prospects for AMP/GMS, the following sections describe briefly three of these regional efforts.

2.1 WINBAN

The Windward Islands Banana Growers Association was organised in 1958. Its members are the local banana growers association located in Grenada, St.Vincent, St. Lucia and Dominica. WINBAN operates on an industry-wide basis by performing the following functions:

a) Serves as bargaining agent and negotiator in dealing with Geest Industries on the price to be paid for bananas from the Windward Islands; other terms in the handling of the product are also negotiated.

b) Coordinates the harvesting and delivery of bananas by the individual associations so as to meet scheduled deliveries on time.

c) Arranges for purchase of imputs (fertilizer, chemicals, boxes etc.) on a pool basis for the industry. The inputs are actually sold to growers by the local associations.

d) Acts as spokesman on matters such as regulations and legislation affecting the banana industry.

e) Serves as focal point in negotiating outside assistance, particularly in research which is an important element of the WINBAN program.

In the beginning, WINBAN operated an insurance scheme covering damage to crops through natural disasters; this service has now been discontinued because member associations have taken over the function. WINBAN is a going organisation providing useful services of general benefit to the banana growers of the Windward Islands.

2.2 Oils and Fats Agreement (OFA)

In a sense, the OFA is a companion to the AMP in that it is now CARICOM sponsored (OFA predates CARICOM) and is commodity oriented. In contrast to AMP, however, the OFA has been reasonably effective as a mechanism for regulating intra-regional trade in coconut products. One major difference between OFA and AMP is the concentration of the former on one group of commodities: largely coconut products such as copra, raw oil, refined oil and margarine. Another important difference is the fact that the price negotiated under OFA is fixed and must be observed by the trading countries; also, the allocations are much more meaningful in terms of performance. In accounting for the superior operating record of OFA, as compared to AMP, it must be noted that OFA is dealing with one clearly defined commodity group derived from a perennial crop in which relatively few firms do the bulk of the processing. Although not always complete, the records relating to the coconut products are far better than those available for the items in the AMP list. In regard to pricing, it is significant to note that under the OFA the level negotiated is considerably above world prices; still the local industry has not grown significantly.

2.3 Regional Food Plan (RFP)

In a further effort to stimulate production and to displace imports on a regional basis, there has been developed within CARICOM a regional food plan that was initially made up of four major parts that relate (1) to livestock production, (2) to fisheries, (3) to corn/soya/legumes in St. Kitts, Guyana and Trinidad, and (4) to corn/soya/legumes in Belize and Jamaica. Among its objectives, the RFP envisages production of beef and other meat, milk and eggs, corn, soyabeans, red kidney beans and blackeye peas that would bring output to 1975 consumption levels within a 10 year period. It will also promote the production, processing and marketing of peanuts, fruits and vegetables. Bulk purchasing of agricultural inputs (fertilizers, chemicals, etc.) is planned.

Integration of agricultural production through the RFP is also contemplated; e.g e.g. fish meal from the fisheries project would contribute to animal production.

Some progress has been made in activating these projects. To implement the RFP, as well as engage in other development activities, the Caribbean Food Corporation (CFC) was established in 1976. It has yet to become operational. It is contemplated that other organisations will also be participating in implementation of the Plan. Certain elements of the RFP are aimed particularly at the LDC's; e.g. fisheries, poultry, small animals, dairying, fruits and vegetables. It is too early to judge the effectiveness of this new program, but through it, the hope is to attract external capital and technical assistance to bolster food production in the region.

V. INTRA-REGIONAL MARKET

A. Introduction

This chapter contains a description of the intra-regional market structures followed by an analysis of demand in this region for specific commodities by country/territory market.

B. Intra-Regional Market Structure

1.0 General

The structure of the markets for small farmer commodities in the Eastern Caribbean is unique in several important respects. Perhaps the most outstanding feature is the prevalence of the huckster[1/] who is a private trader normally handling fresh produce and performing both, wholesale and retail functions. Another feature of the market in this area is the lack of a strong identifiable wholesale trade. Along with these elements, there are the statutory marketing bodies[2/] in most countries/territories; the function of these organisations may include some aspects of wholesaling, retailing, importing and exporting. The channels through which commodities are routed vary from item to item and even from place to place. Overall, there is still a prevalence of the small private operators in most places and fresh produce in particular, is generally sold on an ungraded basis. The local marketing structure for SFC varies somewhat from place to place in the LDCs. Discussion of similarities follow. The differences are more in terms of performance by the various elements than in the organizational pattern. Some of the principal features of the systems, as they relate to small farmer products, are outlined commencing in sub-section 2.0.

1.10 The Huckster

The small traders are mostly women and they are found in large numbers throughout the Caribbean. They are the foundation of the indigenous market system and serve as the outlet for most of the fresh produce in the area. Generally, the hucksters have a fixed location where they sell their products to the consumer. A table, umbrella, scale and sometimes a chair are often the extent of their equipment.

1/ *Also known as hawker or higgler depending upon the local terminology.*

2/ *Variously known as boards, corporations or marketing agencies.*

In some cases, however, the hucksters are itinerant and go from house to house selling their goods. Certain of these traders go to the farm and on occasion, they may buy produce in the field or on the tree. Others take delivery from growers at their home or selling point. Although most hucksters restrict their activities to their own localities, there are some who go much farther afield by engaging in inter-island trade 1/. One outstanding characteristic of this trade is the highly personal nature of such a large part of the dealing. The system has often been criticized as being outmoded and inefficient but it continues to be a very important part of the market structure for fruits, vegetables and root crops. A number of observers have concluded that the huckster is performing a useful service that has over time become firmly entrenched and will likely continue in the foreseeable future. Whether this traditional approach to the marketing of small farmer commodities is wasteful and costly to producer and consumer alike is a moot question.

1.20 Statutory Agencies

In most of the CARICOM countries/territories there is a marketing organisation that is operated or sponsored by the local government. Mostly, these agencies are known as boards or corporations and they perform a variety of functions ranging from buying, transporting and packing to operation of retail markets and engaging in both import and export trade. One reason for organising these agencies has been the failure of the huckster system to cope with periodic surplus situations; another has been a belief that farmers in particular, would benefit through having a public agency involved in marketing, especially in handling exports. These agencies have had a varied experience; a few have been solvent without continuing subsidization but more have had serious financial difficulties. In some cases, the agency has a monopoly position on importing or exporting certain products and this has been helpful from the financial standpoint. Several of these organisations operate retail stores but in no case have they been able to dominate the local produce trade or become more than moderately important as general retailers. One of the most difficult problems faced by the public agencies has been the difficulty of withstanding pressure to buy all produce offered frequently at unrealistic prices; more than any other single cause, this has been the reason for failure. Other reasons for a poor showing include faulty management, inadequate funding and poor facilities. In varying degree, the statutory agencies are involved in the exporting of SFC products within the Caribbean region and to external markets, especially the U.K. In some locations they also function as wholesalers.

1/ *Hucksters involved in intra-regional trade are sometimes called "traffickers"*

1.30 Wholesalers

In the conventional sense, the wholesale trade in small farmer commodities is very limited in the Caribbean; this is particularly true in the produce trade where the hucksters are predominant. In most market centers the only firms functioning as wholesalers are the limited numbers,including statutory agencies, who handle imported products such as meat, eggs and some fresh produce; there are more wholesalers or agents involved where processed goods are handled. Hucksters buying directly from growers have undoubtedly slowed development of the wholesaler link in the produce marketing system. Where there is ready access to the growers, the tendency continues to be to go directly to the source. Wholesalers who handle highly perishable products, especially chilled or frozen goods, have access to cold storage in their own or public facilities; they also have space for dry storage when needed. So far as the SFC commodities are concerned, the wholesalers (hucksters excepted) in the Caribbean LDCs do not play a significant role as exporters. A number of wholesalers/importers are also involved in retailing through affiliation with supermarkets in particular. Some observers believe that the wholesaling function may become more important in the region at such time as retailers and consumers demand a higher quality, graded product.

1.40 Retailers

At the retail level, the huckster is dominant so far as fruits, vegetables and root crops are concerned. Aside from this channel, SFC products such as poultry, pork, eggs and produce as well are sold by the growing number of supermarkets and the myriad small private retail stores throughout the islands. As was noted above, in some cases the statutory agencies are engaging in retail trade although not yet on a broad front. Hucksters number in the hundreds in most countries/territories,and so far as fresh produce is concerned, it is generally conceded that the hucksters offer products that are equal to or better than those available through most other retail channels. This may be the direct result of the personal involvement of the huckster in sorting and roughly grading the things she sells. Supermarkets range greatly in size and facilities; a limited number are large, well equipped units serving urban centers but more are actually medium size, family-type stores that call themselves "supermarkets". Even the mini-supermarkets normally have some refrigeration but usually offer little fresh produce; the emphasis is on the dry, staple groceries and processed foods. This is also true of the numerous country and neighborhood stores except that frozen goods are very limited in most of these places.

2.0 Antigua

2.1 Marketing Structure

Hucksters are a dominant influence in the produce trade of Antigua. These traders handle both domestically produced commodities and those brought in from neighbouring islands via the inter-island schooners, especially those from Dominica and Montserrat. Imports of produce also originate in extra-regional areas such as the U.S.A., including Puerto Rico. In the case of the extra-regional supplies, however, dealers other than the hucksters are generally involved. There are two firms that import produce from extra-regional sources; they serve as wholesalers and supply mostly the super-market and hotel trade.

Supermarkets handle the green vegetables but leave the root crops and most fruits to be retailed by the hucksters. Trade in small farm commodities is generally unrestricted although the Central Marketing Corporation has authority to implement controls. Despite Antigua's membership in the AMP, the import policy on affected products has been largely unrestricted. Commodities other than fresh fruits, vegetables and root crops are usually handled primarily by dealers other than hucksters. There is a public market in Antigua for buyers and sellers who congregate near the pier where the schooners off-load. At this location the hucksters from other islands trade with the local vendors who operate stalls in the market; there are some 50 to 60 such dealers who are important. The hucksters from other areas also retail some produce.

2.2 Statutory Agency

The Central Marketing Corporation is the Antigua statutory marketing agency; it is organised along the same lines as those in other LDCs. The CMC buys produce from local farmers but has made no effort to contract with them to grow specific crops or particular quantities. It is reported that many growers consider the Corporation as a buyer only when it is a last resort; thus the CMC has difficulty obtaining supplies during periods of shortage. A retail produce outlet and a supermarket as well are operated by the CMC. The policy here is to hold prices at a reasonable level for the consumers while at the same time offering a fair price to the farmers.

2.3 Other Marketing Entities

Aside from the CMC and the private supermarkets, there are two major firms that

have a leading role in the sale and distribution of agricultural products. One is INTRADE which averages one trailer per week of potatoes, onions, cabbage, carrots, etc. from Puerto Rico. The other company is ALL WATERS which operates on a smaller scale by bringing in about one plane-load of produce per week. Both have refrigeration facilities and their sales are largely to supermarkets and the hotel trade.

3.0 Belize

3.1 Marketing Structure

Belize has a relatively well organized structure for the domestic marketing of fresh fruits, vegetables,root crops and grains. The wholesale of fresh fruits, vegetables and root crops is dominated by four importers, based in Belize City, who also handle domestic produce. The purchase, domestic sale and export of corn, red kidney beans and paddy rice are controlled by the Belize Marketing Board which buys from farmers at guaranteed prices set by the Cabinet. There is one large mechanized producer of rice for export sale after domestic needs have been determined by the Government to be filled. Citrus production is principally exported in the form of concentrate by processors. A small percent is retained for domestic fresh consumption in the production area and in the form of juice in Belize City.

The production and marketing of small animals with the exception of swine is reported to be insignificant. The wholesale marketing of swine is not organised. A reportedly adverse relationship between swine production costs and the pork sales prices permitted by the Government is understood to have restricted swine production to efficient Mennonite farming communities and the Milpa farmers who sell principally direct to consumers and small shops. There is reported to be overland export sales of live animals but the channel for this trade is not defined. There are approximately one dozen importers of processed foods. Three of these firms, including a supermarket based in Belize City, dominate the trade.

Eighty percent (80%) of the retail trade in fruits, vegetables and root crops in Belize City is conducted through the public Central Market by small merchants who purchase both from wholesalers and directly from small farmers. The balance of national consumption is sold through 5 supermarkets, 4 of which are located in Belize City and I in Belmopan, three other significant retail outlets in Belize City and Orange Walk, and a myriad of very small shops.

A farmer's market is under construction in Belize City. It was originally intended to provide stalls, and possibly storage for direct sales by small farmers to consumers. It is also being considered as a possible replacement for the existing Central Market. However, the actual future scope of operation and its control is not clear at this time.

3.2 Dominant Marketing Entities

a) Import & Wholesale - Fresh Fruits, Vegetables, Root Crops

Anselmo Mai (and Sons)	- Abt. 30% Market share other than onions. established about 3 years. Scope - National
William Urbino	- Abt. 30% of Market other than onions. established over 7 years. Scope - Belize City.
Antonio Para	- Abt. 30% of market other than onions. Long established. Scope - Belize City, Corazal.
Megil Espat	- Dominates onion imports nationally. Well established.

b) Domestic Wholesale - Corn, Red Kidney Beans, Paddy Rice.

Belize Marketing Board.

c) Import Processed Foods

Brodies, Castillo, Ismael Gomes — Est. 90% of market.

d) Retail

Brodies	-	Super Market - Belize City
Betos	-	" " " "
Romac	-	" " " "
Sav-U	-	" " " "
Chito Mai	-	Significant Retailer - Belize City, Orange Walk
Para	-	" " - " " Corazal
Mossiah	-	" " - Belize City.

4.0 Dominica

4.1 Marketing Structure

Dominica has a wide distribution of farms in the 1 - 10 acre range and, as a consequence, there is a substantial output of produce for home use and for off-farm sale. There is a heavy concentration of population in Roseau with a large number of small country villages throughout the island. For the most part, Dominica is largely self-sufficient in fruits, vegetables and root crops, so imports are very limited; in fact the opposite is true - it is exports that are important. Hucksters, many of them farmers' wives, generally conduct market on Fridays and Saturdays when 100/200 will appear in the public markets of Roseau and Portsmouth. It is on these days that the urban housewives are accustomed to buying for the upcoming week. A number of hucksters operate from Dominica in the inter-island trade and thus provide an outlet for some of the island's produce. There is very little trade in fruits, vegetables and root crops indigenous to Dominica in the supermarkets or shops; only the limited imports such as white potatoes and dry onions would normally be handled.

4.2 Statutory Agency

The Dominica Agricultural Marketing Board is the public agency that was set up to buy and sell the small farmer products. Although the DAMB operates a small retail shop, the more important activity is operation of the Roseau Public Market. The board buys produce from the farmer at its country depots and in Roseau; it then retails or exports the products. Through its retail market, the DAMB attempts to monitor and influence prices but its influence is limited because it does not control a significant part of the local retail trade.

4.3 Other Marketing Entities

Dominica exports considerable amounts of citrus products in particular; other produce including fruits and root crops also move to both intra- and extra-regional markets. There is a juicing plant operating on Dominica through which relatively large quantities of lime and grapefruit are processed. The DAMB, along with a local citrus growers association, has been actively involved in the exporting of especially fresh citrus. The juicing plant is owned and operated by L. Rose & Co., which is a private, commercial firm. In addition to the citrus growers association in Dominica, there is also an active association made up of banana growers; both groups participate in planning and executing the marketing program for their products.

5.0 Grenada

5.1 Marketing Structure

Both domestic and export trade in SFC is completely dominated by the hucksters. The only exceptions are bananas, spices and cocoa where active growers associations are participating in the marketing. Hucksters operate in the St.George's central public market, especially on Fridays and Saturdays, which are the days when most buyers appear. Other hucksters are involved in the sale of fruits in particular to Trinidad. These dealers go to the farms to buy and also receive produce in the towns. Many hucksters in the local market are farmers' wives who come to town to retail their products. Supermarkets and grocers are not an important element in the local produce trade; they are important where imported goods are concerned. Several produce growers are themselves supplying the hotel/restaurant trade in St. George's.

5.2 Statutory Agency

The Grenada Marketing Board was established in 1973, but is not yet operational. Plans have been developed for construction of facilities at St.George's and outside financial assistance is being sought to underwrite the project. At such time as the GMB does reach the stage of actively participating in the marketing of produce, the intent is to emphasize import substitution in Grenada itself and to export graded products aimed especially at the supermarket and hotel trade in Trinidad. There appears to be no serious intention of displacing the hucksters but only to provide a supplementary, stabilizing influence in the market.

5.3 Other Marketing Entities

A former organization, the Grenada Farmers' Cooperative, is said to have provided an effective marketing service for a number of local associations. It handled food crops, mainly tomatoes, yams, plantains, sweet potatoes and dasheen for domestic use by Government institutions and for sale to local market vendors. The Grenada-based hucksters who handle the export trade with Trinidad mainly, are firmly established in this trade; locally they are known as traffickers. They personally or in collaboration with friends and relatives oversee the buying and selling at both origin and destination. Normally, these dealers will take fresh produce to Trinidad and return with all manner of merchandise on the trip back.

In the absence of a more effective arrangement, some 10/15 medium-size producers

are supplying produce to hotels/restaurants on a semi-organised basis. Most of these people are part-time farmers and they do not have firm contracts with their buyers. This action reflects the absence of dealers who would normally perform the wholesaling function.

Although supermarkets and grocers play a small part in the fruit and vegetable trade, there is now a cooperative green grocery (Home Industries) operating in Grenada that has become a popular outlet for farm produce with sales of 5/10,000 lbs. per week. This type of outlet may have potential for other areas.

Grenada has a minimum of restrictions on the activities of hucksters and others engaging in the produce trade. The extent of formalities is usually an export licence which poses no problem.

Growers of specialty crops have their own trade organisation in Grenada; there are associations made up of banana, nutmeg/mace and cocoa growers, respectively. These groups have an important function in the export marketing of these products.

6.0 Montserrat

6.1 Marketing Structure

The public market located in Plymouth is the center of produce marketing activities in Montserrat. The island is largely self-sufficient in fruits, vegetables and root crops; it has been able to export some items such as tomatoes, peppers and white potatoes to other intra-regional markets. Cotton is the main export. The local market is dominated by the hucksters and there are no full-line supermarkets in the territory; even locally produced meats are handled by market vendors. In the mid-1970's Montserrat embarked on a programme to produce Irish potatoes for export, but this effort has failed, largely because production and marketing costs proved to be too high. Emphasis has since been shifted toward self-sufficiency in crops and livestock and to growing selected produce for export within the region, such as tomatoes, carrots, hot peppers, onions, etc. Attention is also being directed toward the less perishable crops such as pumpkins and ginger for the extra-regional market. Among the other SFC items, Montserrat has been heavily dependent on imports of livestock and poultry products, some of which are handled by the marketing agency. Limited quantities of vegetables are also imported, mainly to supply the hotel trade.

6.2 Statutory Agency

The Development Finance and Marketing Corporation was set up in 1973 to provide credit, input and output marketing services and assistance to small industry. Operating results have been mixed, the DFMC has done better financially on certain imports such as poultry and rice, than it has on some of the inputs, including fertilizer, seeds and chemicals. The Corporation buys produce from the local farmers and then sells the products for both local use and export. Technically, all marketing arrangements are subject to administration by the DFMC, but as has been noted, the hucksters control the public market for most produce.

6.3 Other Marketing Entities

Except for the hucksters and DFMC, there are no significant commercial dealers in small farm commodities. Aside from the Corporation, there is one major importer operating in the island; this is Michael King, a private dealer.

It is of interest that schooner trade between Montserrat and neighbouring islands has tended to decline following introduction of the Port Authority with higher harbour fees.

7.0 St.Kitts-Nevis

7.1 Marketing Structure

Sugar is the main crop on St. Kitts and cotton has been dominant on Nevis. Because of the tendency to concentrate the agricultural effort on these particular crops, the small farming sector of these islands has never been significant and the production of SFC has not developed. At present, St. Kitts imports fresh produce from Dominica and Montserrat in particular. Recently, following establishment of the National Agricultural Corporation to take over the sugar industry, there has been a growing emphasis on the production of foods for local consumption with self-sufficiency in mind. Some of the NACO lands are now being used to grow food crops and at the same time make better use of the work force. The output of these lands is sold directly to consumers and through the marketing agency, the Central Marketing Corporation.

Hucksters from Dominica and Montserrat operate extensively in St. Kitts. At times, St. Kitts will restrict imports in order to protect local producers; however, this does not happen frequently. The hucksters from other islands sell to local vendors and also deal directly with consumers at times; they also supply some produce to the CMC, mainly bananas and grapefruit.

Supermarkets and grocers are not involved extensively in the produce trade; they do handle other SFC such as meat and eggs.

7.2 Statutory Agency

The Central Marketing Corporation operates a retail outlet in the principal town of Basseterre. The CMC's activities have not yet reached out to the entire territory and to date the influence on SFC has been only moderate. Recent changes in management and operating policy may have a beneficial effect. To the extent that the NACO programme on food crops is successful, there is an obvious need for close coordination between that organisation and CMC. At present, the Corporation is receiving only a part of the NACO output; perhaps about 20%. Small farmers are the other source of produce being sold by the CMC.

7.3 Other Marketing Entities

Although currently not an important element in the produce trade, the St. Kitts supermarkets have expressed interest in this trade. What they would like to do is arrange for regular shipments from Puerto Rico; however, import licences are

not available for supplies from this source. The objection to reliance on CARICOM sources is based mainly on irregularity of supply and indifferent quality.

On the export side, St. Kitts on occasion sells a few fresh products to such places as St. Maarten and the Virgin Islands; some livestock (sheep and goats) is also exported to nearby islands.

8.0 St. Lucia

8.1 Marketing Structure

The domestic market for fruits, vegetables and root crops, as well as other local products, is dominated by the vendors who operate in the public market. It is estimated that some 250 or more vendors account for perhaps 90% of the domestic sales of local produce. The main market days are Friday and Saturday but the market is open daily.

Supermarkets and grocers have played a minor role in the sale of fresh produce, although they dominate the trade in the processed and frozen foods that are imported. Of late, these retail outlets have been showing more interest in handling local products. This shift in attitude may be a reflection of action by the local government to promote self-sufficiency in selected foods.

There are two especially active growers' associations operating in St. Lucia; one is the Banana Growers' Association and the other is the Agriculturists' Association. The banana growers are a part of the WINBAN organisation and, in common with similar organisations in Grenada, Dominica and St. Vincent, they perform both marketing and purchasing functions. Originally, the agriculturists concentrated on cocoa marketing, but now they have become more important as a handler of farm supplies; this association has some 1,200 members and is financially solvent. There is a third grower organisation on St. Lucia; this is the Coconut Growers' Association which is concerned with the production and marketing affairs of these producers.

8.2 Statutory Agency

The St.Lucia Marketing Board, which is located in close proximity to the public market, operates a retail section in which some types of local produce are available to the general public. The purpose of this activity is to influence the price level on products handled but the extent of such influence is not certain because the volume of sales averaged only EC$150,000 from 1973 to 1975. The Board has also engaged extensively in the exporting of produce, particularly to the U.K. Recently, mango and breadfruit have been shipped by air; most other products go by the Geest steamships. Another activity of the Board is the importation of fresh produce from the U.S.A. for sale primarily to the hotel and restaurant trade. Plans are being formulated for expansion of the facilities in Castries; an entirely new physical plant is contemplated.

8.3 Other Marketing Entities

St. Lucia is definitely oriented to the exporting of SFC produce to the extra-regional market with the intra-regional movement much less important. There are a limited number of relatively large producers who are not small farmers but who are successfully marketing fresh produce in overseas markets. There is also Geest Industries who handle a large part of the St. Lucia exports. Hucksters engage in the schooner trade with nearby islands.

A new development in St. Lucia is a processing plant for fruits which is to be operated by a private firm. The company will grow some of the products it will process on lands it controls but is expected to provide a market for small independent growers as well. This plant may reduce somewhat the need for imported fruit products and also provide another export item.

A factory for making cartons in which bananas and other produce are exported is located on St.Lucia. This tends to facilitate the marketing of these products.

9.0 St. Vincent

9.1 Marketing Structure

The public market in Kingstown is the most important outlet for local produce. It is here that the vendors congregate and sell the bulk of the fruits, vegetables, etc. that are marketed domestically. This is a daily market but the greatest activity occurs on Friday and Saturday. The hucksters buy produce from farmers in the countryside as well as in town; much of this produce moves by bus or small pick-up truck. Supermarkets, except for the one operated by the marketing agency, and grocers are not important outlets for fresh produce. These merchants generally have a relatively small chill space for produce; mostly they concentrate on packaged or frozen goods from overseas sources.

Along with the Marketing Corporation, there are some 30/40 principal hucksters who are involved in the export trade with other islands, especially Trinidad and Barbados. Hucksters are required to obtain licences from the Corporation for AMP commodities; at times licences may be refused for such items as sweet potatoes and carrots. There is said to be little control of shipments of non-AMP items. There is regular schooner service from St.Vincent to other islands.

9.2 Statutory Agency

The St.Vincent Marketing Corporation (formerly Board) is among the more successful operations of its kind in the CARICOM region. It operates a retail supermarket in Kingstown as well as four satellite packing plants in the outlying areas; this is in addition to the substantial headquarters' facilities in Kingstown. The local sales, mostly through the supermarket, are a minor part of the activities; being completely overshadowed by the export trade. St. Vincent is unique in that it has consistently made substantial shipments of sweet potatoes and carrots in particular, under the AMP with Trinidad as the major outlet. Generally, these sales are routed through the counterpart marketing agency in Trinidad. The Corporation has also shipped considerable amounts of especially coconuts and root crops, including ginger, to the U.K. market via the Geest Industries. In an effort to coordinate supply with indicated outlets, the SVMC is planning to contract with growers for needed supplies; this move results in part from a glut of sweet potatoes and carrots in the mid-1970's. On the import side, the Corporation benefits substantially from its position as the sole receiver of certain products; e.g. rice and sugar.

9.3 Other Marketing Entities

Growers of special crops have their own trade associations which are variously involved in production and marketing. These are the Banana Growers' Association and the Cooperative Arrowroot Association which have been actively involved in arranging for the marketing of these particular products.

A new plant for the manufacture of corrugated fibre cartons is being constructed on St. Vincent. When this factory is in operation, the packaging of produce for export should be simplified and hopefully, less expensive. At present, many of the root crops exported to the U.K. are shipped in wire bound crates that are brought in from the U.S.A. at considerable expense.

Though not especially important as produce outlets, the following supermarkets/grocers do handle varying types and quantities of small farmer commodities:

Corea & Co. Ltd.
McConnie Yammie & Co. Ltd.
Bonadies Supermarket (2 stores)
W.J. Abbott & Co.
St. Vincent Marketing Corporation

In addition to the SVMC and Geest Industries, there are two other exporters who ship regularly to extra-regional markets; they are Mr. Noel Baynes and Messrs. L. Gansam & Son. Mangoes, ginger, tannias, coconuts, pumpkins and yams are the major products handled by these private shippers.

C. Market Demand Analysis

1.0 Estimated Intra-Regional Market

1.10 Introduction and Methodology

This report section covers the analysis and projections of the total market for "small farmer" type food commodities and major competitive foods, and the estimated market potential for the export of those commodities within the region by the Caribbean LDC's through 1987. The total market estimates include "raw" simply processed and preserved commodities in terms of the weight of the "raw" materials. The purpose of the analysis is to enable forecasts of potential intra-regional trade flows based on comparison of effective market demand and potential LDC supply. The annual demand estimates arrived at in this report section are compared, for this purpose, with potential LDC supply surpluses and deficits on a seasonal basis.

The methodology utilized in arriving at first level demand estimates is the multiplication of per capita annual consumption of individual commodities in each market by the population of those States in 1977. Market growth is projected based on the twin determinants of forecast population and per capita income growth. Specific demand growth rates by commodity group and individual country/territory are arrived at by adding the product of the commodities' income elasticity and forecast per capita income growth rate to the population growth rate. The primary data base used to establish levels of per capita food consumption is the Provisional Food Balance Sheets[1/] recently published by the FAO for most countries of the world, including all of the Caribbean except St. Kitts/Nevis, Montserrat and the U.S. territories (Puerto Rico and the Virgin Islands) and the British Virgin Islands.

Statistical data on net food consumption and its determinants of agricultural production and disposition, and trade in the Caribbean - particularly in the LDC's - is frequently deficient not only in its availability, but also in its quality.

The balance sheets provide a useful and relatively reliable base for estimates since cross checks are built into their preparation. Individual country/territory per capita food consumption levels and patterns can be cross compared by area, and related to

1/ *Provisional Food Balance Sheets, FAO, Rome 1977.*

the apparent state of health and income of the general population. Per Capita consumption rates, based on a 1972-4 average, are provided in detail in those sheets. The consumption rates are net food intake after deductions from net supply for seed, feed, stock changes, and loss through waste or shrinking in processing. The consumption rates for the base year estimates were cross checked against information on LDC production and trade obtained in the course of the study and adjusted where appropriate. St. Kitts/Nevis and Montserrat estimates were derived from area averages and the results of field survey and statistical comparisons.

Population estimates for 1977 are based principally on World Bank source figures for 1975 and 1976, adjusted for Grenada and St. Vincent to reflect the results of intensive analysis by the U.N. of the population of those countries. Estimates for Puerto Rico and the Virgin Islands are based on information originating from these territories. The growth rates used for projection purposes are principally a projection of the trend from 1970 through 1976. In the case of the U.S. Virgin Islands a much lower growth is forecast than in the past due to recent pressure to slow immigration.

Estimation of future per capita income growth for most of the markets studied are based on evaluation of the relative growth rates reported by the World Bank and National statistics for those states for the periods 1960 - 1975 and 1970 - 75. In some cases 1976 data was available. This evaluation took into account future probable improvement in Caribbean tourism in the late 1970's and 1980's, and the current economic difficulties with which Jamaica and Guyana are involved. In the case of the LDC's no precise data as to specific income levels are available. Country documents have been examined as well as current undistributed reports by the World Bank, and U.N. and CDB documents. The matter was also discussed with CDB officials. From this investigation, it is clear that income levels in the LDC's have changed only marginally in recent years with the possible exceptions of St. Lucia having moderate growth, and Grenada apparently having a clear negative trend. On balance, it is judged appropriate to estimate positive, though very moderate, future per capita growth for all the LDC's based on potential increased tourism, continued flow of remittance income from their expatriates, continued foreign aid, and potential benefits from probable investments to increase agricultural output. In any case, it should be noted that the sensitivity of future food demand to error in per capita income growth estimates at the level used is very low. Two percentage points plus or minus in the estimates are considered a probable maximum range of error in the per capita income growth estimates. As can be seen from a subsequent table outlining the impact of income elasticity on growth in specific commodity demand, the maximum error on the resultant 10 year demand projections would be 11% for eggs, 8% for poultry,

TABLE V C - 1.01

Estimated 1977 Intra-Regional Population and Future Growth Rates in Population and Per Capita Income

State	1977 Population Thousands	Estimated Annual Rates of Growth 1976 - 1987	
		Population	Per Capita Income
CARICOM			
Antigua	72.4	1.33	1.0
Barbados	249.4	0.70	2.5
Belize	149.4	3.30	2.0
Dominica	78.9	1.89	1.0
Grenada	10..6	1.59	0.5
Guyana	799.5	1.90	1.0
Jamaica	2,116.2	1.80	2.0
Montserrat	12.3	1.05	1.0
St.Kitts/Nevis	49.5	0.88	1.0
St.Lucia	113.8	2.02	1.5
St.Vincent	102.0	1.96	1.0
Trinidad/Tobago	1,105.9	1.10	2.5
Other Caribbean			
Fr. Guiana	59.4	3.00	4.0
Guadeloupe	328.2	0.50	2.0
Martinique	326.4	0.20	5.5
Neth. Antilles	250.3	1.70	0.5
Puerto Rico	3,299.8	2.70	3.0
Surinam	366.6	0.20	2.5
Venezuela	12,748.1	3.10	2.0
Virgin Is. (US)	111.3	4.0	3.0
Virgin Is. (UK)	11.0	2.0	1.5

Sources: World Bank Undistributed Study of ECCM - 1978; World Bank Atlas - Population, Per Capita Product & Growth Rates; Demographic and Economic Trends and Projections for the East Caribbean States - UNDP Draft Report - Dec. 1976; Commonwealth of Puerto Rico Planning Unit; US Virgin Islands Dept. of Health Vital Statistics.

TABLE V C - 1.02

Impact of Per Capita Income Growth on Growth in Demand for Selected Fresh & Processed Commodities

R/g Per Capita Income	Increment to Annual Rate of Growth in Demand in Per Cent.										
	Wheat	Rice	Pulses	Fruit	Veg.	Roots	Beef	Sheep/ Goat Meat	Pork	Poultry	Eggs
0.5	0.08	0.07	0.05	0.07	0.11	0.04	0.16	0.09	0.05	0.21	0.27
1.0	0.16	0.13	0.10	0.13	0.21	0.07	0.31	0.18	0.10	0.41	0.53
1.5	0.24	0.20	0.15	0.20	0.32	0.11	0.47	0.27	0.15	0.62	0.80
2.0	0.32	0.26	0.20	0.26	0.42	0.14	0.62	0.36	0.21	0.82	1.06
2.5	0.40	0.33	0.25	0.33	0.53	0.18	0.78	0.45	0.25	1.03	1.33
3.0	0.48	0.39	0.30	0.39	0.63	0.21	0.93	0.54	0.30	1.23	1.59
4.0	0.64	0.52	0.40	0.52	0.84	0.28	1.24	0.72	0.40	1.64	2.12
5.5	0.88	0.72	0.55	0.72	1.16	0.39	1.71	0.99	0.55	2.26	2.92

Source: Elasticity of Demand for Caribbean Countries - Agricultural Commodity Projections 1975-1985 F.A.O. 1967, Table V C - 1.01

and for other commodities the maximum error would range from 1% to 6%. The elasticities of demand for specific commodities used in the calculations are those reported for the Caribbean by the FAO 1/ in its projections.

The demand projections are based on the historical precedence that on average per capita food consumption patterns over the long term change gradually; and thus do not take into account unpredictable future abnormal abrupt shifts in demand such as those which might be created by changes in national policies towards imports.

The estimated market potential for CARICOM LDC's for the export of "small farmer" types commodities is determined based on evaluation of the factors limiting their competitive access to country/territory markets. The final step is to identify those commodities imported in significant quantities which they can produce or for which they can supply a competitive substitute. Next, significant country/territory markets are identified and future potential market penetration is estimated based on consideration of such qualifications as future possible market domestic supply, and policy towards self-sufficiency, and such factors as food substitution, marketing effectiveness, etc. This is discussed in further detail in sub-section 3.0.

1.20 Summary Estimated Intra-Regional Current Demand and Value

Table V C 1.03 following summarizes the estimated 1977 demand for and value of, the commodity groups covered in this study in the countries/territories making up the intra-regional market. As can be seen it includes demand estimates for some commodities that are not considered "small farmer" type and/or are not produced in the LDC's. They are included in the analysis as they represent competitive food consumption items and there may be some possibility for a degree of substitution by other products.

Fruits, root crops, wheat, rice and vegetables, in that order, account for the largest element of intra-regional food consumption in terms of physical quantity. Fruit is the largest single commodity consumed by far. Together with vegetables and root crops, they account for 60% of the intra-regional consumption of the major food commodities studied in terms of quantity and about 49% in value terms.

1/ *Agricultural Commodities - Projections 1975 and 1985 - FAO, 1967.*

TABLE VC - 1.03

Summary 1977 Est. Intra-Regional Demand
For Selected Food Commodities

Commodity	Thousand Metric Tons	Million EC Dollars
Wheat (mostly flour)	926	751
Rice (milled)	519	699
Pulses	144	194
Fruit (incl. processed)	2362	3823
Vegetables (incl. ")	509	689
Root Crops	1045	845
Beef	460	2111
Sheep/Goats (Meat)	23	68
Pork	164	664
Poultry (Meat)	259	699
Eggs	139	489

Source: Tables VC 1.05

The figures in Table VC 1.03 are consolidations of country/territory estimates shown in subsequent tables. Physical quantities represent net food consumption estimates based on averages taken after deducting for waste, seed, feed, processing and stock changes. They also include the material content in processed and preserved products in individual commodity categories. The value estimates were made solely to indicate relative orders of magnitude for comparative purposes on an overall basis. Country estimates are contained in the project work file. The estimates are based on average per ton figures for the region. The values indicated fall between the farmgate/export and import/retail levels. The estimating process is necessarily crude although adequate for the purpose intended. In most Caribbean States there is not a clear cut wholesale price, nor are accurate farm gate and retail prices readily available. Even the import/export prices have serious limitations as to local applicability. In this case, however, the intent of this comparison was not to differentiate among commodities from place to place.

1.30 Country/Territory Demand and Projections

Estimated compound annual rates of growth in the demand for food commodities by country/territory are shown in Table VC 1.04; and resultant tonnage demand estimates are shown in Table VC 1.05. The food demand growth rates were derived

TABLE V C - 1.04

Estimated Compound Annual Rates of Growth in Demand for Selected Commodities by Country/Territory 1977-87

Country/Territory	Percent										
	Wheat	Rice	Pulses	Fruit	Vegetables	Roots	Beef	Sheep/Goat Meat	Pork	Poultry	Eggs
CARICOM											
Antigua	1.49	1.46	1.43	1.46	1.54	1.40	1.64	1.51	1.43	1.74	1.86
Barbados	1.10	1.03	0.95	1.03	1.23	0.88	1.48	1.15	0.95	1.73	2.03
Belize	3.62	3.56	3.50	3.56	3.72	3.44	3.92	3.66	3.50	4.12	4.36
Dominica	2.05	2.02	1.99	2.02	2.10	1.96	2.20	2.07	1.99	2.30	2.42
Grenada	1.67	1.66	1.64	1.66	1.70	1.63	1.75	1.68	1.64	1.80	1.86
Guyana	2.06	2.03	2.00	2.03	2.11	1.97	2.21	2.08	2.00	2.31	2.43
Jamaica	2.12	2.06	2.00	2.06	2.22	1.94	2.42	2.16	2.00	2.62	2.86
Montserrat	1.21	1.18	1.15	1.18	1.26	1.12	1.36	1.23	1.15	1.46	1.58
St.Kitts/Nevis	1.04	1.01	0.98	1.01	1.09	0.95	1.19	1.06	0.98	1.29	1.41
St.Lucia	2.26	2.22	2.17	2.22	2.34	2.13	2.49	2.29	3.17	2.64	2.82
St.Vincent	2.12	2.09	2.06	2.09	2.17	2.03	2.27	2.14	2.06	2.37	2.49
Trinidad & Tobago	1.50	1.43	1.25	1.43	1.63	1 28	1.88	1.55	1.35	2.13	2.43
OTHER CARIBBEAN											
FR. GUIANA	3.64	3.52	3.40	3.52	3.84	3.28	4.24	3.72	3.40	4.64	5.12
Guadeloupe	0.82	0.76	0.70	0.76	0.92	0.64	1.12	0.86	0.70	1.32	1.56
Martinique	1.08	0.92	0.75	0.92	1.36	0.59	1.91	1.19	0.75	2.46	3.12
Netherland Antilles	1.78	1.77	1.75	1.77	1.81	1.74	1.86	1.79	1.75	1.91	1.97
Puerto Rico	3.18	3.09	3.00	3.09	3.33	2.91	3.63	3.24	3.00	3.93	4.29
Surinam	0.20	0.13	0.05	0.13	0.33	(0.03)	0.58	0.25	0.05	0.33	1.13
Venezuela	3.42	3.36	3.30	3.36	3.52	3.24	3.72	3.46	3.30	3.92	4.16
Virgin Islands (US)	4.48	4.39	4.30	4.39	4.63	4.21	4.93	4.54	4.30	5.23	5.59
Virgin Islands (UK)	2.24	2.20	2.15	2.20	2.32	2.11	2.47	2.27	2.15	2.62	2.80

Note: ( ) = Minus
Sources: Table VC 1.01, VC 1.02

Current and Projected Intra-Regional Demand[1/] for Selected Foods
(Raw, Processed and their Products in Tonnage of Raw Materials)

	Metric Tons[2/]								
	Wheat			Rice			Pulses		
Country/territory	1977	1982	1987	1977	1982	1987	1977	1982	1987
CARICOM									
Antigua	3,480	3,750	4,030	1,150	1,240	1,330	90	100	100
Barbados	13,650	14,420	15,230	6,040	6,360	6,690	2,120	2,220	2,330
Belize	6,860	8,190	9,790	4,810	5,730	6,820	1,420	1,690	2,000
Dominica	3,790	4,190	4,640	480	530	590	620	680	760
Grenada	5,940	6,450	7,010	1,120	1,216	1,320	750	810	880
Guyana	34,060	37,720	41,760	52,130	57,640	63,730	3,360	3,710	4,100
Jamaica	137,120	152,280	169,130	38,090	42,180	46,710	7,190	7,940	8,760
Montserrat	600	640	680	140	150	160	70	80	80
St. Kitts/Nevis	2,480	2,610	2,750	550	580	610	300	310	330
St. Lucia	6,140	6,870	7,680	940	1,050	1,170	220	250	270
St. Vincent	5,960	6,620	7,350	2,050	2,270	2,520	300	330	370
Trinidad & Tobago	80,850	87,100	93,830	35,390	37,990	40,790	12,170	13,010	13,920
OTHER CARIBBEAN									
FR. Guiana	1,860	2,220	2,660	5,640	6,710	7,970	180	210	250
Guadeloupe	21,900	22,810	23,760	10,640	11,050	11,480	2,100	2,170	2,250
Martinique	22,250	23,480	24,770	3,070	3,210	3,360	1,700	1,770	1,830
Netherland Antilles	10,440	11,400	12,450	6,560	7,160	7,820	580	630	690
Puerto Rico	93,210	109,000	127,470	155,450	181,000	210,740	34,220	39,670	45,990
Surinam	11,470	11,590	11,700	34,820	35,050	35,280	1,140	1,140	1,150
Venezuela	460,280	544,560	644,270	154,280	182,000	214,700	73,950	86,980	102,320
Virgin Islands (US)	3,220	4,010	4,990	5,370	6,660	8,250	1,180	1,460	1,800
Virgin Islands (UK)	400	440	490	240	270	300	80	90	100

1/ Net after deductions for waste, seed, stock changes, feed, etc.
2/ Rounded to nearest ten

Country/territory	Metric Tons								
	Fruit			Vegetables			Root Crops		
	1977	1982	1987	1977	1982	1987	1977	1982	1987
CARICOM									
Antigua	7,570	8,140	8,750	1,120	1,210	1,300	770	830	880
Barbados	7,980	8,400	8,840	6,610	7,030	7,470	25,340	26,470	27,660
Belize	8,930	10,640	12,670	2,730	3,280	3,930	13,740	16,270	19,270
Dominica	10,710	11,840	13,080	1,080	1,200	1,330	8,400	9,260	10,200
Grenada	5,930	6,440	6,990	1,420	1,540	1,680	5,280	5,720	6,210
Guyana	40,220	44,470	49,170	9,990	11,090	12,310	27,100	29,880	32,940
Jamaica	235,930	261,250	289,290	64,960	72,500	80,910	192,550	211,970	233,340
Montserrat	1,710	1,800	1,890	170	180	190	1,107	1,160	1,220
St. Kitts/nevis	6,880	7,240	7,610	690	730	770	4,460	4,670	4,900
St. Lucia	19,510	21,770	24,300	1,230	1,380	1,550	9,930	11,030	12,260
St. Vincent	17,260	19,140	21,230	390	430	480	6,120	6,770	7,480
Trinidad & Tobago	59,500	63,880	68,580	34,290	37,180	40,310	36,280	38,660	41,200
OTHER CARIBBEAN									
Fr. Guiana	2,500	2,970	3,530	960	1,160	1,400	690	810	950
Guadeloupe	29,910	31,060	32,260	26,560	27,800	29,110	34,500	35,620	36,770
Martinique	32,530	34,050	35,650	31,230	33,410	35,750	25,060	25,810	26,580
Netherland Antilles	15,620	17,050	18,620	6,980	7,630	8,350	7,910	8,620	9,400
Puerto Rico	155,450	181,000	210,740	119,930	141,270	166,420	149,590	172,660	199,290
Surinam	15,470	15,570	15,670	5,940	6,040	6,140	4,250	4,240	4,240
Venezuela	1,677,900	1,979,380	2,335,020	181,050	215,240	255,880	483,230	566,750	664,710
Virgin Islands (US)	5,370	6,660	8,250	4,150	5,200	6,530	5,170	6,350	7,810
Virgin Islands (UK)	530	590	660	410	460	510	350	390	430

Country/territory	Beef			Sheep/Goat Meat			Pork		
	1977	1982	1987	1977	1982	1987	1977	1982	1987
	Metric Tons								
CARICOM									
Antigua	580	630	680	100	110	120	410	440	470
Barbados	3,940	4,240	4,560	1,250	1,320	1,400	4,910	5,150	5,400
Belize	1,450	1,760	2,130	30	40	40	1,000	1,190	1,410
Dominica	350	390	440	80	90	100	630	700	770
Grenada	440	480	520	20	20	20	640	690	750
Guyana	6,400	7,140	7,960	640	710	790	1,680	1,850	2,050
Jamaica	22,430	25,280	28,490	4,230	4,710	5,240	8,680	9,580	10,580
Montserrat	80	90	90	10	10	10	90	100	100
St. Kitts/Nevis	320	340	360	60	60	70	350	360	390
St. Lucia	1,010	1,140	1,290	310	350	390	1,290	1,510	1,760
St. Vincent	540	600	680	60	70	70	410	450	500
Trinidad & Tobago	5,860	6,430	7,060	1,220	1,320	1,420	5,200	5,560	5,950
OTHER CARIBBEAN									
Fr. Guiana	390	480	590	10	10	10	170	200	240
Guadeloupe	5,780	6,110	6,460	430	450	470	2,360	2,440	2,530
Martinique	6,660	7,320	8,050	520	550	590	2,810	2,920	3,030
Netherland Antilles	4,810	5,270	5,780	330	360	390	5,280	5,760	6,280
Puerto Rico	64,200	76,730	91,700	2,930	3,440	4,030	57,720	66,910	77,570
Surinam	2,380	2,450	2,520	70	70	70	1,030	1,030	1,040
Venezuela	330,230	396,400	457,820	10,200	12,090	14,330	67,580	79,490	93,500
Virgin Islands (US)	2,220	2,820	3,590	100	120	160	1,990	2,460	3,030
Virgin Islands (UK)	220	250	280	30	30	40	200	220	250

Country/territory	Metric Tons: Poultry 1977	Poultry 1982	Poultry 1987	Eggs 1977	Eggs 1982	Eggs 1987
CARICOM						
Antigua	810	880	960	230	250	280
Barbados	3,390	3,690	4,020	970	1,070	1,190
Belize	1,480	1,810	2,220	510	630	780
Dominica	880	990	1,100	200	230	250
Grenada	910	990	1,090	530	580	640
Guyana	9,110	10,210	11,450	3,600	4,060	4,580
Jamaica	29,410	33,470	38,090	11,000	12,670	14,580
Montserrat	140	150	160	40	40	50
St. Kitts/Nevis	560	600	640	150	160	170
St. ia	1,240	1,410	1,610	400	460	530
St. Vincent	860	970	1,090	390	440	500
Trinidad & Tobago	16,810	18,680	20,750	5,200	5,860	6,610
OTHER CARIBBEAN						
Fr. Giuana	790	990	1,240	250	320	410
Guadeloupe	2,560	2,730	2,920	490	530	570
Martinique	3,490	4,670	6,250	560	650	760
Netherland Antilles	3,530	3,830	4,270	600	660	730
Puerto Rico	48,890	59,280	71,880	28,840	35,580	43,900
Surinam	4,870	5,080	5,290	1,540	1,630	1,720
Venezuela	127,500	154,530	187,280	82,880	101,610	124,580
Virgin Islands (US)	1,690	2,180	2,810	1,000	1,310	1,720
Virgin Islands (UK)	170	190	220	60	70	80

[redacted] Provisional Food Balances - FAO 1977; Country Statistical Reports; Berger Estimates; Tables VC 1.01, VC 1.04

from population and per capita income growth as outlined previously in this report section.

