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COOPERATIVE PROGRAMME FOR THE PRODUCTION/MARKETING OF
PRIORITY FRUIT CROPS IN THE WINDWARD ISLANDS

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INTERAMERICAN INSTITUTE FOR COOPERATION ON AGRICULTURE

The Inter-American Institute for Cooperation on Agriculture (IICA) is the specialized agency for agriculture of the Inter-American system. The Institute was founded on October 7, 1942 when the Council of Directors of the Pan American Union approved the creation of the Inter-American Institute for Agricultural Sciences.

IICA was founded as an institution for agricultural research and graduate training in tropical agriculture. In response to changing needs in the hemisphere, the Institute gradually evolved into an agency for technical cooperation and institutional strengthening in the field of agriculture. These changes were officially recognized through the ratification of a new Convention on December 8, 1980. The Institute's purposes under the new Convention are to encourage, promote and support cooperation among the 29 Member States, to bring about agricultural development and rural well-being.

With its broader and more flexible mandate and a new structure to facilitate direct participation by the Member States in activities of the Inter-American Board of Agriculture and the Executive Committee, the Institute now has a geographic reach that allows it to respond to needs for technical cooperation in all of its Member States.

The contributions provided by the Member States and the ties IICA maintains with its twelve observer countries and numerous international organizations provide the Institute with channels to direct its human and financial resources in support of agricultural development throughout the Americas.

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In order to attain these goals, the Institute is concentrating its actions on the following five programs: Agrarian Policy Analysis and Planning; Technology Generation and Transfer; Organization and Management for Rural Development; Marketing and Agroindustry; and Animal Health and Plant Protection.

These fields of action reflect the needs and priorities established by the Member States and delimit the areas in which IICA concentrates its efforts and technical capacity. They are the focus of IICA's human and financial resource allocations and shape its relationship with other international organizations.



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COOPERATIVE PROGRAMME FOR THE PRODUCTION/MARKETING OF
PRIORITY FRUIT CROPS IN THE WINDWARD ISLANDS

Prepared for the Meeting of Heads of Government of the OECS
on Agricultural Diversification in the OECS, St. Lucia,
February 29 - March 1, 1988

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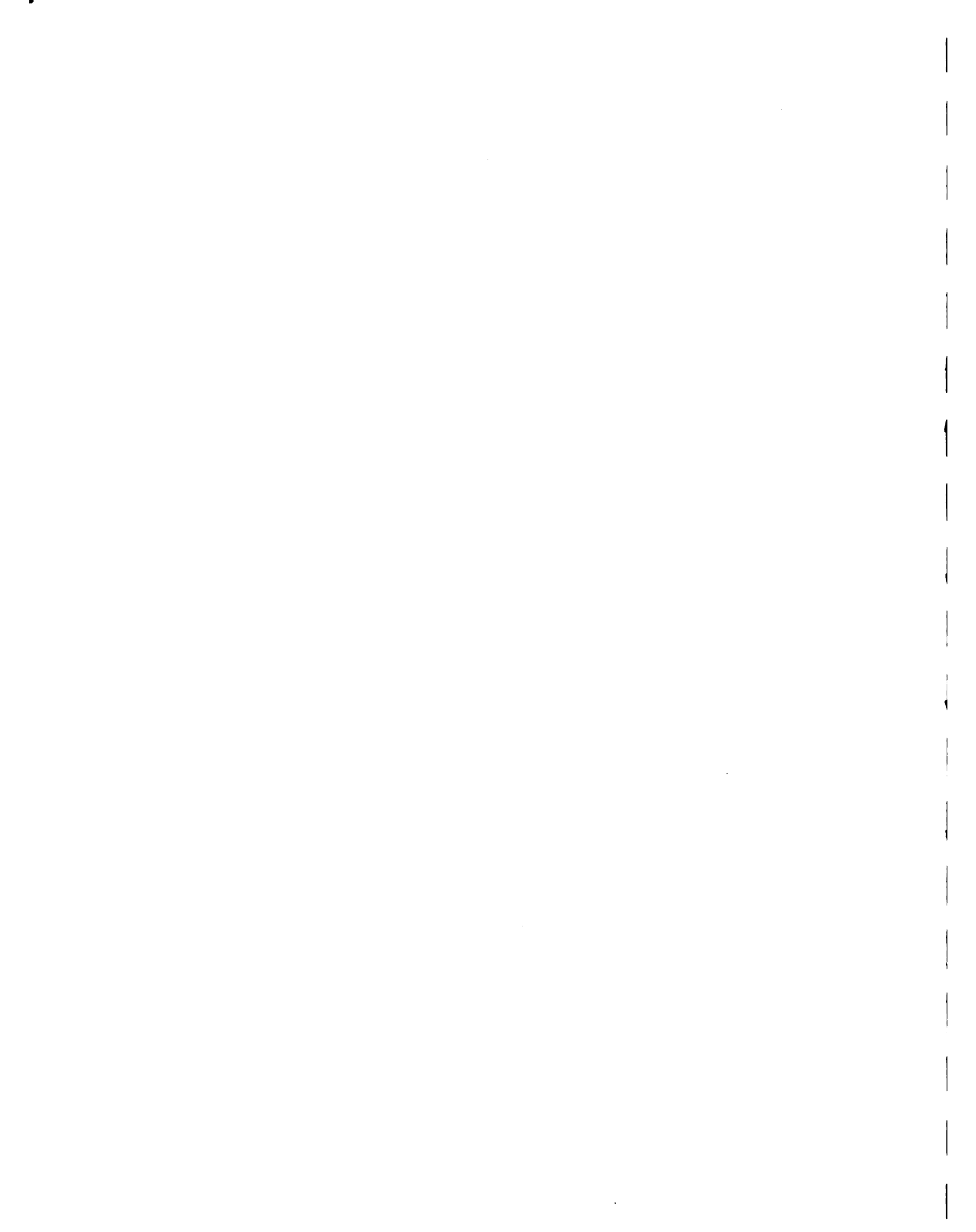


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EXECUTIVE SUMMARY

Excessive dependency of the agricultural sector on banana production, expected modification of the banana marketing agreement in 1992, increasing food imports to meet the demand of the growing tourist industry and changing patterns of consumption of local populations, among others, have prompted decision makers in the Windward Islands to move towards diversification of the agricultural sector. Efforts towards import substitution and export development are carried out under a large number of production and marketing constraints, the most important being:

- a large number of small farms producing small quantities of many items;
- inappropriate planting material;
- farmers who inadvertently produce low quality produce as a result of their strategy to minimize risk;
- insufficient facilitating services to farmers in production for specific markets;
- tendency to export surplus rather than produce for export;
- a public sector attempting to provide all the services but doing so in a mediocre fashion due to limited resources and lack of motivated personnel;
- lack of effective systems for generation and transfer of technologies;
- weak managerial, planning and marketing functions within farmer organisations; and
- underutilization of available resources within the region and poor coordination between public/private sector institutions and donor organisations.

With the exception of ground provisions from St. Vincent and fruits from Grenada, both for the Trinidad market, increased exports from the Windward Islands over the past decade have not been impressive. The vast majority of fresh produce exports are destined to regional markets, primarily Trinidad, Barbados and the French Islands.

Given the large number of problems at the national level, which impact negatively on fruit quantity and quality, the potential for immediate joint marketing on a large scale is almost non-existent. Increased exports of non-banana tropical fruits must therefore be oriented to relatively small niche markets which can be expanded upon as experience is obtained and local problems overcome. The facilitating services provided by CATCO should be further developed and expanded upon as an initial effort in joint marketing.

Suitable ecological conditions, comparative advantages in the production of some fruits, and a favourable institutional base, upon which to build, gives the Windward Islands an opportunity to develop selected fruits for specific markets. In order to penetrate and maintain these markets, however, a diversity of services must be improved and/or developed in each of the four islands. Such an effort will require the orchestration of a



cooperative programme to provide the human, financial and physical resources and an effective interinstitutional body to integrate, coordinate and monitor a number of projects and assistance organisations. Ten project profiles are included as part of the proposal to establish the coordinating mechanism and develop the necessary services.