As detailed in the tables, there are distinct differences in the forecast rates of growth in demand among country/territories and among commodities. The six countries/territories showing the lowest overall growth in demand for the commodities covered are Barbados, Montserrat, St. Kitts/Nevis, Guadeloupe, Martinique and Surinam. The six countries/territories with the highest demand growth rates are Puerto Rico, the U.S. Virgin Islands, Belize, French Guiana and Venezuela. Demand growth for the other nine states over the 10 year period is forecast to be in the range of 16% to 34% for most commodities.

As might be expected, eggs and most meats have higher growth rates than the other commodities. In most of the countries/territories the forecast growth over the period for fruits, vegetables, pulses and root crops is in the 10 to 35% range.

The projections of demand represent total market estimates including not only "raw" but simply processed and preserved foods. Estimation of the proportion of that demand which is or might be supplied by imports is the first step to estimating LDC export potential. This is done in subsequent report sections.

2.0 Proportion and Source of Imports

The proportion of demand for each of the commodities studied which is supplied by imports in the region is shown in Table VC 2.01. Three commodities, wheat, rice and pulses show the highest proportion of imports. Wheat is virtually 100% imported. Rice is also with the exception of Guyana (the major regional supplier), Belize, Trinidad and Venezuela. Imported pulses account for the bulk of such consumption except for Antigua, Belize, Dominica, Grenada and Jamaica.

Meats also show a relatively high proportion of demand to be supplied by imports. At least 50% of the States in the region obtain the bulk of their supply from imports. The demand for eggs, on the other hand, is principally supplied by domestic production except in the case of Antigua, Guadeloupe and the Virgin Islands.

Fruits, vegetables and root crops generally reflect lower rates of import as a proportion of total supply. there are notable exceptions. In the case of fruit, Barbados, the Netherlands Antilles and the Virgin Islands import a major part of their supply. Antigua, the Netherlands Antilles and the Virgin Islands also import a large portion of the vegetables and root crops consumed. Despite the

TABLE V C - 2.01

Estimated Percent Quantities of Current Demand Supplied by Imports

Country/Territory	Wheat	Rice	Pulses	Fruit	Vegetables	Roots	Beef	Sheep/Goats	Pork	Poultry	Eggs
CARICOM											
Antigua	100	100	22	11	54	85	47	35	77	87	65
Barbados	100	100	71	75	45	27	80	73	60	74	18
Belize	100	0	23	6	34	8	30	4	67	50	8
Dominica	100	100	16	2	15	3	47	43	40	84	5
Grenada	100	100	40	6	8	12	40	40	85	72	1
Guyana	100	0	96	2	34	24	14	1	7	0	9
Jamaica	100	99	34	3	12	2	37	68	22	29	10
Montserrat	100	100	8	2	20	6	NA	NA	NA	NA	NA
St.Kitts/Nevis	100	100	70	18	54	90	NA	NA	NA	NA	NA
St. Lucia	100	100	84	2	50	5	53	39	40	84	0
St.Vincent	100	100	56	1	38	2	7	19	67	82	11
Trinidad & Tobago	100	71	97	11	25	48	73	58	47	1	11
OTHER CARIBBEAN											
FR. Guiana	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guadeloupe	100	100	100	11	15	13	52	80	69	93	53
Martinique	100	100	100	9	16	20	58	57	58	59	41
Netherland Antilles	100	100	100	92	100	100	75	74	96	97	42
Puerto Rico	100	100	94	73	89	25	65	NA	73	80	40
Surinam	100	0	95	6	48	59	46	44	30	7	9
Venezuela	99	1	54	3	5	3	7	0	NEG	NEG	0
Virgin Islands (US)	100	100	NA	96	96	96	NA	NA	NA	NA	NA
Virgin Islands (UK)	100	100	100	60	60	60	50	50	50	50	50

Note: NA = Not Available, NEG= Negligible.

Source: Country/Territory Trade Statistics, Provisional Food Balance Sheets FAO 1977, Table VC 1.05
Berger-SYSTEMS Estimates.

lower percent of import of these commodities in other states, the large volume of their total consumption, including that part represented by imports, makes the markets for these commodities worthy of further examination.

The possible substitution of CARICOM source supply for extra-regional imports is an important element for examination. The following table V C - 2.02) presents in summary form the major sources of import supply, classified as CARICOM and NON-CARICOM, for the commodity groups and some important sub-categories under study. The table is an introduction to the more detailed market analysis that follows. Trade is also analysed separately in Chapters III and IV.

TABLE V C - 2.02

Principal Source of Intra-Regional Imports of Selected Commodities

Commodity	Major Source
Wheat	Non-Caricom
Rice	Caricom - mostly Guyana
Pulses	Largely non-Caricom
Deciduous Fruit	Non-Caricom
Tropical Fruit (inc. citrus)	Generally Caricom but some fr outsi
Fresh Vegetables	Generally Caricom but some from outside
Processed Vegetables	Caricom important on sauces and some canned items; otherwise mostly outside
Dry Onions	Non-Caricom chiefly
White Potatoes	Almost wholly non-Caricom
Sweet Potatoes, Yams, etc.	Caricom
Beef (and Cattle)	Non-Caricom chiefly
Sheep/Goat meat (and animals)	" "
Pork (and Pigs)	" "
Poultry	Non-Caricom
Eggs	Non-Caricom

As can be seen from the foregoing table, of the commodities under study only in the categories of fresh fruits, vegetables and root crops and rice are CARICOM States a major source of imports. CARICOM sources have supplied a minor portion of the imports of dry onions, beef and cattle, as well as sheep and goat meat and livestock.

The potential for increased CARICOM supply of these commodities is discussed in the next report section.

3.0 Estimated Market Potential for CARICOM LDC's

3.10 Introduction

The approach used in estimating the LDC's effective market potential for exports is to first determine the commodities which offer a significant potential for LDC export and then the country/territory markets where LDC exports have a prospect for success. The commodity market potentials in these States are then further qualified based on evaluation of potential limiting factors such as increased domestic self-sufficiency, substitution factors, potential marketing and supply effectiveness, etc.

3.20 Commodity Groups Offering Potentials

3.21 Commodities With Little or No Prospect

The consumption of wheat, rice, poultry and eggs can be ruled out as offering a potential for LDC exports, with the possible exception in the case of Belize for rice. Wheat is not now grown nor considered to have a production potential in the LDC's. Rice is the most directly competitive product to wheat that is grown in the CARICOM region, and only in Belize among the LDC's. Belize rice production is principally a highly mechanized large farm operation directed to ex-regional export after satisfying domestic demand. Small farmer production for Eastern Caribbean sales does not appear to be a practical possibility based on transport considerations if none other. Possible substitution of root crops for wheat even in the form of a small percent of raw material for flour (from yams or other roots) is considered extremely marginal, although technically possible. While poultry imports are sizeable, they are principally represented by low cost parts such as backs, necks and wings which are heavily consumed by the lower income elements of the regions' population. The production costs and sales prices of whole birds in the CARICOM region is high in relation to ex-regional poultry supply; and expansion of most domestic production in the region is hindered by the resultant limited market for whole birds. Based on this, and national political attitudes towards maintaining relatively low costs for essential dietary elements for lower income groups, potential LDC export of poultry meat is considered negligible. A similar situation applies to eggs in that production costs are high in the region.

These costs are a function of feed costs, which in turn are high as feed is imported predominantly from outside the region. Most countries have adopted policies of self-sufficiency in egg production despite the higher costs involved. But those that have not are unlikely to wish to subsidize other countries/territories production in preference to their own, and so can be expected to continue to import, if at all, from outside the region.

Beef is a commodity which offers some export potential, due to the high level of imports; but which is not defined as a "small farmer" type commodity. Cattle production is being promoted throughout the region and both domestic supply needs and exports hold potential. Because of this however, the possible substitution of "small farmer" type commodities such as pork, sheep and goats for beef is considered negligible.

3.22 Commodities With Some Prospect

Pork, sheep and goats do however hold a potential for LDC export in the form of both livestock and meat, provided the quality and price of the commodities offered are sufficiently competitive. The bulk of the trade in these commodities have been in the form of chilled, frozen or otherwise preserved products. Trade in live animals, according to trade statistics has been very limited.[1/] There is some indication that there is a small amount of unrecorded LDC exports of live animals from the ECCM LDCs to Trinidad and possibly the French Islands. Total trade of this nature is not expected to grow to significant proportions. Major market penetration will require development of LDC processing facilities for the export of animal products.

The four remaining commodity groups, namely fruit, vegetables, pulses and root crops appear to have the best prospect for LDC export. However, prospective export potential must be first qualified in terms of potential substitution of the same type commodity now principally supplied from an extra-regional source and possible substitution of a fresh or simply processed commodity for a preserved product. The LDC producers, in general, may be able to embargo or limit imports in their own States of various commodities by specific type or condition; but they cannot be expected to have much influence on such imports in their potential export markets. The market countries' policies regarding imports reasonably can be expected to be dominated by their own national objectives concerning self sufficiency, import food costs and related considerations. While regional cooperation will be a consideration, it realistically cannot be expected to significantly outweigh domestic issues.

1/ *Except with Trinidad*

As noted previously, imports of pulses originate principally from extra-regional sources. This is due largely to difficulties such as plant diseases which hinder CARICOM production. Among the LDC's, Belize is the only major pulse producer (red kidney beans) at present. Its principal export market for these beans is Jamaica. Red kidney beans are not heavily consumed elsewhere in the Eastern Caribbean except in Trinidad. The supply analysis indicates some potential for increased production of pulses in the other Eastern LDC's, and potential export surpluses principally of peanuts in some islands, namely Grenada, St. Kitts/Nevis and St. Lucia.

While Table VC 2.01 indicated that all the LDC's imported a portion of their consumption of fruits, vegetables and root crops, this includes imports in the season when domestic production does not take place as well as imports of processed foods, deciduous fruits and white potatoes. The LDC's have exported their seasonal commodity surpluses in varying quantities based on individual States production and marketing effectiveness.

3.30 Commodity Export Markets.

3.31 Limiting Factors

There are certain factors limiting the LDC's effective export market potential over which they individually have little or no control. Important among these are:

1) The market countries' intentions and ability, to achieve domestic self-sufficiency in certain food items;
2) National consumption preferences for deciduous fruit, types of vegetables such as dried onions, types of pulses such as red kidney beans, types of root crops such as Irish potatoes;
3) National consumption preferences for preserved fruits and juices and other processed foods; and,
4) National economic pressures and related policies which may deter imports, both in total and from CARICOM LDC's.

Virtually all the CARICOM states are understood to be attempting to achieve the degree of self-sufficiency possible and practicable in the "small farmer" type commodities which appear to have some export potential for the LDC's. This policy is further strengthened in the cases of Jamaica and Guyana by their current economic difficulties and needs to conserve foreign exchange. National economic considerations are also a factor affecting the scale of the import of higher priced commodities from LDC's as opposed to import from lower cost extra-regional sources. The impact of this factor with respect to Trinidad can be attributed at least in part to, for example,

Trinidad's substantially larger import of carrots from ex-regional as opposed to CARICOM sources (see Table VC 3.01).

Markets' preferences for deciduous fruit and assorted preserved fruits that are ex-regional in origin, are considered strong enough to make the possibility of substitution of tropical fruit impracticable except possibly where a market country's government wishes to impose import restrictions to encourage their own domestic production of tropical fruit. Such an eventuality would not assist LDC exports. The case is similar with respect to "Irish" potatoes and their possible substitution in the market supply by other root crops. Red kidney beans are found to be imported in significant quantities in only two regional markets, namely Jamaica and Trinidad, with the only significant LDC source of supply being Belize.

Substitution of LDC sources of fresh fruits and vegetables for other country imports of preserved products does not appear to be a significant possibility. In addition to the issues previously discussed, there are the issues of consumer preference for convenience foods and longer storage life, which are important to both marketers and end consumers. In free developed and developing country markets, the historical trend has been toward, not away from, preserved foods. Consumer and marketer preferences in this regard have been strengthened in the developing countries by national policies designed to encourage growth of domestic agri-industries.

The impact of LDC marketing effectiveness will be taken into account with the foregoing factors in subsequent estimates of export potential by major market.

3.32 Prospective Commodity Markets

a) Major Markets

Based on evaluation of commodity imports and the impact of probable limiting factors to market penetration, the following countries/territories are determined to be the intra-regional markets offering the best prospects for eastern Caribbean LDC export of "small farmer" type commodities:

1) Barbados
2) Trinidad
3) Netherlands Antilles
4) Martinique
5) Guadeloupe
6) Virgin Islands (US)
7) Puerto Rico

These countries/territories all import significant quantities of the "small farmer" commodities considered to have an export potential, and relatively reasonable transport cost and timely delivery is a practical possibility.

TABLE V C - 3.01

Comparative Imports of Carrots by Trinidad by Source

Period		Metric Tons		1/
		Total	Caricom	Percent Caricom
1972		974	157	16.10
1973		1,408	256	18.15
1974		1,560	618	39.64
1975		1,187	512	43.16
1976P		1,563	648	41.49
1977P		1,688	330	19.57
1976P	January	30	12	38.92
	February	116	62	53.22
	March	174	119	68.65
	April	102	81	78.81
	May	181	127	70.41
	June	99	95	96.29
	July	65	47	72.74
	August	223	73	32.86
	September	128	7	5.79
	October	85	17	20.36
	November	127	6	4.64
	December	231	1	0.39
1977P	January	110	6	5.38
	February	160	7	4.23
	March	208	36	17.16
	April	144	41	28.80
	May	217	112	51.53
	June	108	59	54.71
	July	237	9	3.63
	August	256	39	15.21
	September	108	6	5.42
	October	121	16	13.28
	November	-	-	-
	December	18	-	-

Note: P = Preliminary. 1/ Based unrounded figures.

Source: Central Statistical Office Monthly Overseas Trade Tabulations. (Trinidad)

This possibility is strengthened by current evaluation of means to strengthen both LDC transport facilities and services as well as small farmer production service facilities. LDC marketers already have access to most of these markets, and have some experience in supplying them. Barbados and Trinidad are CARICOM member States and signatories to the AMP, and efforts to improve LDC export performance with those markets have a politically favourable starting point. The future quantitative size of the effective markets for "small farmer" type commodities holding an export prospect in each of these markets is detailed subsequently. However, in addition to the limitations imposed by national consumer preferences, the quantitative impact of domestic self-sufficiency and increased consumption of preserved foods must be considered. For these markets, except Barbados, significant increases in domestic self-sufficiency in the LDC export commodities is considered marginal; but to be conservative, a 10% reduction in the present proportion of overall fresh produce demand represented by imports is assumed. That deduction is estimated to cover as well, potential relatively higher consumption of preserved products other than juices and sauces which might be supplied by the LDC's. Barbados' attempts to achieve a high level of self-sufficiency in fruits, vegetables and root crops are likely to be achieved. Its intent* is to achieve 100% self-sufficiency in bananas and in vegetables and tropical root crops. Sizeable quantities of citrus fruit and juices as well as plantains and other fruits are expected to continue to be imported. Based on such considerations as a rapidly growing tourism industry, apparent current unfilled demand, and possible implementation problems, we estimate, on a conservative basis, that its fresh vegetables self-sufficiency may only reach the level of 30%.

Actual capture of the effective market potentials in these target islands is, of course, subject to the LDC's marketing effectiveness in competition with other supply sources. On a conservative basis, therefore, we have reduced our estimate of effective market potential to 65% of the net figure arrived at based on other constraints in Barbados and Trinidad, and to 30% in the non-CARICOM markets.

Puerto Rico's potential as an LDC market is limited not only by competitive quality, price and quantity supply considerations equivalent to those of the major extra-regional markets; but also by the close proximity of the Dominican Republic, which is a major and highly competitive exporter to it of the same commodities produced in the LDC's. To be conservative a 1% share of its demand for fruits, vegetables, and roots is assumed to represent the potential for LDC exports. Achieving even this level of the market penetration will require an organized marketing effort. It is significant that while space has been available on a back haul basis to Puerto Rico for some time, LDC exports to it have been insignificant.

*Per Barbados Ministry of Agriculture Planning Unit.

b) Marginal Markets

The British Virgin Islands are considered marginal due to the small size of their estimated imports of "small farmer" commodities. The other intra-regional markets are considered to offer little or no prospect for Eastern Caribbean LDC exports.

Competitive delivery times, transport cost factors, as well as Jamaica's current economic problems, effectively severely limit potential commodity exports by LDC's other than small quantities of red kidney beans to this country. Venezuela is relatively self-sufficient in fresh produce; and its fruit and vegetable imports are almost entirely deciduous fruit and assorted processed products that are generally not available from the LDC's. Guyana, produces virtually all the fruit it consumes other than a small amount of preserved items. While its imports of fresh and simply processed vegetables are significant, dry onions make up about three-quarters of these imports. White potatoes account for close to all of its root crop imports. Surinam's situation is roughly comparable.

Onions and white potatoes are shown to represent export potentials for the LDC's in subsequent market estimates since, as shown in Chapter VI several LDC's plan their production. However, as outlined subsequently LDC's marketable surplus of these are expected to be small, and potentially consumed more readily in markets close to the LDC's. Further, based on Montserrat's experience, the high and rising price of seed potatoes for LDC white potatoe production is expected to make successful export of white potatoes dubious.

French Guiana's potential is considered marginal primarily due to relative delivery time and transport costs for the LDC's versus its nearer neighbours. However, the lack of specific data on that market precludes accurate market assessment in this study.

c) Effective LDC Export Potential

Based on the considerations outlined previously, the estimated effective export potential for the LDC's is detailed in terms of per cent of total demand by country and commodity in Table V C - 3.02. The table shows the per cent of total demand forecast to be represented by imported fresh and simply processed produce, and then the per cent of demand which the LDC's might realistically be expected to capture. This of course is dependent upon availability of the LDC supply at acceptable prices. The forecast LDC market shares range up to 27% for fruit, to 19% for vegetables, to 33% for roots and to 58% for pulses. These percentage market shares are translated to tonnage in Table V C - 3.03.

TABLE V C - 3.02

Estimated Effective Export Potential for LDC's in Major Intra-Regional Markets for Fresh & Simply Processed Small Farm Type Commodities (1982-1987)

	Percent of Market Demand for Commodity Group										
	Fruit			Vegetables			Roots			Pulses	
	Total	LDC Potential		Total	LDC Potential		Total	LDC Potential		Total	LDC
Market	Imports	Total	Citrus	Imports	Total	Onions	Imports	Total	White Pot.	Imports	Potential
Major Prospects											
Barbados	41.0	27.0	22.0	5.4	3.5	N.E.	24.3	17.6	17.6	61.0	39.7
Trinidad/Tobago	8.1	5.2	NEG.	20.0	13.0	7.0	38.0	26.0	21.0	87.0	57.0
Martinique	1.3	0.4	0.1	9.0	2.7	1.7	20.0	6.0	6.0	100.0	30.0
Guadeloupe	0.3	0.1	0.1	8.1	2.4	1.3	100.0	30.0	30.0	100.0	30.0
Neth. Antilles	57.0	17.0	7.4	57.0	17.0	7.8	100.0	33.8	32.0	100.0	30.0
Virgin Is. (US)	54.0	16.0	2.4	63.0	19.0	N.E.	86.0	25.9	22.8	86.0	26.0
Puerto Rico	N.A.	1.0		N.A.	1.0		N.A.	1.0	NEG.	NEG.	NEG.
Marginal Prospects											
Jamaica	NEG.	NEG.		5.0	3.2	1.8	NEG.	NEG.	NEG.	20.0	13.0
Guyana	NEG.	NEG.		23.4	15.2	12.6	21.6	14.0	14.0	86.0	56.0
Surinam	NEG.	NEG.		26.1	17.0	17.0	53.1	34.5	34.5	90.0	58.5
Virgin Is. (UK)	32.0	10.0	1.5	32.0	10.0	N.E.	32.0	10.0	N.E.	32.0	10.0

NOTES: N.A. = Not applicable Neg. = Negligible

N.E. = No estimate

No estimate for French Guiana due to lack of data.

Source: Tables VC 1.05/6, Berger-Systems Estimates.

TABLE V C - 3.03

Estimated Effective Quantitative Export Potential in Major Intra-Regional Markets for LDC's - 1982 and 1987

(tons)

Market		Fruit			Vegetables			Roots			Pulses
		Total	Citrus	Other	Total	Onions	Other	Total	White Pot.	Other	
A. Major Prospects											
Barbados	1982	2,270	1,850	420	250	N.E.	N.E.	4,660	4,660	-	880
	1987	2,390	1,950	440	260	N.E.	N.E.	4,870	4,870	-	920
Trinidad/Tobago	1982	3,320	-	3,320	4,830	2,600	2,230	10,050	8,120	1,930	7,420
	1987	3,570	-	3,570	5,240	2,820	2,420	10,710	8,650	2,060	7,930
Martinique	1982	140	30	110	900	570	330	1,550	1,550	-	530
	1987	140	30	110	970	610	360	1,590	1,590	-	550
Guadeloupe	1982	30	30	-	670	360	310	10,690	10,690	-	650
	1987	30	30	-	700	380	320	11,030	11,030	-	680
Neth. Antilles	1982	2,900	1,260	1,640	1,300	560	740	2,910	2,760	150	190
	1987	3,170	1,380	1,790	1,420	620	800	3,180	3,010	170	210
Virgin Is. (US)	1982	1,070	160	910	990	N.E.	N.E.	1,640	1,450	190	380
	1987	1,320	200	1,120	1,240	N.E.	N.E.	2,020	1,780	240	470
Puerto Rico	1982	1,810	N.E.	N.E.	1,410	N.E.	N.E.	1,730	N.E.	N.E.	-
	1987	2,110	N.E.	N.E.	1,660	N.E.	N.E.	1,990	N.E.	N.E.	-
B. Marginal Prospects 1/											
Jamaica	1982	-	-	-	2,320	1,310	1,010	-	-	-	1,030
	1987	-	-	-	2,590	1,460	1,130	-	-	-	1,140
Guyana	1982	-	-	-	1,690	1,400	290	4,180	4,180	-	2,080
	1987	-	-	-	1,870	1,550	320	4,610	4,610	-	2,300
Surinam	1982	-	-	-	1,030	1,030	-	1,460	1,460	-	670
	1987	-	-	-	1,040	1,040	-	1,460	1,460	-	670
Virgin Is. (UK)	1982	60	10	50	50	N.E.	N.E.	40	N.E.	N.E.	10
	1987	70	10	60	50	N.E.	N.E.	40	N.E.	N.E.	10

NOTES: N.E. = No Estimate

1/ Considered marginal for competitive transport cost and delivery in the case of Guyana and Surinam, Jamaica probably continuing emphasis on self-sufficiency, and severe competition for the Puerto Rican Market.

Source: Table V C 3.02

The export potential for the LDC's in seven major markets is estimated at approximately 65,000 tons in 1982 and 70,000 tons in 1987. Four other country markets, considered marginal for reasons of either individual market size or delivered cost and commodity supply constraints, represent an additional estimated maximum potential of about 14,000 and 16,000 tons respectively in those years.

Trinidad holds the largest export potential by far for the LDC's. Its potential is about three times the size of that of the next largest market. Together with Guadeloupe, the Netherlands Antilles and Barbados, it represents approximately 80% of the LDC effective export potential.

White potatoes, at close to 30,000 tons per year, is the single commodity with the greatest export potential. However, as discussed in the chapter on supply potential, its forecast supply in the LDC's is low, and the probability of high production costs severely limits, if not eliminates, its potential for profitable export sale. Montserrat did not export white potatoes for that reason last year, and is understood to have dropped them from production this year as a result. It seems apparent that actual exports of this commodity at a profit will require special contractual agreements under the AMP. Based on the foregoing, actual exports of white potatoes to non-CARICOM markets can be discounted entirely and CARICOM destination exports considered marginal at best. Onions are another significant export possibility for the LDC's. They are shown separately in the tables, to facilitate identification for point to point trade flow projection purposes. However, at the level of overall market penetration estimated for vegetable commodities as a group, most if not all of the tonnage could be in the form of other vegetables, if the country market imports significant quantities of those other vegetables. This of course would not be the case in the markets whose potentials are indicated to be marginal.

Based on the foregoing,exports of fruits and vegetables represent the principal export potential for the LDC's. While the relative importance of fresh fruit versus vegetables varies from market to market, overall the relationship is about equal. The export of pulses, up to some 10,000 tons per year, represents a significant opportunity for the LDC's, provided they can supply the needs at reasonable cost. There are indications that imports of peanuts in the shell from LDC's by Trinidad, the largest market prospect, is hindered by LDC's prices being higher than ex-regional source prices. This indicates a need for not only sufficient supply, but either simple processing, i.e. shelling and roasting, or negotiations under the AMP to capture the share of market indicated.

d) Export Demand for Small Animals

As noted earlier in this chapter, overall LDC export potential for small live animals is very small. Only sheep, goat and pig exports are of any significance; and that chiefly to Trinidad by Grenada and St.Vincent.

As shown in Table V C - 3.04, some exports are reported to be made also by Antigua, St.Lucia and possibly St.Kitts/Nevis to the French West Indies and the Netherlands Antilles, but the numbers indicated by available trade statistics are very small. There is a clear indication that unrecorded exports of livestock occur in the LDC's. However, even if the trade numbers were to be multiplied by a factor of 10 for destination other than Trinidad, they would still represent insignificant exports. Barbados and Jamaica do not import live sheep, goats and pigs for slaughter. Jamaica did import some 800 sheep and goats in 1976 from extra-regional sources for breeding stock. The 1976 Belize trade statistics indicated exports of 25 sheep and goats and 415 pigs to Mexico. Significant growth in these overland exports is not forecast to take place due to supply constraints.

The import data for Trinidad is considered to be relatively reliable, and the quantities of sheep, goats and pigs currently exported to it by Grenada and St.Vincent can be expected to grow gradually in line with meat consumption growth in that country. Trinidadian demand for sheep and goat meat is forecast to grow at 1.55% per year and pork demand at 1.35% (see Table V C - 1.04). Grenada and St.Vincent currently supply the bulk of Trinidad's live sheep, goat and pig imports for slaughter purposes. As outlined in Chapter VI, LDC supplies can be expanded easily to meet demand. Both Grenada and St.Vincent are judged to have well established marketing relationships for their trade with Trinidad. Based on the foregoing, the current pattern of this trade is expected to continue. As can be seen in Table V C - 3.05, live animal exports from Grenada and St.Vincent to Trinidad are forecast to grow to about 6,950 animals in 1982 and then to about 7,510 animals in 1987.

3.33 The LDC's as Markets

a) Introduction

The section evaluates the LDC's in terms of their potential trading inter-relationships, based on comparisons of demand and potential domestic supply in the individual States. The seasonal net surpluses in supply which are identified in this process also provide the basis for calculation of forecast commodity flows in Chapter VIII.

TABLE V C - 3.04

Comparative Trade Statistics[1/] on LDC* Exports of Live Sheep, Goats and Pigs

(in Numbers of Animals)

Origin	Year	LDC Exports by Destination According to Latest Available Statistics					1976 Trinidad Imports[2/] by Source
		Grenada	Neth. Antilles	French W.I.	Trinidad	Antigua	
Grenada	1973						
Sheep		-	-	-	980	-	2,646
Goats		-	-	-	5,255	-	1,640
Pigs		-	-	-	-	-	-
St.Vincent	1976						
Sheep		-	-	-	1,405	-	1,548
Goats		-	-	-	384	-	384
Pigs		12	-	-	103	-	124
Antigua	1975						
Sheep/Goats		-	94	15	-	-	-
Pigs		-	-	-	-	-	-
Dominica	1976						
Sheep/Goats		-	-	-	-	-	-
Pigs		-	-	-	-	-	-
Montserrat	1976						
Sheep/Goats		-	-	-	-	3	-
Pigs		-	-	-	-	-	-
St.Lucia	1976						
Sheep/Goats		-	-	19	-	-	-
Pigs		-	-	-	-	-	-
St.Kitts/Nevis	1973						
Sheep/Goats		-	-	-	-	-	-
Pigs		-	-	25	-	-	-

* ECCM

1/ Eastern Caribbean.

2/ EEC 10 sheep & Canada 13 pigs. Total imports all sources = 6,365 animals.

There were no imports in 1976 of this livestock by Barbados and only 800 sheep and goats by Jamaica for breeding purposes.

Source: Country Trade Statistics.

TABLE V C - 3.05

Forecast LDC Export Potential[1/] for Live Sheep, Goats and Pigs to Trinidad

(numbers of Animals)

Probable LDC Sources [2/]	1982				1987			
	Sheep	Goats	Pigs	Total	Sheep	Goats	Pigs	Total
Grenada	2,902	1,799	-	4,701	3,134	1,942	-	5,076
St. Vincent	1,698	421	134	2,253	1,833	455	144	2,432
TOTAL	4,600	2,220	134	6,954	4,967	2,397	144	7,508

Notes: 1/ For slaughter, based forecast rates of growth in Trinidad meat demand by type i.e. 1.55% for sheep and goats, and 1.35% for pigs.

2/ Based current pattern of Trinidad imports.

Source: Tables V C - 1.04 and V C - 3.04.

Calculation of individual LDC's potential as markets for other LDC exports is accomplished by first estimating the demand in each LDC for small farmer commodities having a prospect for significant LDC export and then comparing their demand with forecast potential available supply to arrive at seasonal net surpluses or deficit supply estimates. The supply estimates used for this purpose are brought forward from Chapter VI. The demand calculations are based on the following premises:

1) All of the LDC's are seeking self-sufficiency to the extent possible in small farmer type commodities;

2) In the LDC's production season, imports of fresh and simply processed commodities would be restricted when there is an available domestic supply. This would include substitution of tropical for deciduous fruit, but not substitution of LDC source citrus nor onions and white potatoes for which there are strong consumer preferences as significant food consumption elements;

3) These import restrictions would not significantly affect overall imports of preserved foods, since their import generally is largely carried out off-season, and import levels are a relatively low percent of total food consumption in the LDC's;

4) LDC's will supply domestic demand before permitting export of small farmer commodities.

While Belize is included in the scope of this examination, it effectively cannot be considered as fitting within the marketing and transport framework of the Eastern Caribbean LDC's. This is due very importantly to its physical separation and related separate transport links, and also to the nature and focus of its marketing and supply relationships with its nearer neighbours such as Mexico, Honduras, Jamaica and the U.S.A. It supplied some red kidney beans to Jamaica, and has shipped on at least one occasion, citrus concentrate to Trinidad when Trinidad encountered domestic supply problems. It is currently supplying citrus concentrate to Barbados. Otherwise, its trade focus for "small farmer" type commodities is directed towards the U.S.A. and Mexico. Even assuming effective WISCO services via Jamaica to Belize in the future, the pattern is unlikely to change. The ECCM should continue to represent a more logical "small farmer" commodity supply source to the Eastern Caribbean Islands based on transport costs and time, except possibly for air shipment of meat to the French islands, which Belize has already developed for beef.

b) Forecast LDC Demand/Domestic Supply Availability

The forecast LDC demand for imports of SF commodities is estimated to total about 26,000 metric tons in 1982, and about 28,000 tons in 1987. While all of the ECCM States have sizeable seasonal export surpluses, their annual import needs are significant. The largest LDC import market for SF commodities is Belize. However, as discussed previously, it is not considered a viable market, under competitive costs and transport conditions, for ECCM exports. The ECCM States export demand is estimated at about 15,000 tons in 1982. As shown in Table V C - 3.06, despite a decline in import needs by four of the States, overall ECCM imports needs are forecast to increase to approximately 16,000 tons in 1987. St.Lucia and St.Kitts/Nevis are the largest ECCM markets, but all appear significant.

The bulk of the LDC's import needs are represented by fruit and root crops. However, the commonality in seasonal availability of surplus supplies among the LDC's seriously reduces the possibilities for inter-LDC trade. Tables V C - 3.07 and V C - 3.08 detail the seasonal import demand and regional export surplus availabilities forecast for each State.

The seasonally available supply estimates represent net supplies after deductions for planned extra-regional exports of bananas and citrus by Dominica, Grenada, St.Vincent and St.Lucia. The figures are brought forward from Chapter VI for this comparison. Total demand estimates by States represent the demand for fresh and simply processed produce. Their demand is assumed to remain relatively constant throughout the year with the actual consumption of various types of commodities principally a function of supply. Net import demand or exportable surplus is the seasonal difference between total demand and available supply.

The following tables (V C - 3.07/8) indicate that there is a seasonal potential for inter-LDC trade. The comparative potentials for intra-LDC trade and LDC exports to other States in the region are shown in Chapter VIII, Tables VIII B - 1.01/2.

TABLE V C - 3.06

Forecast LDC Demand for Imported Small Farmer Commodities

(Metric Tons)

		Fruits			Vegetables			Roots			Pulses	Total
		Citrus	Other	Total	Onions	Other	Total	White Potatoes	Other	Total		
Antigua	1982	-	858	858	156	213	369	576	36	612	48	1,887
	1987	-	-	-	162	-	162	624	-	624	48	834
Dominica	1982	-	-	-	108	-	108	72	1,296	1,368	285	1,761
	1987	-	-	-	120	-	120	72	807	879	216	1,215
Grenada	1982	18	63	81	372	6	378	576	852	1,428		2.223
	1987	111	-	111	480	-	480	624	834	1,458	219	2,268
Montserrat	1982	18	561	579	24	27	51	72	291	363	39	1,032
	1987	45	456	501	24	9	33	72	207	279	21	834
St.Kitts/	1982	18	1,386	1,404	78	-	78	468	903	1,371	123	2,976
Nevis	1987	9	1,122	1,131	84	-	84	492	759	1,251	81	2,547
St.Lucia	1982	108	2,787	2,895	276	-	276	552	1,089	1,641	123	4,935
	1987	120	3,921	4,041	276	-	276	552	591	1,143	81	5,541
St.Vincent	1982	96	1,071	1,167	108	-	108	144	-	144	-	1,419
	1987	105	2,166	2,271	120	-	120	156	126	282	15	2,688
Belize	1982	300	2,964	3,264	516	828	1,344	816	4,524	5,340	432	10,380
	1987	456	3,402	3,858	792	954	1,746	960	5,796	6,756	390	12,750
TOTALS												
1982	ECCM	258	6,726	6,984	1,122	246	1,368	2,460	4,467	6,927	954	16,233
	Belize	300	2,964	3,264	516	828	1,344	816	4,524	5,340	432	10,380
	Total	558	9,690	10,248	1,638	1,074	2,712	3,276	8,991	12,267	1,386	26,613
1987	ECCM	390	7,665	8,055	1,266	9	1,275	2,592	3,324	5,916	681	15,927
	Belize	456	3,402	3,858	792	954	1,746	960	5,796	6,756	390	12,750
	Total	846	11,067	11,913	2,058	963	3,021	3,552	9,120	12,672	1,071	28,677

Source: Tables V C - 3.07/8

TABLE V C - 3.07

Comparison 1982 LDC Demand/Domestic Supply of
Fresh and Simply Processed Small Farmer Commodities
(in Metric Tons)

Annual Total and Average Month by Quarter

Country/ Territory			Fruits		Vegetables		Roots		Pulses
			Citrus	Non-Citrus	Onions	Other	White Potatoes	Other	
Antigua	Year	D	Neg.	7,490	290	690	580	250	100
		S		8,630	130	757	0	826	69
	1 Q	D		624	24	58	48	21	8
		S		520	22	112	0	159	12
		S (D)		(104)	(2)	54	(48)	138	4
	2 Q	D	Neg.	624	24	58	48	21	8
		S		442	22	22	0	73	0
		S (D)		(182)	(2)	(36)	(48)	52	(8)
	3 Q	D	Neg.	624	24	58	48	21	8
		S		780	0	23	0	9	0
		S (D)		156	(24)	(35)	(48)	(12)	(8)
	4 Q	D	Neg.	624	24	58	48	21	8
		S		1,222	0	95	0	44	11
		S (D)		598	(24)	37	(48)	23	3
Dominica	Year	D	7,190	4,410	110	1,080	90	9,170	680
		S	11,853	9,399	0	3,691	159	12,302	627
	1 Q	D	599	368	9	90	8	764	57
		S	723	573	0	391	53	1,947	130
		S (D)	124	205	(9)	301	45	1,183	73
	2 Q	D	599	368	9	90	8	764	57
		S	889	705	0	273	0	1,059	19
		S (D)	290	337	(9)	183	(8)	295	(38)
	3 Q	D	599	368	9	90	8	764	57
		S	1,245	986	0	207	0	361	0
		S (D)	646	618	(9)	117	(8)	(403)	(57)
	4 Q	D	599	368	9	90	8	764	57
		S	1,079	855	0	310	0	735	59
		S (D)	480	487	(9)	220	(8)	(29)	2

Country/ Territory			Fruits		Vegetables		Roots		Pulses
			Citrus	Non-Citrus	Onions	Other	White Potatoes	Other	
Grenada	Year	D	240	543	370	1,100	570	5,150	810
		S	244	6,652	0	1,583	0	5,917	1,282
	1 Q	D	20	453	31	92	48	429	68
		S	18	479	0	168	0	964	249
		S (D)	(2)	26	(31)	76	(48)	535	181
	2 Q	D	20	453	31	92	48	429	68
		S	16	432	0	130	0	432	24
		S (D)	(4)	(21)	(31)	38	(48)	3	(44)
	3 Q	D	20	453	31	92	48	429	68
		S	25	692	0	90	0	189	0
		S (D)	5	239	(31)	(2)	(48)	(240)	(68)
	4 Q	D	20	453	31	92	48	429	68
		S	22	612	0	139	0	385	151
		S (D)	2	159	(31)	47	(48)	(44)	83
Montserrat	Year	D	70	1,690	50	110	70	1,090	80
		S	70	1,320	186	321	0	1,083	87
	1 Q	D	6	141	4	9	6	91	7
		S	6	57	31	37	0	118	21
		S (D)	0	(84)	27	28	(6)	27	14
	2 Q	D	6	141	4	9	6	91	7
		S	0	38	31	0	0	66	2
		S (D)	(6)	(103)	27	(9)	(6)	(25)	(5)
	3 Q	D	6	141	4	9	6	91	7
		S	6	183	0	16	0	19	0
		S (D)	0	42	(4)	7	(6)	(72)	(7)
	4 Q	D	6	141	4	9	6	91	7
		S	12	164	0	55	0	157	6
		S (D)	6	23	(4)	46	(6)	66	(1)

Country/ Territory			Fruits		Vegetables		Roots		Pulses
			Citrus	Non-Citrus	Onions	Other	White Potatoes	Other	
St.Kitts/ Nevis	Year	D	30	6,560	160	380	470	4,200	310
		S	18	6,911	102	717	0	3,750	294
	1 Q	D	3	547	13	32	39	350	26
		S	3	330	17	52	0	431	47
		S (D)	0	(217)	4	20	(39)	81	21
	2 Q	D	3	547	13	32	39	350	26
		S	0	388	17	35	0	386	5
		S (D)	(3)	(159)	4	3	(39)	36	(21)
	3 Q	D	3	547	13	32	39	350	26
		S	0	1,116	0	68	0	49	6
		S (D)	(3)	569	(13)	36	(39)	(301)	(20)
	4 Q	D	3	547	13	32	39	350	26
		S	3	461	0	93	0	386	40
		S (D)	0	(86)	(13)	61	(39)	36	14
St.Lucia	Year	D	430	2,090	280	850	550	10,480	250
		S	506	19,279	0	1,456	0	11,619	165
	1 Q	D	36	1,742	23	71	46	873	21
		S	56	1,289	0	156	0	1,394	33
		S (D)	20	(453)	(23)	85	(46)	521	12
	2 Q	D	36	1,742	23	71	46	873	21
		S	0	1,266	0	121	0	1,092	4
		S (D)	(36)	(476)	(23)	50	(46)	219	(17)
	3 Q	D	36	1,742	23	71	46	873	21
		S	56	2,061	0	96	0	593	0
		S (D)	20	319	(23)	25	(46)	(280)	(21)
	4 Q	D	36	1,742	23	71	46	873	21
		S	56	1,804	0	111	0	790	18
		S (D)	20	62	(23)	40	(46)	(83)	(3)

Country/ Territory			Fruits		Vegetables		Roots		Pulses
			Citrus	Non-Citrus	Onions	Other	White Potatoes	Other	
St. Vincent	Year	D	380	18,570	110	250	140	6,630	330
		S	435	19,250	0	2,590	0	14,065	604
	1 Q	D	32	1,548	9	21	12	553	28
		S	37	1,538	0	243	0	1,871	54
		S (D)	5	(10)	(9)	222	(12)	1,318	26
	2 Q	D	32	1,548	9	21	12	553	28
		S	0	1,201	0	186	0	1,027	33
		S (D)	(32)	(347)	(9)	165	(12)	474	5
	3 Q	D	32	1,548	9	21	12	553	28
		S	36	1,618	0	192	0	563	28
		S (D)	4	70	(9)	171	(12)	10	0
	4 Q	D	32	1,548	9	21	12	553	28
		S	72	2,074	0	246	0	1,224	86
		S (D)	40	526	(9)	225	(12)	671	58
Belize	Year	D	2,420	8,110	510	2,470	810	15,460	1,690
		S	4,596	5,538	0	2,061	0	16,183	2,104
	1 Q	D	202	676	43	206	68	1,288	141
		S	611	739	0	274	0	2,152	280
		S (D)	409	63	(43)	68	(68)	864	139
	2 Q	D	202	676	43	206	68	1,288	141
		S	152	182	0	274	0	2,152	280
		S (D)	(50)	(494)	(43)	68	(68)	864	139
	3 Q	D	202	676	43	206	68	1,288	141
		S	152	182	0	68	0	534	69
		S (D)	(50)	(494)	(43)	(138)	(68)	(754)	(72)
	4 Q	D	202	676	43	206	68	1,288	141
		S	611	739	0	68	0	534	69
		S (D)	409	63	(43)	(138)	(68)	(754)	(72)

Notes: D = Demand; S = Supply; S (D) = Surplus (Deficit); Q = Quarter
NEG= negligible

Source: TABLES VC 1.05; VI B - 1.09; VI C 1.06; VI D 1.06; VI E 1.08; VI F 1.07; VI G 1.04; VI H 1.06; VI I 1.06.