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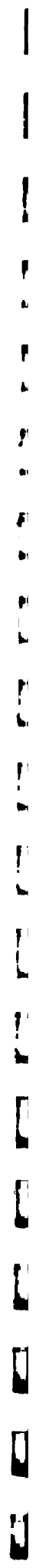
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1.1 - Current Situation

The current situation is characterized by a lack of coordination and integration of resources and efforts. This situation hinders the effective implementation of projects and the provision of assistance to the target population.

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COOPERATIVE PROGRAMME FOR THE PRODUCTION/MARKETING OF
PRIORITY FRUIT CROPS IN THE WINDWARD ISLANDS *

I. INTRODUCTION

A common felt need for diversification of the agricultural sector in the Windward Islands prompted the Ministers of Agriculture, as early as 1983, to request assistance in the design of a development strategy. This led to an agreement between IICA and CDB, in January 1986, to carry out a joint effort to determine priority constraints and alternative solutions to the production and marketing of agricultural commodities other than banana. In anticipation of expected increases in production, due to diverse development projects in the early eighties, priority was given in the IICA/CDB study to the following fruits: mango, avocado, citrus, breadfruit and plantain.

In July 1987, IICA published the Windward Island fruit sub-sector study.^{1/} This document presents a comprehensive analysis of the ecological, institutional, production, postharvest and marketing constraints that will impact upon diversification efforts, particularly within a joint marketing framework.

The following document is based primarily upon the IICA study and therefore concentrates on the fruit sub-sector. The team which prepared this document recognizes that other commodity groups, such as roots and flowers, may play a significant role in diversification efforts.

1.1 Current Situation

The Windward Islands, with the exception of Grenada, are clearly dependent on banana production for obtaining foreign exchange. In the past 8 years both volume and value exported to the UK, under the special market agreement, have been on the increase. In 1986, total tonnage of banana exports from the subregion reached 206,164 tonnes (Table 1). In 1984, the value of banana exports from St. Lucia surpassed 82% of total agricultural exports from that country.

Although banana is probably the most adequate crop for the ecological and economic conditions of these islands (year round production and fast recuperation from high wind damage), governments in the region are rightly concerned by supposed ending of protected market arrangements with the UK in 1992 and the beginning of a period of increased competition with countries that produce bananas at lower costs and with equal, or better, quality.

* Prepared by IICA specialists: Jerry La Gra, Rafael Marte, and Gonzalo Estefanell with the collaboration of Antonio Pinchinat and Everton Ambroise.

^{1/} La Gra, J. and R. Marte. The fruit sub-sector in the Windward Islands: diagnosis, strategy, actions. IICA, Office in St. Lucia. July 1987, 317 pages.



The above described situation, plus the need to avoid "putting all the eggs in one basket," has lead the governments of the Windward Islands to define agricultural diversification as one of the top priorities in their development policies.

Table 2 compares the average volumes of selected fruits exported over the decade 1975-85 with those exported in 1985. Two main characteristics are apparent, one is the generally low levels of exports and the second is the apparent lack of growth in fruit exports in recent years (even when there is growth, in percentage terms, the starting values are actually so low that the relative increase is meaningless). Table 3 shows the distribution of exports by commodity, by country and destination (regional and extra-regional). Of the total 1985 exports of fruit from the sub-region (20,852 tonnes), 27% were plantains, 13% were non-UK bananas, 12% grapefruit, 9% mangoes and 8% avocados. The remaining 31% was others. Of the total exports of fruit, 86% were exported to destinations within the region. Only 2,881 tonnes of all fruits were exported to extra-regional markets. This is roughly equivalent to one week shipment of bananas to the UK. Table 4 presents the evolution of the relative volumes of fresh produce exported since 1975. As shown, fruit exports have only increased significantly from Grenada and St. Vincent and in both cases the principal destination has been the market of Trinidad. In both cases, the statistics may be over estimated.

The four Windward Islands have several structural characteristics in common. These include: small size of farms, skewed distribution of land (with plantations occupying the largest areas and the best land) and a high proportion of owned land, although much of it without title (Table 5). This situation is aggravated by the fact that small farmers usually work on plots that are scattered and far from their place of residence.

In respect to production, Table 6 presents estimates of the acreage and production of selected fruits by country. It can be seen that bananas, by far, predominate in acreage and tonnage, with other fruit crops lagging far behind. The fruit which can be considered a distant second in importance to banana, in volume of production, is grapefruit, particularly in Dominica.

Governments of the four Windward Islands are divesting themselves of State owned land, distributing it in small plots in the order of five acres. At the same time, all governments of the Sub-region are calling for diversification, to allow import substitution and increased exports of non-traditional commodities. To many critics, these two goals seem contradictory as it is felt that exportable volumes of crops can only be produced on large farms. In fact, governments of the Sub-region are acting upon knowledge that farmers within the Sub-region are small farmers, who represent the future of the Sub-region. If the social and economic conditions of the small farmer cannot be improved, agricultural development will not occur and the Sub-region will stagnate. Governments, however, have a chronic lack of resources to provide the necessary services.



Table 1: volume and value of Exports of bananas from the Nirowara Islands by Country, 1980-87

YEAR	VOLUME (Tons) EXPORTED					VALUE (EC\$ Million) OF EXPORTS				
	BCA	SLU	SvS	BCA	TOTAL	BCA	SLU	SvS	BCA	TOTAL
1980	7966	28996	18603	11516	66981	7.977	23.831	16.364	11.100	64.292
1981	26454	43029	29427	11218	110128	24.613	33.593	27.149	10.020	101.385
1982	26637	42240	26385	9334	105046	26.910	42.208	24.689	9.150	102.957
1983	28219	53479	27142	5577	117456	30.334	50.168	29.700	9.750	119.952
1984	31135	64576	32490	8449	136649	30.037	64.207	31.959	7.885	134.088
1985	33295	90634	40077	7916	161922	35.966	89.528	45.620	9.646	179.760
1986	50474	110234	37641	7815	206164	67.832	150.551	53.322	10.110	281.815
1987	60648	93199	34750	8002	186599	82.840	113.741	47.599	10.900	254.970