TABLE V C - 3.08

Comparison 1987 LDC Demand/Domestic Supply for
Fresh and Simply Processed Small Farmer Commodities
(in Metric Tons)

Annual Total and Average Month by Quarter

Country/ Territory			Fruits		Vegetables		Roots		Pulses
			Citrus	Non-Citrus	Onions	Other	White Potatoes	Other	
Antigua	Year	D	Neg.	8,050	320	730	620	260	100
		S		13,807	323	2,243	0	1,451	89
	1 Q	D	Neg.	671	27	61	52	22	8
		S		911	54	236	0	247	16
		S (D)		240	27	175	(52)	225	8
	2 Q	D	Neg.	671	27	61	52	22	8
		S		801	53	124	0	113	0
		S (D)		130	26	63	(52)	91	(8)
	3 Q	D	Neg.	671	27	61	52	22	8
		S		1,104	0	141	0	42	0
		S (D)		433	(27)	80	(52)	20	(8)
	4 Q	D	Neg.	671	27	61	52	22	8
		S		1,795	0	243	(0)	81	14
		S (D)		1,124	(27)	182	(52)	59	6
Dominica	Year	D	7,950	4,870	120	1,170	100	10,100	760
		S	13,725	12,954	0	5,127	295	15,187	720
	1 Q	D	663	406	10	98	8	842	63
		S	865	816	0	513	98	1,981	120
		S (D)	202	410	(10)	415	90	1,139	57
	2 Q	D	663	406	10	98	8	842	63
		S	1,043	985	0	400	0	1,285	54
		S (D)	380	579	(10)	302	(8)	443	(9)
	3 Q	D	663	406	10	98	8	842	63
		S	1,414	1,334	0	349	0	573	0
		S (D)	751	928	(10)	251	(8)	(269)	(63)
	4 Q	D	663	406	10	98	8	842	63
		S	1,235	1,166	0	441	0	1,006	66
		S (D)	572	760	(10)	343	(8)	164	3

Country/ Territory			Fruits		Vegetables		Roots		Pulses
			Citrus	Non-Citrus	Onions	Other	White Potatoes	Other	
renada	Year	D	1,305	4,845	480	1,120	620	5,590	880
		S	1,305	8,811	0	2,025	0	6,742	1,602
	1 Q	D	109	404	40	93	52	466	73
		S	94	634	0	205	0	1,098	282
		S (D)	(15)	230	(40)	112	(52)	632	209
	2 Q	D	109	404	40	93	52	466	73
		S	87	591	0	160	0	492	85
		S (D)	(22)	187	(40)	67	(52)	26	12
	3 Q	D	109	404	40	93	52	466	73
		S	134	908	0	130	0	216	0
		S (D)	25	504	(40)	37	(52)	(250)	(73)
	4 Q	D	109	404	40	93	52	466	73
		S	120	811	0	182	0	438	168
		S (D)	11	407	(40)	89	(52)	(28)	95
lontserrat	Year	D	150	1,700	50	120	70	1,150	80
		S	153	1,841	191	371	0	1,121	179
	1 Q	D	13	142	4	10	6	96	7
		S	12	78	32	29	0	119	36
		S (D)	(1)	(64)	28	19	(6)	23	29
	2 Q	D	13	142	4	10	6	96	7
		S	0	54	32	7	0	75	11
		S (D)	(13)	(88)	28	(3)	(6)	(21)	4
	3 Q	D	13	142	4	10	6	96	7
		S	12	257	0	33	0	48	0
		S (D)	(1)	115	(4)	23	(6)	(48)	(7)
	4 Q	D	13	142	4	10	6	96	7
		S	24	227	0	54	0	130	13
		S (D)	11	85	(4)	44	(6)	34	6

Country/ Territory			Fruits		Vegetables		Roots		Pulses
			Citrus	Non-Citrus	Onions	Other	White Potatoes	Other	
St.Kitts/ Nevis	Year	D	30	6,900	170	400	490	4,410	330
		S	1,367	8,241	340	1,519	0	4,035	469
	1 Q	D	3	575	14	33	41	368	28
		S	113	319	57	86	0	492	68
		S (D)	110	(256)	43	53	(41)	124	40
	2 Q	D	3	575	14	33	41	368	28
		S	0	615	56	80	0	359	20
		S (D)	(3)	40	42	47	(41)	(9)	(8)
	3 Q	D	3	575	14	33	41	368	28
		S	113	1,328	0	165	0	133	9
		S (D)	110	753	(14)	132	(41)	(235)	(19)
	4 Q	D	3	575	14	33	41	368	28
		S	225	457	0	185	0	359	60
		S (D)	222	(118)	(14)	152	(41)	(9)	32
St. Lucia	Year	D	480	23,330	280	850	550	10,480	250
		S	595	19,921	0	1,787	0	13,264	264
	1 Q	D	40	1,944	23	71	46	873	21
		S	66	1,329	0	172	0	1,592	46
		S (D)	26	(615)	(23)	101	(46)	719	25
	2 Q	D	40	1,944	23	71	46	873	21
		S	0	1,293	0	134	0	1,247	15
		S (D)	(40)	(651)	(23)	63	(46)	374	(6)
	3 Q	D	40	1,944	23	71	46	873	21
		S	66	2,109	0	127	0	676	0
		S (D)	26	165	(23)	56	(46)	(197)	(21)
	4 Q	D	40	1,944	23	71	46	873	21
		S	66	1,903	0	129	0	902	27
		S (D)	26	(41)	(23)	58	(46)	29	6

Country/ Territory			Fruits		Vegetables		Roots		Pulses
			Citrus	Non-Citrus	Onions	Other	White Potatoes	Other	
St.Vincent	Year	D	420	20,600	120	280	150	7,330	370
		S	211	20,027	0	2,811	0	14,220	624
	1 Q	D	35	1,717	10	23	13	611	31
		S	52	1,547	0	247	0	1,891	61
		S (D)	17	(170)	(10)	224	(13)	1,280	30
	2 Q	D	35	1,717	10	23	13	611	31
		S	0	1,255	0	200	0	1,038	38
		S (D)	(35)	(462)	(10)	177	(13)	427	7
	3 Q	D	35	1,717	10	23	13	611	31
		S	53	1,627	0	219	0	569	26
		S (D)	18	(90)	(10)	196	(13)	(42)	(5)
	4 Q	D	35	1,717	10	23	13	611	31
		S	106	2,100	0	270	0	1,237	82
		S (D)	71	383	(10)	247	(13)	626	51
Belize	Year	D	2,880	9,660	790	2,790	960	18,310	2,000
		S	4,970	7,212	0	2,248	0	16,960	3,098
	1 Q	D	240	805	66	233	80	1,526	167
		S	661	959	0	299	0	2,256	412
		S (D)	421	154	(66)	66	(80)	730	245
	2 Q	D	240	805	66	233	80	1,526	167
		S	164	238	0	299	0	2,256	412
		S (D)	(76)	(567)	(66)	66	(80)	730	245
	3 Q	D	240	805	66	233	80	1,526	167
		S	164	238	0	74	0	560	102
		S (D)	(76)	(567)	(66)	(159)	(80)	(966)	(65)
	4 Q	D	240	805	66	233	80	1,526	167
		S	661	959	0	74	0	560	102
		S (D)	421	154	(66)	(159)	(80)	(966)	(65)

Note: D = Demand; S = Supply; S (D) = Surplus (Deficit); Q = Quarter;
Neg. = Negligible

Source: TABLES VC 1.05/6; VI B-1.09; VI C-1.06; VI D-1.06; VI E-1.08; VI F-1.07; VI G-1.04; VI H-1.06; VI I-1.06.

VI SUPPLY SITUATION ANALYSIS - CARICOM LDC's

A. Introduction

1.0 Scope of Analysis

1.10 Objectives

The objectives of the small farmer production and marketing systems study are twofold:

Firstly, to determine the potential basis for the development of a regional market, and

Secondly, to provide a detailed operational design of integrated production and marketing systems which would be necessary to realise this potential.

However, it was agreed that, in the first phase of the study, emphasis should be placed on that work which was essential to the successful conduct of Phase II.

The scope of the supply analysis is therefore geared, within the constraints of time and available quantitative material, to provide information on both crops and small animals, which would expedite the achievement of the objectives. This information includes estimation of:

(i) the current and potential production for the commodity groups: fruits, vegetables, roots, pulses and small animals for each of the CARICOM LDC's;

(ii) the average monthly available supply of these crop commodity groups for each quarter,

(iii) the commodities within the groups for which a country may be expected to develop a comparative advantage due to experience, cost or favourable conditions. (Comparative advantage is discussed in Chapter VII).

1.20 Crops

1.21 Current Estimates

No statistical agricultural information systems exist in any of the CARICOM LDC's, and hence the quality of data on production estimates is extremely poor. The data that are available either from a census, the extension service, other studies, or by discussions locally vary tremendously, and as a result major effort had to be placed on a methodology for reconciling these discrepancies and arriving at current estimates with some measure of objectivity.

1.22 Potential estimates

Estimates of potential production are based on expected increases, over the current estimates, due to increased land area, intercropping, improved husbandry practices or availability of irrigation. On the assumption that conditions exist or are planned which will lead to increases in production, then a professional estimate of the increase based on expected yield, management practices and the likelihood of implementation of the plans, was made. A high and low estimate is given for 1982 and 1987. In general the 'high' estimates assume that all the objectives of the development plans will be achieved, whereas the 'low' estimates is arrived at by taking a less optimistic stand.

1.23 Seasonality

In order to determine surpluses and deficits of the specified commodity groups it is not sufficient to compare annual totals of supply and demand, since information on the seasonal effects of supply, even if it is assumed that demand remains constant throughout the year, will be lost and the resulting annual surpluses and deficits will be meaningless in the context of determining available supply at LDC sources for a commodity trade flow. Although monthly or weekly estimates of surpluses would have been ideal as an input to the commodity flow analysis, the quality of the information available did not warrant such a precise approach and average monthly surpluses and deficits, for each quarter, were decided upon.

1.24 Commodity groups

Ideally, the supply analysis should consider estimates for each commodity within a commodity group, but here again this is not justified by the quality and quantity of the data available. However, three important commodities, citrus, white potatoes and onions, were considered separately within their respective commodity groups. As a result, where available supply for trade is indicated for a commodity group, it is to be understood that there will be some flexibility in the production possibilities of the commodities within that group, depending on the mix of commodities dictated by the market demand. A planned production programme may then be implemented to produce an appropriate mix of commodities.

1.30 Small animals

1.31 Current estimates

For the most part, there is no organised livestock industry in the LDC's. The quality of information is considerably poorer than for crops. The population

estimates for small animals varies tremendously from one source to another due to the wide dispersion of the flocks, the large number of farmers with a small number of animals and landless farming.

1.32 Potential estimates

The estimation of the potential for an increase in production depends to a large extent on the probability associated with the removal of the constraints to livestock production. The major constraint is the lack of development of the markets for live animals mainly in Trinidad and the French Antilles. But also important is the unavailability of feed*, the high mortality rate, low management and the lack of adequate processing facilities. No attempt is made to quantify potential estimates but where special favourable conditions exist in a country for small animal production, the potential possibilities are described. An exception is made for sheep and goats from Grenada and St. Vincent, where a sizeable marketing operation is already in existence for exports to Trinidad.

1.33 Seasonality

Here again, no quantitative estimates are made but because of the low management and high percentage of landless farmers, animals lose practically all their weight during the long dry season and take a very long time to arrive at slaughter weight.

1.34 Commodity group

The type of small animals considered in the commodity group are sheep, goats, pigs, poultry and bees.

2.0 Methodology - Crops

2.10 Current production estimates

2.11 Fieldwork

Estimates of production of commodities within the commodity groups were obtained by reviewing the available literature, by conducting personal interviews with personnel in Government Departments and by consulting the latest agricultural development plan (where available). Much of these data were very variable. In particular, it became apparent that there was considerable unrecorded non-commercial production, as a result of 'back-yard' production, particularly of fruit, which it was suspected was excluded from the official statistics.

Information was also obtained on the structure and composition of the agricultural sector, including information on land area distribution, irrigation and private and

*Of consistent high quality

public sector institutional framework. Information on the disposition of the crops, i.e. on farm consumption, waste on farm, storage, seed, processing, animal feed, spoilage and food consumption, was not available in any detail. The fieldwork, therefore, was insufficient to arrive at estimates of production and disposition; trade statistics and food balance sheets had to be scrutinised in an effort to arrive at respectable estimates.

2.12 Trade statistics

The most recent import and export statistics for each LDC were aggregated by commodity group and in some cases sub-aggregates were obtained to distinguish between the fresh and preserved categories. The citrus, onions and white potato categories were segregated from their respective commodity group where possible. The net imports (imports less exports) were obtained in each case. The last available year for the trade statistics varied between country from 1973 to 1976. Here again, the available data base was patchy and not uniform.

2.13 Food balance sheets

The FAO provisional food balance sheets for 1972 - 1974 (average) were available for all LDC's, except Montserrat and St. Kitts/Nevis. The food consumption/per caput/annum data were examined by country and some of these figures were suspect, and were adjusted based on the team's knowledge of the nutritional status of the peoples of the LDC's and the average man's nutritional requirements. The supply and demand equilibration equations from the food balance sheets

(i) Domestic supply = production + imports - stock changes - exports

(ii) Domestic utilization = feed + seed + manufacture + waste + food

(iii) Domestic supply = Domestic utilization

were utilized to reconcile the production estimates with information obtained from 2.11 and 2.12 as well as to give some insight into the global commodity group disposition (ii), above.

2.14 Reconciliation process

Step 1.

For each country, the per capita per annum consumption estimates for demand of each commodity group was multiplied by the estimated population for 1977 and an estimate of the 1977 food demand (A_1), obtained.

Step 2.

The amount of non-food utilization (A_2) was calculated using percentages obtained from the food balance sheets.

Step 3.

The net imports (A_3) were obtained. It was assumed that the pattern of net imports would not change radically between the last year it was available and 1977. Where there were known changes in imports or exports in the elapsed period, appropriate adjustments were made.

Step 4.

A revised estimate of production (A_4) for 1977 was obtained by the formula

$$A_4 = A_1 + A_2 - A_3$$ (See 2.13 (i), (ii) and (iii))

Step 5.

The production estimate made by the team on the field visit was then compared with A_4, thus completing the reconciliation process. A judgement decision was then used to make the final estimate of production, which took into account factors including unrecorded non-commercial production.

2.20 Potential production estimates

The estimate for increased production for 1982 and 1987 was then obtained by taking the mean of the high and low estimates of the increase in production (See 1.22) for 1982 and 1987 respectively and adding this to the current production estimate (See 2.14).

2.30 Available supply

The supply which is available for local food consumption is estimated by subtracting the non-food use component of the potential production estimates (See 2.20) from the potential production estimates. The non-food use component is estimated from the food balance sheet by aggregating the non-food use categories for the fresh commodity categories (i.e. excluding the preserved categories) and taking it as a percentage of the fresh domestic supply category. This percentage of the potential production estimates gives the non-food use component of the potential production estimates.

2.40 Seasonal supply distribution

The available supply is the total estimate for one year. However, because of the seasonal nature of the commodities the available supply will not be uniform throughout the year. An estimate is therefore made of the average monthly supply for each quarter of the year for each commodity group. On the assumption that there is flexibility, in response to the market demand, with the mix of crops within a commodity group, which can be grown in a given territory, the 'average seasonal pattern' is taken for a commodity group to represent the seasonal supply distribution for that group.

The total available supply is then allocated according to the seasonal supply distribution to give monthly averages by quarter. For commodities such as citrus, onions and white potatoes the specific seasonal production pattern for that commodity in the particular territory is used to allocate the total available supply.

2.50 Average seasonal pattern

For a given commodity, in a given territory for any given month there are different expectations on the yield of that commodity depending on the conditions. Consider the following conditions and the corresponding relative scores representing the magnitude of the yield:

	Conditions	Scores
(i)	Rainfed with glut	2
(ii)	Rainfed without glut	1
(iii)	Full irrigation	0.75
(iv)	Partial irrigation	0.25
(v)	No production	0

It is assumed that for those territories where irrigation is projected that the growing season will be extended under irrigation but that by 1982 only part of the irrigated acreage will have been developed and that by 1987 the total projected acreage would have been developed. It is also assumed that the average yield under irrigation will not be as high as the average yield under rainfed conditions. Hence a score of 0.75 is used for (iii) above rather than a score of 1.

The Table on the seasonality of food crops indicate the harvest and glut monthly period and the expected extended growing season with irrigation. If the above scores are allocated to each crop/territory/month combination and then aggregated over crops with a commodity group for each territory/month combination, then the monthly, or quarterly as has been specified, average seasonable pattern would have been obtained for that commodity group.

3.0 Methodology - Small animals

3.10 Focus on objectives

In Section 1.10 it was pointed out that, in the first phase of the study emphasis should be placed on that work which was essential to phase 2.

The only significant existing trade in small animal commodities is live sheep and goats from Grenada and St. Vincent to Trinidad, see Table VC - 3.04 . There is no sustainable demand potential for sheep and goats in the other nearby markets such as Barbados and the French Antilles, where there are good processing facilities, because of their aim at self-sufficiency. Even if there were markets further afield it is not feasible to transport them because of the high losses which might occur en route. The transport losses for pigs can be even higher than for sheep and goats. In Belize, however, pigs are walked across the Mexican and Guatemalan borders.

For poultry and eggs, production costs in the LDC's are high because of the high cost of imported feed. However, Governments, in general, seem to have opted to encourage self-sufficiency in these commodities. There is at present no potential for trade in poultry and eggs from LDC sources because of the high production costs.

There is little potential for trade between the LDC's in live sheep, goats and pigs because of political decisions to import cheaper frozen meat from abroad to stem the rising cost of living. It is, however, assumed that the demand for fresh local meat within an LDC will grow with the total demand for meat, in the same proportion as indicated in the food balance sheets, and that local production will be geared to meet this demand. In the cases of St. Vincent and Grenada, sheep and goat production will increase to meet the growth in the local and in the Trinidad markets.

As a result of the above current and potential production estimates were obtained only for sheep and goats in St. Vincent and Grenada where there is the opportunity to develop the existing trade with Trinidad.

3.20 Current production estimates

3.21 Fieldwork

As for crops, estimates of the production of pigs, sheep and goats and poultry were obtained by fieldwork. Data were available from

(i) United Nations Economic Commission for Latin America (UN/ECLA) - Agricultural Statistics of the Caribbean Countries - August 1976.
(ii) Small Farming Study in the Lesser Developed Member Territories - Weir et al.
(iii) Canefeed Livestock Study in the Less Developed Territories of the Caribbean - Lambie et al.
(iv) Agricultural Sector Plans
(v) Agricultural Censuses
(vi) Ministries of Agriculture, and
(vii) Departments of Statistics.

The data on historical production statistics from these sources were extremely variable. The task of estimating current statistics, therefore, required a reconciliation process, as for crops. Other information on institutional framework and production and disposition of commodities was recorded, where available. Trade Statistics and food balance sheets were used to obtain information for the estimation of current small animal production in the areas of focus, See Section 3.10.

3.22 Reconciliation process

The process used for small animals is the same in structure as that described in Section 2.14.

3.30 Potential production estimates

The production estimates for 1982 and 1987 are obtained by multiplying the current production estimate by the demand growth rate for fresh meat.

3.40 Available supply

All the fresh meat, less offals, is available for domestic food consumption in the LDC's. There is no processing done.

B. Antigua

1.0 Supply Analysis - Crops

1.10 Structure and Composition of the Agricultural Sector

1.11 Land and Farm Holdings

The pattern of land use in Antigua in 1974 is reported in Table VI B - 1.01.

TABLE VI B - 1.01

Land Utilization in 1974

	Acres		%	
Crop land				
Tree crops	Nil		Nil	
Other cultivated land	4,500		6.82	
Grassland				
Cultivated	5,000		7.58	
Pasture	18,000		27.27	
Unused	1,500	29,000	2.27	43.94
Forest and Woodland	25,000		37.88	
Non-agricultural land	12,000	37,000	18.18	56.06
Total		66,000		100.00

Source: U.W.I., Trinidad, quoted in Weir et al, Small Farming Study 1 (b) 194 (1976).

In 1976, a Government Committee made proposals for future land use as shown in Table VI B - 1.02.

TABLE VI B - 1.02

Proposals for Land Use in Antigua

(Government owned, 20,124 acres; privately owned, 17,129 acres)

Proposed Use	Acres	
Corn	4,437	(d)
Sugar	6,199	(a)
Cotton	1,069	
Vegetables	796	(b)
Mixed farming	2,691	
Pineapples	921	
Tree crops	2,710	
Livestock	13,129	
Housing	2,301	
Reafforestation	3,000	
Total	37,253	

(a) Sugar acreage will probably be reduced to 2,000 or 3,000, leaving the remaining good arable land for some other purpose, possibly mixed farming.

(b) In course of time, some 400 of the 796 acres of vegetables should be irrigated, and 100 of the pineapples.

(c) No distinction is made between large and small farmers in the above table, but it is expected that some 700 acres of vegetables, nearly all the cotton (1,000 acres) and most of the sugar (1,500 acres), all the mixed farming (2,700 acres) and some of the pineapples and tree crops (say, 500 acres) would be in the hands of small farmers - say, 3,400 acres.

(d) Approximately 4,000 acres of Government owned land has been leased to a private company, Antigua Agricultural Industries Ltd. (AAI) primarly for the production of maize.

Source: Ministry of Agriculture.

The acreage operated by 5,551 small farmers in 1961 was 13,181 (source as for Table VI B - 1.01). However, due to the ultimate demise of the sugar industry in 1971, the number and acreage of small farms have declined. In 1971 there were only 4,316 farms (source - Agricultural Extension Service) with an estimated acreage of approximately 6,000, a substantial part of which is employed for grazing. The acreages for food crops and cotton which were cultivated by small farmers is given in Table VI B - 1.03.

TABLE VI B - 1.03
Land Cultivated by Small Farmers (Acres)

Crop	Year					
	1972	1973	1974	1975	1976	1977
Vegetables & other foods	1,827	2,255	1,952	1,717	1,809	1,160
Cotton	107	198	134	318	550	630
Total:	1,934	2,453	2,086	2,035	2,359	1,790

Source - Agricultural Extension Service.

The main food crop production areas are illustrated on the map in the Figure VI B - 1.01. In addition to the small farming sector, there are two Government Estates, Diamond (150 acres) and Claremont (10 acres), where food crops can be grown.

1.12 Irrigation

Rainfall is 35 - 45 inches per year and is subject to annual as well as seasonal fluctuations; irrigation is therefore very important. The major irrigation project is at Diamond (50 acres of vegetables) where water is obtained from the Potworks and Collins dams. Another project is at Bethesda where water is obtained from a local dam and serves about 40 acres operated by small farmers who pay EC$1.00 per 1,000 gallons and $20.00 per acre per month for rental of equipment.

This is equivalent to $158.00 per acre for a dry month when 6 inches of irrigation water would be required. Some farmers operate from their own catchments or use the public supply. The cost for the use of the public supply is $10.00 per 1,000 gallons or $230.00 per acre inch. A new dam is scheduled for Creekside which is expected to yield about 1 m.g.p.d. This yield would go into the public supply releasing an equivalent amount from the Potworks and Collins dams for irrigation in the Betty's Hope area. At a maximum estimated requirement of 2 inches per acre per week, this would irrigate up to 150 acres. The crops planned for irrigation include Onions, Carrots, Cabbage, Pulses and Peanuts.

1.13 Institutional and Private Sector Framework for S.F.C. Production and Market Supply

a) Credit

Credit is available for agricultural enterprises through commercial banks. The Government and large scale enterprises are the main customers. The Antigua and Barbuda Development Bank (ABDB) is the main source of credit to small farmers but at the end of 1977 only three loans had been approved to small farmers. The main reasons for this are the reluctance of the small farmer to take loans and the inability of the small farmer to fulfil the collateral requirement. The new CDB Agricultural Production Credit scheme, which accepts crop lien as security, may enable the ABDB to be of greater assistance to small farmers.

b) Technical assistance

The Government's Agricultural Extension Service (AES) undertakes mechanical cultivation for small farmers. The availability of tractors is not adequate and ploughing was quoted at EC$56 per acre.

The Central Marketing Corporation (CMC) sells agricultural chemicals against the purchase of crops but the amounts purchased by small farmers indicates an average application which is extremely small compared with the recommended practice.

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Extension services are provided by the AES. However, with 3 senior staff and 9 field officers to service 2,000 farmers, it is greatly undermanned. There is no formal coordination of the activities of the ABDB, CMC or AES.

c) Farm to market services

Small farmers market their produce with the aid of the CMC and hucksters or direct to supermarkets, hotels or restaurants. The CMC does not provide transport for the farmers' produce neither are there any collection points for food crops or fruit. The farmer arranges for the produce to be taken to CMC headquarters in St. John's where he often has a long wait to deliver his produce. There is new washing and grading equipment at the CMC but is is not functional. The hucksters either collect the produce from the farmers or the farmers deliver it to an agreed point for shipment by sea or air to a neighbouring territory. At supermarkets, hotels and restaurants, where the farmer makes his own deliveries, the waiting time is usually very short, as the delivery time is set by pre-arrangement. Cotton is taken by farmers to collection points at Picadilly in the South and Wilkies in the East. It is then transported by the Cotton Growers Association to the ginnery at Cassada Gardens, where the ginned cotton is stored until it is exported.

Corn is held in silos at two points and is normally exported by AAI direct to Guadeloupe, Martinique, Barbados and Trinidad.

d) Farmers Associations, Cooperatives.

There are no major small farm food crop cooperatives.

1.20 Small farmer commodity production and disposition.

1.21 Production

a) Total by small farm categories

Small farmer production for the four food crop categories is shown in Table VI B - 1.04.

TABLE VI B - 1.04

Summary of Small Farmer Production *

1974 - 1977 ('000 lb.)

Commodity	1974	1975	1976	1977+
Root Crops	530	552	1,014	375
Pulses	115	195	195	109
Vegetables	754	871	1,117	592
Fruit	308	1,355	826	314

Source - Agricultural Extension Service.

* These figures are stated to be total production, including that consumed by small farmers.

\+ This year was atypical because of drought.

The fluctuation in production may be due to annual rainfall variation, response of the farmer to glut or scarcity in the previous year and fluctuation in tree crop yields.

b) Small farmers vs Large farmers.

There are no large food crop farmers (except one for pineapples who looks after his own marketing). The Government estates respond to requests to produce food crops, under irrigation, when there is likel- to be a shortfall from small farmers.

c) Seasonality of commodities.

The harvest and glut periods under rain-fed conditions and the extended growing season under irrigation, are given in detail in Tables VIIA - 2.01 - VIIA - 2.04

d) Export crops.

There is currently no significant export of small farmer production.

e) Glut crops.

Some of the main crops liable to gluts and the quantities purchased and sold by the CMC are given in Table VI B - 1.05. The CMC is committed to buying all small farmer produce at a guaranteed minimum price and hence the CMC purchases and sales data are adequate indicators of the glut situation. This table also indicates the low percentage sales for several commodities corresponding to the large wastage of food crops which are thrown away.

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TABLE VI B - 1.05

Purchases & Sales of Glut Crops at C.M.C. lbs.

		1972	1973	1974	1975	1976	1977	Jan 1978 Feb
Sweet Potato	P	317,971	138,687	216,516	306,401	879,761	137,554	93,282
	S	127,920	116,068	182,945	202,607	101,240	95,314	22,812
	%	40%	84%	84%	66%	12%	69%	24%
Pumpkin	P	14,321	36,914	21,120	98,457	113,661	72,917	107,198
	S	12,094	32,804	18,422	57,579	22,882	46,723	18,809
	%	84%	89%	87%	58%	20%	64%	17%
Tomato	P	35,405	57,396	107,021	244,631	289,401	149,569	165,294
	S	29,622	40,320	63,680	85,339	31,006	61,843	32,630
	%	84%	70%	60%	35%	11%	41%	20%
Egg Plant	P	108,088	95,196	62,887	121,489	98,530	51,952	51,187
	S	75.379	51,232	42,658	68,378	28,989	24,159	9,123
	%	70%	54%	68%	56%	29%	47%	18%
Cucumber	P	108,002	111,151	157,044	145,602	218,851	151,044	14,745
	S	70,486	65,969	73,880	50,817	57,577	42,640	10,402
	%	65%	59%	47%	35%	26%	28%	71%

2/ Source - Central Marketing Corporation.

1.22 Disposition

There is no detailed information on the disposition of small farmer commodities. It is believed that up to 50% of the small farmer production is consumed on the farm. Direct sales are made to hotels, supermarkets, restaurants, etc. and as a last resort to the CMC. Some of the glut commodities sold to the CMC are bought by the Food Technology Division of the Ministry of Agriculture where an experimental scale pilot processing plant is operated. Also, there are about 100 hucksters in the island, but there is no indication as to what proportion of small farmer produce goes to hucksters either for export or to be distributed in the nearby villages.

1.30 Supply Potential

1.31 Basis for increase in production

a) Increased land area

There is a substantial amount of good agricultural land (formerly in sugar cane), which could be used for rain-fed food production and increases of 200 - 400% could be envisaged. However, yields from rain-fed crops are low and produce seasonal gluts which at present are not satisfactorily disposed of by the CMC, so there is little incentive for the cultivation of more land to be operated on a purely seasonal basis. In any case there is still some uncertainty as to the land use position regarding the revival of the sugar industry.

b) Intercropping

There may be some possibilities for growing root crops (yams and sweet potatoes), maize and some pulses as rotation or intercrops with sugar cane, when the proposed revival of the sugar industry takes place. An estimated 500 acres per year could be so grown and should yield, say, 60,000 lb. of yams and 60,000 lb. sweet potatoes, and 10-15,000 lb. of dry corn, and, at the same time, release other land for more valuable crops. Similarly, as orchard development continues, there would be scope for intercropping, e.g. with pineapples or pulses, in the early years of tree growth.

c) Improved practices.

At present, inputs among small farmers are low. If proper husbandry were practised, notably weeding, fertilizing and protection from pests and diseases, most yields could be doubled. However, the typical small farmer is a part-timer and the practice of good husbandry is very difficult in a part-time operation.

d) Irrigation.

Antigua has good possibilities for extending irrigation. The map, Figure VI B - 1.01, shows present irrigated areas (100 acres at Diamond, Bethesda and Claremont) and some 500 acres or more where irrigation could be developed (See 1.12). Recommendations have been made to rehabilitate the catchments at Body Pond and St. Luke's to provide sufficient water for a further 100 acres, and surveys are also underway to examine to what extent small farmers can construct and use their own small catchments for irrigation. The augmenting of small farmer irrigation schemes will require the injection of considerable sums of money, however, their production could be trebled or even quadrupled (See Table VI B - 1.06) without any increase in acreage, provided that adequate inputs were applied. There is no indication that irrigation or cultural practices among small farmers has improved since 1974.

TABLE VI B - 1.06

Yields per acre for selected crops in Antigua (lb)

Crop	1971	1972	1973	1974	+Normal yield in Barbados
Corn	1017	1426	961	567	1,000 - 1,500
Sweet potatoes	1670	2933	954	427	3,000 - 4,000
Cassava	1066	2101	840	315	2,000 - 3,000
Yam	3129	3629	1706	1200	3,000 - 5,000
Tomatoes	984	1529	666	533	3,000 - 4,000
Cabbage	2000	2000	712	226	4,000 - 5,000
Carrots	2000	1528	2364	688	1,500 - 2,500
Onion	na	1351	875	489	6,000 -10,000
Egg Plant	na	2148	1141	691	4,000 - 6,000
Pumpkin	na	1256	1304	886	3,000 - 5,000

Source - Weir et al (1976), p. 203

+ Barbados yields are for dry zone rain-fed crops for those farmers who practice good husbandry.

1.32 Estimated Current and Potential Production.

The current production estimates (Section VIA-2.14) are shown in Table VI B - 1.08. The basis on which production may be increased is given in Section 1.31. This basis coupled with the land use proposals by a Government committee 1976 (See Table VI B - 1.02), which was supported in the Budget Speech of March 16, 1978, gives some justification for the estimates of increased production given in Table VI B - 1.08.

This potential increase in production will take some time to be fully achieved and Table VI B - 1.08 shows 'low' and 'high' estimates for the development of this increase in production for 1982 and 1987.

The 'high' estimate for 1987 corresponds to the increase in production indicated in Table VI B - 1.07 and assumes that the Government's land utilisation proposals are implemented, that the 500 acres of irrigable land is irrigated and brought into production and that proper agronomic practices are undertaken.

Table VI B - 1.07

Potential Production

Crop	Acres	Yield/acre (lb)	Total (lb)
Rootcrops			
Among sugar cane	400	4,000	1,600,000
Mixed farming	400	2,000	800,000
Irrigated	100	8,000	800,000
Corn			
Pure stand (AAI)	4,500	5,000	22,500,000
Rotation with cane	50	1,500	75,000
Mixed farming	100	1,000	100,000
Pulses			
Pure stand			
Rainfed	50	1,000	50,000
Irrigated	50	1,000	50,000
Mixed farming	300	500	150,000
Vegetables			
Rotation with cane	50	3,000	150,000
Pure stand			
Rainfed	250	3,500	875,000
Irrigated	500	15,000	7,500,000
Mixed cropping	500	1,500	750,000
Pineapples			
Pure stand	900	10,000	9,000,000
Mixed cropping	300	5,000	1,500,000
Tree fruit			
Pure stand	2,700	6,000	16,200,000
Mixed farming	500	1,000	500,000

Source: Based on Antigua Land Development Plan Proposals

TABLE VI B - 1.08

Production Estimates
(metric tons)

Commodity Group	Current	Increase in production			
		1982		1987	
		Low	High	Low	High
Fruits	7,508	659	2,474	3,835	10,187
Vegetables	531	174	627	627	3,701
Roots	460	84	674	674	1,355
Pulses	37	13	54	31	76

Source: See section 1.32

The distribution of the available supply, after a deduction for non-food usage (See section VIA - 2.30) for 1982 and 1987 is given in Table VIB - 1.07.

TABLE VI B - 1.09

Supply Distribution
(Metric tons)

Commodity Group	Current Production Estimate	1982 Production	1982 Supply Total Available	1982 Supply Quarterly (Monthly Averages) 1	2	3	4	1987 Production	1987 Supply Total Available	1987 Supply Quarterly (Monthly Averages) 1	2	3	4
Fruits													
Citrus*													
Other													
Total	7,508	9,075	8,630	520	442	780	1,222	14,519	13,807	911	801	1,104	1,795
Vegetables													
Onions	14	137	130	22	22	0	0	340	323	54	53	0	0
Other	517	795	757	112	22	23	95	2,354	2,243	236	124	141	243
Total	531	932	887	134	44	23	95	2,694	2,566	290	177	141	243
Roots													
White potatoes*													
Other													
Total	460	839	826	159	73	9	44	1,475	1,451	247	113	42	81
Pulses	37	70	68	12	0	0	11	91	89	16	0	0	14

* No significant production anticipated.

Source: Table VIB - 1.08, Sections VIA - 2.30 and VIA - 2.40

2.0 Supply Analysis - Small Animals

2.10 Institutional Framework

2.11 Present Situation

Livestock constitutes a major part of the agricultural economy in Antigua. However, this is mainly concerned with the production of cattle. The Antigua Government has made a commitment under the Regional Food Corporation to establish a regional livestock complex. This complex will provide production units for meat, milk, dairy products, a feed mill and a hatchery for poultry production.

2.12 Transport

Most of the animals slaughtered are walked to the town, although pigs are taken by pick-up trucks. Itinerant butchers go around the villages purchasing animals and transport these in their own trucks.

2.13 Marketing facilities

a) Slaughter

The number of animals slaughtered is given in Table VI B - 2.01.

TABLE VI B - 2.01

Animals slaughtered

	1974	1975	1976	1977
Sheep	359	319	598	999
Goats	1044	172	590	689
Pigs	34	862	981	1303

Source - Government Statistical Department.

It is estimated that some 40 - 50% of the small animals are slaughtered privately outside of the St. John's slaughterhouse and these figures do not enter the official statistics.

b) Imports

Imports of live animals other than chickens from the United States and Barbados and the odd breeding stock for stud service are not significant.

2.20 Production and disposition

2.21 Production

a) An estimate of the population of small animals is as shown in Table VI B - 2.02.

TABLE VI B - 2.02
Small animal population

	1971	1972	1973	1974
Sheep	6,000	7,000	11,000	7,000
Goats	6,000	5,000	5,000	5,000
Pigs	3,000	4,000	3,000	4,000
Chickens	55,000	56,000	58,000	60,000

Source - Agricultural Statistics for Caribbean Countries - UN/ECLA 1976.

However, there is considerable variation in these estimates between the above source and two other studies, commissioned by the CDB, done by Weir et al. and Lambie et al. There has been little change in the quantities of small stock over the past years. There has been an increase in chickens and if the high cost of feed constraints could be removed there is no reason why Antigua could not become self sufficient in poultry meat and eggs.

b) Constraints

The major constraints to production are Government Control Prices on fresh meat products, lack of effective veterinary and agricultural services, disease, praedial larceny, stray dog attack and the high price of imported feed stuffs.

c) Government regulations

Agricultural equipment and feed stuffs are imported duty free and communal pastures have been established for rental by small farmers. There is a control price on meat and live animals. There is no export quota restriction but no active attempt is made to market small animals in the French Islands which should be profitable.

d) Management

The standard of management and production of small animals by small farmers is generally low. Quality of production without sophisticated marketing methods, such as grading of meat, etc., tends to be low.

2.22 Disposition

a) Consumption patterns

Little or no information on consumption patterns of small animals exist, however, praedial larceny, attack by stray dogs, disease and inadequate extension and veterinary services account for the death of a large portion of the animals born.

b) Processing facilities

There are no agribusiness processing projects in Antigua for small animals except for a couple small poultry farms.

2.3 Supply potential

2.31 Special favourable conditions

With the rehabilitation of the sugar industry and removal of large tracts of land from free grazing, there is likely to be an expansion in the small stock population as compared with the present cattle population. Antigua imports a large quantity of milk and the Government has recently imported some dairy goat breeding stock to encourage the small farmer to produce milk - using the dairy goat - for on farm consumption. The Antiguan climate and flora are particularly suited to goat production.

2.32 Increase in output

The climate and soil types of Antigua are suitable for small stock production, and availability of land and labour, at the present, shows potential for an increase in output. An export drive to find lucrative markets - particularly in the French islands - should pay dividends, thus giving an incentive to small farmers to increase output. The location of areas suitable for livestock production is shown on the map in Figure VI B - 1.01.

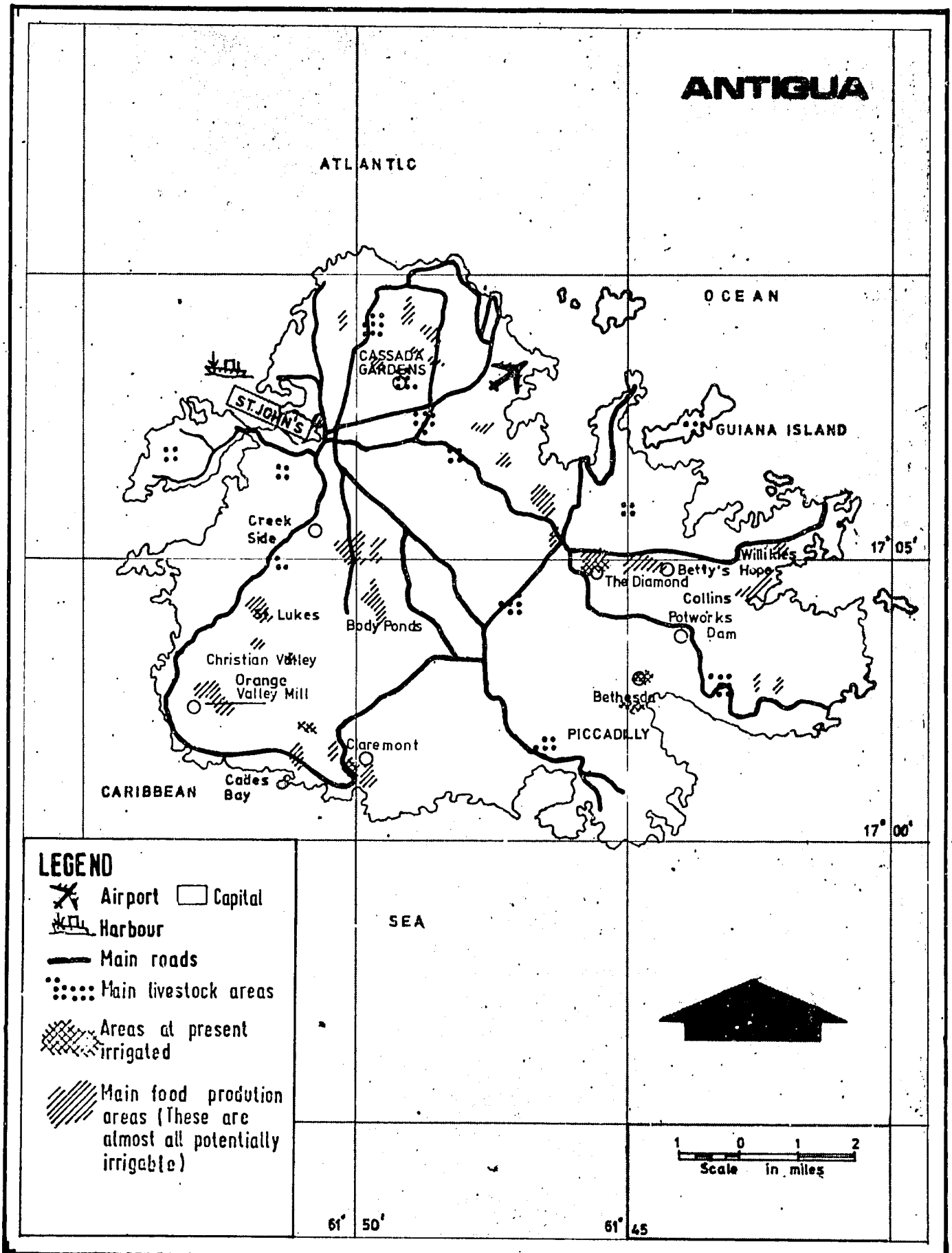

FIGURE VI B-1.01

C. Belize

1.0 Supply Analysis - Crops

1.10 Structure and Composition of the Agricultural Sector

1.11 Land and Farm Holdings

Belize has a total land area of 5.7 million acres of which Government owns 3.5 million acres (61.4%). Of the total land area, 2.6 million acres (37.9%) are considered suitable for crop and livestock farming, see Table VI C - 1.01.

TABLE VI C - 1.01

Land Utilization ('000 Acres)

	Acres	%
Agricultural lands		
Cultivated	215	3.8
Uncultivated	1,946*	34.1
Non-Agricultural lands		
Government Forest Reserves	1,180	20.7
Private Forest Reserves	283	5.0
Cayes, Beaches, etc.	200	3.5
Other lands (mainly swamps)	280	4.9
Lands unaccounted for	1,596	28.0
Total	5,700	100.0

* Includes almost 300,000 acres in the Toledo District which is virtually inaccessible.

Source: Development Plan 1977-79.

In 1974 there were 6,177 small farmers who comprise 69.4% of the land holders, but hold only 8.5% of the lands. Most of these small holdings are cultivated.

1.12 Irrigation

The prospects for irrigation for small farmers are not very good. There is some flood irrigation practiced for rice in the Toledo district and provision is being made for the rice growing areas in the Toledo and Belize districts. As far as irrigation for food crops is concerned there are a few artesian wells in the Belize districts. In The Rancho Dolores area water is available at depths of 550 ft, but special rigs would be required to tap this source, a very expensive proposition indeed. Salinity can be a problem in ground water and in streams up to 15 miles from the coast.

1.13 Institutional and Private Sector Framework for SFC Production and Market Supply

a) Credit

The Development Finance Corporation (DFC) is the main source of finance for farmers. The DFC has field offices in the main districts of the country to facilitate the preparation of projects and the disbursement and supervision of loans. Only 2 or 3 loans have been made for food crops and these have been disastrous. This is mainly because the risk in growing food crops is exceptionally high, since there is no adequate extension service to guide the farmers as to the best cultural practices.

b) Technical assistance

The Government's extension officers currently focus on specific crops, i.e. rice, red kidney (R.K.) beans and corn. They work closely with research staff to bring better practices to the farmer. CARDI is currently providing a stimulus in research, development and extension for vegetable production. Government provides limited mechanical services to farmers.

c) Farm to Market activities

There are no vegetable pick up points and farmers either bring their produce into the market or send it in on buses and trucks for it to be sold to vendors in the market. There are Marketing Board depots at Orange Walk, Toledo and Cayo in addition to the headquarters depot in Belize. These depots supply the farmers with fertilizer and purchase red kidney beans, corn and rice paddy from the farmers. The Marketing Board does not purchase vegetables and other food crops.

d) Farmer Associations, Cooperatives

Cooperatives have been successful in Belize particularly for honey and fish. Agricultural cooperatives have not caught on because of the greater risk involved and the greater difficulty in organizing farmers. However, the division of cooperatives is working at a programme to get farmers together in an effort to increase their efficiency in an integrated production and marketing system.

There is the Belize Cane Farmers Association (BCFA) with a membership of 2,200, more than 85% of whom have an acreage of less than 25 acres. Because of the uncertainty in the sugar industry, the BCFA is promoting a food crop diversification programme.

1.20 Small Farmer Commodity production and disposition

1.21 Production

a) Total production by commodity.

In Table VI C - 1.02 the level of production of selected commodities is given for 1975.

TABLE VI C - 1.02

Production of selected commodities

1975

Sugar cane	('000 tons)	783
Citrus	('000 boxes) **	1,336
Rice	('000 lb)	10,700
Corn	('000 lb)	28,000
* Beans	('000 lb)	3,000
Bananas	(acres)	1,050
Sorghum	(acres)	1,200
Vegetables	('000 lb)	650
Fruits	('000 lb)	5,000
Plantains & Root crops	('000 lb)	5,000

Source: Development Plan 1977 - 79.

* R.K.beans comprises about 90% of total.

** Average weight of a box of oranges is 90 lbs, and grapefruit 80lbs.

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In Table VI C - 1.03, the production of vegetables during 1973/74 are presented

TABLE VI C - 1.03

Production of Vegetables ('000 lb)
1973/74

Cabbage	104	String Beans	25
Lettuce	40	Tomatoes	305
Carrots	13	Cucumbers	55
Onions (shallot)	9	Pumpkins	360
Hot peppers	70	Squash	50
Sweet peppers	80	Ochroes	17
Watermelon	465		

Source: Census 1973/74

b) Small Farmers vs Large Farmers

The Table VI C - 1.04 gives estimates of the percentage of total production for the major commodities which are grown by small and large farmers, derived from 73/74 Census figures:

TABLE VI C - 1.04

Distribution of Small and Large Farm Production

Crop	Percentage of total Production	
	Small Farmers	Large Farmers
Corn	46.3	53.7
Rice	84.0	16.0
Beans	92.4	7.6
Root Crops	81.2	18.8
Vegetables	22.8	77.2
Mangoes (grafted)	30.6	69.4
Papaya	70.5	29.5
Bananas	76.1	23.9
Plantains	93.4	6.6
Oranges	20.5	79.5
Grapefruit	36.0	64.0
Limes	61.0	39.0

Source: Census 1973/74

c) Seasonality of Commodities

There are two extremes in climate in Belize, drought and flooding, which limit production of food crops, pulses, fruits, vegetables, cereals and roots. The rainfall pattern varies considerably over the whole country. The main production season for vegetables occurs during the cooler part of the year from November to February. The planting season depends mainly on the rainfall pattern. In the Belize district tomatoes, cabbages and sweet peppers are usually planted in June to July and then again in November to December. In addition, lettuce, carrots and melons are planted in December to January. Vegetables planted along river banks in the Belize and Cayo districts are usually subject to flooding and water-logging and this limits production during the wetter months of the year. During March to May production without irrigation is impossible. With irrigation, vegetable production can be perennial in the lower rainfall areas of the Northern districts. Tables showing the harvest and glut period under rainfed conditions are given in detail in Tables VII A - 2.01 to VII A - 2.04.

The pulses, cereals, fruit and roots are also very sensitive to weather conditions and the yield is unpredictable. Production in the dry season is only possible with irrigation.

d) Export crops

Rice is a major export crop due to the large mechanised operation at the Big Falls ranch in the Belize River Valley. Citrus, the next largest export after sugar, is exported primarily in processed form, segments and concentrates. Production and processing takes place in the Stann Creek Valley. A surplus of corn was produced in 1977 in response to a production drive but storage and cost of production foiled a successful attempt to export the crop. The R.K. bean is a staple in Belize and small quantities have been exported to Jamaica where vast quantities are consumed as 'red peas'. Honey as well as banana production are on the increase and an export trade is being developed. Fresh mangoes and processed papaya chips (by the Menonites) are being exported to the U.S.

e) Glut crops

Because food crops are produced under rainfed conditions there is a tendency to glut for all of the food crop commodities in the harvesting period in March to May.

1.22 Disposition

There is little quantitative information about the disposition of food crops. Milpa farmers have adopted a 'slash and burn' practice over the years and produce mainly for home consumption. Farmers producing R.K beans, rice and corn are assured a market at guaranteed prices by the Marketing Board. Vegetable farmers are mainly located near to population centres to minimize the problems of distribution for the perishable produce. Consumption of fresh vegetables in the rural areas (50% of the total population) is negligible due partly to the traditional consumption habits of not eating vegetables. Rice and R.K. beans is the main staple combination for the majority of Belizeans despite the variety of ethnic origin.

1.30 Supply potential

1.31 Basis for increase in production

a) Increased Land Area

Land is not a constraint in Belize and all production in all commodities may be increased with increased acreage, given that services for access roads and land clearing are available. Rice is a viable export crop and the Government plans to construct feeder roads and provide land clearing services so that farmers can increase the acreage under production. A company, Big Falls Ranch Limited, eventually aims at cultivating 32,000 acres. The acreage cultivated in 1976 was 10,629 acres of which 5,048 was irrigated and double cropped by the private company. An estimated 30,642 acres of corn was cultivated in 1976. The Government intends to induce increased acreage under corn by providing the necessary services for farmers. The acreage under beans is likely to be increased as soon as Government can improve storage and marketing facilities and thus provide an incentive to farmers. The Banana Control Board is developing the required infrastructure to enable farmers to develop another 2,500 acres of bananas, in addition to the 1,600 acres under production in 1976.

b) Intercropping

Since there is no constraint on land in Belize, intensive cropping is not commonly practised. Intercropping, therefore, is not a major factor in increasing production.

c) Improved practices

The Milpa farmers of Toledo were until 1972 the major rice producers. However, research and development programmes have been introduced with a view to increasing yields and inducing farmers to practise sedentary mechanized agriculture.

Average yields in citrus orchards are generally very low, especially for the small grower. Problems with pests and diseases are being researched and interim findings are being implemented thus resulting in a higher level of output. The Ministry of Agriculture's extension services is also making recommendations with respect to corn which, if followed, should result in higher yields. Pest and disease problems and storage are major constraints to increased yields of peas and beans. Other varieties, which are more resistant to disease and pests are being considered in order to increase yields.

Research is being conducted into selecting vegetable varieties which could be cultivated during the warmer months of the year.

d) Irrigation

Experimental irrigated rice projects are planned where water supplies are available. Farmers will be encouraged to introduce limited irrigation systems for pulses, roots and vegetables to overcome the shortage of water in the dry seasons.

1.32 Estimated current and potential production

The basis on which an increase in production may be projected is given in section 1.31. The projections in the Belize Development Plan 1977 - 79 were also considered. The estimates of increased production are given in Table VI C - 1.05. The 1977 1977 production projection in the Development Plan was overestimated when compared with the actual production, which indicates the development of the sector is not taking place as rapidly as was proposed in the Development Plan. The 'high' estimates of increase in production in 1982 now represent what was originally projected for 1979 in the Development plan. The 'low' estimates are based on more pessimistic considerations. The 1987 estimates assume no major change in the rate of growth of production.

2.0 Supply analysis - small animals

2.10 Institutional framework

Table VI C - 1.05

Production Estimates

(metric tons)

Commodity Group	Current	Increase In Production			
		1982		1987	
		Low	High	Low	High
Fruits	83,277	5,226	12,485	12,485	22,467
Vegetables	1,976	411	638	638	865
Roots	17,434	140	956	956	1,863
Pulses	1,310	363	1,633	1,633	2,540

Source: see section 1.32

The distribution of the available supply after a deduction for non-food usage (see section VI A-2.30) for 1982 and 1987, is given in Table VI C - 1.06.

TABLE VI C - 1.06

Supply Distribution
(Metric tons)

Commodity Group	Current Production Estimate	1982 Production	1982 Supply Total Available	1982 Supply Quarterly (Monthly Averages) 1	2	3	4	1987 Production	1987 Supply Total Available	1987 Supply Quarterly (Monthly Averages) 1	2	3	4
Fruits													
Citrus	65000	69647	4596	611	152	152	611	75318	4970	661	164	164	661
Other	18277	22486	5538	739	182	182	739	25435	7212	959	238	238	959
Total	83277	92133	10134	1350	334	334	1350	100753	12182	1620	402	402	1620
Vegetables													
Onions *													
Other													
Total	1976	2501	2061	274	274	68	68	2728	2248	299	299	74	74
Roots													
White potatoes *													
Other													
Total	17434	17982	16183	2152	2152	534	534	18844	16960	2256	2256	560	560
Pulses	1310	2308	2104	280	280	69	69	3397	3098	412	412	102	102

* No significant production anticipated.

Source: Table VI C - 1.05, Sections VI A - 2 30 and VI A - 2.40.

2.11 Present situation

Small animal production in Belize is concentrated mainly on poultry and pigs. The sheep population is relatively small primarily because of the limited market for mutton. The number of bee-keepers is increasing steadily and there are now well organised cooperatives for the export marketing of honey; the industry is growing rapidly.

There are plans to expand the production of pigs to provide not only for the growing local demand for fresh pork, but also for the production of ham, bacon and salted meats which are now being imported. In the Belize Agricultural Development Plan it is indicated that the local market as well as the export market for mutton is increasing and that sheep farming will be encouraged on a commercial scale. The Menonite communities are the main producers of eggs and poultry meat and Belize is self sufficient in these products. A small proportion of the poultry production is exported to Mexico in the form of live birds.

Livestock feeds for pigs and poultry can be met by increased corn production, residue from the flour mill, bran from the rice industry and offals from the abbatoir and fish processing plants.

There is no significant goat production in Belize.

2.12 Transport

Live chickens are transported by trucks to the border town in Mexico and also to the market place in towns in Belize. Pigs are walked across the border to Mexico and Guatemala. Pig production, with few exceptions, is confined to backyard type operations and production is sufficiently wide spread with each unit of production serving its immediate environs.

2.13 Marketing conditions

a) Slaughter

The number of pigs slaughtered at the official slaughter houses are shown in Table VI C - 2.01

TABLE VI C - 2.01

Animals Slaughtered

1972	1973	1974	1975	1976
9,902	9,439	5,795	5,925	4,163

Source: Ministry of Agriculture

b) Imports

Belize imports over one million pounds of ham and bacon as well as 50% of its consumption of salted and smoked pork. The natural herd supplies the entire local demand for fresh pork (5,000 per annum) besides some 2,000 - 3,000 head per annum for the export market.

c) Existing facilities

There are no centrally organised marketing arrangements for pigs and sheep. The Menonites, the main poultry and egg producers, have their own marketing arrangements.

2.20 Production and Disposition

2.21 Production

a) Population

The natural swine herd is estimated at 18,000 head. The production statistics are shown in Table VI C - 2.02

TABLE VI C - 2.02
Pork Production
(lb. dressed weight)

1972	1973	1974	1975	1976
891,123	652,090	426,370	451,390	371,217

Source: Ministry of Agriculture

The total consumption of poultry meat is about 3.0 million lb. all of which is produced locally. The country is self-sufficient in table eggs.

Production of honey has increased considerably over recent years due to a response to the reliable export market. The production figures are shown in Table VI C - 2.03.

TABLE VI C - 2.03
Honey Production
(lb)

1972	1973	1974	1975	1976
184,951	292,458	363,585	298,390	655,018

Source: Ministry of Agriculture

b) Constraints

The lack of sufficient quantities of good quality breeding stock is a major obstacle to further development in the pig industry.

The sheep population is relatively small because of the limited local market for mutton.

Extension and animal health services are also major constraints to small animal development.

c) Government regulations

The export of pigs is restricted by law to animals weighing in excess of 225 lb. live weight.

d) Management

The level of management in the poultry and honey industries is high. However, in the pig and sheep industries, because of the mainly backyard type operation the overall level of management is relatively low.

2.22 Disposition

a) Consumption pattern

There is no detailed information on the percentage on farm consumption. The poultry and eggs are distributed by the Menonite community and are available at retail outlets over the country.

b) Processing

Meat processing facilities are inadequate.

2.3 Supply potential

2.31 Special favourable conditions

a) Pigs

An increasing live animal market in Mexico.

b) Sheep

Sheep farming is suited to small farmers in Belize, not only because of the low capital investment required but also because these animals can do well under moderate conditions, plenty of which is available in Belize.

c) Honey

There is an expanding U.K. and European market with reliable marketing arrangements already well established through an agent.

2.32 Increase in output

a) Pigs

The projected potential pig production based on a domestic demand growth rate of 3.5% per annum for pork and a export growth rate of 11.7% is given in Table VI C-2.04.

TABLE VI C - 2.04
Potential Pig Production
(Numbers)

	Current	1982	1987
Domestic	8,000	9,501	11,284
Export	3,000	5,116	9,070
Total	11,000	14,617	20,354

Source: Table VC - 1.04 and Relize Development Plan.

b) Poultry

The projected potential for poultry production based in a domestic demand growth rate of 4.12%, see Table VC - 1.04 is 3.67 million lb in 1982 and 4.49 million lb in 1987.

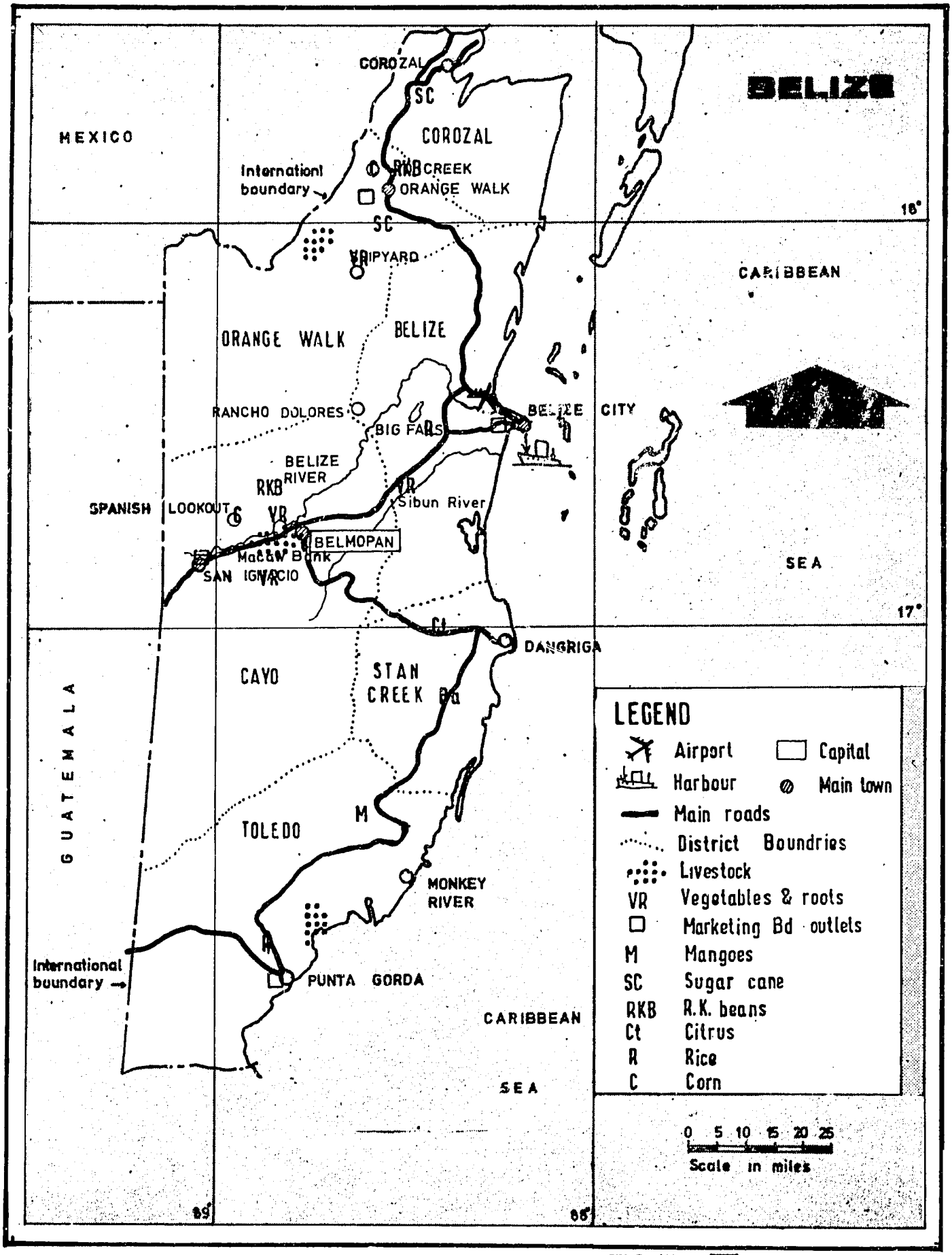

FIGURE VI C-1.01

D. Dominica

1.0 Supply Analysis - Crops

1.10 Structure and Composition of the Agricultural Sector

1.11 Land and Farm Holdings

Dominica has a land area of 195,200 acres and is extremely mountainous. It is estimated that 60% (117,000 acres) is the maximum likely to be suitable for agriculture. There are areas of potential agricultural land not yet used mainly through difficulty of access.

Table VI D - 1.01
Land Utilization

	Acres	%
Crop Land		
Tree crops	24,890	12.8
Other crop land	8,792	4.5
Grassland		
Cultivated	631	<1.0
Uncultivated	3,705	1.9
Forest and Woodland	37,073	19.0
Forest Reserve and National Park	35,000	17.9
Non-agricultural land	1,071	<1.0
*Unaccounted for	84,038	43.1
TOTAL	195,200	100.0

Source: 1961 Census of Agriculture and
Agricultural Sector Plan 1977-81

* The 'unaccounted for' land is a remarkably high figure and a new cadastral survey has been recommended.

There are 7,600 small farmers who comprise 95% of the land holders, but operate only 30.8% of the lands or 22,016 acres (Agricultural Sector Plan 1977-81). Of the total of 71,469 acres in holding, only 36,000 acres is actually cultivated, leaving 35,469 acres uncultivated, but it is not known how much of this area would be arable. It is presumed that virtually all of the uncultivated land is on the larger holdings and that small farmers cultivate all of their holdings.

1.12 Irrigation

No irrigation is practised although there are some relatively dry areas, particularly on the western side of the island, where it would be beneficial because of the length and severity of the dry season in this same area. In the small vegetable farming areas both north and south of Roseau a little "watering" is carried out, mainly to get seedlings established. Some consideration has been given to irrigation of bananas in one or two areas, but nothing has come of it nor do there seem to be any definite plans. A mini-dam is proposed for the Warners area in the near future.

1.13 Institutional and Private Sector Framework for S.F.C.Production and Market Supply

a) Credit

Credit is available through commercial banks, credit unions and the Dominica Agricultural and Industrial Bank (AIDB). At the end of 1977 over 230 agricultural loans from the AIDB totalling EC$1.7 M were operational. Of these, 169 were for crop development.

b) Technical assistance

The Government's Extension Service has 26 of its 35 officers continuously in the field. A small farmer equipment pool is being developed and some use was being made of this service but many farmers found it too costly.

c) Farm to Market activitities

There are no vegetable pick up points and farmers operate or hire trucking facilities to move their produce to Roseau or Portsmouth. The banana boxing plants and the limited road system are shown on the map, Figure VI D-1.01.

d) Farmer Associations, Cooperatives

The Dominica Banana Growers' Association which provides assistance to the registered growers (7,460) and operates the boxing plants, and The Citrus Growers Association, which is purely a marketing body, are the main farmer associations.

1.20 Small farmer commodity production and disposition

1.21 Production

a) Total production by commodity

The most reliable figures for total crop production stated to be those in the Agricultural Sector Plan 1977-81, though there is reason to believe these are heavily over-estimated. The estimated total production and fate of the products is outlined in Table VI D - 1.02 and VI D - 1.03

TABLE VI D - 1.02

Major Export Crops - Production, Export And Domestic Use 1974

Crop	Acreage	Approx yield per acre (s.tons)	Total (s.tons)	Exported (s.tons)	Local Consumption (s.tons)
Bananas	6,860	6.7	45,860	34,651	11,209
Coconut	7,700	*2,940	*22,638,000	*2,337,211	*20,300,789 (1)
Oranges	800	2.8	2,240	376	1,864
Cocoa (wet)	1,160	0.56	644	**64	NA
Grapefruit	2,000	10.56	21,170	3,532	17,588 (2)
Limes	1,500	2.25	3,375	314	3,061 (3)
Bay	1,100	+80	+88,000	+88,000	NA
Plantain	430	7	3,010	574	2,436
Mangoes	NA	NA	NA	++215,710	
Avocadoes	NA	NA	NA	++78,965	

Source: Agricultural Section Plan 1977-81

* nuts + lb oil

++ numbers ** dry beans

(i) Much of this was processed and exported as coconut oil and as soap. 1974 exports of these commodities was approximately 400,0001b.

(2) There were serious marketing problems in 1974 and a substantial amount was left unharvested. The situation has now altered and a substantial quantity is processed.

(3) Mainly processed: 43,000 gallons of lime juice and 16,000 gallons of lime oil were exported.

TABLE VI D - 1.03

Production Of Foodcrops; Exports And Local Consumption 1976

Crop	Acreage (Estimated)	Approx. yield per acre (s. tons)	Total (s.tons)	Exported 1974 (s.tons)	Local Consumption (s. tons)
Dasheen	2,000	6.5	13,000	300	12,700
Tannia	1,500	4	6,000	150	5,850
Yam	500	6	3,000	50	2,950
Sweet Potato	300	4	1,200	20	1,180
Cassava	200	4	800	200	600
Bananas	6,860	6.7	45,860	34,651	11,209
Plantains	430	8	3,010	574	2,436
Breadfruit	*39,000	+50	1,464	NIL	1,464
Corn	5	0.9	4.5	NIL	4.5
Legumes	15	0.6	9	NIL	9
Leafy Vegetables	50	6	300	NIL	300
Lettuce	50	5	250	NIL	750
Cucumber	250	8	2,000	NIL	2,000
Carrot	100	4	400	NIL	400
Pineapple	20	5	100	NIL	100
Cabbage	200	4	800	NIL	800
Watermelon	20	3	60	NIL	60

Source: Agricultural Sector Plan 1977-81

* trees + yield per tree.

b) Small farmers vs. large farmers

The Table VI D - 1.04 gives estimates of the percentage of total production for the major commodities which is grown by small and large farmers. It is estimated that some 90% of the other crops are grown by small farmers.

c) Seasonality of commodities

Tables showing the harvest and glut period under rain-fed conditions and the extended growing season under irrigation are given in detail in Tables VII A - 2.01 to VII A - 2.0

d) Export crops

The estimates of export crops are given in Tables VI D - 1.02 and VI D - 1.03.

TABLE VI D - 1.04

Approximate Division of Crops by Small and Large Farmers

Crop	Percentage of Total Production	
	Small Farmers	Large Farmers
Bananas	80	20
Grapefruit	65	35
Oranges	65	35
Bay	80	20
Coconuts	70	30
Lime	60	40
Cocoa	90	10
Foodcrops	95	5
Fruits	90	10

Source: Personal discussions in Dominica

e) Glut crops

Two of the crops liable to glut are sweet potato and christophene. High production in the favourable growing period is usually successfully marketed, particularly by hucksters who do a thriving trade with neighbouring islands.

1.22 Disposition

There is little information about the local disposition of food crops as much of this is distributed by the huckster operation. The local consumption of food and fruit crops must be substantial. For many commodities, especially fruit, a large quantity is left unharvested except where there are local facilities for the processing of those commodities.

1.30 Supply Potential

1.31 Basis for Increase in Production

a) Increased Land Area

All authorities state that there is a very large amount of unused land in Dominica potentially suitable for agriculture, though estimates vary from 5,000 acres to 20,000 acres. Marketing problems and the resulting lack of incentive is blamed for the non-development of much of this land, though there are undoubtedly many areas where inaccessibility is the major constraint,

and the on-going feeder road development is designed to alleviate the latter.

However, there seems to be no doubt that crop production could be carried out on a much larger area than at present. Most of the available unused land would be more suitable for tree crops than for vegetable crops, but there are areas where bananas are being grown that are regarded as unsuitable for this crop and which could be more profitable in vegetables, if marketing constraints were minimised. Among these "marketing" constraints are, of course, the over production (under present circumstance) of seasonal crops: it is not possible to quantify at all precisely the increase in productivity that could result from bringing all available land into production, but the figure of 50% was frequently quoted in discussions on the spot. The Agricultural Sector Plan 1976-1980 has a target of 3,500 additional acres in domestic food production by 1980, though much of this will be in root crops.

b) Intercropping

Intercropping is the normal method of food production in Dominica and no general increase in yield seems likely as a result. Small farmer land is, in general, very intensively cultivated.

c) Improved practices

Lack of inputs is a major constraint and it is stated that proper fertilizing and pest control could increase the yield of most crops by 50% to 75%. However, until recently, the only source of chemical inputs has been through the Dominica Banana Growers Association for its members. It is also now available through the Coconut Rehabilitation Scheme for those coconut growers taking part, but yet has to reach the majority. Growers of other crops (including citrus) have no way of obtaining fertilizer unless they happen to be growing a mixed stand with bananas.

d) Irrigation

There are plans to irrigate some of the vegetable growing areas. Indeed, the Warners region has temporarily ceased production pending the construction of a mini-catchment to provide irrigation water. An estimated 20% has been suggested as the return to be expected from 2 or 3 small irrigation schemes on these limited areas. A total of about 20 acres is all that is envisaged to help to make the cropping pattern for vegetables more uniform.

1.32 Estimated Current and Potential Production

The current production estimates (Section VI A - 2.14) are shown in Table VI D - 1.05. The basis on which an increase in production may be projected is given in 1.31. The estimates of the potential increase in production are given in in Table VI D - 1.05. In Table VI D - 1.05, forecasts are made of potential levels of increase in production in 1982 and 1987, a 'high' and 'low' level is indicated. The former is based on Government predictions in the Agricultural Sector Plan 1976 - 78, and assume considerable and rapid development (see 1.31 (a)) and also assume full availability of inputs and a high standard of agronomic practices. Experience would suggest that this is an over optimistic view, and the 'low' figure presents a more pessimistic view of the minimum likely if Government plans can be only partially implemented and agronomic practices improve only slowly. It may be noted that white potatoes have been included. There appears to be considerable official enthusiasm about developing this crop in Dominica, in spite of the high price of imported seed potatoes, and its production is expected to receive high priority.

The distribution of the available supply, after a deduction for non-food usage (Section VI A - 2.30) for 1982 and 1987 is given in Table VI D - 1.06.

TABLE VI D - 1.05

Production Estimates

(metric tons)

Commodity Group	Current	Increase in Production			
		1982		1987	
		Low	High	Low	High
Fruits	63,485	4,120	19,592	20,454	41,778
Vegetables	3,457	172	1,080	1,080	3,348
Roots	10,110	2,722	5,036	5,036	9,891
Pulses	688	3	139	139	230

Source: See section 1.32

TABLE VI D - 1.06

Supply Distribution
(Metric tons)

Commodity Group	Current Production Estimate	1982 Production	1982 Supply Total Available	1982 Supply Quarterly (Monthly Averages) 1	2	3	4	1987 Production	1987 Supply Total Available	1987 Supply Quarterly (Monthly Averages) 1	2	3	4
Fruits													
Citrus	18148	21551	11853	723	889	1245	1079	24954	13725	865	1043	1414	1235
Other	3731	5015	9399	573	705	986	855	8395	12954	816	985	1334	1166
Total *	21879	26566	21252	1296	1594	2231	1934	33349	26679	1681	2028	2748	2401
Vegetables													
Onions													
Other													
Total	3457	4083	3691	391	273	207	310	5671	5127	513	400	349	441
Roots													
White potatoes		159	159	53	0	0	0	295	295	98	0	0	0
Other		13656	12302	1947	1059	361	735	16869	15187	1981	1285	573	1006
Total	10110	13815	12461	2000	1059	361	735	17164	15482	2079	1285	573	1006
Pulses	688	759	627	130	19	0	59	872	720	120	54	0	66

* Excludes grapefruit exports to U.K. (1,815 - 3,630 metric tons/year)
Excludes banana exports to U.K. (current estimate 41,606 t; 1982 - 48,775 t; 1987 - 61,252 t.)

Source: Table VI D - 1.05, Sections VI A - 2.30 and VI A - 2.40.

2.0 Supply Analysis - Small animals

2.10 Institutional Framework

2.11 Present situation

Because of the heavy rainfall and the hot, moist climate in Dominica there are only limited parts of the island suitable for livestock production, - particularly of small stock. Populations are generally low and the quality of the animals are relatively poor, however the availability of coconut-oil meal and citrus pulp with some banana rejects and banana leaves as forage, indicates a potential for expanding animal production in Dominica. It is significant that the effect of the feed availability gives rise to a larger population of pigs and poultry in comparison with sheep and goats.

2.12 Transport

Practically all of the sheep and goats are slaughtered on farm and some are bought by butchers who provide their own transport from the farm. This trade is chiefly on Thursdays in order to have the animals ready for the weekend market trade. Pigs are transported by small truck to the abattoir from within reasonable distances from Roseau. However as Dominica is a relatively large island with mountainous terrain - the cost of transport in many cases is prohibitive, especially when dealing with distances of over 15 miles from the town.

2.13 Marketing conditions

a) Slaughter

The only slaughter figures available to date are for 1976/77 when 928 goats and sheep were slaughtered, 1990 pigs and 12,055 chickens at the Government facilities, but it is estimated that this would not be more than about 40% of the total yearly take off of small stock.

b) Imports

There are no imports of livestock other than the occasional breeding animal and day old chicks for the poultry industry from Barbados. The number of chicks imported in the years 1974 - 1977 are estimated to be 79,773, 71,000, 70,550 and 38,380 respectively. (Ministry of Agriculture).

2.20 Production and disposition

2.21 Production

a) Population

The estimated population of small animals is given in Table VI D - 2.01.

TABLE VI D - 2.01

Small animal population

	1971	1972	1973	1974
Sheep	3,000	3,000	3,000	3,000
Goats	5,000	5,000	5,000	5,000
Pigs	7,000	7,000	8,000	8,000
Chickens	82,000	86,000	90,000	94,000

Source - Agricultural Statistics of the Caribbean Countries - UN/ECLA 1976.

b) Constraints

The climate of Dominica is not conducive to large scale production of sheep, goats and rabbits.

c) Government regulations

The only incentives to livestock are duty free imports of feed stuffs and equipment. There are price controls on eggs and meat and milk products, however these are ignored for the most part and are about to be lifted.

d) Management

The standard of management for small animal production is extremely low and, due to the limited extension service and farm training schemes and to the part time nature of small animal production, quality of production is low for the unsophisticated market where no premium is paid for quality meat.

2.22 Disposition

a) Consumption pattern

There is no record of consumption statistics, but from discussion with officials in the Ministry of Agriculture it is estimated that approximately 30% of the marketable animals are consumed on farm with the other 70% being taken up by itinerant butchers for local direct consumption.

b) Processing

There are no agribusiness processing projects for small animals in Dominica.

2.3 Supply potential

2.31 Special favourable conditions

The availability of a low cost feedstuff constitutes a condition favourable to the production of pigs.

2.32 Increase in output

The major potential for increase in output is in the pig and poultry sectors, mainly because of availability of land, labour and feedstuffs. With the ready availability of banana rejects and banana leaves, coconut oil meal, and citrus pulp Dominica has the potential to rapidly increase its pork production and providing a balanced market can be obtained within the CARICOM market a pork processing plant could be Dominica's contribution to the Regional Food Plan. It is estimated that there are some 200 hives of bees in Dominica and if a proper marketing system for honey can be developed for export outside the region, Dominica has the land, labour and the nectar availability to produce large quantities of honey.

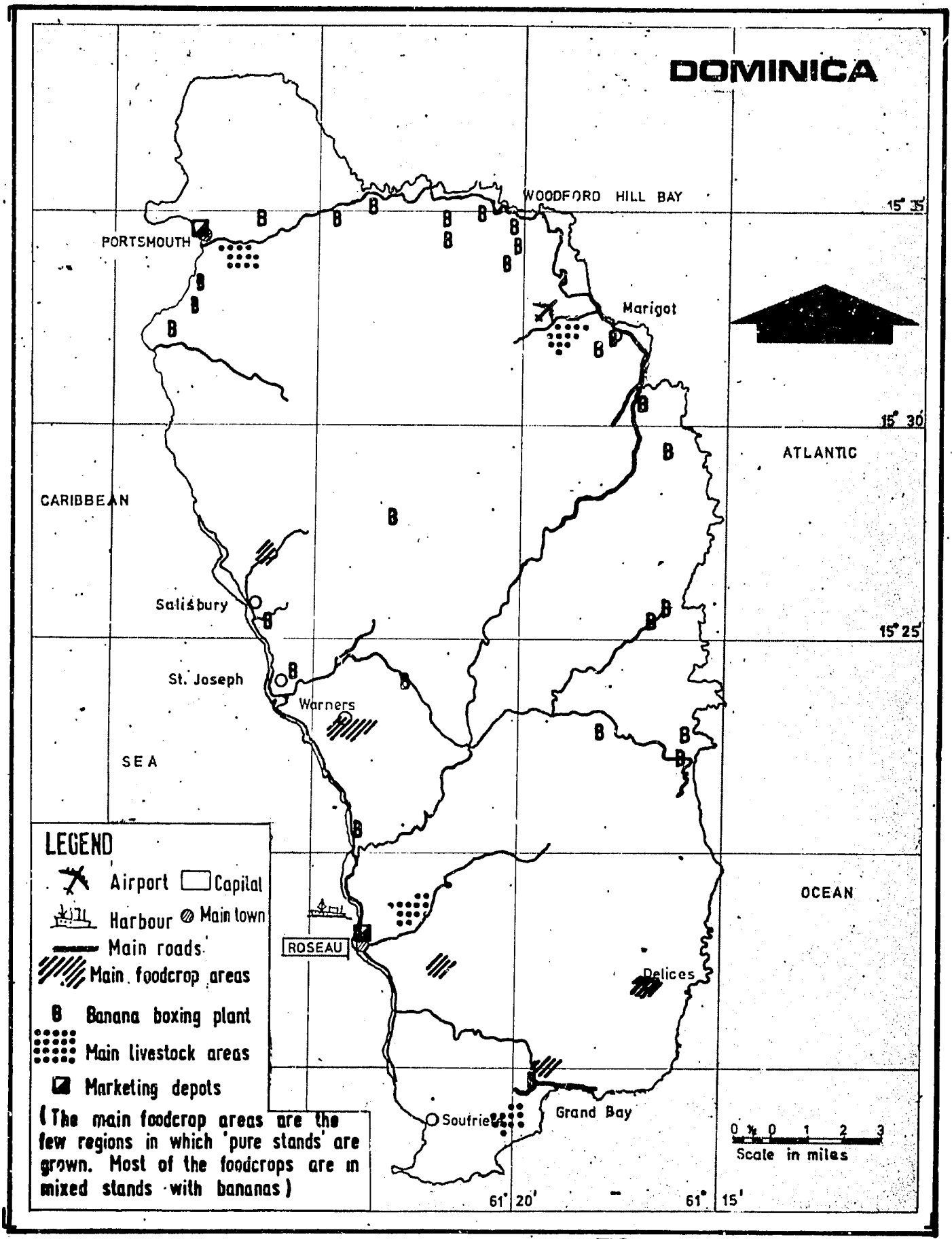

FIGURE VI D-1.01

E. Grenada

1.0 Supply Analysis - Crops

1.10 Structure and Composition of the Agricultural Sector

1.11 Land and Farm Holdings

The pattern of land use in Grenada from the 1974 - 75 Census of Agriculture is given in Table VI E - 1.01.

TABLE VI E - 1.01
Land Use in Grenada

Category	Acres	
	Grenada	Carriacou
Permanent Crops	23,153	639
Arable land		
Temporary Crops	6,994	
Temporary Pasture	2,540	593
Temporary Fallow	1,398	
Other Arable Land	1,833	
Grassland		
Cultivated	391	32
Uncultivated	1,703	475
Forest/Woodland	7,635	
Other agricultural land	930	
Total agricultural land	46,577	1,739
Non-agricultural land	30,223	6,581
Total	76,800	8,320

Source - Ministry of Agriculture. Grenada figures from 1974-1975 Census of Agriculture Carriacou figures from 1961 Census.

Of the 12,172 holdings (Agricultural Census 1974-75), 98% are operated by small farmers. All the small holdings are in private hands, either by ownership or rental from private owners or Government. However, of the 23,918 acres (51%) of holdings larger than 25 acres, approximately 7,000 have been acquired by Government and are being operated by the Prime Minister's office. A large number of holdings are fragmented into one or more 'parcels' particularly among those under 25 acres where the average number of parcels per holding is 1.6.

Most of the farmers, although relying on their land for some of their food, are

cash rather than subsistence farmers, growing such crops as Bananas, Cocoa, Sugar cane, etc. as well as foodcrops. There are a few farmers who are predominantly vegetable producers, though usually as part of a mixed farming pattern. These have tended to concentrate in the south (within easy reach of St. George's) at Mardi Gras, Vendome, New Hampshire, Willis, Mt. Moritz, Mt. Plaisir, Grand Roy, and Concord. In the Grenville area, there are Adelphi and Birch Grove, which produce mainly root crops. The main food production areas are illustrated on the map in Figure VI E - 1.01.

1.12 Irrigation

Irrigation would be of considerable benefit over most of the productive area of the island, both to increase yields and to permit the development of additional crops and also to extend the period throughout which seasonal crops can be grown.

There are no existing schemes but two are planned:

(I) Mardi Gras in the south (Chemin River Watershed): 100 acres of terraced land with trickle irrigation, already started by UNDP/FAO - to be a demonstration project growing fruit and foodcrops, the fruit including Mangoes, Avocadoes, Sapodillas, Soursop, Sugar Apple and Pineapples.

(2) La Poterie in the north-east is currently being investigated. It has potential for 300 to 500 acres of irrigated farmland from rivers, and trickle irrigation is proposed.

If there is any expansion in the Chemin River Watershed or development in the La Poteries area, the land would be for small farmers. No organisational pattern has yet been decided upon, nor have costs been estimated.

1.13 Institutional and Private Sector Framework for S.F.C. Production and Market Supply

a) Credit

The commercial banks are somewhat reluctant to lend to small farmers. A small amount of borrowing is done through Credit Unions or money lenders, and credit in kind is available through the Banana, Cocoa and Sugar Cane associations. By far the greatest amount of financial credit is through the Grenada Agricultural and Industrial Development Corporation*. The CDB Agricultural Production Credit scheme has recently been approved.

* *Prior to 1978, principal credit was from CDB source loan funds available under the Farm Improvement Credit Scheme, through the Grenada Agricultural Bank and the Grenada Development Corporation.*

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b) Technical assistance

The Commodity Associations have technical officers in the field as well as the Ministry of Agriculture, with 26 field officers. The facilities available to the Ministry's Extension staff lead to problems of low productivity.

A tractor service is available to the farmer at reasonable rates.

Agricultural chemicals are obtainable through the Commodity Associations on a crop lien basis or may be purchased through normal commercial channels.

c) Farm to Market service

The major export crops are well organised. Bananas are purchased at each of the 17 boxing plants located in the main banana growing areas. Cocoa is fermented and dried on farms or sent to the nearest fermentary, and then farmers are responsible for transporting the dried product to the Board's warehouse. Nutmeg and Mace are purchased at one of the 16 receiving stations or at one of the three main factories. Sugar cane is transported to the central factory at Woodlands or to one of the seven syrup mills located in small sugar growing areas.

There are no organised facilities for handling food and fruit crops and the Marketing Board is not yet in operation. Some food crops are sold in village shops but most of the produce is distributed by truck, car or bus to retail outlets, supermarkets, hotels in the urban districts or sold to hucksters who operate in the public markets. Hucksters are also responsible for a substantial trade of fruit to Trinidad in particular.

d) Farmer Associations and Cooperatives

There are farmer associations for the major commodities, Banana, Cocoa, Nutmeg and Sugar Cane. There is also a minor Spice Cooperative. There is no food and fruit growers association.

1.20 Small farmer commodity production and disposition

1.21 Production

The production of the major crops in 1976 and 1977 are given in Table VI E - 1.02.

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TABLE VI E - 1.02

Production and Export of Major Crops

('000 lb.)

Crop		1976	1977
Cocoa	(P)	7,010	4,090
	(E)	6,990	4,070
Nutmeg	(P)	6,141	6,786
	(E)	6,141	6,786
Mace	(P)	956	502
	(E)	956	502
Bananas	(P)	36,746	34,515
	(E)	34,999	32,566
Clove	(P)	19	16
	(E)	15	NA
Cinnamon	(P)	116	30
	(E)	85	NA
Pimento	(P)	3	3
	(E)	NA	NA

Source - Ministry of Agriculture
(P) (Production)
(E) (Exports)

a) Total by small farm categories

The estimated food crop production for 1977 and reported fruit exports for 1976 is shown in Table VI E - 1.03, though the latter is only a fraction of total fruit production.

TABLE VI E - 1.03

Small Farmer Production

Production estimates (1977) (lb.)	
Root Crops	
(S/Potatoes, Yams, Dasheen, Eddoes)	10,000,000
Vegetables	
Carrots	66,000
Pumpkin	1,067,000
Tomato	132,000
Peppers	50,000
Green Vegetables	1,540,000
Green Bananas, Bluggoes and Plantains	8,800,000
Pulses	
Pigeon Peas & Beans	2,200,000
Peanuts	13,200
Fruit	
Avocadoes	1,995,400
Citrus fruit	1,051,600
Mangoes	2,000,000
Miscellaneous	2,000,000

Fruit (exports 1976)[1]	lb.
Soursop	207,515
Sapodilla	27,100
Sugar Apple	52,175
Golden Apple	158,185
Pawpaw	12,150
Plums	20,420
Mangoes	15,280
Avocadoes	625,480
Tamarinds	1,100
Limes	17,485
Plantain	625,630
Green Bananas	10,150
Bluggoes	775
Dry Coconuts	1,700
Miscellaneous Fruit[2]	1,159,433
Other Items Exported	
Pumpkins	30,555
Peppers	15,760
Sea Moss	7,570
Cinnamon	7,780

Source - Ministry of Agriculture Estimates

(1) Export bananas not included.

(2) Unspecified - includes any of those listed above.

b) Small farmers vs. large farmers

The breakdown of the production in Table VI E - 1.02 into estate and small farmer production was not available but it is estimated that approximately 50% of the total was from small farmers who produced 60% - 70% of the Bananas and 30% - 40% of the tree crops. Although larger holdings occupied 51% of the agricultural land, and, acre for acre, the best large farms showed higher productivity than small farms, many large farms were not being cultivated and some of the acreage was in forest.

Food crops are virtually all in the hands of small farmers and most of the fruit exported are also from small farms.

c) Seasonality of commodities

Tables showing the harvest and glut periods of major commodities under rainfed conditions and the extended growing season under irrigation, are given in detail in Tables VII A - 2.01 to VII A - 2.04.

d) Export crops

Export crops are indicated in Tables VI E - 1.02 and 1.03.

e) Glut crops

Some of the main crops liable to gluts, with the corresponding period of glut, are shown in Table VI E - 1.04.

TABLE VI E - 1.04
Peak Season with possibility of Gluts

Crop	Season
Green beans	Sept - Nov
Cabbage	March
Carrots	April
Cucumbers	Sept - Dec
Peppers (sweet)	Feb - May
Potatoes (sweet)	March
Pumpkin	Oct - March
Bananas	Feb - April
Bloggoes	Feb - April
Plantain	Feb - April

1.22 Disposition

On farm consumption on the basis of 1,100 lb. per farm family per year of farm crops (root crops, vegetables and fruit) would account for some 13 million lb. per year out of an apparent total production of 24.3 million lb. of produce. However, Ministry of Agriculture figures put total banana rejects at the boxing plants and in the field as approximately 2 million lb. (the Banana Association regards this as an underestimate), and these rejects form an important part of the farmers' food supply. It is probable that the 13 million lb. should be reduced to about 11 million lb. leaving some 13.3 million lb. of saleable produce from the small farms (not including major crops).

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1.30 Supply potential

1.31 Basis for increase in production

a) Increased land area

There is little unused land that could be brought into food (as distinct from fruit) crop production and no increase in production is envisaged from this source. However, there are proposals for increasing fruit production which are indicated in Table VI E - 1.05.

TABLE VI E - 1.05

Proposed new acreage and fruit production by 1982 (tonnes)

Fruit	New Acreage	Yield
Mangoes	125	86
Sapodilla	125	43
Guava	100	68
Oranges	125	6
Grapefruit	125	6
Limes	100	8
Soursop	63	40

Source - Ministry of Agriculture

(Note - The yields do not represent the ultimate yields attainable but only those expected from a series of planned annual plantings starting in 1977).

b) Intercropping

Intercropping with sugar cane could lead to further increases in such commodities as root crops (particularly yams and sweet potatoes), maize and beans, grown as catch crops between the last ratoon and the end-of-year planting of cane. With an estimated cane acreage of approximately 300 being replanted annually with, for example, 100 acres in each of the above crops, production should be about 225 tonnes of rootcrops, 70 tonnes of maize and 45 tonnes of pulses. There is also further scope for intercropping among bananas - a possible 1,000 acres of dasheen, with an estimated yield of 1,000 tonnes.

c) Improved practices

The Ministry of Agriculture predicts that, mainly by increasing fertilizer on existing acreages of foodcrops, the small farm production will be as shown in Table VI E - 1.06.

TABLE VI E - 1.06

Predicted increase in SF Production as a result of Improved Agronomic Practices (tonnes)

Commodity	1977 Production	1981 Production
Root Crops	1245	2268
Carrots	30	68
Pumpkin	485	800
Tomato	60	90
Green Vegetables	700	1050
Green Bananas		
Bluggoes & Plantains	4000	7000
Pigeon Peas & Beans	1000	1580
Peanuts	6	12
Total	7526	12,868

Source - Ministry of Agriculture
(Projected increase - 5,342 tonnes)

d) Irrigation

Between 300 to 500 acres of new irrigated land could be opened up at La Poteries for vegetable and fruit production if the market incentive made it desirable. With 3 crops per year of vegetables permitted by irrigation and a total yield of 15,000 lb. per acre, 200 acres of vegetables would produce some 3,000,000 lb. (1,300 tonnes). Another 200 to 300 acres could go into tree fruit but it would be many years before these would come on the market.

1.32 Estimated current and potential production

The current production estimates (Section VI A - 2.14) are shown in Table VI E - 1.07. The basis on which production could be increased is given in Section 1.31. Grenada has exceptional possibilities in this respect and has the advantage that the Ministry of Agriculture has already given detailed consideration to the matter. The projections for increase in production are given in Table VI E - 1.07.

TABLE VI E - 1.07
Production Estimates
(metric tons)

Commodity Group	Current	Increase in Production 1982 Low	1982 High	1987 Low	1987 High
Fruits	22,844	1,361	4,651	5,513	12,591
Vegetables	1,295	193	721	463	1,427
Roots	5,148	907	1,815	1,815	2,722
Pulses	998	136	590	590	817

Source - See section 1.32.

In Table VI E - 1.07, the 'high' figure is based on the assumption that the Ministry's plans proceed as proposed and that sound husbandry is practised throughout, and the 'low' estimate represents a minimum increase based on only partial fulfilment of plans and only a slow improvement in agronomic practices.
The distribution of available supply, after a deduction for non-food usage (See section VII A - 2.30) for 1982 and 1987, is given in Table VI E - 1.08.

2.0 Supply Analysis - Small animals

2.10 Institutional Framework

2.11 Present situation

Small animal production plays a relatively small part in the overall agricultural economy of Grenada. However, in Carriacou, a small island dependency of Grenada, the production of livestock plays a major economic role as there are no large scale crop developments in the island.

2.12 Transport

Animals close to the abattoir are walked to market and those situated more distant are purchased by butchers and traffickers who transport them in their own pick-up trucks. Purchasing is usually done weekly for the weekend trade. Chickens are often transported live on the top of a bus.

2.13 Marketing conditions

a) Slaughtering

There is an abattoir in St. George's and the recent statistics on slaughterings are shown in Table VI E - 2.01.

TABLE VI E - 1.08

Supply Distribution
(Metric tons)

Commodity Group	Current Production Estimate	1982 Production	1982 Total Available	1982 Quarterly (Monthly Averages) 1	2	3	4	1987 Production	1987 Total Available	1987 Quarterly (Monthly Averages) 1	2	3	4
Fruits													
Citrus	477	488	244	18	16	25	22	2609	1305	94	87	134	120
Other	6714	8574	6652	479	432	692	612	10684	8811	634	591	908	811
* Total	7191	9062	6896	497	448	717	634	13293	10116	728	678	1042	931
Vegetables													
Onions													
Other													
Total	1295	1752	1583	168	130	90	139	2240	2025	205	160	130	182
Roots													
White potatoes													
Other													
Total	5148	6509	5917	964	432	189	385	7417	6742	1098	492	216	438
Pulses	998	1361	1282	249	24	0	151	1701	1602	282	85	0	168

* Excludes banana Exports to U.K. (Current estimate 15,653 t; 1982 - 16,788 t; 1987 - 18,063 t)

Source: Table VI E - 1.07, Sections VI A - 2.30 and VI A - 2.40.

TABLE VI E - 2.01
Animals slaughtered
(lb.)

	1976	1977
Sheep	2,036	1,808
Goats	770	1,152
Pigs	51,185	79,069
Chickens	477,000	

Source - Government Statistical Department.

b) Imports

There are no significant imports of live animals into Grenada other than live day old chicks from Barbados, as shown in Table VI E - 2.02.

TABLE VI E - 2.02
Imports of live animals
(Numbers)

	1973	1974	1975	1976	1977
Chickens	70,200	115,090	147,980	152,700	134,675
Hens	NA	NA	4,600	NA	NA
Cocks	NA	1,500	NA	NA	NA
Grenadines -Chickens	NA	1,900	NA	NA	NA

Source - Trade Statistics.

c) Existing facilities

A meat market is situated adjacent to the Abattoir and operates primarily on Saturdays. Chickens are marketed by the producer directly to the supermarkets, hotels and restaurants. Eggs are also marketed through the supermarkets and village shops.

2.20 Production and disposition

2.21 Production

a) Population

The population of small animals is shown in Table VI E - 2.03.

TABLE VI E 2.03

Small Animal Population

	1971	1972	1973	1974
Sheep	9,000	9,000	9,000	9,000
Goats	4,000	1,000	1,000	1,000
Pigs	15,000	16,000	16,000	16,000
Chickens	250,000	280,000	300,000	308,000

Source - Agricultural Statistics of the Caribbean Countries - UN/ECLA - 1976

b) Constraints

The constraints would be praedial larceny, excessive feed costs, veterinary costs, market prices and lack of good breeding stock.

c) Government Regulations

Besides duty free concessions for equipment and feeds there are no special incentives for livestock production. There would appear to be a certain amount of confusion on the regulations of exports between the Ministries of Trade and Agriculture. It is strongly recommended that the control of exports of live animals should be placed entirely in the hands of the Ministry of Agriculture.

d) Management

The production of small animals being done by part time farmers the standard of management and production is generally low, and with unsophiscated marketing the quality of production is also low.

2.22 Disposition

a) Consumption Pattern

No statistical information is available on the breakdown of the commodity sales. The slaughter figures outside the St. George's abbatoir are estimated to be approximately 65%. The largest percentage of sheep, goats and pigs are sold to the itinerant butchers and a small amount is taken up by the supermarket trade. However the trend of export of live animals to Trinidad indicates that the trade may exceed total slaughter. The buyers of chickens are mainly local - the supermarkets, hotels and restaurants.

b) Processing

There are no agribusiness processing projects for animals in Grenada, and no immediate plans for the implementation of any.

2.3 Supply Potential

2.31 Special Favourable Conditions

There is available rural population capable of part time livestock farming. Good climatic and soil conditions in the South of Grenada and Carriacou and a good market for the live animals in Trinidad are conditions favourable to production. Reject bananas, banana leaves, cotton seed meal, limeskins and coconut oil meal are also available locally for feed supplementation.

2.32 Increase in Output

The major potential for the increase in output lies in sheep, goats and pigs and this is in the area of the export market to Trinidad. This market apparently could absorb all of the production of Grenada and Carriacou and should be exploited to its full potential. The climate and soil type of the drier southern areas of the island are ideally suited for sheep, goats and rabbits and, provided the marketwere available, the potential area for increase in output. The Agricultural Sector Plan for Grenada, 1977-81 estimates that over 90% increase in production can be achieved by 1981.

Grenada is importing honey and it would appear from the considerable forested areas available that the potential to at least satisfy the local demand is certainly there.

The increase in the production of poultry supplies is evident from the rapidly rising imports of day old chicks, and there is potential to become self sufficient in the higher quality poultry meat and eggs.

The major constraints of sheep and goats are in the South and North-East sections of the island, while pigs are mainly in the South and East. The location of potential livestock areas are shown on the map in Figure VI E - 1.01.

Estimates of the potential production for sheep and goats are shown in table VI E - 2.04.

TABLE VI E - 2.04

Potential Sheep and Goat Production
(numbers)

	Current	1982	1987
Domestic	8,714	9,471	10,294
Export	4,286	4,701	5,076
Total	13,000	14,172	15,370

Source: Tables V C - 1.04; V C - 3.04 and V C - 3.05; Ministry of Agriculture

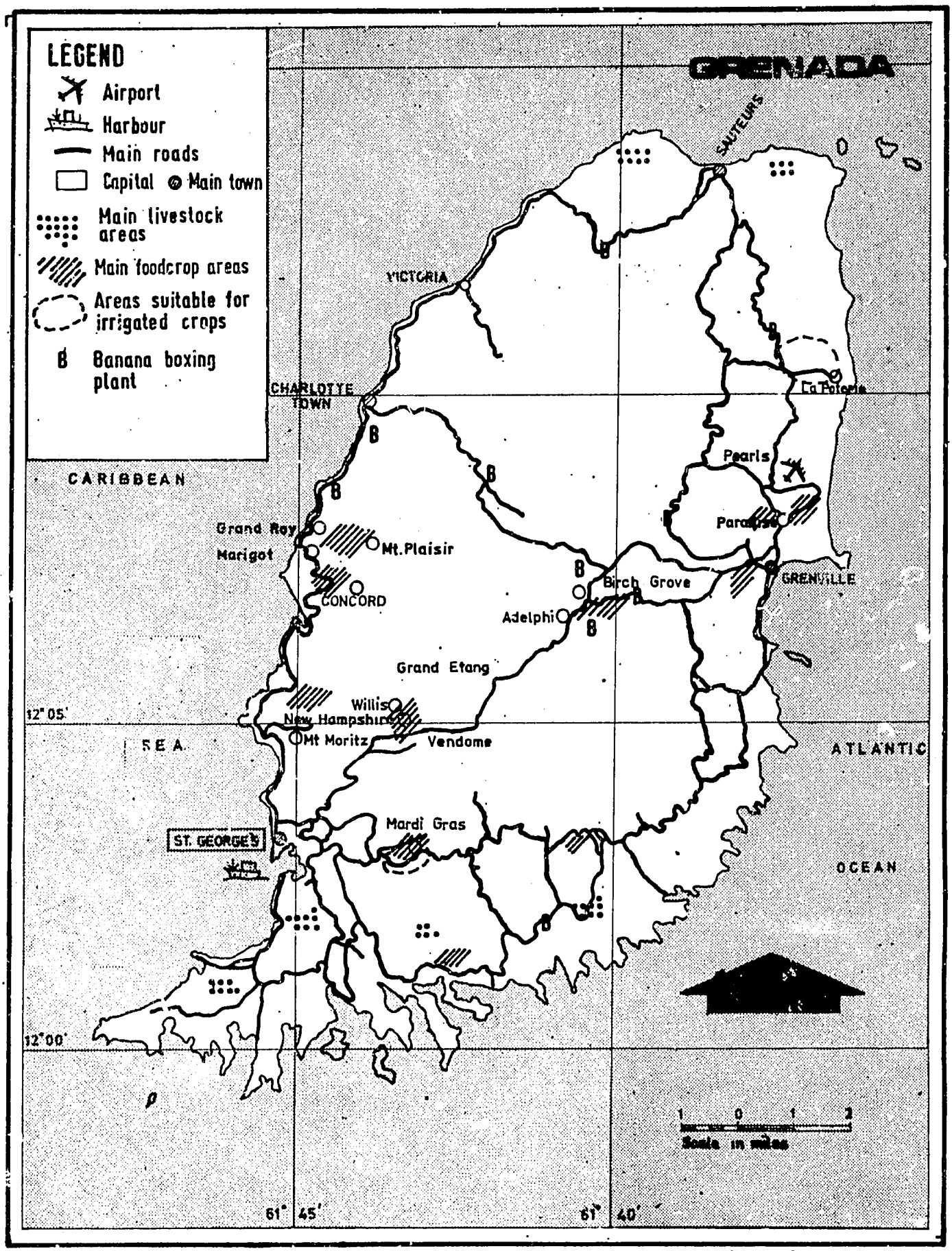

FIGURE VI E-1.01

F. Montserrat

1.0 Supply Analysis - Crops

1.10 Structure and Composition of the Agricultural Sector

1.11 Land and Farm Holdings

Of a total of 25,344 acres in Montserrat approximately 17,420 acres are described as arable but much is now derelict and likely to remain so. In 1972 the land in farms was 5,620 acres with 1,420 acres in small farms. The estimate of land use produced by the Government Statistical Digest 1975 is given in Table VI F - 1.01.

TABLE VI F - 1.01

Land Use

Use	Acres
Tree Crops	500
Vegetables	150
Root Crops	250
Pineapples	15
Bananas	15
Improved pasture	400
Rough grazing	1,000
Forestry	10,000
Urban, derelict, etc.,	5,090
	17,420

1.12 Irrigation

There are no irrigation schemes existing at present. Experimental work is under way at Grove Botanical Station using a trickle system for tomatoes. The potential for irrigation is likely to be small because of the difficulties of impounding water.

1.13 Institutional and Private Sector Framework for S.F.C. Production and Market Supply.

a) Credit

The commercial banks make loans primarily to the larger farmers. Loans for small farmers can be obtained through the Development Finance and Marketing Company (DFMC) and collections are either in cash or by crop lien, as crops have to be sold through DFMC.

b) Technical assistance

The Ministry of Agriculture's extension service provides tractor assistance for land preparation. The 9 serviceable tractors currently assist 250 farms cultivating food crops over a total of 527 acres.

c) Farm to market service

There are no assisted transport facilities so farmers use what is available, bus, taxi or hired truck. The farmer usually travels to market with this produce and does his own unloading. The DFMC in Plymouth is the single receiving point and has a 20 ton chill store for holding vegetables for export at the Airport. All grading at the reception end is by hand. There is mechanical equipment on the spot, but it is not used.

d) Farmer Associations and Cooperatives

There are no major farmer groupings.

1.20 Small farmer commodity production and disposition

1.21 Production

a) Total by small farm categories

The DFMC intake from 1974 - 1977 is shown in Table VI F - 1.02.

TABLE VI F - 1.02

Main crop purchases by DFMC 1974 - 1977

Crop	1974 (Year)	1975 (Year)	1976 (1st 5 months)	%	1976 Year	1977 (1st 5 months)
White Potatoes	92,238	419,357	453,576	89	489,835	126,896
Sweet Potatoes	6,487	4,509	4,628	37	12,498	2,184
Tomatoes	190,250	67,801	52,305	73	71,636	69,144
Carrots	117,794	41,271	53,610	77	69,512	5,713
Onions	41,154	10,536	91,163	92	99,577	7,634
Cabbage	11,881	9,985	5,124	72	7,090	4,795
Pumpkins	3,747	22,979	5,186	72	7,197	2,665
Pineapples	10,333	9,548	-	0	14,984	5
Limes	25,931	35,879	10,726	35	30,216	17,036
Mangoes (at 2 to the lb.)	19,461	7,624	80	3	2,900	1,803
	509,276	629,989	676,398	84	805,445	237,875

Source - Ministry of Agriculture

All the above except limes is small farmer production.

For 1974 it is estimated to represent about 43% of the total production of tomatoes, 70% of carrots and 31% of white potatoes; for other commodities the proportion was described as very small. No information is currently available on the proportion represented in other years. The estimated production in Montserrat 1977 is shown in Table VI F - 1.03.

TABLE VI F - 1.03

Estimated production 1977

Commodity	Approx Acreage	Approx Yield ave. (lb.)	Total (lb.)
Rootcrops	250	6,000	1,500,000
Vegetables	150	7,000	1,050,000
Pineapples	15	10,000	150,000
Tree fruit	500	5,000	2,500,000
Pulses	NA	NA	123,000

Source - Ministry of Agriculture

b) Small farmers vs large farmers

Virtually all production of the commodities in question is in the hands of small farmers.

c) Seasonality of commodities

Tables VII A - 2.01 to VII A - 2.04 show the harvest and glut periods under rainfed conditions and the extended growing season under irrigation. The high proportion of production of most commodities in the period January to May is striking. Pineapples normally "peak" in June to August. There is no information on the seasonality of Avocadoes in Montserrat, but in St. Kitts they are available from April to October. In Montserrat, mangoes are reported to be in season from June to September and December to February, though the main "exportable" cultivars are not represented, with the exception of Julie.

d) Export crops

The major export crops at present are cotton and limes. Cotton is sold by farmers at the ginnery. Limes are packed and shipped direct by the main growers (large farmer) or sometimes they are brought to the DFMC.

e) Glut crops

Sweet potato and pumpkin are the main glut crops.

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1.22 Disposition

There is no detailed information available. It is estimated that the on farm consumption is 22% for root crops, 10% for vegetables, 77% for pulses and 7% for fruit.

1.30 Supply potential

1.31 Basis for Increase in Production

a) Increased land area

There are three developed and five underutilised estates which are only partially developed. Government proposes to develop them more fully. Table VI F - 1.04 is a summary of the proposed increase in acreage under selected commodity categories.

TABLE VI F - 1.04

Current and proposed averages

Commodity	Acreage Currently	Proposed
Vegetables, root crops, pineapples	395	859
Irrigated Vegetables	20	30
Cotton	41	106
Livestock	446	616
Fruit Trees	130	652 (I)
Exploitable forest	40	110

Source - Development plan.

(I) To include 250 acres of limes: 30 acres for fresh internal market; 220 acres for processing. The remaining 402 acres will be mangoes, avocadoes and possibly other "exotic fruit" if a market can be developed.

b) Intercropping

About 40 acres of additional tree crops are planned for the near future. This would give the equivalent of 20 acres of intercropping for the first 3 or 4 years, or an expansion of about 3.5% in the foodcrop level.

c) Improved practices

An overall 20% increase in yield is estimated based on improved practices. The Government's 15 year development plan implies that, with reasonable inputs, production could and should be from 869 acres as shown in Table VI F - 1.05.

TABLE VI F - 1.05

Expected food crop production and consumption

	Domestic (lb.)	Exportable (lb.)	Total Production (lb.)
Vegetables	510,000	920,000	1,430,000
Pulses & grains	177,000	480,000	657,000
Rootcrops	1,588,000	112,000	1,700,000
Fruit (including tree fruit)	4,995,000	675,000	5,670,000

d) Irrigation

An increase in production of 3.5% overall is anticipated as a result of a total of 30 acres being developed under irrigation, see Table VI F - 1.04.

1.32 Estimated current and potential production

The current production estimates (see Section VI A - 2.14) are shown in Table VI F - 1.06. The basis on which production may be increased is given in 1.31. The estimates of the potential increase in production in 1982 and 1987 are also given in Table VI F - 1.06.

TABLE VI F - 1.06

Production estimates

(metric tons)

Commodity group	Current	Increase in Production			
		1982		1987	
		Low	High	Low	High
Fruits	1134	136	703	726	1438
Vegetables	477	62	108	120	172
Roots	1257	0	45	45	91
Pulses	70	12	35	80	167

Source - See Section 1.32

A 'high' and a 'low' level of production is indicated in each instance, the 'high' assumes that the Government plans proceed as intended and that high levels of husbandry are attained; the 'low' assumes delays in bringing the plan into position

TABLE VI F - 1.07

Supply Distribution
(Metric tons)

Commodity Group	Current Production Estimate	1982 Production	1982 Total Available	1982 Supply Quarterly (Monthly Averages) 1	2	3	4	1987 Production	1987 Total Available	1987 Supply Quarterly (Monthly Averages) 1	2	3	4
Fruits													
Citrus	45	79	71	6	0	6	12	170	153	12	0	12	24
Other	1089	1475	1328	57	38	183	164	2046	1841	78	54	257	227
Total	1134	1554	1399	63	38	189	176	2216	1994	90	54	269	251
Vegetables													
Onions	167	186	186	31	31	0	0	191	191	32	32	0	0
Other	310	376	321	37	0	16	55	432	371	29	7	33	54
Total	477	562	507	68	31	16	55	623	562	61	39	33	54
Roots													
White potatoes													
Other													
Total	1257	1280	1083	118	66	19	157	1325	1121	119	75	48	130
Pulses	70	94	87	21	2	0	6	194	179	36	11	0	13

Source: Table VI F - 1.06, Sections VI A - 2.30 and VI A - 2.40.

and lower levels of husbandry than had been anticipated. The distribution of the available supply, after a deduction for non-food usage is given in Table VI F - 1.07.

2.0 Supply Analysis - Small animals

2.10 Institutional framework

2.11 Present situation

Animal production in Montserrat is a relatively small part of the agricultural economy. The Government of Montserrat is very keen to expand its livestock production, particularly in sheep and are interested in developing a dairy goat population, since the present goat population is mainly small meat type animals which are feral and live in the mountains.

2.12 Transport

The method of transport for sheep and goats is to walk them to the public abattoir from the closer surrounding districts. Slaughter of animals over 5 miles distant from Plymouth would mostly be done on farm except in the case where they are purchased by itinerant butchers

2.13 Marketing conditions

a) Slaughter

No actual statistics were available on slaughter of small animals but estimates have been obtained through discussion with officials in the Ministry of Agriculture, as follows: sheep - 600, goats - 1200, pigs - 150.

b) Imports

No live animals are imported into Montserrat except for day old chicks from Antigua and Barbados. The recent trend in numbers of chicks from 1974 - 1977 is 6,425, 4,000, 4,200 and 3,100.

c) Existing facilities

The Plymouth slaughter house operates on Friday evening for Saturday morning sales. It is small with no room for lateral expansion.

2.20 Production and disposition

2.21 Production

a) Population

An estimate of small animal population is shown in Table VI E - 2.01. The most recent figures, 1978, from the Government Statistical Department indicate a change in population number since 1974. There are now 2,000 rabbits, 5,000 chickens and 15 bee hives. Sheep have increased to 4,000, goats to 8,000 but the number of pigs has dropped rapidly due to the high cost of imported feed.

b) Constraints

Constraints apply mainly to pigs and chickens since these are the ones most dependent on imported feeds. Lack of an aggressive marketing policy in the French islands also acts as a constraint, as apparently this trade depends largely on visits by private entrepreneurs from Guadeloupe who purchase the animals direct from the farmer.

c) Government regulations

There are duty free concessions for the importation of equipment for agricultural use and feed stuffs. There is also limited extension service. There is an official price control on meat, which for the most part is ignored and should be removed. There appears to be no quota on the export of live animals to the French islands, however permission to export is necessary.

d) Management

The standard of management on the small farms producing small animals is extremely low since most of management is on a part time basis and inputs from extension services and veterinary care is necessarily minimal. Quality of produce for an unsophisticated market where no premiums are paid for higher grades of meat are necessarily low.

2.22 Disposition

a) Consumption Pattern

There is no detailed information on how the small animals are disposed of. There would appear to be a ready market in the French islands for sheep, goats, pigs and rabbits. Production of chickens is not enough to satisfy the local market - mainly because the cost of imported feed makes production uneconomical. There is only a very small amount of honey produced and it is sold ex farm. The supermarkets form the main commodity buyers for poultry meat and eggs.

b) Processing

There are no agribusiness processing projects at present in Montserrat.

2.3 Supply potential

2.31 Special favourable conditions

The availability of land and labour, and the mountainsides for free grazing, with a ready market in the French islands and the cost of shipping to Guadeloupe being minimal, creates a special condition for Montserrat for the production of sheep and goats and to a certain extent for rabbits. There is considerable room for the expansion of bee keeping since Montserrat imports honey from the United States and there is ample area for nectar for the bees in the mountains.

2.32 Increase in output

The climate and soil types in Montserrat are suitable for the production of sheep, goats, pigs and rabbits, also for bees and chickens to a certain extent. The availability of land and rural labour indicates that providing markets for the animals were found there is potential to increase output. See the map in Figure VI F - 1.01 for areas of major concentration of livestock.

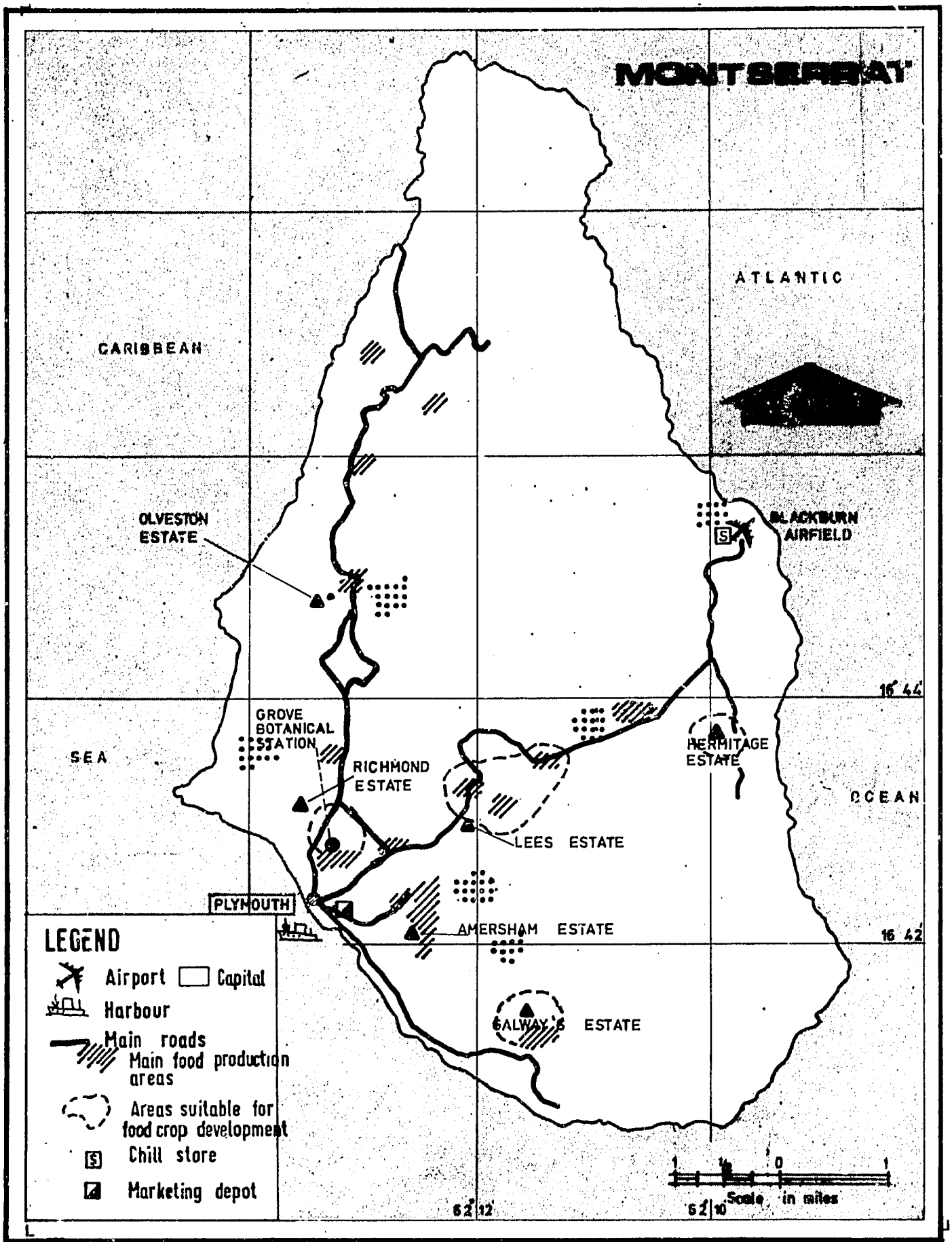

FIGURE VI F-1.01

G. St. Kitts/Nevis

1.0 Supply Analysis - Crops

1.10 Structure and Composition of the Agricultural Sector

1.11 Land and Farm Holdings

St. Kitts and Nevis have land areas of 41,600 acres and 23,040 acres, respectively. The land utilization profile is shown in Table VI G - 1.01.

TABLE VI G - 1.01

Land Utilization

	St. Kitts		Nevis	
	Acres	%	Acres	%
Arable land				
*Crops	14,275	34.3	6,000	26.0
Uncultivated	2,725	6.6	9,000	39.1
Non-agricultural	24,600	59.4	8,040	34.9
	41,600	100.0	23,040	

Source: Census of Agriculture, 1975.

* About 12,000 acres are in sugar cane, 1,200 in foodcrops and 1,000 in coconuts. However, there is considerable food crop production done by workers in the 12,000 acres of sugar cane which is probably not included in the Census report.

The census figure for St. Kitts states that there are 1,642 small farmers who cultivate 1,934 acres. This should probably be augmented in the spirit of the footnote to Table VI G - 1.01. In Nevis it is estimated that there are 1,763 small farmers operating 3,310 acres.

1.12 Irrigation

The existing irrigated areas include 60 - 90 acres primarily for cane at Ponds Needmust, including 15 acres of vegetables, all operated by The National Agricultural Corporation (NACO). There are 83 acres irrigated by small holders from the Government's supply including 33 in food crops, 6 in banahas and 19 in grassland, almost all in the 0 - 5 acre size group. There are plans to irrigate 15 additional acres in the Basseterre Valley but no date has been specified.

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There is a 60 acre scheme proposed for Conarie. It is planned to irrigate vegetables for out of season production.

1.13 Institutional and Private Sector Framework for S.F.C. Production and Market Supply

a) Credit

The DFC is virtually ineffective in St. Kitts/Nevis and credit is obtained almost exclusively through commercial banks to the large farming (i.e. Government) sector.

b) Technical assistance

The Government's extension service is very weak. NACO provides ploughing services, free for its employees, but at a charge for other farmers. NACO sprays free for all farmers and will sell fertilizer to small farmers if they order far in advance. NACO provides transport for its employees produce but no other transportation service is available. CARDI is now developing a demonstration centre to assist farmers in the production of food crops.

c) Farm to Market facilities

There are 11 collection points on the railway line in St. Kitts, see Figure VI G - 1.01, which serves the sugar industry. In Nevis, cotton is carried by farmers to the ginnery. There are no farm to market services for food crops and the Central Marketing Corporation and private distributors rely on the farmers to bring their produce to the market.

d) Farmer Associations, Cooperatives

There are no farmer associations or cooperatives of any significance in St. Kitts/Nevis.

1.20 Small farm commodity production and disposition

1.21 Production

a) Total production by commodity

There is a paucity of detailed information on food crop production. It is estimated that NACO produced 500,000 lb in 1976 and that small farmers were responsible for 4,000,000 lb.

However, NACO employees are permitted to produce a much greater amount for themselves intercropped with sugar cane, and it is doubtful whether this has been taken into account in the production estimate.

b) Small farmers vs Large farmers

The Census figures indicate that the small farmer production is distributed as follows: rootcrops (1,526,000 lb), vegetables (717,100 lb), pulses (313,000 lb), and fruit (1,662,000 lb) out of a total of 4,218,200 lb. If these figures are correct it would suggest that there is severe malnutrition in the state.

c) Seasonality of commodities

Crop production under rain-fed conditions is somewhat seasonal (Tables VII A-2.01 to VII A - 2.04). However, the 1975 Census shows that for most vegetable crops two per year are normally grown, the "early crop" in April to September and the "late crop" in October to March. The latter is smaller, with 435,000 lb for the "early crop" and 266,000 lb for the "late crop", though this is mainly due to the absence of onions in the latter (2,200 lb).

d) Export crop

No small farmer crops are exported through official channels, though there is a lucrative schooner trade between the Islands and the U.S. Virgins. In 1978 CMC exported 35,000 lb peanuts to Barbados; 27,000 lb onions to Dominica, 1,000 lb onions to Antigua; all NACO production. CMC cannot handle more than 20% of NACO production as it has inadequate storage space, low sales volume and a poor distribution network. It handles little, if any, small farmer production.

e) Glut crops

Although there are reports of gluts and shortages due to crop production under rainfed conditions, there is no specific information as to the crops for which gluts have been experienced.

1.22 Disposition

The 1975 Census gives information on farm consumption of SFC as shown in Table VI G - 1.02.

TABLE VI G - 1.02

Estimated SFC Production and Consumption

on Farm and by Marketable surplus type of crop

(1974/75)

Type of Crop	Production	Farm Consumption	Marketed
Rootcrops	1,527,100	622,200	904,900
Vegetables	717,100	325,000	392,100
Pulses & Grains	313,000	60,320	77,680
Fruit	1,682,000	952,875	729,125

Source: Census of Agriculture 1975

The quantity of SFC used for livestock feed is unknown and there are no processing facilities. It was reported that the CMC purchased 74% NACO production in 1976/77 but recent information from CMC states that it purchases only 20% of NACO production. NACO and small farmers both sell direct to hotels, the public, huscksters, etc., but there is no information as to quantities.

1.30 Supply potential

1.31 Basis for increase in production

a) Increased Land Area

Given the current land use pattern where the arable land is predominantly in sugar cane the estimated increase in acreage is 500 acres for food crops and 1,000 acres for tree crops.

b) Intercropping

Possibly 20 acres of interplanted cane at Fahies and Harrises where farmers have approximately 300 acres of cane some of which are already interplanted. It is assumed that 500 additional acres will all be in that area. No additional intercropping is envisaged for Nevis. If further tree crop development takes place, then possibly 50 acres, i.e. the equivalent of 15 acres at any one time, will be available for intercropping between young trees.

c) Improved practices

Present yields in food crops should be least doubled, by proper use of fertilizers and weeding, and increased by 50% for fruit. The 1975 census shows the average use of fertilizer on small farms to be 48 lb. per acre. For intensive cropping, 1,000 lb. or upwards is required.

d) Irrigation

It is assumed that plans will materialize for the irrigation of 50 additional acres.

1.32 Estimated Current and Potential Production

The current production estimates (Section VI A-2.14) are given in Table VI G - 1.03. St. Kitts/Nevis has no published plan for agriculture except for its main commodity, sugar, which is organised by a Government body, NACO. It is therefore difficult to forecast the rate at which the full potential, on the basis of 1.31, is likely to be achieved. The estimate of a potential increase in production shown in Table VI G - 1.03 is therefore preceded by the following commentary:

1) Without much likelihood of SFC irrigation, crops will be rainfed and seasonal, while most foodcrops will be limited to one per year in the dryer areas (Basseterre and Southerly coastal areas); at higher elevations and in the north, two crops should be possible in most years. With good agronomy high yields should be possible since small scale trials carried out by U.W.I. in 1969 and 1970 on several locations showed excellent yields, by Caribbean standards, on a number of crops. Of particular interest is the high yield of tomato at Otways "out of season" i.e. August to January. Even at 5 tons per acre, that crop should be highly profitable. Corn at 3,000 lb. per acre is also remarkably good. This underlines the belief that St. Kitts is physically capable of producing excellent crops and has out of season potential.

2) Nevis, however, does not have as good conditions as St. Kitts. Virtually no mechanisation is possible (even with small tools), and only one crop per year could be grown. If Nevis is able to increase production it may be that it should sell to St. Kitts, while St. Kitts concentrates more on export crops such as tomatoes, onions, peanuts and "exotica".

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3) Fruit should be developed and organised with small farmers having a substantial share in the operation. Tree fruit - citrus, mangoes, avocadoes are said to satisfy the local market and could be developed for export. Pineapples appear particularly promising. NACO's early success has been striking and these fruit may well be suited to part-time farmers, requiring little day to day attention, but yielding excellent monetary returns.

4) St. Kitts' soil, climate and people give it an advantage over the other LDC's, but lack of official initiative can quickly lose all this and leave St. Kitts as a non-starter in non-sugar agriculture. In forecasting production, it is assumed that a programme of land development with Government assistance to bring the 1,500 acres of new farm land envisaged under cultivation, will be planned and implemented, and that the DFC will be restructured as a functioning institution.

5) In view of the absence of plans, and of the involvement of NACO in the production of foodcrops, it is difficult to estimate how the small farm sector will develop. It seems probable that, unless strong marketing incentives develop, the small farm sector is likely to diminish in strength, rather than increase. NACO has the capability of pushing the small independent farmer out of business, leaving him as a subsistence farmer. This would be socially disastrous, and for the purpose of this report, the view is taken that that the danger is recognised by the Government and that the small farmer section will receive the necessary incentives.

The forecast increased production for 1982 and 1987, given in Table VI G - 1.03, are based on the considerations outlined above and do not include possible increase in NACO production, but do assume that 1,000 acres of tree crops will be put into small farmers' hands. A 'high' and a 'low' figure are given for each period, the 'high' figure assuming that plans are made now and implemented at once, and that a high level of agricultural practice is employed, the 'low' figure assuming that some progress is made, but at a much slower rate.

TABLE VI G - 1.03

Production Estimates
(metric tons)

Commodity	Current	Increase in Production			
		1982		1987	
		Low	High	Low	High
Fruits	7138	272	851	1936	5316
Vegetables	558	50	652	833	2174
Roots	4147	115	457	364	895
Pulses	237	60	103	178	364

Source: See section 1.32

The distribution of the available supply, after a deduction for non-food usage (see section VI A - 2.30) for 1982 and 1987 is given in Table VI G - 1.04.

2.0 Supply Analysis - Small Animals

2.10 Institutional Framework

2.11 Present Situation

Livestock farming plays only a small part in the overall agricultural picture of these two islands. However, the two islands differ greatly in that St. Kitts is devoted mainly to the production of sugar and cash crops, with livestock being only a part time operation, while in Nevis the land is mainly owned by the Government and has been broken up into small lots and leased to farmers who tend to grow a multiple number of crops and also raise livestock at the same time. There is one exception in St. Kitts where one farm has some 900-1000 sheep and about 40 goats.

2.12 Transport

The sheep and goats are normally walked to market since they are mainly produced in the areas adjacent to Basseterre. Small animals from Nevis are transported by truck or walked to the Charlestown port and shipped by Ferry to St. Kitts.

TABLE VI G - 1.04

Supply Distribution
(Metric tons)

Commodity Group	Current Production Estimate	1982 Production	1982 Supply Total Available	1982 Supply Quarterly (Monthly Averages) 1	2	3	4	1987 Production	1987 Supply Total Available	1987 Supply Quarterly (Monthly Averages) 1	2	3	4
Fruits													
Citrus	19	20	18	3	0	0	3	1519	1367	113	0	113	225
Other	7119	7679	6911	330	388	1116	461	9245	8241	319	615	1328	457
Total	7138	7699	6929	333	388	1116	464	10765	9608	432	615	1441	682
Vegetables													
Onions	52	102	102	17	17	0	0	340	340	57	56	0	0
Other	506	807	717	52	35	68	93	1720	1519	86	80	165	185
Total	558	909	819	69	52	68	93	2061	1859	143	136	165	185
Roots													
White potatoes													
Other													
Total	4147	4433	3750	431	386	49	386	4770	4035	492	359	133	359
Pulses	237	319	294	47	5	6	40	508	469	68	20	9	60

Source: Table VI G - 1.03, Sections VI A - 2.30 and VI A - 2.40.

This is done mostly on a Thursday for slaughter in St. Kitts on Friday for marketing over the weekend. Pigs are mainly a backyard operation and are transported by small truck. Chickens are transported by small truck. Chickens are transported by the producer direct to the supermarkets and hotels.

2.13 Marketing Conditions

a) Slaughter

Slaughter figures for 1976 and 1977 are shown in Table VI G - 1.05.

TABLE VI G - 1.05

Animals Slaughtered

(Numbers)

	1976	1977
Sheep	3,614	3,676
Goats	1,600	1,511
Pigs	2,243	2,264

It is estimated that approximately 30% more stock are slaughtered outside of the public abattoir in St. Kitts and the figure for Nevis would be more like 50%.

Figures for one farm in St. Kitts for 1976/77 are shown below:

	1976			1977		
	Stock	Sold	Slaughter	Stock	Sold	Slaughter
Cattle	96	13	20	87	18	17
Sheep	957	102	638	810	51	537
Goats	27	27	2	35	16	4

b) Imports

There are little or no imports of live animals other than breeding stock and day old baby chicks, as follows: 1974 - 1560 chicks and 1975 - 10,000 chicks. In 1976 there were 4,500 and 1977 - 5,000 chicks.

c) Existing Marketing Facilities

There is a Government Abattoir in Basseterre and a small slaughter facility and chill house in Charlestown, Nevis.

The recently created Central Marketing Corporation is mainly concerned with the marketing of agricultural produce particularly for wholesale and export and has little or nothing to do with animals.

2.20 Production and Disposition

2.21 Production

a) Population

The estimates of population of small animals is shown in Table VI G - 1.06.

TABLE VI G - 1.06
Population

	1971	1972	1973	1974
Sheep	19,000	20,000	21,000	21,000
Goats	12,000	13,000	13,000	13,000
Pigs	15,000	15,000	16,000	17,000
Chickens	66,000	68,000	70,000	72,000

Source: Agricultural Statistics of Caribbean Countries - UN/ECLA 1976.

The livestock population has varied only slightly over the period 1971 - 1974 and the picture is unlikely to change unless a major effort can be made to produce a feed locally to make it more economically attractive for the small farmer to feed concentrates to his livestock.

b) Constraints

Special Constraints to Livestock Production

Major constraints to small livestock production are Government control prices, high cost of supplementary feeds, export quota restrictions, low standard of management, lack of agricultural extension staff and veterinary assistance, praedial larceny and damage by stray dogs.

c) Government Regulations

Other than duty free concessions on equipment and feeds there are no other Government incentives for livestock production. There are control prices, licensing of imports and export quotas.

d) Management and Production

The production of small animals is concentrated mainly in Nevis in the hands of small part time farmers with inadequate extension services from the Ministry of Agriculture therefore the general standard of management is low. Marketing is unsophisticated and there is no premium for quality. The farms with good management practices and who slaughter and chill their meat, thus obtaining premium prices, are viable concerns.

2.22 Disposition

a) Consumption Pattern

No figures are available for breakdown on consumption of live animals, however, there is a regulation controlling the export of animals to Guadeloupe which states that only one animal may be exported for every three slaughtered locally. Loss by praedial larceny, stray dog depredation and disease is likely to account for up to 50% of animals born. About 7,000 lbs of honey are produced annually and sold locally; the beeswax produced is sold mainly to the local Batik industry.

The commodity buyers for sheep, goats and pigs are local butchers and the Guadeloupe butchers for the export trade. Honey is marketed locally through the supermarkets in two sized containers - 16 ozs and 32 ozs.

b) Agribusiness Processing Projects

There are no processing projects for sheep, goats, pigs and rabbits in the two islands. There are two chicken farms processing a small amount of meat and producing eggs for the local market, and there is one apiary with a honey processing plant.

2.3 Supply Potential

2.31 Special Favorable Conditions to the Production of Livestock

The Salt Ponds peninsula has produced sheep of high quality in the past and has the potential to be a major mutton production centre. This could be run in conjunction with the Salt industry, now in the process of re-habilitation. There should be a good market for salted mutton and goat meat throughout the Caribbean. The central mountains and the forests could provide a good source of nectar for increasing the honey production.

2.32 Increase in Output

There is great scope for increase in output in St. Kitts and Nevis as the soil type and climate are ideally suited to livestock production. There is good availability of land, particularly in the Salt Ponds area of St. Kitts for sheep and goats and on the mixed farms in Nevis. Availability of labour is good particularly in Nevis and the market for export to the French islands is financially attractive - provided the government regulations can be relaxed. If feed prices could be reduced the production of chicken meat and eggs have great potential for increase in output as there is a large amount of chicken meat imported.

The location of areas for potential increase in production is shown in the map in Figure VI G - 1.01. The way in which supply may be readily increased is by expansion of the existing areas under production. The largest concentration of sheep and goats in St. Kitts is on the Mattingley Farm, on the West Coast of the island, with a number being reared in the peninsula. In Nevis they are mainly in the South. Chickens are found in the Conaree area and on the North coast of St. Kitts, while in Nevis there are farms near to the airport in the North. Bee hives are scattered around the island, with a greater concentration on the West. Pigs are kept mainly around the Basseterre area with one large farm having upward of 100 animals.

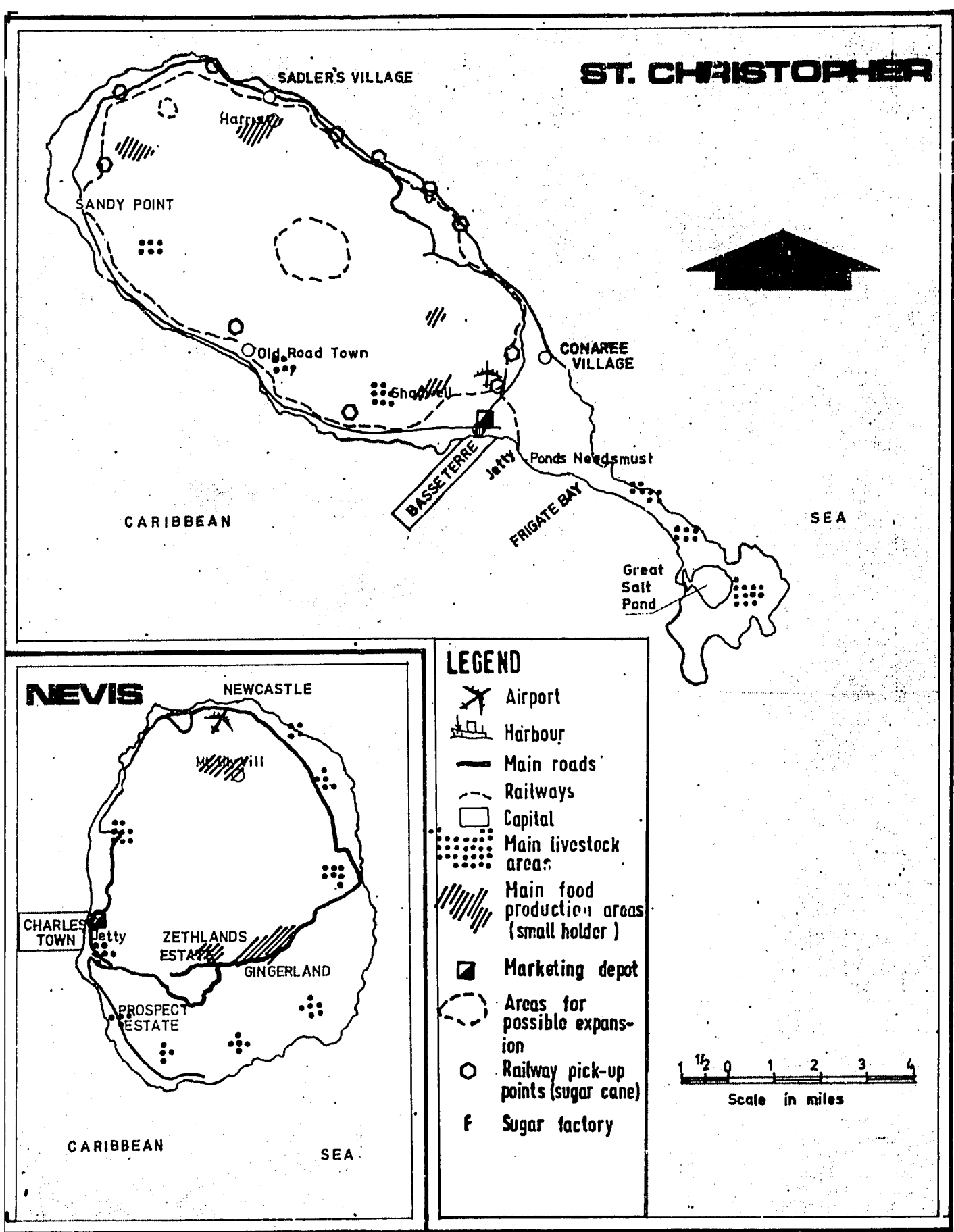

FIGURE VI G-1.01

H. St. Lucia

1.0 Supply Analysis - Crops

1.10 Structure and Composition of the Agricultural Sector

1.11 Land and Farm Holdings

Although St. Lucia (150,000 acres) is a very mountainous island, a high proportion of its land is agricultural as is shown in Table VIH - 1.01.

TABLE VI H - 1.01

Land Utilization

	Acres	%
Crop land		
Tree crop	28,536	19.0
Other crops	13,146	8.7
Grassland		
Cultivated	2,624	1.7
Uncultivated	4,722	3.1
Forest and Woodland	19,002	12.7
Other agricultural land	3,971	2.6
Non-agricultural land	78,000	52.1
	150,000	100.0

Source Annual Statistical Digest, 1975

Government is undertaking a land capability survey which should lead to better use of soil reserves.

It is estimated that there are 10,037 farmers in the small farm category (less than 25 acres) with an acreage totalling 22,272 out of a total of 10,433 farms and an agricultural acreage totalling 72,000.

1.12 Irrigation

Because of the long dry season (January to July) and the considerable variability from year to year, irrigation is of utmost importance. Very little is practised, the only major scheme being at Dennery on a large (100 acre) vegetable production area. The extent of watering among small farmers is seldom more than necessary to start seedlings and vegetable farmers are restricted to one crop per year. Only about 6% of all small farmers are reported to use any water at all.

Trickle irrigation experimental systems on bananas are under way at Forestiere and Mahaut (spring water) and Dennery (river water). If these are successful then they could be applied to vegetable production by small farmers. There is no indication yet as to probable costs.

1.13 Institutional and Private Sector Framework for S.F.C. Production and Market Supply.

a) Credit

Agricultural loans are available through the Agricultural and Industrial Bank, the CDB, FIC and APC schemes and from Commercial banks. The small farmers have benefitted considerably from these credit schemes. However, in general, the Commercial banks seldom lend to small farmers, though the Barclayplan scheme is being developed. The loan repayments deducted from payments to growers for their crops by the Growers' Associations and the Marketing Board and then passed on to the lending agency.

b) Technical assistance

The St. Lucia Banana Growers Association (SLBGA) provides a complete service for its members including purchasing and distribution of fertilizer, plant protection and extension. Research and demonstration is provided by WINBAN. Small farmers who are members of SLBGA may benefit because the fertilizer service primarily for the bananas may also be of benefit to other food crops.

The Government Extension service also assists the small farmers.

c) Farm To Market Facilities

The SLBGA transports bananas from collection points in the field to the boxing plants. The Coconut Growers Association collects copra and transports it to the processing plant. The St. Lucia Marketing Board (SLMB) has 8 major collection points in the main vegetable and fruit growing areas and also undertakes a certain amount of roadside "picking up". The SLMB has two trucks and collects produce 2 or 3 times weekly. There are no mechanical grading facilities at the SLMB depots. Sorting and grading are carried out by hand. There are two small chill rooms (about 5 tons capacity each) used for holding fruit and vegetables at the Castries depot.

d) Farmer Associations, Cooperatives

The SLBGA and the Coconut Growers Association are the two main farmers associations. There are no significant food crop grower associations.

1.20 Small Farmer Commodity Production and Disposition

1.21 Production

a) Total Production by Commodity

The most recent figures giving a breakdown of crop production in St. Lucia are given in Table VIH - 1.02.

b) Small Farmers vs Large Farmers

The percentage of total production by commodity which was grown by small farmers in 1973 is given in Table VIH - 1.02. The pattern has remained substantially the same since then.

c) Seasonality of Commodities

Information showing the harvest and glut periods under rain-fed conditions and the extended growing period under irrigation are given in Tables VII A - 2.01 to VII A - 2.04.

d) Export Crops

The major small farm crops exported through the St. Lucia Marketing Board are indicated in Table VIH - 1.03.

e) Glut Crops

Sweet potato is liable to serious glut in the favourable growing season.

1.22 Disposition

Quantities of various commodities actually purchased by the SLMB in 1977 are shown in Table VIH - 1.03. The SLMB estimates that, of the local produce coming on the market, no more than 20% reaches the two depots at Vieux Fort and Castries; about 20% was sold locally by the growers in the neighbouring villages, 20% was exported directly through "hucksters" or went to supermarkets or rural markets and 40% went to the main Castries market.

On the basis of 1,100 lbs of farm produce per farm family per year and 10,000 small holders, on farm consumption would be about 11,000,000 lbs anually leaving only 10,600,000 lbs of foodcrops for sale (see footnote 15 Table VIH - 1.02). The total intake by the SLMB approximately 1.6 million lbs is in the region of 16% of this, but this is for 1977 and not 1973. The year 1973 was a year of below average rainfall. In the all important first 6 months, the precipitation was 14.22 inches, compared with the average of 20.63, so crops were short. It appears that under normal conditions, the SLMB might indeed handle about 20% of available small farmer production.

1.30 Supply Potential

1.31 Basis For Increase In Production

a) Increased Land Area

Most of the cultivated land in St.Lucia is already in production, with the exception of some relatively small areas such as Delcer in the South (rather erodable plateaux and valley slopes, at present more or less barren; and some valleys north of Vieux Fort), and also a little in the North. The Ministry of Agriculture estimates an increase of not more than about 300 acres, or less than 1% of the present productive land.

The present farming pattern in St. Lucia, while suitable for hilly terrain is not necessarily the only possibility and has been conditioned by economic and political circumstances. If good markets were developed for vegetable crops it might be economic as well as technically possible to replace some of the banana acreage by vegetable crops (as indeed Dennery has done).

There is already a marketing organisation, Geest Industries, who have prepared a list of 'Exotica', Table VI H - 1.04. Geest has based its 'Exotica' scheme on the production potential in St.Lucia.

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TABLE VI H - 1.02

Crop Production in St. Lucia - 1973 ('000 lb)

Crops	Farms Up To 25 Acres	Island Total	Percentage By Small Farms
Maize	65	68	96
Pigeon peas	87	89	98
Other pulses	76	92	83
Tannia,Dasheen,Eddoes	6,700	6,997	96
Yams	2,000	2,262	88
Sweet Potatoes	2,210	2,348	94
Cassava *	400	407	98
Vegetables	2,000	210	96
Ginger	235	243	97
Bananas for export	85,000	113,870	74
Bananas (other)	2,700	2,975	91
Plantains	2,600	3,150	83
Oranges +	600	850	71
Grapefruit +	400	526	76
Limes	50	354	14
Other citrus +	93	98	95
Breadfruit +	1,300	1,520	85
Mangoes (grafted) +	900	1,302	69
Mangoes (ordinary) +	2,400	2,614	92
Avocadoes +	580	687	84
Coconuts +	8,500	25,481	33
Nutmegs +	10	27	37
Corn	250	408	61
Coffee	47	52	90

Source: Adapted from Statistical Digest 1975.

* Information from S.L.Marketing Board. + Yield in numbers of fruit.

Note: Total small farmer production of fruits (not including bananas for export), vegetables, pulses and roots is approximately 21,566,000 lb.

TABLE VI H - 1.03

Major Items Of Produce Purchased For
The Year 1977

(1b)

	Castries	Vieux-Fort	Total
Avocadoes	10335	6262	16597
Bananas (Green)	27891	17521	45412
Breadfruit (1)	14620	5137	19757
Breadnut	93	78	171
Black Eye Peas	98	63	161
Coconuts (1)	54892	--	54892
Carrots (1)	27942	289	28231
Cabbage (2)	37092	1201	38293
Chive	84	55	139
Cucumber (2)	7624	14730	22354
Cush-Cush	8972	358	9330
Christophene	5131	1272	6403
Celery	45	18	63
Cinnamon (1)	784	138	922
Dasheen (1)	25871	23985	49856
Grapefruit	11648	9476	21124
Ginger (1)	173468	109167	282635
Limes	2260	3248	5508
Lettuce (2)	9098	--	9098
Macambou (1)	32622	61353	93975
Mangoes (1)	132301	58538	190839
Marrow (1)	236	424	660
Oranges	6217	2794	9011
Okro (1)	183	--	183
Onions (3)	473	581	1054
Eggplant (1)	221	156	377
Paw-Paw	5424	2330	7754
Pigeon Peas	154	95	249

	Castries	Vieux-Fort	Total
Plantain (1)	31327	48299	79626
Passion Fruit	522	188	710
Pumpkins (1)	121786	120097	241883
Pineapples	1232	54	1286
Pepper Sauce (2)	154	--	154
Sweet Potatoes	15939	5193	21132
Sweet Peppers	4116	--	4116
String Beans	427	357	784
Tomatoes	52281	3374	55655
Tannia (1)	12185	10504	22689
Watermelons	8471	5506	13977
Yams (white) (1)	84735	101398	186133
Tangerine	5382	--	5382
Hot Peppers (1)	856	--	856
Yams	22551	--	22551

(1) substantial quantities exported.
(2) small quantities imported.
(3) almost all or entirely imported.

Source: St. Lucia Marketing Board.

TABLE VI H - 1.04

West Indian Exotica Of Interest To Geest

Seafreight		Airfreight
Coconuts	Limes	Okra
Aubergines	Sweet Potatoes	Chillies
Ginger	Eddoes	Mangoes
Mangoes	Plantains	Beans
Yams	Squash	Courgettes
Tannias	Macambou	Limes
Christophenes	Capsicums	Breadfruit
Pumpkins	Dasheen	
Pineapples		

Sources: Geest Industries

The major "official" thrust is the establishment of 10,000 acres of private-lands of pure orchards with Government providing 50% of the cost of establishment of the orchard and 25% of the cost of maintenance over a period of 5 years. The types of fruit include mangoes, avocadoes, passion fruit, soursop, cashew, citrus, spices, cocoa, kola, pineapple, guava and pawpaws. It is not clear what proportion, if any, is intended for small farmers, though with SF acreage being defined as under 25, it might be considerable.

b) Intercropping

Intercropping is already normal practice and smallholders with their mixed cropping systems, are already highly intensive. The only possibility for increased productivity in this connection is intensive pure stand cropping of such crops as vegetables and certain fruit (e.g.pineapples), but it is not possible to quantify probable increases due to the adoption of such practices.

c) Improved Practices

The major source of fertilizer for farmers is the Banana Growers Association (except for one large estate Dennery which imports its own). Only 41% of all farms under 25 acres use fertilizer and those that did do used substantially less than recommended. The inherent fertility in St. Lucia soils is lo.. and it is believed that productivity could be increased by at least 50% by proper use of fertilizers and pesticides.

d) Irrigation

A rough estimate by the Ministry of Agriculture suggests a possible 100 acres, including possibly 50 acres at Delcer and Black Bay (the latter now being revived after failure of the initial scheme).

1.32 Estimated Current and Potential Production

The current production estimates (Section VI A - 2.14) are shown in Table VI H-1.05. The basis on which an increase in production may be projected is given is given in 1.31. The estimates of the potential increase in production are given in Table VI H - 1.05.

In Table VI H - 1.05 forecasts of increases in production are made for 1982 and 1987 showing a 'high' figure based on the assumption that the Ministry's plans will proceed as proposed in the Development Plan and that sound husbandry is practised throughout, and a 'low' estimate representing a minimum increase based on only partial fulfilment of plans and only a slow improvement in agronomic practice. The possibility of having 10,000 acres of new fruit orchards in full bearing in St.Lucia within 10 years seems very remote and this has been taken into account in the 'high' 1987 estimate, which shows much less fruit production than would be expected from 10,000 acres of fully bearing fruit.

TABLE VI H - 1.05

Production Estimates

(metric tons)

Commodity Group	Current	Increase In Production			
		1982		1987	
		Low	High	Low	High
Fruits	67,279	2,538	12,186	12,220	17,956
Vegetables	1,268	73	393	370	779
Roots	11,192	1,179	2,087	2,087	4,809
Pulses	91	23	136	91	272

Source: See Section 1.32

The distribution of the available supply after a deduction for non-food usage, (Section VI A - 2.30) for 1982 and 1987 is given in Table VI H-1.06.

TABLE VI H - 1.06

Supply Distribution
(Metric tons)

Commodity Group	Current Production Estimate	1982 Production	1982 Supply Total Available	1982 Supply Quarterly (Monthly Averages) 1	2	3	4	1987 Production	1987 Supply Total Available	1987 Supply Quarterly (Monthly Averages) 1	2	3	4
Fruits													
Citrus	454	522	506	56	0	56	56	613	595	66	0	66	66
Other	23722	24209	19279	1289	1266	2061	1804	25032	19921	1329	1293	2109	1903
* Total	24176	24731	19785	1345	1266	2117	1860	25645	20516	1395	1293	2175	1969
Vegetables													
Onions													
Other													
Total	1268	1501	1456	156	121	96	111	1842	1787	172	134	127	129
Roots													
White potatoes													
Other													
Total	11192	12825	11619	1394	1092	593	790	14640	13264	1592	1247	676	902
Pulses	91	170	165	33	4	0	18	272	264	46	15	0	27

* Excludes Banana exports to UK (current estimate 43103t; 1982 - 49909t; 1987 -56715t.)

Source: Table VI H - 1.05, Sections VI H - 2.30 and VI H - 2.40.

2.0 Supply Analysis - Small animals.

2.10 Institutional framework

2.11 Present situation

The livestock industry in St. Lucia plays only a minor part in the overall agricultural sector.

2.12 Transport

There are abbatoirs in both Castries and Vieux Fort and the usual method for transporting animals is to walk them there from the nearby areas. However, itinerant butchers, who provide their own small trucks for transport, also play a part in the marketing of small animals.

2.13 Marketing conditions

a) Slaughter

Specific figures for slaughter at the abattoir are not available but the total slaughter figures for 1974 are given as:

sheep - 3,664, goats - 2,962, pigs - 3,634, chickens - 24,635

b) Imports

With the exception of day old chicks from Barbados there is hardly any importation of live animals other than the occasional breeding stock. In the period 1974 to 1977 the trend in importation of chicks has been 53,750, 52,300; 52,091 and 12,653.

c) Existing facilities

There are slaughter houses in both Castries and Vieux Fort.

2.20 Production and disposition

2.21 Production

a) Population

The estimate of population is given in Table VI H - 2.01.

TABLE VI H - 2.01

Small Animal Population

(Numbers)

	1971	1972	1973	1974
Sheep	9,000	9,000	9,000	9,000
Goats	5,000	5,000	5,000	5,000
Pigs	24,000	25,000	26,000	27,000
Chickens	73,000	73,000	73,000	74,000

Source: Agricultural Statistics of the Caribbean Countries - UN/ECLA - 1976.

The Agricultural Census figures are Sheep (10,442), Goats (8,055), Pigs (7,851) and Chickens (111,842). These figures differ quite considerably from those in Table VI H - 2.01. It is extremely difficult to rationalise these differences without an extensive carefully coordinated study.

b) Constraints

The main constraints to livestock production is the control of prices.

c) Government regulations

Government has a limited farmer assistance programme to cover all aspects of assistance including duty free imports of feedstuffs and equipment. There is no feed subsidy but a controlled price is put on coconut meal sold locally in order to assist the small farmer and and some assistance is given for pig housing. The control price of meat and live animals is a deterent to farmers for expanding livestock production.

d) Management

The standard of management for raising small animals is rather low due to the part time nature of the undertaking. There is also no premium for the unsophisticated marketing of small animals - therefore quality tends to be on the same low level. The establishment of a pork processing plant could lead to better management in pigs and higher production in good quality pork.

2.22 Disposition

a) Consumption pattern

It is estimated that the loss due to death by disease, praedial larceny and attack by stray dogs may account for as high as 40% of the total disappearance.

The percentages of small animals consumed on the farm and sold live are given in Table VI H - 2.02.

TABLE VI H - 2.02
Disposition of small animals
(percentages)

	Sheep	Goats	Pigs	Chickens
Consumed on farm	9.3	7.0	18.9	26.1
Sold live	31.2	9.9	31.5	9.4

Soruce - Agricultural Census.

The market for small animals would appear to be mainly in Martinique, with some possibility in Trinidad, for sheep and goats. On the local scene - the butcher plays a major role in sheep and goats while chickens are sold direct to the supermarkets, hotels and restaurants.

b) Processing

There are no agribusiness processing projects at present, however a proposed pork and meat processing plant has been under discussion for sometime.

2.3 Supply potential

2.31 Special favourable conditions

Due to the possible favourable feed situation, there would seem to be good possibilities for the production of pigs.

2.32 Increase in output

Where availability of reasonable feedstuffs in the form of controlled prices on coconut oil meal, the possibility of obtaining reject bananas and the feed plant

of the St. Lucia Flour Milling Company, there would appear to be great potential for an increase in pig and poultry production, with pigs being top priority. However, the Ministry of Agriculture sees the greatest potential in agriculture to be about 95% in crops and only about 5% in livestock generally. Provided that markets for all cuts of pork can be assured then St.Lucia, like Dominica, could become a major pig producing country. The possibility of becoming self sufficient in poultry meat and eggs is certainly also there.

The greater concentrations of sheep and goats are in the West around Castries and Gros Islet and in the South around Vieux Fort and Laborie. Pigs follow much the same pattern, while chickens are mainly in the Castries area and Gros Islet.

The areas primarily suited for small animal production are shown in the map in Figure VI H - 1.01.

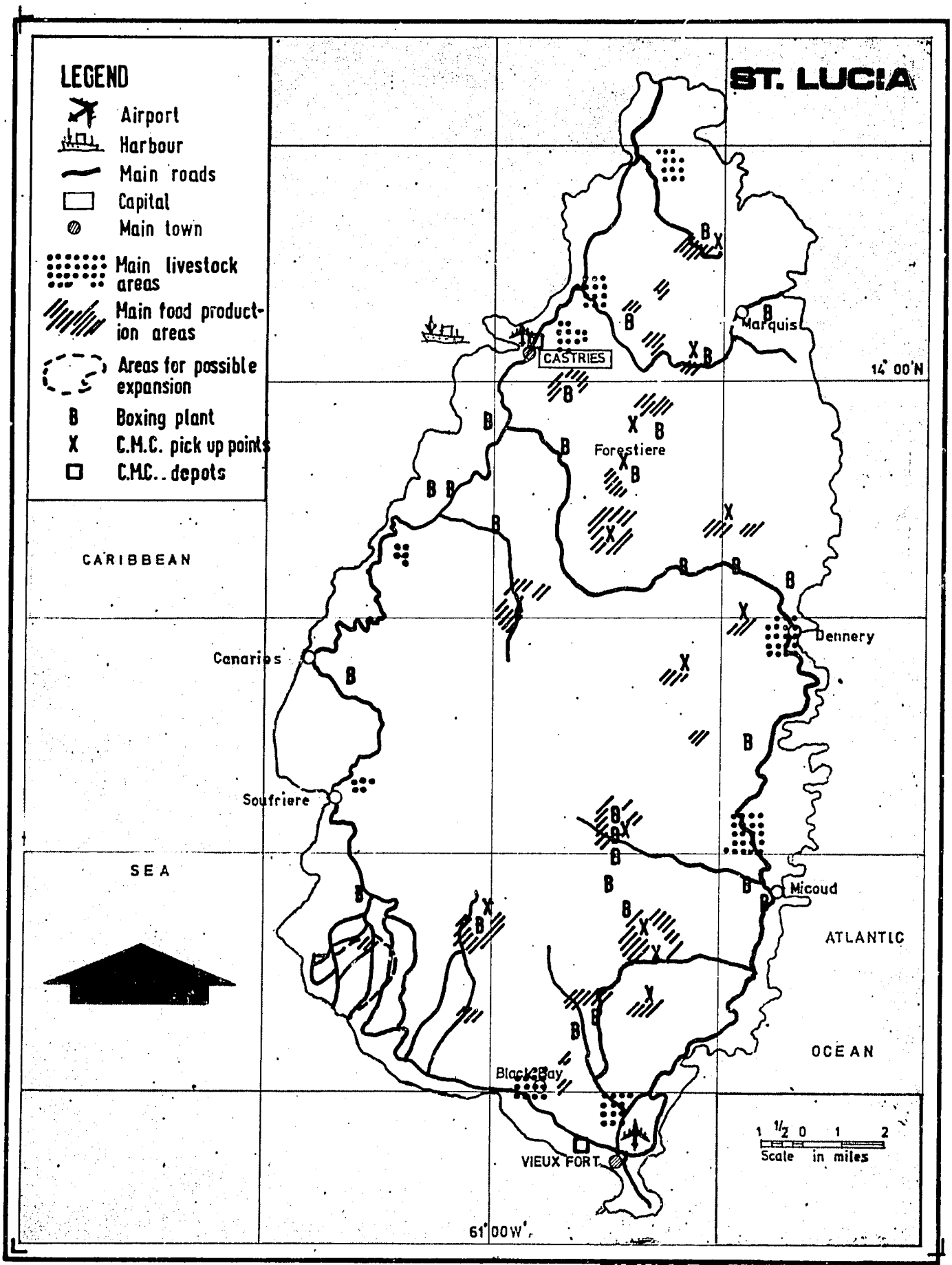

FIGURE VI H-1.01

I St. Vincent

1.0 Supply Analysis - Crops

1.10 Structure and Composition of the Agricultural Sector

1.11 Land and Farm Holdings

St. Vincent has a land area of 96,000 acres. The land utilization profile is shown in Table VI I - 1.01.

TABLE VI I - 1.01
Land Utilization

	Acreage	%
Permanent crops	9,623	10.0
Other crops	11,926	12.4
Uncultivated	12,806	13.3
Non-agricultural	61,645	64.2
	96,000	100.0

Source - Census of Agriculture, 1972 - 3.

The Census stated that of the 34, 355 acres in holdings, 14,204 (41.1%) is operated by small farmers. However, 99% of the 7,088 farm holdings are less than 25 acres.

1.12 Irrigation

There are 500 acres currently under irrigation, mainly large farmers.

1.13 Institutional and Private Sector Framework for S.F.C. Production and Market Supply

a) Credit

Credit for small farmers is available at the Agricultural and Cooperative Bank (ACB) and the Commercial Banks in the State. The terms of the ACB are favourable to farmers. The ACB has an arrangement with Marketing Institutions, such as the Banana Growers' Association, so that payments on loan are deducted from the sales of the farmers' produce. Barclays Bank

has a farm plan loan which caters for small farmers.

b) Technical assistance

The Department of Agriculture has 33 extension officers, of whom 8 are in training and 8 recently recruited, who advise farmers in the areas of weed and pest control and contouring. There is also some activity in research and propagation. The Banana Growers' Association has 9 field staff who advise on proper cultural practices in banana production. The Agro-Lab provides a market for some of the supply. It is concerned with the processing of fruits.

The tractor service is very limited. They are three tractors (50% break-down time on average) with the main tools: mould board plough, rotovators and disc harrows.

The Arrowroot Association provides services of credit, fertilizer, planting material and transport to genuine arrowroot farmers.

c) Farm to Market services

The St. Vincent Marketing Corporation (SVMC) has three main purchasing depots at Rosehall in the carrot producing area on the Leeward side of the island, at Belmont on the Windward side of the island for the sweet potato farmers and the main marketing complex in Kingstown, which has a large floor space for purchasing fruits and vegetables. In addition to these permanent depots there are two sub-depots leased by Government at Landers and Bellevue in the ginger producing section of the island. The farmer is responsible for getting his produce from the field to the depot.

Grading is done manually and packing is usually done at the purchasing depots in preparation for export. The SVMC has two freezer rooms and four cold storage rooms which are used for storing commodities for sale in the super-market or for export. Most of the SVMC purchases are sold through their supermarket or exported.

The private sector has no organised facilities for the purchase of fruit and vegetables. They rely on hucksters and traffickers who travel far and wide over the country to purchase their commodities.

d) Farmer Associations, Cooperatives

The better known associations are the St. Vincent Banana Growers' Association and the Arrowroot Association.

1.20 Small farm commodity production and disposition

1.21 Production

a) Total production by commodity

The estimated production of selected commodities is shown in Table VI I - 1.02.

TABLE VI I - 1.02
Estimated production of selected commodities
('000 lb)

Commodity	1974	1975	1976	1977
Carrots	1,800	1,300	1,820	871
Sweet Potatoes	5,000	3,000	3,700	1,619
Ginger	700	2,600	1,749	1,317
Peanuts	170	210	147	54
Cocoa	NA	NA	18	23
Yams, Tannias, Eddoes, Dasheen	5,100	3,800	4,365	5,422
Pumpkins	212	168	422	212
Plantains	NA	NA	565	907

Source - Ministry of Agriculture and Digest of Statistics, 1976.

b) Small farmers vs. large farmers

Over 80% of the fruits and vegetables are produced by small farmers in the private sector.

c) Export crops

The major export crops are bananas and arrowroot. Other crops which are exported are carrots, sweet potatoes, plantains, tannias, eddoes, ginger, pumpkins and peanuts. The magnitude of these exports is shown in Table VI I - 1.03.

TABLE VI I - 1.03

Export of food crops 1976 and 1977

Commodity	Destination	Quantity ('000 lb) 1976	1977
Carrots	Trinidad and Guyana	1,582	709
Sweet potatoes	U.K. Trinidad, Grenada Canada, Barbados	3,922	1,349
Plantains	Barbados, U.K. Trinidad	116	592
Tannias	Trinidad, U.K. Barbados, Canada	953	1,195
Eddoes	U.K. Trinidad, Barbados, Canada	1,911	2,406
Ginger	Trinidad, Barbados, Antigua, Montserrat, U.K. Canada	1,666	1,255
Pumpkins	Trinidad, Barbados, U.K. Canada	402	212
Peanuts	Trinidad, Barbados, Guyana	171	45

Source - Trade Statistics

d) Glut crops

The fate of the recorded gluts are shown in Table VI I - 1.04.

TABLE VI I - 1.04

Major recorded gluts

Crops	Year	Disposition
Sweet potatoes	1974/1976	Price reduced, more went to animal feed.
Ginger	1974	Left in field
Tomatoes	1976	Reduction in price, rotted
Peppers	1973/1974	Rotted
Grapefruit	Almost every year	Spoiled
Mangoes	Almost every year	Spoiled

1.22 Disposition

The marketing system and the corresponding planned production is relatively well organised in St. Vincent. A comparison of Tables VI I - 1.02 and VI I - 1.03 for

1976 and 1977 will show that the exports of the selected commodities is a high percentage of the total production. (Clearly, there is an error for sweet potato and peanuts in 1976, since the exports are higher than the production) In Table VI I - 1.04 some indication is given as to the fate of glut commodities. There is no further detailed quantitative information on the disposition of small farmer commodities.

1.30 Supply Potential

1.31 Basis for increase in Production

a) Increased land area

There are a few small areas in which an increase in land area for small farmer crops may be possible, but not sufficient to make a real impact.

b) Intercropping

Intercropping is already a common practice. Greater intensity could improve output significantly. Pulses alone could probably be doubled from the present 90,000 lb. (dry) by further intercropping.

c) Improved practices

It is estimated that yields of virtually all commodities could be doubled by the adoption of proper agricultural practices. The St.Vincent Government has drawn up a Crop Diversification Project (Ministry of Agriculture, 1977) in which details are set out, including financial and technical assistance to small farmers, for a very substantial increase in production. The overall scheme envisages the contouring and proper drainage of 500 acres of land and,in addition of 100 acres of fruit trees. This is not new land but improvements on existing farm land.

d) Irrigation

Possibly about 100 to 200 acres with doubling or trebling of productivity.

1.32 Estimated current and potential production

The current production estimates (Section VI A - 2.14) are shown in Table VI I - 1.05. The 'high' estimates assume that the present dynamism, in the agricultural sector will be sustained and the 'low' estimates allow for a rather more possible assumption.

The basis on which an increase in production may be projected is given in 1.31, coupled with information from the St.Vincent National Agricultural Plan and the Tree Crop Diversification Project (1977). The estimates of potential production are given in Table VI I - 1.05.

TABLE VI I - 1.05

Production estimates

(Metric tons)

Commodity group	Current	Increase in Production			
		1982		1987	
		Low	High	Low	High
Fruits	54,317	2830	7890	7874	13175
Vegetables	2,844	32	332	259	622
Roots	15,211	250	585	681	962
Pulses	625	23	45	45	68

Source: See Section 1.32

The distribution of available supply, after a deduction for non-food usage, (see section VII A - 2.30) for 1982 and 1987 is given in Table VI I - 1.06.

2.0 Supply Analysis - Small animals

2.10 Institutional Framework

2.11 Present Situation

The most significant development in small animal livestock husbandry has been the establishment of a flour mill. Wheat middlings, or pollard, is produced as a by-product of flour milling and plans are afoot at the mill to produce mixed feeds. St. Vincent also produces and exports coconut meal and a by-product of the arrowroot industry, arrowroot bittie, is also available. Therefore, with a minimal amount of imports a high quality livestock feed can be prepared for the pig and poultry industries. The production of meat from sheep and goats is unlikely to be profitable enough to allow for supplementary feeding.

TABLE VI I - 1.06

Supply Distribution
(Metric tons)

Commodity Group	Current Production Estimate	1982 Production	1982 Supply Total Available	1982 Supply Quarterly (Monthly Averages) 1	2	3	4	1987 Production	1987 Supply Total Available	1987 Supply Quarterly (Monthly Averages) 1	2	3	4
Fruits													
Citrus	137	222	145	37	0	36	72	322	211	52	0	53	106
Other	22872	23157	19540	1538	1201	1618	2074	23685	20027	1547	1255	1627	2100
Total	23009	23379	19685	1575	1201	1654	2146	24007	20238	1599	1255	1680	2206
Vegetables													
Onions													
Other													
Total	2844	3026	2590	243	186	192	246	3284	2811	247	200	219	270
Roots													
White potatoes													
Other													
Total	15211	15628	14065	1871	1027	563	1224	15800	14220	1891	1038	569	1237
Pulses	625	659	604	54	33	28	86	681	624	61	38	26	82

Note: Excludes banana exports to U.K. (current estimate 31308t; 1982-36298t; 1987 40,835t.)

Source: Table VI I - 1.05, Sections VI A - 2.30 and VI A - 2.40.

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2.12 Transport

Since only about 50% of the animals are slaughtered in the Government Abattoir, the other 50% being slaughtered on farm or by butchers in the villages, the method of transport is usually to walk the animals to the abattoir from distances of 4 to 5 miles away. However, very few animals are transported; if so they would be taken by small pick-up truck or sometimes on the roof of a bus.

2.13 Marketing Conditions

a) Slaughter

Slaughter of sheep, goats and pigs at the Government Abattoir for the years 1973 to 1977 are shown in Table VI I - 2.01.

TABLE VI I - 2.01
Animals Slaughtered
(Numbers)

	1974	1975	1976	1977
Sheep	207	314	402	287
Goats	175	96	76	61
Pigs	739	686	886	849

Source: Government Statistics Department

It should be noted that with the difficulty of transporting live animals to the abattoir it can be estimated that the slaughter figures only indicate about 50% of the total slaughter in the island.

b) Imports

There are no significant imports of live small animals other than day old chicks, mainly from Barbados, 102,110 in 1974 and 84,760 in 1975.

c) Existing facilities

There is a slaughter house in Kingstown and the produce is sold in a nearby meat market.

2.20 Production and disposition

2.21 Production

a) Population

An estimate of the small animal population is given in Table VI I - 2.02.

TABLE VI I - 2.02

Small Animal Population

(Numbers)

	1971	1972	1973	1974
Sheep	5,000	5,000	5,000	5,000
Goats	3,000	3,000	3,000	3,000
Pigs	4,000	4,000	4,000	4,000
Chickens	105,000	110,000	118,000	126,000

Source: Agricultural Statistics for Caribbean Countries - UN/ECLA - 1976

Recent discussions with the Ministry of Agriculture indicate that the population of sheep, goats and pigs are rising but that the number of chickens has declined and is at its lowest ebb, approximately 50,000 birds. However, with the possibility of feed becoming available, there may be an increase in the production of eggs and chicken meat.

There are four Apiaries in St. Vincent and they all produce a high quality honey, primarily to satisfy the local market and there is little or no export at the present. The beeswax produced is sold to the local Batik industry.

b) Constraints

The high cost of imported feed and chicks has forced some chicken farmers out of business.

The large percentage of small animals lost by death, through one cause or another indicates the serious constraints to small animal production, as the small farmer can hardly afford to lose nearly half of the animals that are born. This death loss could be prevented by improved extention services to improve the level of management, thus reducing the loss especially in young animals; improved and expanded veterinary services to treat animals affected by disease; the enforcement of the legislation passed in 1976 for the control of praedial larceny and the passing of new legislation for control of the stray dog problem.

c) Government Regulations

There are no financial incentives for livestock producers except duty free concessions for agricultural equipment and feeds. There are no regulatory constraints on small animal production.

d) Management

With the exception of chickens, which are produced on a few relatively sophiscated farms, all other animals are produced on the village or backyard level by part-time farmers. The standard of management is therefore very low, and since the market is unsophisticated there is no premium for quality, hence the quality of production also tends to be low.

2.22 Disposition

a) Consumption Patterns

It is estimated that some 11% of the annual take off of the sheep population is consumed on farm, while about 34% are slaughtered on farm and distributed locally in the neighbouring villages. Some 55% of sheep stock depletion annually is due to loss by death from disease, attack by stray dogs and praedial larceny.

The picture with goats is somewhat similar with 18% being consumed on farm and 38% for local direct consumption and 44% loss by death in the various forms.

Some 25% are slaughtered and consumed on farm, with 49% for local direct consumption and approximately 26% loss by death.

The major buyers of small animals are butchers and traffickers, who travel around the countryside in their own small pick-up trucks and purchase animals on site and remove them. Chickens are the only exception to this. The position is that a few small farms supply the supermarkets with fresh eggs in direct competition with imported eggs.

b) Processing

There are no agribusiness projects for sheep and goats. There is the St. Vincent Packers for processing pigs into hams and bacon, however, this company is under severe financial stress. - mainly due to the high cost of producing pigs and the difficulties in marketing the whole carcass. There is a good market for the lower priced cuts but a surplus of the higher priced cuts for which there is no market locally. With processing plants in the two major countries, Barbados and Trinidad, to which they could market their products there is great difficulty in marketing this ham and bacon.

2.3 Supply Potential

2.31 Special Favourable Conditions

The establishment of the flour mill and the availability of protein supplements such as coconut oil meal and crop by-products such as reject bananas, banana leaves and arrowroot bittie, affords the potential for producing livestock feed at a cost that would be economically attractive to the small farmer. The major potential is for the increase in the production of chicken and eggs to make the island self sufficient in these commodities. If a market can be found for the ham and bacon produced, the production of pigs also has great potential.

The production of honey and beeswax from the four major apiaries is already satisfying the local demand and the high quality of honey produced indicates a great potential for export particularly to Barbados and Trinidad. There is a very small Rabbit industry at present. The Ministry of Agriculture has some breeding animals and there is one commercial producer, but rabbit meat plays little part in the total meat consumption of St. Vincent.

2.32 Increase in Output

The climate of St. Vincent is conducive to the production of sheep, goats, pigs and chickens and it is planned to encourage the production of rabbits and bees. The potential to increase the output of these commodities would depend primarily on the locating of lucrative export markets.

About one third of the population of sheep and goats are in the St. Vincent Grenadine islands. Pigs are situated mostly in the Calliaqua and Marriqua area and to Windward. Chickens are reared principally in the Calliaqua/Marriaqua area, Leeward, Kingston and suburbs.

Potential areas for small animal production are indicated on the map in Figure VI I - 1.01. Estimates of the potential sheep, goat and pig production are shown in Table VI I - 2.03.

TABLE VI I - 2.03

Potential Sheep, goat and Pig Production

(Numbers)

	Current		1982		1987	
	Sheep & Goats	Pigs	Sheep & Goats	Pigs	Sheep & Goats	Pigs
Domestic	9,068	5,876	10,080	6,506	11,206	7,205
Export	1,932	124	2,119	134	2,288	144
Total	11,000	6,000	12,199	6,640	13,494	7,349

Source: Tables VC-1.04; VC-3.04 and VC-3.05; Ministry of Agriculture Sections VI A - 3.20; VI A - 3.30.

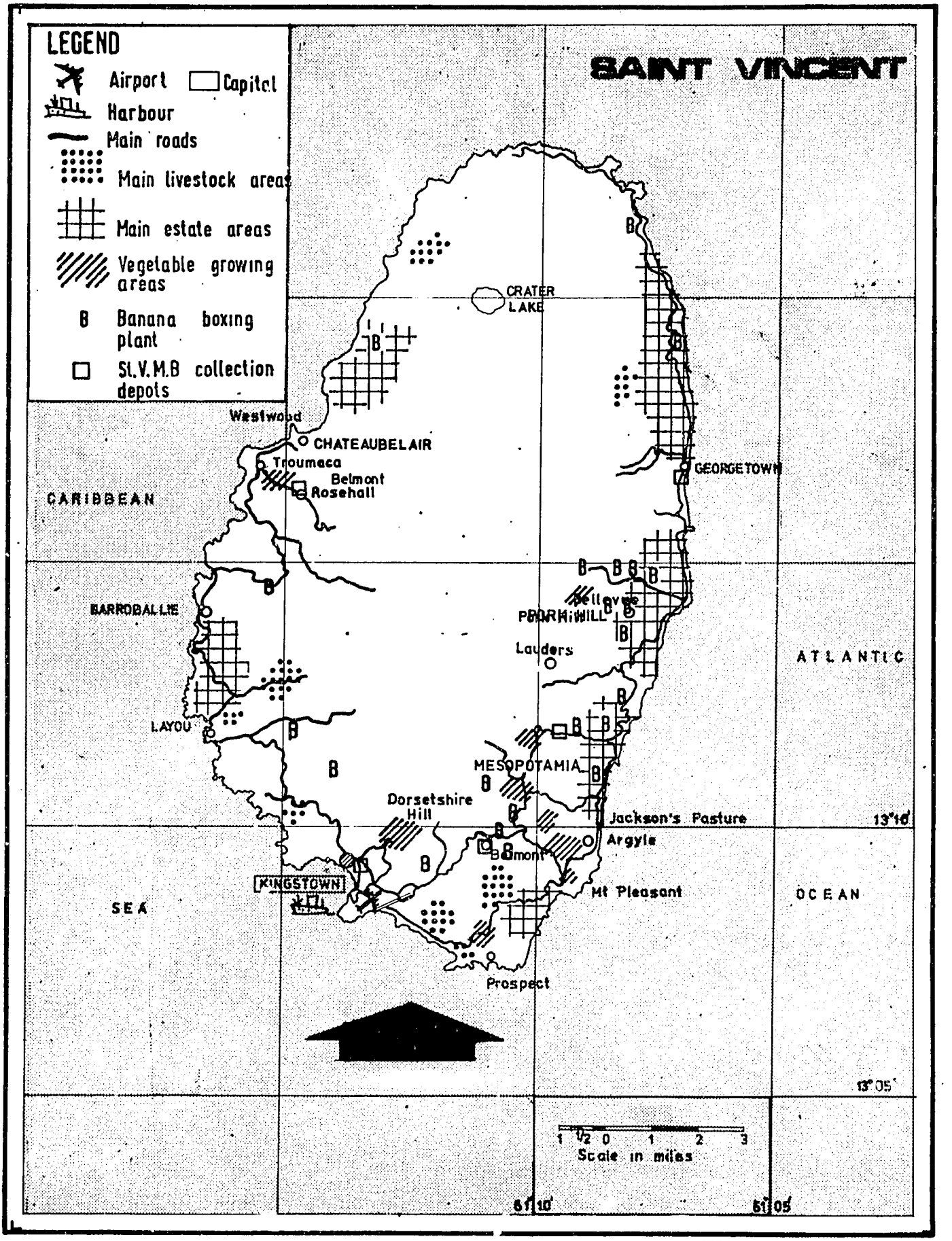


FIGURE VI I-1.01

VII COMPARATIVE ADVANTAGE ANALYSIS

A. Introduction

1.0 Scope of Analysis

The supply analysis in Chapter VI estimates seasonal production potential by commodity groups. However, in designing an integrated production and marketing system (Phase II) it is not sufficient to consider the commodity groupings alone. In this chapter particular commodities, for which there is a potential comparative advantage for small farmer production, are identified by country. (See Table VII A - 1.01)

This evaluation of comparative production advantage is essentially judgements based on information developed in the course of the study. It is necessarily general in nature and derived from consideration of certain basic criteria. These criteria reflect the States current productivity, physical potential and related production capabilities. This takes into account current price information which is considered to reflect farmers' production costs, the value placed on their labour by farmers, and their income expectations. The conclusions derived from these factors are considered reasonable and adequate for the purposes of this study.

More precise evaluation, including in-depth examination of such factors as relative production efficiency, the impact of possible future political conditions and actions on farming costs and produce prices, future foreign assistance to agricultural development, etc. is precluded by time and budgetary constraints under this project. However, the data gaps, variations in actual farming practices within individual States, and uncertainties involved in any projections even from such an exhaustive analysis are considered to render questionable the potential validity of precise conclusions which might result from its conduct.

Marketing factors also have a bearing on comparative supply potential. This is covered generally in this section. But the impact of market demand and transport facilities and costs are covered in other report chapters.

The basic criteria utilized to determine whether a given commodity in a country/territory currently has a potential comparative supply advantage include:

TABLE VII A - 1.01

Summary of Comparative Supply Advantage

Fruits

	ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	BEL
Pineapple	x			x				
Oranges		x	x					x
Grapefruit		x						x
Limes		x	x					
Mangoes		x		x		x		x
Papaya		x	x			x	x	x
Plantain		x	x			x	x	
Avocadoes		x	x					
Breadfruit			x			x		
Golden Apples			x					
Soursop			x				x	
Other		x						

Vegetables

Tomato	x		x	x	x	x	x	
Eggplant	x				x	x		
Cucumber	x	x	x			x	x	
Onion	x			x	x			
Christophene		x	x				x	
Squash		x	x			x	x	
White Potatoes		x		x				
Peppers			x	x	x	x	x	
Pumpkin			x	x			x	
Green Beans			x	x	x			
Carrots			x	x	x	x	x	
Cabbage			x	x	x	x	x	
Beets					x			
Other		x						

	ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	BEL
Roots								
Sweet Potato	x	x	x	x		x	x	x
Dasheen		x	x			x	x	
Tannias						x		
Yams							x	x
Eddoes							x	
Pulses								
R.K. Beans								x
Peanuts					x		x	
Other		x	x	x	x	x	x	
Small Animals								
Sheep			x	x	x		x	
Goats			x	x	x		x	
Pigs		x	x			x	x	x
Poultry						x	x	

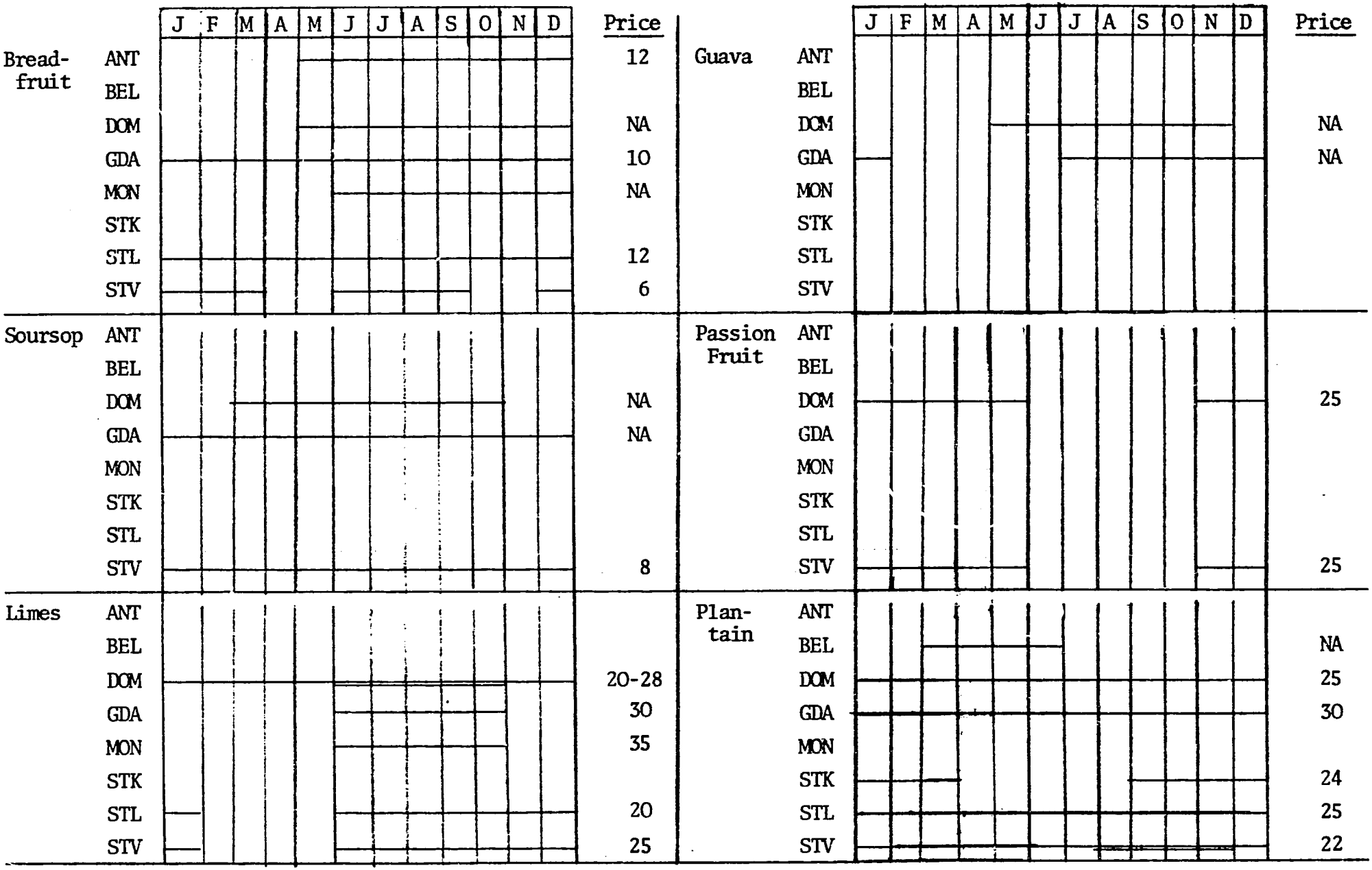
Source: Sections VII B to VII I.

TABLE VII A - 2.01

Seasonality of Fruits and Current Prices (EC cents/lb)

		J	F	M	A	M	J	J	A	S	O	N	D	Price
Pine-apples	ANT	-	-	-	-	-	-				-	-	-	30
	BEL													
	DOM													
	GDA													
	MON													30
	STK													50
	STL													40
	STV													
Avaca-does	ANT													24
	BEL													NA
	DOM													20
	GDA													25
	MON													20
	STK													NA
	STL													20
	STV													20
Oranges	ANT													24
	BEL													NA
	DOM													30
	GDA													
	MON													15
	STK													
	STL													25
	STV													

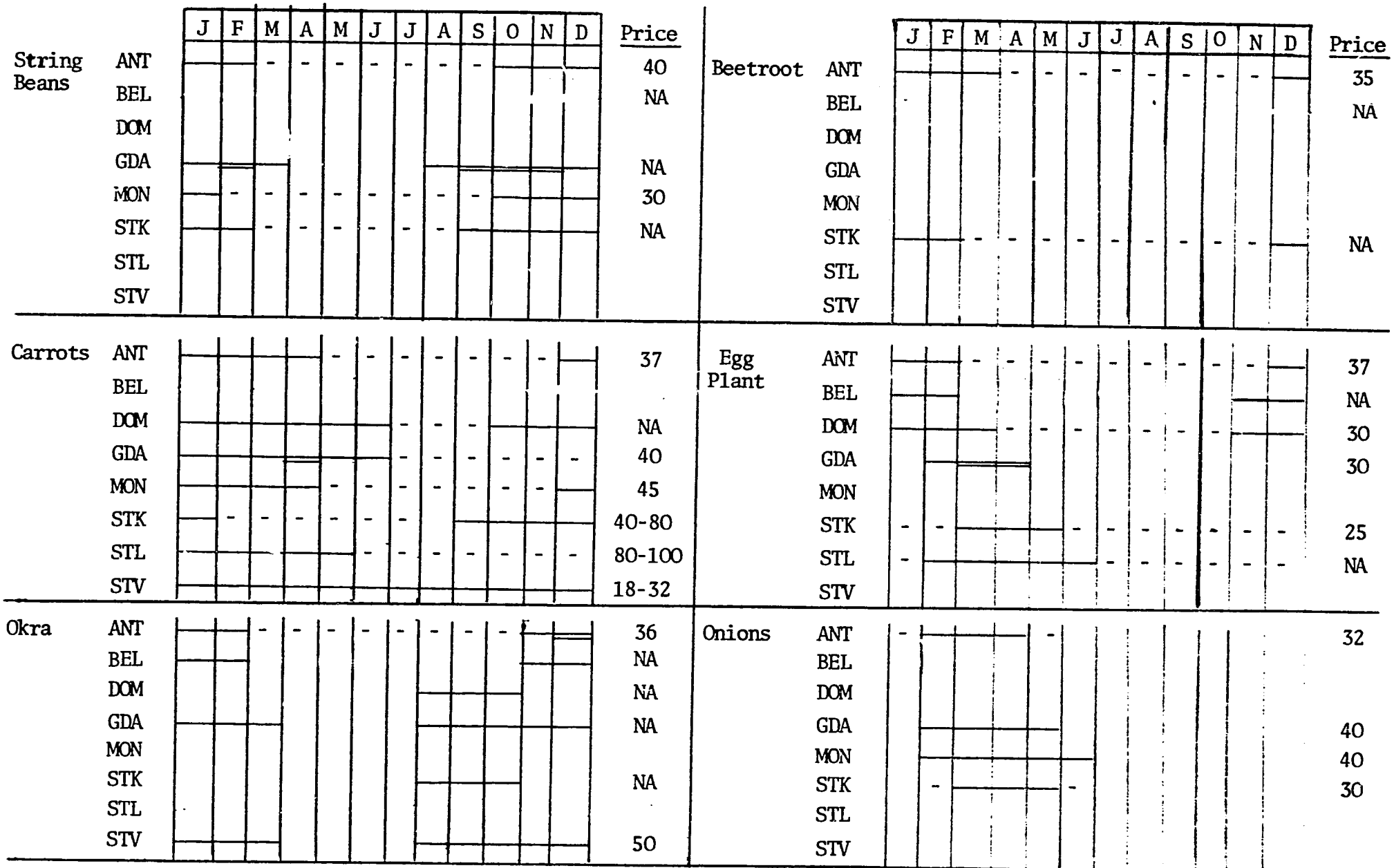
		J	F	M	A	M	J	J	A	S	O	N	D	Price
Mangoes (Grafted)	ANT													24
	BEL													NA
	DOM													20
	GDA													25
	MON													20
	STK													NA
	STL													16
	STV													28-30
Grape-fruit	ANT													20
	BEL													NA
	DOM													11
	GDA													20
	MON													
	STK													
	STL													20
	STV													8
Paw-Paw	ANT													20
	BEL													NA
	DOM													20
	GDA													12
	MON													20
	STK													
	STL													20
	STV													6

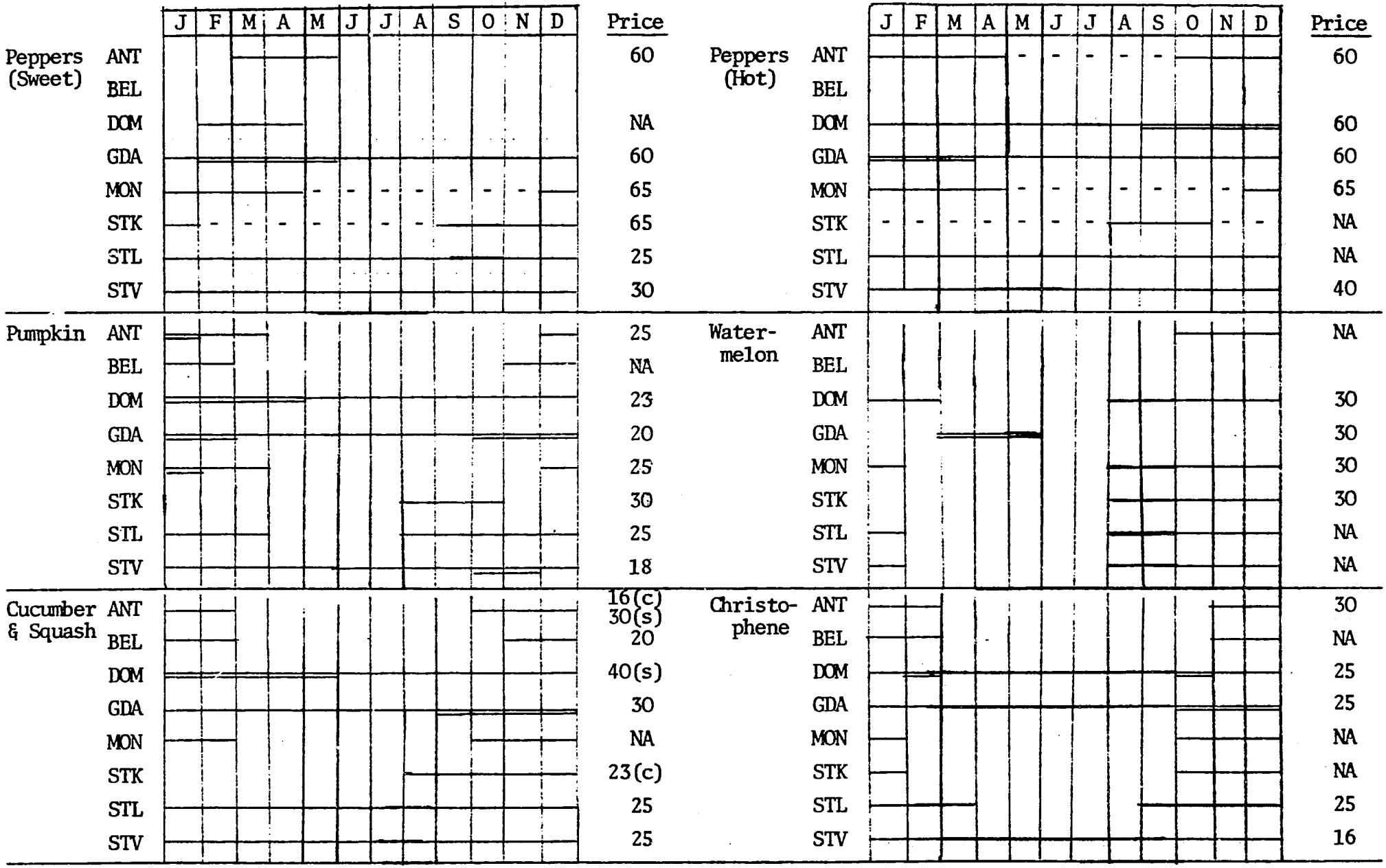


Source: Ministry of Agriculture

TABLE VII A - 2.02

Seasonality of Vegetables and Current Prices (EC Cents/lb)




J F M A M J J A S O N D
Price
Peppers (Sweet)
ANT 60
BEL
DOM NA
GDA 60
MON 65
STK 65
STL 25
STV 30
Peppers (Hot)
ANT 60
BEL
DOM 60
GDA 60
MON 65
STK NA
STL NA
STV 40
Pumpkin
ANT 25
BEL NA
DOM 23
GDA 20
MON 25
STK 30
STL 25
STV 18
Water-melon
ANT NA
BEL
DOM 30
GDA 30
MON 30
STK 30
STL NA
STV NA
Cucumber & Squash
ANT 16(c) 30(s)
BEL 20
DOM 40(s)
GDA 30
MON NA
STK 23(c)
STL 25
STV 25
Christo-phene
ANT 30
BEL NA
DOM 25
GDA 25
MON NA
STK NA
STL 25
STV 16

		J	F	M	A	M	J	J	A	S	O	N	D	Price
Tomatoes	ANT					-	-	-	-	-	-	-		42
	BEL													35
	DOM					-	-	-	-	-	-	-		100
	GDA							-	-	-	-	-	-	100
	MON					-	-	-	-	-	-			45
	STK							-	-	-	-	-	-	45-100
	STL							-	-	-	-	-	-	100
	STV						-	-	-	-	-	-	-	150
Cabbage	ANT				-	-	-	-	-	-	-	-		52
	BEL													35
	DOM						-	-	-	-	-	-		80
	GDA	-				-	-	-	-	-			-	60
	MON						-	-	-	-	-	-		50
	STK						-	-	-	-	-	-		50
	STL						-	-	-	-	-	-		120
	STV					-	-	-	-	-	-	-		100

		J	F	M	A	M	J	J	A	S	O	N	D	Price
Ginger	ANT													
	BEL													
	DOM													50
	GDA													
	MON													
	STK													
	STL													45
	STV													55

Note: Belize prices in Belize cents.

Source: Ministry of Agriculture.

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TABLE VII A - 2.03

Seasonality of Roots and Current Prices
(EC cents/lb)

		J	F	M	A	M	J	J	A	S	O	N	D	Price
Sweet Potatoes	ANT	—	—	—	—	—	—	-	-	-	-	-	-	35
	BEL	—	—	—	—	—								NA
	DOM	—	—	—	—	—	-	-	-	-	-	-	-	25
	GDA	—	—	—						—	—	—		30
	MON	-	-	—	—	—	-	-	-	-	—	—	—	25
	STK	-	-	-	—	—	—	-	-	-	—	—	—	20
	SLU	—	—	—	—	—								25
	STV	—	—	—	—	—	—	—	—	—	—	—	—	19
Tannias & Eddoes	ANT	—	—	—										35
	BEL	—	—	—										NA
	DOM	—	—	—	—	—	—					—	—	40
	GDA	—	—	—	—	-	-	-	-	-	—	—	—	35
	MON													
	STK	—	—	—									—	60
	STL	—	—	—	—	—	—	—	—	—	—	—	—	25
	STV	—	—	—	—							—	—	30
Yams	ANT	—	—	—	—	—	—					—	—	35
	BEL			—	—	—	—							NA
	DOM	—	—	—	—	—	—					—	—	35
	GDA	—	—	—	—	—	—							35
	STK	—	—	—	—	—	—					—	—	40
	STL	—	—	—	—	—	—					—	—	30
	STV	—	—	—	—	—	—							26

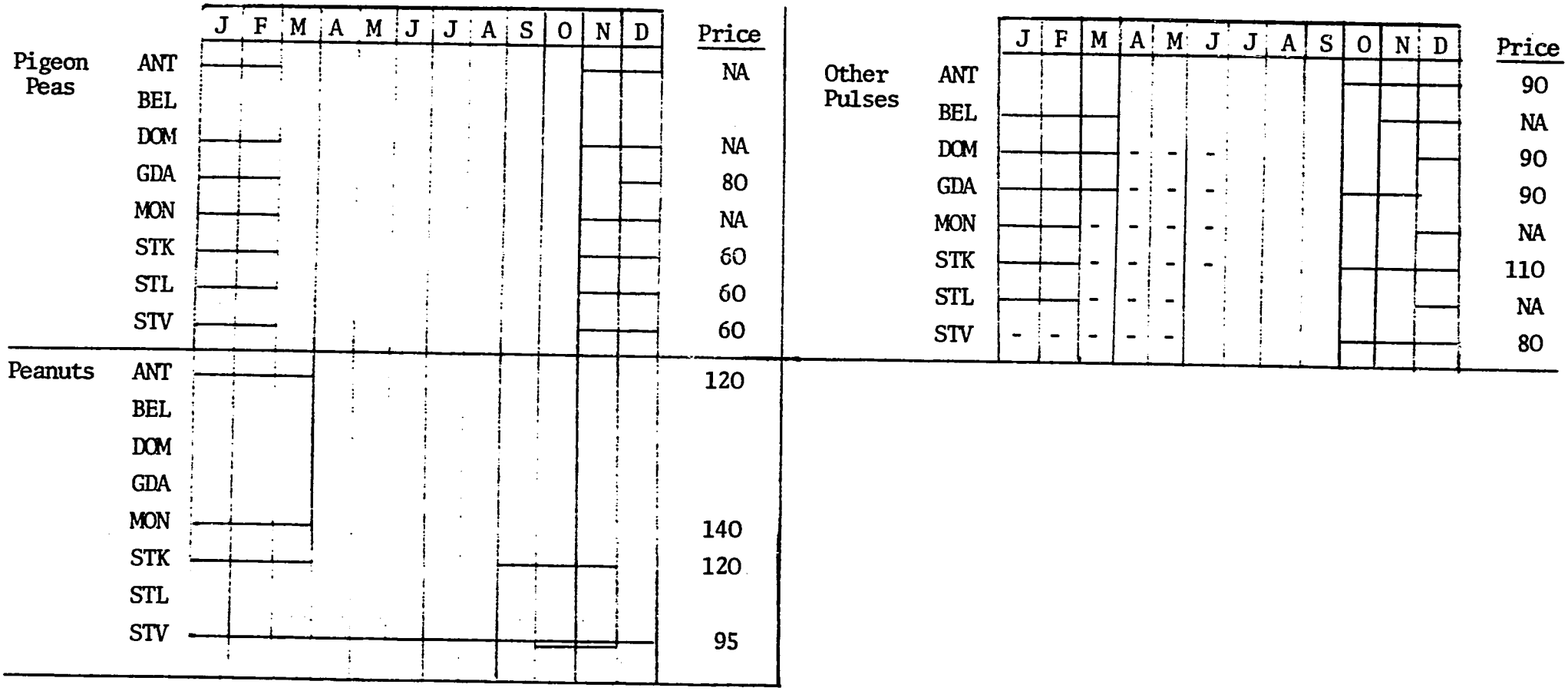
		J	F	M	A	M	J	J	A	S	O	N	D	Price
Dasheen	ANT													
	BEL		—	—	—	—								NA
	DOM	—	—	—	—	—	—	—	—	—	—	—	—	23
	GDA	—	—	—	—	—	—	—	—	—	—	—	—	25
	MON													
	STK													
	STL	—	—	—	—	—	—	—	—	—	—	—	—	20
	STV	—	—	—	—	—	—	—	—	—	—	—	—	16
White Potatoes	ANT													
	BEL													
	DOM	—	—	—										NA
	GDA													
	MON	—	—	—	—								—	NA
	STK													
	STL													
	STV													

Source: Ministry of Agriculture.

TABLE VII A - 2.04

Seasonality of Pulses and Current Prices

(EC cents/1b)



Source: Ministry of Agriculture

(i) seasonality of production (based soils, climate, irrigation, farming practices)
(ii) current average expected market price by farmer
(iii) established trade flows
(iv) history of large surpluses
(v) traditional commodity production, and
(vi) proximity to markets (See Chapter VIII).

A planned production programme may permit a country to respond to seasonal demand for specific commodities. For example, there is more than one mix of vegetables which may be produced on a given land area, under given resources, during a particular time period and the mix could be selected so that the glut of vegetables produced under favourable growing conditions matches, to a large extent, the external market demand.

2.0 Seasonality and prices - Crops

2.10 Seasonality

The harvest and glut periods for commodities within the fruits, vegetables, roots and pulses groupings, by territory, are given in Tables VII A - 2.01, VII A - 2.02, VII A - 2.03 and VII A - 2.04, respectively. The following explanation will assist with the interpretation of the Tables:

(i) The more important crops are shown, territory by territory. Solid lines (——) indicate the normal period of availability, double lines (═══) show glut periods and a dash (-) means that the crop is available if irrigation is used. Where the seasonality is not indicated, it is because the particular crop is considered unimportant in the particular territory.

(ii) A crop produced 'out of season' by irrigation is usually poorer in yield and quality and also more costly than if it were produced in the normal season. In general, irrigation is of greater value for vegetable crops where it will not only improve the yield of rainfed crops (by making up for irregular rainfall), or even save a crop in case of drought, but also enable one or two additional crops per year to be grown during the dry season. The economics of irrigating 'other pulses' is doubtful.

(iii) A number of crops, however, cannot be made to produce out of season, even with irrigation, e.g. yams, onions, most tree fruit, though irrigation can still be valuable as it can increase yields and possibly extend the seasonality of the crop by permitting later planting, e.g. onions. In still other cases, e.g. dasheen, where the crop could be grown with irrigation, the value of the crop is too low to warrant irrigation.

(iv) White potatoes are shown for Montserrat and Dominica. This crop has been moderately successful in the former for several years, but the current price of imported seed potatoes is so high that the Government has decided to give up the crop, feeling that the final price would make the product unsaleable. Dominica on the other hand is just starting experiments with this crop. If locally produced seed potatoes were available then Montserrat and Dominica would have a comparative advantage and hence the seasonality of production is shown in the tables.

(v) Pigeon peas normally produce only in the November-February short day length period, but new cultivars have been developed, a dwarf type which gives two bearings per year, and an everbearing type. These are not yet fully commercialised and have not been included in the table.

2.20 Prices

The prices shown in the tables are those given by the various government marketing outlets, 1977 and 1978, for normal purchases. They are not floor prices for gluts. These are regarded as a reasonably valid approximation to what growers expect for their products, though there is no doubt that growers will find some outlets (e.g. hotels and supermarkets) that will give higher prices.

3.0 Small animals

St. Vincent and Grenada have a significant comparative advantage in the trade of sheep and goats to Trinidad, in that the market is well established and has potential for growth. There is also a trickle of trade in pigs but the potential for growth is not very promising. The magnitude of the growth is given in Table V C - 3.05. Belize has a growing established trade in live pigs with Mexico and Guatemala.

B Antigua

1.0 Comparative advantage analysis - Crops

1.10 Seasonality

Antigua has an advantage over most of the other territories in that the prospects for irrigation are good* and therefore there is likely to be potential for off season production of sweet potato, a mix of vegetables and pineapples.

1.20 Established trade flows

There are no major trade flows even though there is good potential for pineapples.

1.30 Gluts

The glut crops are sweet potato, pumpkin, tomato, eggplant and cucumber (See Table VI B - 1.05). Large quantities of these crops are currently dumped because of spoilage.

1.40 Traditional commodity preferences

Pineapples have been successfully grown in Antigua for years and the fruit is very popular. It currently constitutes virtually all of the commercial fruit production.

1.50 Price

Onions can be produced at a reasonable price.

1.60 Summary

The crops for which Antigua may currently be said to have a comparative advantage are:

Pineapple
Sweet Potato
Tomato
Eggplant
Cucumber
Onion

2.0 Comparative advantage analysis - Small animals

Antigua has no comparative advantages for the small farm production of small animal commodities

* *In that irrigation facilities now exist and are planned to be expanded.*

C. Belize

1.0 Comparative advantage analysis

1.10 Seasonality

Water is the main limiting factor to production in Belize and hence the country does not enjoy any comparative advantage for out of season production.

1.20 Established trade flows

There are established trade flows of citrus concentrate to the Eastern Caribbean*, U.S. and E.E.C.; mangoes and papaya (chips) to the U.S.; rice to the U.S.; bananas to the U.K.; and sugar to the U.K.

1.30 Gluts

Vegetables and root crops are the main glut crops. Root crops are planted by milpa farmers for home consumption and it is possible that there are large quantities not consumed by them which do not reach the market place.

1.40 Traditional commodities

Apart from the export oriented commodities, corn and R.K. beans are the commodities which are popularly produced. With a little organisation the present foundation could be used to considerably increase production.

1.50 Price

The level of management in small farmer commodity production is extremely low and the prices are likely to put Belize at a disadvantage, until greater efficiency can be injected into the agricultural sector.

1.60 Summary

The particular commodities, for which there is a potential comparative advantage for small farmer production in Belize, are - sugar cane, citrus, bananas, rice, corn, R.K. beans, mangoes and papaya.

2.0 Comparative advantage analysis - small animals

Belize has a comparative advantage for the production of pigs and honey, based primarily on the established trade flows to Central America and U.K. respectively.

Barbados and Trinidad

D. Dominica

1.0 Comparative advantage analysis - crops

1.10 Seasonality

The prospect of irrigation will enhance the off season production of sweet potato and some vegetables; it will also extend the growing season for some pulses. The high average precipitation also permits year round production of dasheen, pumpkin, cucumber, christophene, squash, papaya, plantain, bananas and limes.

1.20 Established trade flows

There are established trade flows of bananas, coconuts, oranges, cocoa, grapefruit, limes, bay, plantain, mangoes and avocadoes (see Table VI D - 1.02).

1.30 Gluts

Sweet potato and christophene are the main crops liable to glut. There would also be a glut of citrus in the market if the fruit were harvested and removed from the field.

1.40 Traditional commodities

Dominica regularly produces bananas, citrus and a variety of other fruits, roots and vegetables.

1.50 Price

Dominica has a price advantage on grapefruit. If the seed potatoes can be produced locally then Dominica may have a price advantage for white potatoes.

1.60 Summary

The particular commodities, for which there is a potential comparative advantage for small farmer production in Dominica are - bananas, bay, dasheen, oranges, plantain, sweet potato, limes, mangoes, christophene, grapefruit, avocadoes, squash, papaya, cucumber, coconuts, cocoa, white potatoes, pulses, and other fruits and vegetables.

2.0 Comparative advantage analysis - small animals

Dominica has a comparative advantage for the production of pigs because of the low cost of suitable feedstuff.

E. Grenada

1.0 Comparative advantage analysis - crops

1.10 Seasonality

Dasheen, peppers (hot and sweet), pumpkin, papaya, breadfruit, soursop, plantain, cucumber, squash and christophene can be grown all year round in Grenada. The growing season of carrots, tomatoes and cabbages, in particular, and some pulses can be extended by means of irrigation.

1.20 Established trade flows

There are established trade flows for bananas, soursop, golden apple, avacadoes, plantain and other miscellaneous fruit (see Table VI E - 1.03).

1.30 Gluts

The crops which appear in gluts during the rainfed season are green beans, cabbages, carrots, cucumbers, peppers, sweet potatoes, pumpkin, bananas and plantain.

1.40 Traditional commodities

Grenada regularly produces bananas and a variety of other fruits (including citrus) roots and vegetables.

1.50 Price

Grenada has a price advantage on papaya and onions can be produced at a reasonable price.

1.60 Summary

The particular commodities, for which there is a potential comparative advantage for small farmer production in Grenada, are - dasheen, peppers (hot and sweet), papaya, bananas, pumpkin, breadfruit, golden apples, cucumber, soursop, avacadoes, squash, plantain, green beans, christophene, citrus, sweet potatoes, carrots, onions, tomatoes, cabbages and pulses.

2.0 Comparative advantage analysis - small animals

Grenada has a comparative advantage of sheep and goats based on the established live animal market in Trinidad. The favourable climate and availability of low cost feedstuff also make pig production viable.

F. Montserrat

1.0 Comparative advantage analysis - crops

1.10 Seasonality

The prospects of irrigation enhances the potential for off season production of string beans, carrots, peppers (hot and sweet), tomatoes, cabbages and some pulses.

1.20 Established trade flows

There is an established trade flow for limes. There was a trade flow in white potatoes but this disappeared with the escalation of the price of seed potatoes.

1.30 Gluts

Sweet potato and pumpkin are the main glut crops.

1.40 Traditional commodities

Traditionally Montserrat produces sweet potatoes, tomatoes, carrots, onions, cabbage, pumpkin, pineapples, limes and mangoes.

1.50 Price

Montserrat has a price advantage on sweet potato, tomatoes and pineapples. Onions can be produced at a reasonable price. If seed potatoes can be produced locally then Montserrat may have a price advantage for white potatoes.

1.60 Summary

The particular commodities, for which there is a potential comparative advantage for small farmer production in Montserrat, are - string beans, carrots, peppers, tomatoes, cabbages, sweet potato, pumpkin, onions, pineapples, mangoes, pulses and white potatoes.

2.0 Comparative advantage analysis - small animals

Montserrat has a comparative advantage for sheep and goats based on the availability of free hillside land for grazing, a suitable climate and a ready market in nearby Guadeloupe.

G. St. Kitts/Nevis

1.0 Comparative advantage analysis - crops

1.10 Seasonality

The prospects of irrigation enhances the potential for off season production of string beans, beets, carrots, eggplant, peppers (hot and sweet), tomatoes, and cabbages. Irrigation will also extend the growing season of onions and some pulses.

1.20 Established trade flows

Peanuts and onions have been recently exported to Barbados, Dominica and Antigua as a result of increased NACO production.

1.30 Gluts

No glut crops have been identified.

1.40 Traditional commodities

The traditional commodity produced in St. Kitts is sugar cane but with the advent of NACO recently, vegetables, fruits, roots and pulses are being produced to a greater extent.

1.50 Price

Onions can be produced at a reasonable price.

1.60 Summary

The particular commodities, for which there is a potential comparative advantage for small farmer production in St. Kitts/Nevis, are - string beans, beets, carrots, eggplant, peppers, tomatoes, onions, pulses, cabbages and peanuts.

2.0 Comparative advantage analysis - small animals

St. Kitts/Nevis has a comparative advantage for sheep and goats based on the availability of land in the South East of St. Kitts and on mixed farms in Nevis and the markets to the French Islands is financially attractive.

H. St. Lucia

1.0 Comparative advantage analysis - crops

1.10 Seasonality

Dasheen, tannias, peppers, cucumbers, squash, papaya, breadfruit, plantain and bananas can be produced throughout the year. With the prospect of irrigation the growing season for carrots, eggplant, tomatoes, cabbage and pulses may be extended.

1.20 Established trade flows

There are established trade flows for bananas, eggplant, breadfruit and a number of 'exotica', fruits and vegetables, are exported by Geest Industries.

1.30 Gluts

Sweet potato is the main glut crop. There would also be a glut of oranges in the market if the fruit were harvested and removed from the field.

1.40 Traditional commodities

Traditionally, St. Lucia produces bananas and a wide range of other fruits, roots, vegetables and pulses.

1.50 Price

St. Lucia has a price advantage on yams, sweet peppers and mangoes (grafted).

1.60 Summary

The particular commodities for which there is a potential advantage for small farmer production in St. Lucia, are - dasheen, tannias, peppers, cucumbers, squash, papaya, breadfruit, bananas, plantain, carrots, eggplant, tomatoes, cabbage, pulses, sweet potato and mangoes.

2.0 Comparative advantage analysis - small animals

St. Lucia has a comparative advantage for pigs and poultry based on the availability of coconut oil meal, reject bananas and the output from the feed plant at the St. Lucia flour milling company.

I. St. Vincent

1.0 Comparative advantage analysis - crops

1.10 Seasonality

Sweet potato, dasheen, carrots, peppers, pumpkin, cucumber, squash, christophene, peanuts, papaya, soursop and plantain can be produced throughout the year. With the prospect of irrigation the growing season of tomatoes, cabbages and pulses may be extended.

1.20 Established trade flows

There are established trade flows for bananas, carrots, sweet potato, plantain, tannias, eddoes, ginger, pumpkins and peanuts.

1.30 Gluts

Gluts are experienced for sweet potatoes, tannias, eddoes, yams, pumpkin, peanuts and plantain.

1.40 Traditional commodities

Traditionally St. Vincent produces bananas, carrots, sweet potatoes, and a variety of other roots, fruits, pulses and vegetables.

1.50 Price

St. Vincent has a price advantage for plantains, breadfruit, papaya, oranges, grapefruit, christophene, pumpkin, eggplant and sweet potatoes.

1.60 Summary

The particular commodities, for which there is a particular advantage for small farmer production in St. Vincent, are - sweet potato, dasheen, carrots, peppers, pumpkin, cucumbers, squash, christophenes, peanuts, papayas, soursops, plantain, tomatoes, cabbages, pulses, bananas, tannias, eddoes, ginger and yams.

2.0 Comparative advantage analysis - small animals

St. Vincent has a comparative advantage for sheep, goats, pigs and chickens. This is based on the favourable climate and the availability of coconut oil meal, crop by-products and the output from the flour mill. Also there is a well established live animal market in Trinidad for sheep and goats and to a lesser extent pigs.

VIII COMMODITY FLOW ANALYSIS

A. Introduction

This chapter takes the demand and supply forecasts and the present commodity flows described in the preceding chapters, and produces commodity flow forecasts based on two alternative marketing strategies: a) regional self-sufficiency, or b) international marketing priority. Each marketing strategy is examined for its implications concerning production and marketing of small farmer commodities in the CARICOM LDC's. Then the origin-destination flows and transport requirements by mode are defined for each strategy.

The fundamental difference between the two marketing strategies is the relative priority of the extra-regional and the intra-regional markets. Under the regional self-sufficiency strategy the intra-regional market is the highest priority, and the available production is assumed to be marketed in the regional markets first and in the extra-regional markets second.

The international marketing priority strategy assumes that production areas are devoted to those crops within each general category (non-citrus fruits, pulses, etc.) which are most acceptable in the extra-regional market. All products capable of meeting extra-regional market demand are assumed to go to overseas markets on a priority basis.

Under either strategy, the supply of small farmer commodities is assumed to be first used to satisfy domestic demand, and the remainder is exported. The commodities within each general category will vary somewhat between strategies but it is assumed that the total production within each general category is roughly the same for both strategies.

The methodology for determination of origin-destination flows for each strategy takes into account the distribution of the present exports of each LDC up to present levels. Additional exports over the present levels are assumed to go to the first priority markets according to each strategy. Where maximum market penetration is achieved, the remainder of supply is assumed to go to the second priority markets according to each strategy. Final adjustments to flows are made where necessary to eliminate forecast market surpluses. The result is a set of forecast commodity flows by origin and destination for 1982 and 1987 for each alternative strategy.

Finally, the implied requirements for mode of transport and marketing systems are analysed by commodity and specified for each set of forecast flows. These flows and requirements will be used as the demand forecast on which analysis of the proposed transport and marketing systems in Phase II of the present study will be based.

B Summary of Forecast Supply and Demand for Small Farmer Commodities

Three types of demand and supply forecasts were made. One was made for the LDCs through a detailed consumption and production analysis for each quarter of the two forecast years (1982 and 1987). A second, less detailed analysis of future consumption and supply was made for seven intra-regional markets (Barbados, Trinidad, Martinique, Guadeloupe, Netherlands Antilles, U.S. Virgin Islands and Puerto Rico). The second analysis focuses on consumption in these markets and is assumed to represent a relatively constant demand throughout the year. The third forecast for the three extra-regional markets (the EEC, U.S.A. and Canada) focuses primarily on imports and, in particular, on that part of the year in each market where supply is weakest, and prices are highest.

1.0 LDC Supply and Demand

A summary for LDC supply and demand is shown in Tables VIIIB - 1.01 and 1.02 for the four quarters of each forecast year. These figures represent the net production after local consumption is subtracted from total production. (See Chapters V and VI for the derivation of these figures). Figures without parentheses represent a net supply which is available for marketing outside the producing territory or country. Figures inside parentheses indicate a net demand for that category of consumption. These represent potential markets for production by other LDCs. Belize figures are not given as it has been shown previously (Section VC) to be an isolated market with little potential for intra-regional trade.

2.0 Non-LDC Intra-regional markets

The net demand forecast for these markets is also shown in Tables VIIIB - 1.01 and 1.02. The derivation of these demand figures is discussed in Chapter V. They are based principally on per capita consumption with local production netted out. This demand is assumed to remain relatively constant throughout the year. This demand is only the portion (1% to 65%) of the market for which LDC products could conceivably compete, given the level of competition in each market. This percentage potential LDC market penetration is lowest in Puerto Rico (1%) where the Dominican Republic and U.S. imports are available at the lowest costs. It is highest in Barbados and Trinidad (65%) where trade is facilitated by CARICOM procedures such as the AMP (See discussion in Chapter IV).

TABLE VIII B - 1.01

Comparison of 1982 Average Monthly Intra-Regional Demand and LDC* Export Surplus (Deficits) for Small Farmer Commodities

(Metric Tons)

Major Markets' Demand		
Market		Effective LDC Market Potential Per Month
Barbados	Citrus Fruit	154
	Other Fruit	35
	Vegetables	20
	White Potatoes	388
	Pulses	73
Trinidad	Non-Citrus Fruit	276
	Onions	216
	Other Vegetables	185
	White Potatoes	676
	Other Roots	160
	Pulses	618
Martinique	Citrus	3
	Other Fruit	9
	Onions	48
	Other Vegetables	28
	White Potatoes	129
	Pulses	44

LDC Potential Average Monthly Export Surplus (Deficit) Per Quarter							
	Fruits		Vegetables		Roots		
LDC Source	Citrus	Non-Citrus	Onions	Other	White Potatoes	Other Roots	Pulses
Antigua							
1Q	-	(104)	(2)	54	(48)	138	4
2Q	-	(182)	(2)	(36)	(48)	52	(8)
3Q	-	156	(24)	(35)	(48)	(12)	(8)
4Q	-	598	(24)	37	(48)	23	3
Dominica							
1Q	124	205	(9)	301	45	1,183	78
2Q	290	337	(9)	183	(8)	295	(38)
3Q	646	618	(9)	117	(8)	(403)	(57)
4Q	480	487	(9)	220	(8)	(29)	2
Grenada							
1Q	(2)	26	(31)	76	(48)	535	181
2Q	(4)	(21)	(31)	38	(48)	3	44
3Q	5	239	(31)	(2)	(48)	(240)	(68)
4Q	2	159	(31)	47	(48)	(44)	83
Montserrat							
1Q	-	(84)	27	28	(6)	27	14
2Q	(6)	(103)	27	(9)	(6)	(25)	(5)
3Q	-	42	(4)	7	(6)	(72)	(7)
4Q	6	23	(4)	46	(6)	66	(1)

Major Markets' Demand

Market		Effective LDC Market Potential Per Month
Guadeloupe	Citrus	3
	Onions	30
	Other Vegetables	26
	White Potatoes	891
	Pulses	54
Neth. Antilles	Citrus	105
	Other Fruit	137
	Onions	47
	Other Vegetables	62
	White Potatoes	230
	Other Roots	13
	Pulses	16
Virgin Is.(US)	Citrus	13
	Other Fruit	76
	Vegetables	83
	White Potatoes	120
	Other Roots	16
	Pulses	32
Puerto Rico	Fruit	150
	Vegetables	118
	Roots	144

LDC Potential Average Monthly Export Surplus(Deficit) Per Quarter

	Fruits		Vegetables		Roots		
LDC Source	Citrus	Non-Citrus	Onions	Other	White Potatoes	Other Roots	Pulses
St.Kitts/ Nevis							
1Q	-	(217)	4	20	(39)	81	21
2Q	(3)	(159)	4	3	(39)	36	(21)
3Q	(3)	569	(13)	36	(39)	(301)	(20)
4Q	-	(86)	(13)	61	(39)	36	14
St.Lucia							
1Q	20	(453)	(23)	85	(46)	521	12
2Q	(36)	(476)	(23)	50	(46)	219	(17)
3Q	20	319	(23)	25	(46)	(280)	(21)
4Q	20	62	(23)	40	(46)	(83)	(3)
St.Vincent							
1Q	5	(10)	(9)	222	(12)	1,318	26
2Q	(32)	(347)	(9)	165	(12)	474	5
3Q	4	70	(9)	171	(12)	10	-
4Q	40	526	(9)	225	(12)	671	58

* Excluding Belize.
Q = Quarter.

Source: Table V C - 3.07.

TABLE VIII B - 1.02

Comparison of 1987 Average Monthly Intra-Regional Demand and LDC* Export Surplus (Deficit) for Small Farmer Commodities

(Metric Tons)

Major Markets' Demand		
Market		Effective LDC Market Potential Per Month
Barbados	Citrus Fruit	163
	Other Fruit	37
	Vegetables	22
	White Potatoes	406
	Pulses	77
Trinidad	Non-Citrus Fruit	298
	Onions	235
	Other Vegetables	202
	White Potatoes	720
	Other Roots	172
	Pulses	660
Martinique	Citrus	3
	Other Fruit	9
	Onions	51
	Other Vegetables	30
	White Potatoes	133
	Pulses	46

LDC Potential Average Monthly Export Surplus (Deficit) Per Quarter							
	Fruits		Vegetables		Roots		
LDC Source	Citrus	Non-Citrus	Onions	Other	White Potatoes	Other Roots	Pulses
Antigua							
1Q	-	240	27	175	(52)	225	8
2Q	-	130	26	63	(52)	91	(8)
3Q	-	433	(27)	80	(52)	20	(8)
4Q	-	1,124	(27)	182	(52)	59	6
Dominica							
1Q	202	410	(10)	415	90	1,139	57
2Q	380	579	(10)	302	(8)	443	(9)
3Q	751	928	(10)	251	(8)	(269)	(63)
4Q	572	760	(10)	343	(8)	164	3
Grenada							
1Q	(15)	230	(40)	112	(52)	632	209
2Q	(22)	187	(40)	67	(52)	26	12
3Q	25	504	(40)	37	(52)	(250)	(73)
4Q	11	407	(40)	89	(52)	(28)	95
Montserrat							
1Q	(1)	(64)	28	19	(6)	23	29
2Q	(13)	(88)	28	(3)	(6)	(21)	4
3Q	(1)	115	(4)	23	(6)	(48)	(7)
4Q	11	85	(4)	44	(6)	34	6

Major Markets' Demand

Market		Effective LDC Market Potential Per Month
Guadeloupe	Citrus	3
	Onions	32
	Other Vegetables	27
	White Potatoes	919
	Pulses	57
Neth. Antilles	Citrus	115
	Other Fruit	149
	Onions	52
	Other Vegetables	67
	White Potatoes	251
	Other Roots	14
	Pulses	18
Virgin Is. (US)	Citrus	17
	Other Fruit	93
	Vegetables	103
	White Potatoes	148
	Other Roots	20
	Pulses	39
Puerto Rico	Fruit	176
	Vegetables	138
	Roots	166

LDC Potential Average Monthly Export Surplus(Deficit) Per Quarter

	Fruits		Vegetables		Roots		
LDC Source	Citrus	Non-Citrus	Onions	Other	White Potatoes	Other Roots	Pulses
St.Kitts/ Nevis							
1Q	110	(256)	43	86	(41)	124	40
2Q	(3)	40	42	47	(41)	(9)	(8)
3Q	110	753	(14)	132	(41)	(235)	(19)
4Q	222	(118)	(14)	152	(41)	(9)	32
St.Lucia							
1Q	26	(615)	(23)	101	(46)	719	25
2Q	(40)	(651)	(23)	63	(46)	374	(6)
3Q	26	165	(23)	56	(46)	(197)	(21)
4Q	26	(41)	(23)	58	(46)	29	6
St,Vincent							
1Q	17	(170)	(10)	224	(13)	1,280	30
2Q	(35)	(462)	(10)	177	(13)	427	7
3Q	18	(90)	(10)	196	(13)	(42)	(5)
4Q	71	383	(10)	247	(13)	626	51

* Excluding Belize.
Q - Quarter.
Source: Table V C - 3.08.

TABLE VIII B - 1.03

Comparison Estimated LDC Export Potential
in Extra-Regional Markets and LDC Export Surplus

(Average Monthly Metric Tons)

Markets		Fruits: Citrus 1Q	2Q	3Q	4Q	Fruits: Other Fruit 1Q	2Q	3Q	4Q	Vegetables Excluding Onions 1Q	2Q	3Q	4Q	Roots* 1Q	2Q	3Q	4Q
EEC	1982/7	417	417	2,917	2,917	522	42	113	256	3,500	17	17	67	104	104	104	104
Canada	1982/7	229	229	229	229	421	342	258	346	226	233	8	8	83	83	83	83
U.S.A.	1982/7	129	129	129	129	1,050	397	120	397	2,173	1,058	8	8	42	42	42	42
		775	775	3,275	3,275	1,993	781	491	999	5,899	1,308	33	83	229	229	229	229
LDCs' Export Surpluses																	
Antigua	1982	-	-	-	-	-	-	156	598	54	-	-	37	138	52	-	23
	1987	-	-	-	-	240	130	433	1,124	175	63	80	182	225	91	20	59
Dominica	1982	124	290	646	480	205	337	618	487	301	183	117	220	1,183	295	-	-
	1987	202	380	751	572	410	579	928	760	415	302	251	343	1,139	443	-	164
Grenada	1982	-	-	5	2	26	-	239	159	76	38	-	47	535	3	-	-
	1987	-	-	25	11	230	187	504	407	112	67	37	89	632	26	-	-
Montserrat	1982	-	-	-	6	-	-	42	23	28	-	7	46	27	-	-	66
	1987	-	-	-	11	-	-	115	85	19	-	23	44	23	-	-	34
St.Kitts/Nevis	1982	-	-	-	-	-	-	569	-	20	3	36	61	81	36	-	36
	1987	110	-	110	222	-	40	753	-	86	47	132	152	124	-	-	-
St.Lucia	1982	20	-	20	20	-	-	319	62	85	50	25	40	521	219	-	-
	1987	26	-	26	26	-	-	165	-	101	63	56	58	719	374	-	29
St.Vincent	1982	5	-	4	40	-	-	70	526	222	165	171	225	1,318	474	10	671
	1987	17	-	18	71	-	-	-	383	224	177	196	247	1,280	427	-	626
Total LDC Supply	1982	149	290	675	548	231	337	2,013	1,855	786	439	356	676	3,803	1,079	10	796
	1987	355	380	930	913	880	936	2,898	2,759	1,132	719	775	1,115	4,142	1,361	20	912
Acceptable Supply for Extra-Reg. Export (70%)	1982	104	203	473	384	162	236	1,409	1,299	550	307	249	473	2,662	755	7	557
	1987	249	266	651	639	616	655	2,028	1,931	792	503	543	781	2,899	953	14	638

*Excluding white potatoes.

Source: Tables III B - 1.01/2; Tables III B - 2.02/3.01/4.01.

3.0 Extra-regional markets

The extra-regional demand is shown in Table VIII B - 1.03 by quarter. This estimate is based on the analysis of the periods when these products are cost competitive with local production and other imports (See Chapter III for a detailed discussion). It is in this period (called the "open" period in Chapter III) that CARICOM LDC products are most acceptable in these markets. In other periods high quality products closer to the markets are plentiful and keep prices lower than LDC costs.

The open period demand by commodity in Chapter III has been converted into the seven categories used in the forecast table by taking total estimated demand for all commodities within a category and dividing by the number of months in the open period. The potential market for CARICOM LDC's was then estimated by multiplying the average open period demand by a maximum LDC market penetration factor. This factor varies fro 1% for tomatoes and cucumbers to 10% for eggplant to 50% for products destined for immigrant markets. These factors are derived from comparative market acceptability of competing varieties of each commodity. (See Chapter III.B. 2.20). Onions, pulses and white potatoes are excluded from the analysis due to supply constraints.

Additional consideration of the high quality required for extra-regional markets was provided through a limitation on the proportion of supply that would be judged acceptable. This was assumed to be a maximum of 70% of total export potential by commodity. (See Strategy Analysis below).

C. Marketing Flows by Strategy

From the market demand and supply figures, it was possible to forecast maximum potential marketing flows by origin and destination for each category of commodity. The process of assigning a destination to each potential flow was carried out in four steps. First the present distribution of destinations for each territory's products was used to estimate base levels of shipments up to the present export tonnages. Then additional forecast tonnages were assigned to the nearest (and therefore least cost) available market. Third, market surpluses resulting from initial allocation of flows between pairs of territories were eliminated, and finally market surpluses resulting from groups of supplying flows were reallocated to available markets. The reallocation process took into account both the relative distance from the market to th competing suppliers, and size of the supply flows(major suppliers of certain markets, such as St. Vincent to Trinidad were allocated a relatively greater proportion of the total forecast market flows due to expected greater ease of marketing).

This process was further complicated by the existences of total surpluses of supply over demand for three commodity groups in certain forecast periods. These surpluses are summarised in Table VIII C - 1.01. The general result was that root crops are

in surplus for all quarters except the 3rd quarter of 1982 and 1987, other vegetables are in surplus for the fourth quarter of 1982 and the last half of 1987, and non-citrus fruits are in surplus for the third quarter of 1982 and the last half of 1987. (It is expected that the growing countries will, in fact, produce less than these maximum forecasts and/or ship to other extra-regional markets. The situation for other root crops is the most serious and will probably require a change in planned planting patterns in the LDC's.)

The results of this process for each strategy is described below.

1.0 Regional Self-Sufficiency (Strategy 1)

Under this strategy forecast LDC supplies of small farmer commodities are assumed to go in first priority to intra-regional markets. Only if there are region-wide surpluses, or there are present overseas exports, are the supplies assumed to go to extra-regional markets. Forecast LDC production of pulses, onions and white potatoes do not meet regional demand and are not exported to extra-regional markets. The other commodities normally satisfy the forecast maximum penetration of the regional markets, including the LDC's, Barbados, Trinidad, Guadeloupe, Martinique, U.S. Virgin Islands, Netherlands Antilles and Puerto Rico, with some high quality produce available for extra-regional markets. For certain commodities (root crops, other vegetables, and non-citrus fruit) in a few quarters, forecast production exceeds all available markets for LDC commodities. (See Table VIII C - 1.01). In these cases extra-regional markets are filled to maximum LDC penetration, as are the regional markets.

Tables VIII C - 1.02 to 1.09 summarize the forecast average monthly small farmer commodity exports by origin and destination for each quarter of 1982 and 1987. Tables VIII C - 1.01 to 1.13 present the annual total flows by strategy. In addition file tables are available to show the annual flows for seven commodity groups (citrus fruit, non-citrus fruit, onions, other vegetables, root crops and live animals). The single flow of white potatoes from Dominica to Trinidad is combined with other root crops, but the significant flows of live animals from Grenada and St. Vincent to Trinidad are summarized separately.

The largest export flows (16,800 tons per year) are forecast for Dominica, followed by St. Vincent, Antigua and Grenada (all in 5000 - 7000 tons per year range). Montserrat has the lowest export flows of about 100 tons per year in 1987. The largest intra-regional flows (over 2,000 tons per year) are to Trinidad from Dominica, St. Vincent and Grenada. The largest extra-regional flows are from Dominica to the EEC and Canada. Exports to the US and Canada would also show substantial increase under this strategy, but not as much as for strategy 2.

These flows are depicted graphically in Figure VIII C - 1.01.

The seasonal variations are quite pronounced with root crop flows practically zero in the third quarter, but otherwise in surplus. Non-citrus fruit flows are largest in the first two quarters to intra-regional markets and in the last two quarters to extra-regional markets. Onions and white potatoes only have flows in the first two quarters. Flows from all countries fluctuate up to 50% of maximum from quarter to quarter. The largest seasonal variations occur for the extra-regional markets.

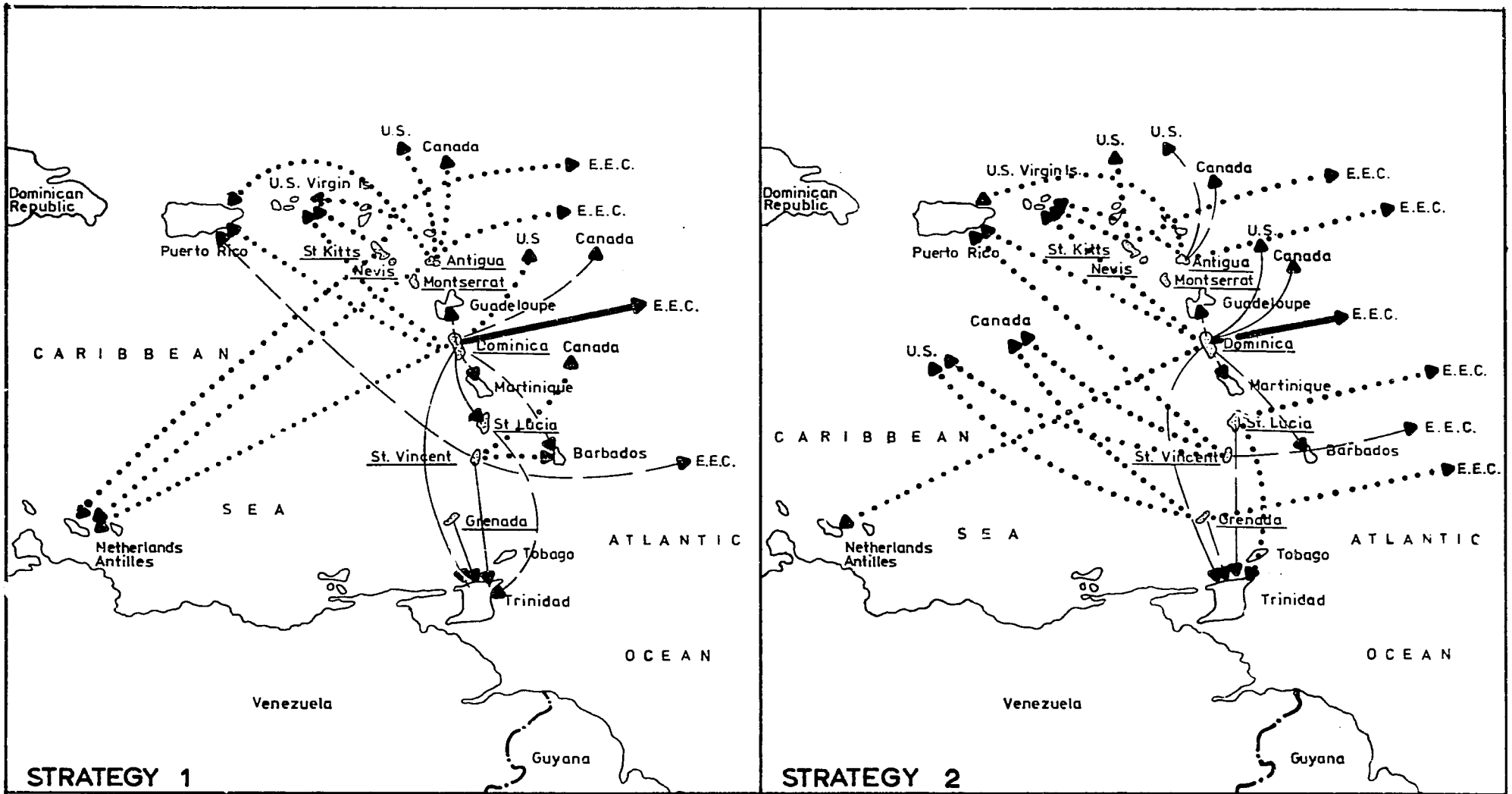
2.0 Extra-Regional Marketing Priority (Strategy 2)

Under this strategy the highest quality 70% of LDC export potential is assumed to go in first priority to satisfy extra-regional market demand. The remaining 30% (and any of the 70% that exceeds LDC marketing potential in the extra-regional markets) is assigned to regional markets in the same priority as in Strategy 1. Also, due to supply constraints, pulses, onions and white potatoes are confined to regional markets as in Strategy 1.

The major differences between this strategy and stratety 1, appear in the fruits and vegetable categories. There is no difference between the two strategies in periods of overall surplus (root crops in all quarters except quarter 3, and quarters 3 and 4 for vegetables and non-citrus fruits). The flows for this strategy are also shown in Tables VIII C - 1.02 to 1.13. Where no strategy is indicated in these tables, the flows for both strategies are the same. The significant flows are also illustrated in figure VIII C - 1.01.

Significant flows for Strategy 2 are increased to the extra-regional markets by 3,500 tons in 1982 and 6,000 tons in 1987. The greatest change is from Dominica to the U.S.A. and Canada and from St. Vincent to the U.S.A., under strategy 2. These shifts in flows for strategy 2 are mostly away from the marginal intra-regional markets of the Netherlands Antilles and Puerto Rico and from Antigua in the LDC's. Trinidad, Barbados and the U.S. Virgin Islands also have a 10 - 30% reduction in LDC imports under strategy 2 compared with strategy 1, although the exports to all these markets are still substantial (6,000 tons to Trinidad and 1 - 2,000 tons per year to the others).

The seasonal variations are essentially the same as in strategy 1, except that the variations in the extra-regional markets are slightly reduced. These are still significant as only open period markets are available for most export products.



Significant Forecast Exports Of Small-Farmer Commodities From ECCM Countries 1987

FIGURE VIIIC-1.01

TABLE VIII C - 1.01

Unmarketable Surplus Forecasts* for Small Farmer Commodities
(metric tons)

Commodity		ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	TOTAL
Rootcrops									
1982	Q1	333	3,225	1,227	57	159	1,191	3,531	9,723
	Q2	81	531	-	-	54	309	501	1,476
	Q4	-	-	-	93	-	-	609	702
	Total	414	3,756	1,227	150	213	1,500	4,641	11,901
1987	Q1	570	3,018	1,443	60	330	1,701	3,351	10,473
	Q2	138	789	-	-	-	669	570	2,166
	Q4	30	189	-	54	-	-	633	906
	Total	738	3,996	1,443	114	330	2,370	4,554	13,545
Other Vegetables									
1982	Q4	-	141	-	-	-	-	57	198
	Total	-	141	-	-	-	-	57	198
1987	Q3	-	249	-	-	207	-	51	507
	Q4	285	516	-	-	255	-	273	1,329
	Total	285	765	-	-	462	-	324	1,836
Non-Citrus Fruit									
1982	Q3	129	834	252	-	915	387	-	2,517
	Q4	-	-	-	-	-	-	273	273
		129	834	252	-	915	387	273	2,790
1987	Q3	340	1,455	894	183	1,566	96	-	5,034
	Q4	1,104	873	360	42	-	-	198	2,577
	Total	1,944	2,328	1,254	225	1,566	96	198	7,611

* Assuming production at full potential.

Source: Tables VIII B - 1.01/2/3, VIII C - 1.02 to 1.13 and related file tables.
Note: Total figures are shown, not average monthly figures as in source tables.

TABLE VIII C - 1.02

Quarterly Forecast Flows of Small Farmer Commodities by Origin and Destination - 1982 - Quarter 1

(Average Monthly tons)

Destination		Origin ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	TOTAL
Antigua	Strat.1	x	60	-	1	1	-	-	62
	Strat.2		18	-	1	1	-	-	20
Dominica		-	x	-	8	1	-	-	9
Grenada		-	2	x	-	-	-	-	2
Montserrat	Strat.1	-	21	-	x	-	-	-	21
	Strat.2	-	17	-		-	-	-	17
St.Kitts	Strat.1	-	53	-	-	x	-	-	53
	Strat.2	-	18	-	-		-	-	18
St.Lucia		-	-	-	18	2	x	-	20
St.Vincent		-	-	-	-	-	-	x	-
Total LDC's	Strat.1	-	136	-	27	4	-	-	167
	Strat.2	-	55	-	27	4	-	-	86
Barbados	Strat.1	-	68	-	-	-	-	38	106
	Strat.2	-	35	-	-	-	-	30	65
Trinidad	Strat.1	-	85	287	5	-	101	128	606
	Strat.2	-	72	259	5	-	77	128	541
Fr.West Indies		-	147	-	-	7	-	-	154
Neth.Antilles	Strat.1	-	19	18	7	-	14	29	87
	Strat.2	-	4	3	-	-	3	4	14
US Virgin Is.	Strat.1	28	52	3	38	38	8	5	172
	Strat.2	23	24	3	25	24	6	2	107
Puerto Rico	Strat.1	45	45	33	-	24	24	91	262
	Strat.2	24	24	24	-	24	24	24	144
Total Intra-Reg.	Strat.1	73	552	341	77	73	147	291	1554
	Strat.2	47	361	289	57	59	110	188	1111
EEC	Strat.1	-	207	51	-	-	63	70	391
	Strat.2	12	221	69	7	5	69	88	471
U.S.A.	Strat.1	-	51	10	-	-	10	20	91
	Strat.2	12	152	27	7	5	23	63	289
Canada	Strat.1	12	51	20	-	-	21	30	134
	Strat.2	14	127	37	6	4	39	72	299
Total Extra-Reg.	Strat.1	12	309	81	-	-	94	120	616
	Strat.2	38	500	133	20	14	131	223	1059

Note: Where no alternate strategies are shown, flows are identical under each strategy.

Source: Tables VIII B - 1.01/2/3 - Berger Estimates.

TABLE VIII C - 1.03

Quarterly Forecast Flows of Small Farmer Commodities by Origin and Destination - 1982 - Quarter 2

(Average Monthly tons)

Destination		Origin ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	TOTAL
Antigua	Strat.1	x	238	-	1	1	-	-	240
	Strat.2		61	-	1	1	-	-	63
Dominica		-	x	-	8	1	-	-	9
Grenada		-	-	x	-	-	-	-	-
Montserrat	Strat.1	10	57	-	x	10	-	-	77
	Strat.2	10	37	-		10	-	-	57
St.Kitts	Strat.1	-	37	-	-	x	-	-	37
	Strat.2	-	34	-	-		-	-	34
St.Lucia		-	35	-	18	2	x	-	55
St.Vincent		-	-	-	-	-	-	x	-
Total LDC's	Strat.1	10	367	-	27	14	-	-	418
	Strat.2	10	167	-	27	14	-	-	218
Barbados	Strat.1	-	86	-	-	-	-	9	95
	Strat.2	-	35	-	-	-	-	9	44
Trinidad	Strat.1	5	20	98	-	-	54	232	409
	Strat.2	5	20	71	-	-	54	145	295
Fr.West Indies	Strat.1	-	66	-	-	-	-	-	66
	Strat.2	-	39	-	-	-	-	-	39
Neth.Antilles	Strat.1	-	7	-	-	-	33	27	67
	Strat.2	-	7	-	-	-	4	5	16
US Virgin Is.	Strat.1	4	87	-	-	7	5	-	103
	Strat.2	4	7	--	--	7	5	-	23
Puerto Rico		-	52	-	-	-	39	53	144
Total Intra-Reg.	Strat.1	19	685	98	27	21	131	321	1302
	Strat.2	19	327	71	27	21	102	212	779
EEC	Strat.1	-	219	-	-	-	9	98	326
	Strat.2	-	228	3	-	-	38	104	373
U.S.A.	Strat.1	2	6	-	-	2	7	25	42
	Strat.2	2	219	20	-	2	7	111	361
Canada	Strat.1	4	18	-	-	2	19	40	83
	Strat.2	4	154	4	-	2	19	57	240
Total Extra-Reg.	Strat.1	6	243	-	-	4	35	163	451
	Strat.2	6	601	27	-	4	64	272	974

Note: Where no alternate strategies are shown, flows are identical under each category.

Source: Tables VIII B - 1.01/2/3 - Berger Estimates.

TABLE VIII C - 1.04

Quarterly Forecast Flows of Small Farmer Commodities
by Origin and Destination - 1982 - Quarter 3

(Average Monthly tons)

Destination		Origin ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	TOTAL
Antigua		x	36	-	2	-	-	-	38
Dominica		-	x	-	-	-	-	-	-
Grenada		-	2	x	-	-	-	-	2
Montserrat		-	-	-	x	-	-	-	-
St.Kitts		-	3	-	-	x	-	-	3
St.Lucia		-	-	-	-	-	x	-	-
St.Vincent		-	-	-	-	-	-	x	-
Total LDC's		-	41	-	2	-	-	-	43
Barbados	Strat.1	-	168	5	-	-	28	13	214
	Strat.2	-	166	2	-	-	16	11	195
Trinidad	Strat.1	-	90	102	-	-	107	183	482
	Strat.2	-	90	102	-	-	107	174	473
Fr.West Indies		-	66	-	-	-	3	-	69
Neth.Antilles	Strat.1	45	152	-	-	40	-	5	242
	Strat.2	45	87	-	-	40	-	5	177
US Virgin Is.	Strat.1	19	36	-	15	46	19	-	135
	Strat.2	19	32	-	15	35	19	-	120
Puerto Rico	Strat.1	35	35	17	13	30	10	10	150
	Strat.2	35	35	17	13	30	10	10	150
Total Intra-Reg.	Strat.1	99	588	124	30	116	167	211	1335
	Strat.2	99	517	121	30	105	155	200	1227
EEC	Strat.1	-	352	23	-	24	28	32	459
	Strat.2	-	406	26	-	29	32	39	532
U.S.A.	Strat.1	3	63	6	4	59	9	7	151
	Strat.2	3	71	6	4	62	13	9	168
Canada	Strat.1	11	100	20	15	101	31	12	290
	Strat.2	11	109	20	15	104	35	14	308
Total Extra-Reg.	Strat.1	14	515	49	19	184	68	51	900
	Strat.2	14	586	52	19	195	80	62	1008

Note: Where no alternate strategies are shown, flows are identical under each strategy.

Source: Tables VIII B - 1.01/2/3 - Berger Estimates.

TABLE VIII C - 1.05

Quarterly Forecast Flows of Small Farmer Commodities
by Origin and Destination - 1982 - Quarter 4

(Average Monthly Tons)

Destination		Origin ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	TOTAL
Antigua		x	-	-	-	-	-	-	-
Dominica		-	x	-	-	-	-	-	-
Grenada		-	-	x	-	-	-	-	-
Montserrat		-	-	-	x	-	-	-	-
St.Kitts		44	20	-	22	x	-	-	86
St.Lucia		-	-	-	-	-	x	-	-
St.Vincent		-	-	-	-	-	-	x	-
Total LDC's		44	20	-	22	-	-	-	86
Barbados	Strat.1	2	115	2	-	-	29	119	267
	Strat.2	2	115	1	-	-	17	91	226
Trinidad	Strat.1	-	116	233	10	10	4	351	724
	Strat.2	-	116	233	10	10	4	351	724
Fr.West Indies	Strat.1	-	68	-	6	-	2	1	77
	Strat.2	-	68	-	2	-	2	1	73
Neth.Antilles	Strat.1	55	136	10	6	15	23	72	317
	Strat.2	55	62	10	6	15	23	72	243
US Virgin Is.		51	57	-	27	40	7	23	205
Puerto Rico	Strat.1	32	58	25	19	21	-	253	408
	Strat.2	32	58	25	19	21	-	253	408
Total Intra-Reg.	Strat.1	184	570	270	90	86	65	819	2084
	Strat.2	184	496	269	86	86	53	791	1965
EEC	Strat.1	85	285	30	-	-	57	226	683
	Strat.2	85	357	31	2	-	61	238	774
U.S.A.	Strat.1	208	160	4	-	-	-	79	451
	Strat.2	208	161	4	1	-	4	87	465
Canada	Strat.1	184	127	-	20	20	-	90	441
	Strat.2	184	128	-	21	20	4	98	455
Total Extra-Reg.	Strat.1	477	572	34	20	20	57	395	1575
	Strat.2	477	646	35	24	20	69	423	1694

Note: Where no alternate strategies are shown, flows are identical under each category.

Source: Tables VIII B - 1.01/2/3 - Berger Estimates.

TABLE VIII C - 1.06

Quarterly Forecast Flows of Small Farmer Commodities
by Origin and Destination - 1987 - Quarter 1

(Average Monthly Tons)

Destination		Origin ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	TOTAL
Antigua		x	-	-	-	-	-	-	-
Dominica		-	x	-	5	5	-	-	10
Grenada		-	15	x	12	16	-	-	43
Montserrat	Strat.1	-	65	-		1	-	-	66
	Strat.2	-	65	-	x	-	-	-	65
St.Kitts	Strat.1	240	16	-	-		-	-	256
	Strat.2	72	16	-	-	x	-	-	88
St.Lucia	Strat.1	-	255	-	11	12		-	278
	Strat.2	-	34	-	11	12	x	-	57
St.Vincent		-	-	-	-	10	-	x	10
Total LDC's	Strat.1	240	351	-	28	44	-	-	663
	Strat.2	72	130	-	28	43	-	-	273
Barbados	Strat.1	2	80	-	-	-	24	57	163
	Strat.2	2	43	-	-	-	8	45	98
Trinidad	Strat.1	20	135	518	-	10	120	116	919
	Strat.2	20	135	366	-	10	96	116	743
Fr.West Indies		27	129	-	16	22	-	-	194
Neth.Antilles	Strat.1	13	31	13	-	94	12	14	177
	Strat.2	12	5	3	-	18	2	3	43
US Virgin Is.	Strat.1	42	65	3	35	57	5	-	207
	Strat.2	42	37	3	25	57	4	-	168
Puerto Rico	Strat.1	53	83	64	-	16	49	89	354
	Strat.2	19	49	49	-	6	49	50	222
Total Intra-Reg.	Strat.1	397	874	598	79	243	210	276	2677
	Strat.2	194	528	421	69	156	159	214	1741
EEC	Strat.1	52	311	74	-	30	63	94	624
	Strat.2	83	338	96	4	67	72	86	746
U.S.A.	Strat.1	17	56	17	-	10	10	30	140
	Strat.2	125	251	120	3	35	30	65	629
Canada	Strat.1	19	66	27	-	10	21	41	184
	Strat.2	83	190	79	3	35	43	76	509
Total Extra-Reg.	Strat.1	88	433	118	-	50	94	165	948
	Strat.2	291	779	295	10	137	145	227	1884

Note: Where no alternate strategies are shown, flows are identical under each strategy.

Source: Tables VIII B - 1.01/2/3 - Berger Estimates.

TABLE VIII C - 1.07

Quarterly Forecast Flows of Small Farmer Commodities
by Origin and Destination - 1987 - Quarter 2

(Average Monthly Tons)

Destination		Origin ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	TOTAL
Antigua		x	-	-	-	-	-	-	-
Dominica		-	x	-	5	5	-	-	10
Grenada		-	-	x	12	15	-	-	27
Montserrat	Strat.1	15	95	-	x	-	-	-	110
	Strat.2	15	71	-		-	-	-	86
St.Kitts		4	8	-	-	x	-	-	12
St.Lucia	Strat.1	-	456	-	11	12	x	-	479
	Strat.2	-	104	-	11	12		-	127
St.Vincent		-	35	-	-	10	-	x	45
Total LDC's	Strat.1	19	594	-	28	42	-	-	683
	Strat.2	19	218	-	28	42	-	-	307
Barbados	Strat.1	-	101	-	-	-	-	11	112
	Strat.2	-	101	-	-	-	-	7	108
Trinidad	Strat.1	70	45	264	-	8	77	168	632
	Strat.2	16	20	128	-	-	69	126	359
Fr.West Indies		26	72	-	-	-	-	-	98
Neth.Antilles	Strat.1	52	21	12	-	13	4	31	133
	Strat.2	-	6	-	-	-	4	6	16
US Virgin Is.	Strat.1	75	75	-	4	66	5	-	225
	Strat.2	60	29	-	4	26	4	-	123
Puerto Rico	Strat.1	12	86	-	-	-	55	99	252
	Strat.2	-	55	-	-	-	55	56	166
Total Intra-Reg.	Strat.1	254	994	276	32	129	141	309	2135
	Strat.2	121	501	128	32	68	132	195	1177
EEC	Strat.1	-	279	30	-	-	18	71	398
	Strat.2	12	336	18	-	7	18	73	464
U.S.A.	Strat.1	3	14	-	-	-	8	24	49
	Strat.2	78	49	94	-	37	40	117	715
Canada	Strat.1	7	154	-	-	-	47	24	232
	Strat.2	53	255	66	-	17	24	43	458
Total Extra-Reg.	Strat.1	10	447	30	-	-	73	119	679
	Strat.2	143	940	178	-	61	82	233	1637

Note: Where no alternate strategies are shown, flows are identical under each strategy.

Source: Tables VIII B - 1.01/2/3 - Berger Estimates.

TABLE VIII C - 1.08

Quarterly Forecast Flows of Small Farmer Commodities
by Origin and Destination - 1987 - Quarter 3

(Average Monthly Tons)

Destination		Origin ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	TOTAL
Antigua		x	-	-	-	-	-	-	-
Dominica		-	x	-	-	-	-	-	-
Grenada		-	-	x	-	-	-	-	-
Montserrat	Strat.1	20	-	-	x	1	-	-	21
	Strat.2	6	-	-		1	-	-	7
St.Kitts		-	-	-	-	x	-	-	-
St.Lucia		-	-	-	-	-	x	-	-
St.Vincent		-	92	-	-	-	-	x	92
Total LDC's	Strat.1	20	92	-	-	1	-	-	113
	Strat.2	6	92	-	-	1	-	-	99
Barbados	Strat.1	4	116	36	-	-	35	22	213
	Strat.2	4	116	19	-	-	19	10	168
Trinidad	Strat.1	-	130	151	-	-	113	120	514
	Strat.2	-	130	151	-	-	113	120	514
Fr.West Indies		-	69	-	-	-	3	-	72
Neth.Antilles	Strat.1	45	117	30	22	40	10	17	281
	Strat.2	45	117	30	22	40	10	17	281
US Virgin Is.	Strat.1	47	57	-	45	57	7	-	213
	Strat.2	47	57	-	45	57	7	-	213
Puerto Rico	Strat.1	72	59	35	10	123	15	35	349
	Strat.2	72	59	35	10	86	15	35	312
Total Intra-Reg.	Strat.1	188	640	252	77	221	183	194	1755
	Strat.2	174	640	235	77	184	167	182	1659
EEC	Strat.1	10	482	30	-	46	28	6	602
	Strat.2	24	482	40	-	69	37	13	665
U.S.A.	Strat.1	3	120	-	-	75	2	2	202
	Strat.2	3	120	3	-	82	5	4	217
Canada	Strat.1	52	120	-	-	62	2	2	238
	Strat.2	52	120	4	-	69	6	5	256
Total Extra-Reg.	Strat.1	65	722	30	-	183	32	10	1042
	Strat.2	79	722	47	-	220	48	22	1138

Note: Where no alternate strategies are shown, flows are identical under each strategy.

Source: Tables VIII B - 1.01/2/3 - Berger Estimates.

TABLE VIII C - 1.09

Quarterly Forecast Flows of Small Farmer Commodities
by Origin and Destination - 1987 - Quarter 4

(Average Monthly Tons)

Destination		Origin ANT	DOM	GDA	MONT	ST.K	ST.L	ST.V	TOTAL
Antigua		x	-	-	-	-	-	-	-
Dominica		-	x	-	-	-	-	-	-
Grenada		-	-	x	-	-	-	-	-
Montserrat		-	-	-	x	-	-	-	-
St.Kitts		50	23	-	54	x	-	-	127
St.Lucia	Strat.1	-	21	20	-	-	x	-	41
	Strat.2	-	21	20	-	-		-	41
St.Vincent		-	-	-	-	-	-	x	-
Total LDC's	Strat.1	50	44	20	54	-	-	-	168
	Strat.2	50	44	20	54	-	-	-	168
Barbados	Strat.1	6	85	22	-	2	24	134	273
	Strat.2	6	85	15	-	2	8	92	208
Trinidad		20	173	254	5	10	50	282	794
Fr.West Indies		-	75	-	-	5	-	-	80
Neth.Antilles	Strat.1	62	108	43	23	50	-	59	345
	Strat.2	62	108	43	17	50	-	59	339
US Virgin Is.	Strat.1	83	84	-	42	58	5	-	272
	Strat.2	83	84	-	41	58	5	-	271
Puerto Rico	Strat.1	126	100	61	22	15	-	156	480
	Strat.2	126	100	61	22	15	-	156	480
Total Intra-Reg.	Strat.1	347	669	400	146	140	79	631	2412
	Strat.2	347	669	393	139	140	63	589	2340
EEC	Strat.1	102	404	20	-	108	40	201	875
	Strat.2	102	404	25	5	108	49	223	916
U.S.A.	Strat.1	234	129	40	-	36	-	79	518
	Strat.2	234	129	41	1	36	3	89	533
Canada	Strat.1	215	114	36	2	37	-	106	510
	Strat.2	215	114	37	3	37	4	116	526
Total Extra-Reg.	Strat.1	551	647	96	2	181	40	386	1903
	Strat.2	551	647	103	9	181	56	428	1975

Note: Where no alternate strategies are shown, flows are identical under each strategy.

Source: Tables VIII B - 1.01/2/3 - Berger Estimates.

TABLE VIII C - 1.10

Total Annual Forecast Flows of All Small Farmer Commodities by Origin and Destination - - Strategy 1
(tons)

	Origin							
Destination	Antigua	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent	Total
Antigua	x	1002	-	12	6	-	-	1020
Dominica	-	x	-	48	6	-	-	54
Grenada	-	12	x	-	-	-	-	12
Montserrat	30	234	-	x	30	-	-	294
St. Kitts	132	339	-	66	x	-	-	537
St. Lucia	-	105	-	108	12	x	-	225
St. Vincent	-	-	-	-	-	-	x	-
Total LDC's	162	1692	-	234	54	-	-	2142
Barbados	6	1311	21	-	-	171	537	2046
Trinidad	15	933	2160	45	30	798	2682	6663
Fr. West Indies	-	1041	-	18	21	15	3	1098
Neth.Antilles	300	942	84	39	165	210	399	2139
US Virgin Islands	306	696	9	240	393	117	84	1845
Puerto Rico	336	570	225	96	225	219	1221	2892
Total Intra-Reg.	1125	7185	2499	672	888	1530	4926	18825
EEC	255	3189	312	-	72	471	1278	5577
USA	639	840	60	12	183	78	393	2205
Canada	633	888	120	105	369	213	516	2844
Total Extra-Reg.	1527	4917	492	117	624	762	2187	10626
Total Flows	2652	12102	2991	789	1512	2292	7113	29451

Source: Tables VIII B - 1.01/2/3 - Berger Estimates

TABLE VIII C - 1.11

Total Annual Forecast Flows of All Small Farmer Commodities
by Origin and Destination - 1982 - Strategy 2
(tons)

	Origin							
Destination	Antigua	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent	Total
Antigua	x	345	-	12	6	-	-	363
Dominica	-	x	-	48	6	-	-	54
Grenada	-	12	x	-	-	-	-	12
Montserrat	30	162	-	x	30	-	-	222
St. Kitts	132	225	-	66	x	-	-	423
St. Lucia	-	105	-	108	12	x	-	225
St. Vincent	-	-	-	-	-	-	x	-
Total LDC's	162	849	-	234	54	-	-	1299
Barbados	6	1053	9	-	-	99	423	1590
Trinidad	15	894	1995	45	30	726	2394	6099
Fr. West Indies	-	960	-	6	21	15	3	1005
Neth.Antilles	300	480	39	18	165	90	258	1350
US Virgin Islands	291	360	9	201	318	111	75	1365
Puerto Rico	273	507	198	96	225	219	1020	2538
Total Intra-Reg.	1047	5103	2250	600	813	1260	4173	15246
EEC	291	3636	387	27	102	600	1407	6450
USA	675	1809	171	36	207	141	810	3849
Canada	639	1554	183	126	390	291	723	3906
Total Extra-Reg.	1605	6999	741	189	699	1032	2940	14205
Total Flows	2652	12102	2991	789	1512	2292	7113	29451

Source: Tables VIII B - 1.01/2/3 - Berger Estimates

TABLE VIII C - 1.12

Total Annual Forecast Flows of All Small Farmer Commodities
by Origin and Destination - 1987 - Strategy 1
(tons)

Destination	Origin							
	Antigua	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent	Total
Antigua	x	-	-	-	-	-	-	-
Dominica	-	x	-	30	30	-	-	60
Grenada	-	45	x	72	93	-	-	210
Montserrat	105	480	-	x	6	-	-	591
St. Kitts	882	141	-	162	x	-	-	1185
St. Lucia	-	2196	60	66	72	x	-	2394
St. Vincent	-	381	-	-	60	-	x	441
Total LDC's	987	3243	60	330	261	-	-	4881
Barbados	36	1146	174	-	6	249	672	2283
Trinidad	330	1449	3561	15	84	1080	2058	8577
Fr. West Indies	159	1035	-	48	81	9	-	1332
Neth.Antilles	516	831	294	135	591	78	363	2808
US Virgin Islands	741	843	9	378	714	66	-	2751
Puerto Rico	789	984	480	96	462	357	1137	4305
Total Intra-Reg.	3558	9531	4578	1002	2199	1839	4230	26937
EEC	492	4428	462	-	552	447	1116	7497
USA	771	957	171	-	363	60	405	2727
Canada	879	1362	189	6	327	210	519	3492
Total Extra-Reg.	2142	6747	822	6	1242	717	2040	13716
Total Flows	5700	16278	5400	1008	3441	2556	6270	40653

Source: Tables VIII B - 1.01/2/3 - Berger Estimates

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TABLE VIII C - 1.13

Total Annual Forecast Flows of All Small Farmer Commodities
by Origin and Destination - 1987 - Strategy 2
(tons)

Destination	Origin							
	Antigua	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent	Total
Antigua	x	-	-	-	-	-	-	-
Dominica	-	x	-	30	30	-	-	60
Grenada	-	45	x	72	93	-	-	210
Montserrat	63	408	-	x	3	-	-	474
St. Kitts	378	141	-	162	x	-	-	681
St. Lucia	-	477	60	66	72	x	-	675
St. Vincent	-	381	-	-	60	-	x	441
Total LDC's	441	1452	60	330	258	-	-	2541
Barbados	36	1035	102	-	6	105	462	1746
Trinidad	168	1374	2697	15	60	984	1932	7230
Fr. West Indies	159	1035	-	48	81	9	-	1332
Neth.Antilles	357	708	228	117	324	48	255	2037
US Virgin Islands	696	621	9	345	594	60	-	2325
Puerto Rico	651	789	435	96	321	357	891	3540
Total Intra-Reg.	2508	7014	3531	951	1644	1563	3540	20751
EEC	663	4680	537	27	753	528	1185	8373
USA	1320	2547	774	12	570	234	825	6282
Canada	1209	2037	558	18	474	231	720	5247
Total Extra-Reg.	3192	9264	1869	57	1797	993	2730	19902
Total Flows	5700	16278	5400	1008	3441	2556	6270	40653

Source: Tables VIII B - 1.01/2/3 - Berger Estimates

D. Small Farmer Commodity Flows by Mode

The analysis of present trade flows in Chapters III and IV indicates that only approximately 650 tons or 5% of present annual small farmer commodity exports are shipped by air rather than by sea, to either regional or extra-regional markets. Analysis of present air cargo rates shows that tariffs to the North American markets are roughly the same for sea and air, but for the EEC sea freight is much lower than air. If volume increased, air cargo rates will become lower as air cargo flights become feasible where there is freight traffic in both directions. In the Caribbean region, sea freight and particularly schooner rates are significantly less than air. However both sea and air flows in small farmer commodities are constrained: air flows by lack of scheduled air cargo space, and sea flows by lack of refrigeration.

Assuming that all transport constraints were removed, (most probable cost relationships) it is likely that the present 5% proportion of air traffic would remain the same for the shorter intra-regional flows and for the EEC market. 1/ For intermediate intra-regional flows such as Dominica to the other islands, between the northern islands (St. Kitts, Antigua and Montserrat) and the southern islands (St. Vincent, St. Lucia, Grenada, Trinidad and Barbados) and between northern EEC countries and U.S. Virgin Islands a 20% of total flow is assumed in the future for air cargo and 80% by sea; and for longer intra-regional flows to the U.S. Virgin Islands, Puerto Rico, and the Netherlands Antilles, and to the U.S.A. and Canada, an estimated 80% of future flows will go by air, and 20% by sea. These flows are summarized in Tables VIII D - 1.01, 2,3,and 4 for the two strategies in 1987.

Clearly the future choice of mode will depend on the exact future configuration and relative costs of both air and sea transport services which will be available. Therefore the general mode distribution forecast above will be re-analysed in Phase II of the present study when specific transport services are proposed.

E. Relation of Forecast Flows to Phase II

The flows described in this chapter represent maximum potential flows under the assumptions that future production plans are carried out, and that transport and marketing constraints are overcome. In all probability, at least part of these assumptions will not be met in the future. In addition future production will respond to some extent to the availability of transport and marketing services.

1/ *Except for certain products such as Eggplant and Sweet peppers which are very perishable.*

TABLE VIII D - 1.01

Total Annual Forecast Flows of All Small Farmer Commodities
by Sea Transport - 1987 - Strategy 1
(tons)

Destination	Origin							
	Antigua	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent	Total
Antigua	x	-	-	-	-	-	-	-
Dominica	-	x	-	24	24	-	-	48
Grenada	-	36	x	58	74	-	-	168
Montserrat	100	384	-	x	6	-	-	490
St.Kitts	838	113	-	154	x	-	-	1105
St.Lucia	-	1757	57	53	58	x	-	1925
St.Vincent	-	305	-	-	48	-	x	353
Total LDC's	938	2595	57	289	210	-	-	4089
Barbados	29	917	165	-	5	237	638	1991
Trinidad	264	1159	3383	12	67	1026	1955	7866
Fr.West Indies	151	983	-	46	77	9	-	1266
Neth. Antilles	103	166	59	27	118	16	73	562
US Virgin Islands	148	169	2	76	143	13	-	551
Puerto Rico	158	197	96	19	92	71	227	860
Total Intra-Reg.	1791	6186	3762	469	712	1372	2893	17185
EEC	467	4207	439	-	524	425	1060	7122
USA	154	191	34	-	73	12	81	545
Canada	176	272	38	1	65	42	104	698
Total Extra-Reg.	797	4670	511	1	662	479	1245	8365

Source: Tables VIII C - 1.02 to 1.13

TABLE VIII D - 1.02

Total Annual Forecast Flows of All Small Farmer Commodities
by Sea Transport - 1987 - Strategy 1
(tons)

Destination	Origin							
	Antigua	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent	Total
Antigua	x	-	-	-	-	-	-	-
Dominica	-	x	-	6	6	-	-	12
Grenada	-	9	x	14	19	-	-	42
Montserrat	5	96	-	x	-	-	-	101
St.Kitts	44	28	-	8	x	-	-	80
St.Lucia	-	439	3	13	14	x	-	469
St.Vincent	-	76	-	-	12	-	x	88
Total LDC's	49	648	3	41	51	-	-	792
Barbados	7	229	9	-	1	12	34	292
Trinidad	66	290	178	3	17	54	103	711
Fr.West Indies	8	52	-	2	4	-	-	66
Neth. Antilles	413	665	235	108	473	62	290	2246
US Virgin Islands	593	674	7	302	571	53	-	2200
Puerto Rico	631	787	384	77	370	286	910	3445
Total Intra-Reg.	1767	3345	816	533	1487	467	1337	9752
EEC	25	221	23	-	28	22	56	375
USA	617	766	137	-	290	48	324	2182
Canada	703	1090	151	5	262	168	415	2794
Total Extra-Reg.	1345	2077	311	5	580	238	795	5351

Source: Tables VIII C - 1.02 to 1.13

TABLE VIII D - 1.03

Total Annual Forecast Flows of All Small Farmer Commodities
by Sea Transport - 1987 - Strategy 2
(tons)

Destination	Origin							
	Antigua	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent	Total
Antigua	x	-	-	-	-	-	-	-
Dominica	-	x	-	24	24	-	-	48
Grenada	-	36	x	58	74	-	-	168
Montserrat	60	326	-	x	3	-	-	389
St.Kitts	359	113	-	154	x	-	-	626
St.Lucia	-	382	57	53	58	x	-	550
St.Vincent	-	305	-	-	48	-	x	353
Total LDC's	419	1162	57	289	207	-	-	2134
Barbados	29	828	97	-	5	100	439	1498
Trinidad	134	1099	2562	12	48	935	1835	6625
Fr.West Indies	151	983	-	46	77	9	-	1266
Neth. Antilles	71	142	46	23	65	10	51	408
US Virgin Islands	139	124	2	69	119	12	-	465
Puerto Rico	130	158	87	19	64	71	178	707
Total Intra-Reg.	1073	4496	2851	458	585	1137	2503	13103
EEC	630	4446	510	26	715	502	1126	7955
USA	264	509	155	2	114	47	165	1256
Canada	242	407	112	4	95	46	144	1050
Total Extra-Reg.	1136	5362	777	32	924	595	1435	10261

Source: Tables VIII C - 1.02 to 1.13

TABLE VIII D - 1.04

Total Annual Forecast Flows of All Small Farmer Commodities
by Sea Transport - 1987 - Strategy 2
(tons)

Destination	Origin							
	Antigua	Dominica	Grenada	Montserrat	St.Kitts	St.Lucia	St.Vincent	Total
Antigua	x	-	-	-	-	-	-	-
Dominica	-	x	-	6	6	-	-	12
Grenada	-	9	x	14	19	-	-	42
Montserrat	3	82	-	x	-	-	-	85
St.Kitts	19	28	-	8	x	-	-	55
St.Lucia	-	95	3	13	14	x	-	125
St.Vincent	-	76	-	-	12	-	x	88
Total LDC's	22	290	3	41	51	-	-	407
Barbados	7	207	5	-	1	5	23	248
Trinidad	34	275	135	3	12	49	97	605
Fr.West Indies	8	52	-	2	4	-	-	66
Neth. Antilles	286	566	182	94	259	38	204	1629
US Virgin Islands	557	497	7	276	475	48	-	1860
Puerto Rico	521	631	348	77	257	286	713	2833
Total Intra-Reg.	1435	2518	680	493	1059	426	1037	7648
EEC	33	234	27	1	38	26	59	418
USA	1056	2038	619	10	456	187	660	5026
Canada	967	1630	446	14	379	185	576	4197
Total Extra-Reg.	2056	3902	1092	25	873	398	1295	9641

Source: Tables VIII C - 1.02 to 1.13

Therefore it is proposed in Phase II of the present study to revise the above flow estimates following an analysis of the proposed marketing and transport services. This will have the effect of restricting future flows in patterns that cannot be predicated at this stage of the study.

Future flows in Phase II will include a maximum, minimum and most probable flow estimate depending on the characteristics of the proposed marketing and transport system. In any case, it is possible to say that maximum future flows (30,000 tons in 198? and 41,000 tons in 1987) will be approximately 2.5 to 3.4 times the level of present flows[1/] and that the most probable future flows (30 - 35,000 tons per year in 1987) will be more than twice as large as present flows. This doubling of transport and marketing demand will require a major change in the type and level of future services to be used by the CARICOM LDC's for small farmer commodities.

1/ *Excluding all Belize exports and 3,000 tons of organised exports such as Geest Grapefruit exports from Dominica and Dennery breadfruit exports from St.Lucia*