Source: WINBAN

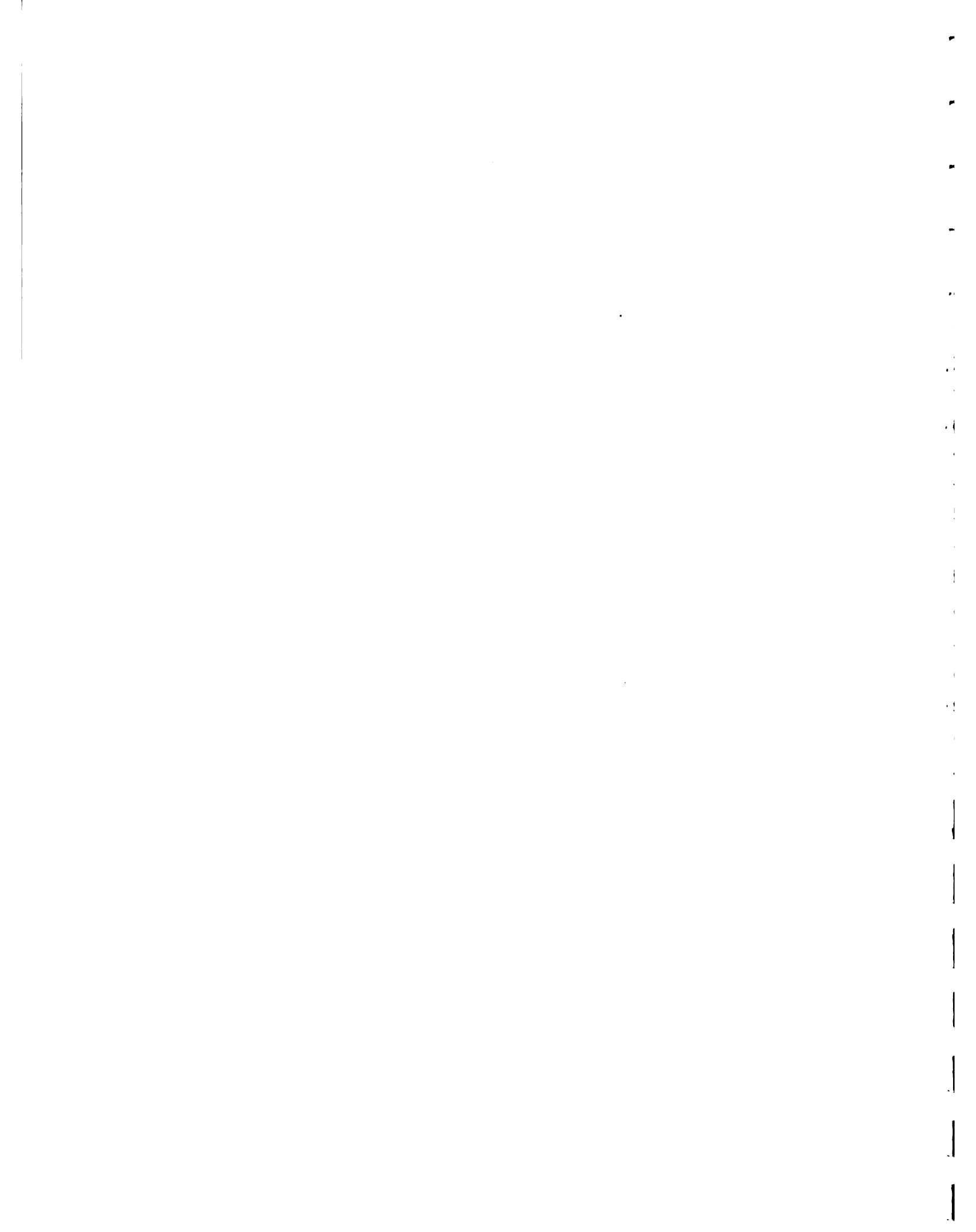


Table 2: Exports of Fresh Produce (excluding UK bananas) in 1985 in comparison with 11 year (1975-1985) Average, tonnes

Commodity	Dominica		Grenada(1)		St. Lucia		St. Vincent(2)	
	Ave.	1985	Ave.	1985	Ave.	1985	Ave.	1985
Mangoes	128	178	420	567	304	369	408	780
Avocados	50	68	297	618	7	28	344	880
Grapefruit	2291	2387	n.a.	35	31	48	49	47
Oranges	448	641	n.a.	36	27	28	74	n.a.
Limes	264	239	64	52	12	1	38	77
Plantain	459	645	426	1077	208	445	1914	3510
Breadfruit	-	-	-	13	480	912	-	-
Bananas (nonUK)	(3)	(3)	339	1162	98	285	125	599
Coconuts	(3)	(3)	154	4	315	2	1166	809
Other fruit	1132	738	1306	2331(4)	8	28	299	962(5)
Vegetables	184	167	31	71	81	40	133	113
Ground prov.	466	499	154	98	113	115	15752	42456

Source: La Gra, J. and R. Marte. The fruit sub-sector in the Windward Islands diagnosis, strategy, actions. IICA, Office in St. Lucia, July, 1987, 317 pages.

- (1) Eight year average 1978-1985
- (2) Seven year average 1979-1985
- (3) Other fruit includes non UK bananas & coconuts
- (4) Mainly soursop, golden and sugar apples, sapodilla, plums, pawpaw & tamarind.
- (5) Mainly golden apple

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Table 3: Exports of Fresh Produce (excluding UK bananas) from the Windward Island Sub-Region by Commodity, Country and by Destination, tonnes, 1985

Commodity	TO REGIONAL DESTINATIONS FROM					TO EXTRA-REGIONAL DESTINATIONS FROM					TOTAL EXPORTS	Percent of Total
	Dominica (a)	Grenada (b)	St Lucia (c)	St Vincent (d)	Sub Total	Dominica (a)	Grenada (b)	St Lucia (c)	St Vincent (d)	Sub Total		
Mangoes	171	567	2	632	1372	7	0	367	148	522	1894	9
Avocados	63	618	<1	876	1557	6	0	29	4	39	1596	8
Oranges	640	36	23	62	761	0	0	5	0	5	766	4
Grapefruit	1815	35	43	47	1940	572	0	5	0	577	2517	12
Limes	235	52	<1	77	364	5	0	<1	0	5	369	2
Breadfruit	0	0	71	0	71	0	13	847	94	954	1025	5
Plantains	642	1077	150	3505	5374	3	0	288	5	296	5670	27
Bananas:												
(non-UK)	703	1162	285	597	2747	0	0	0	3	3	2750	13
Soursop	0	914	1	34	949	0	0	42	0	42	991	5
Golden/sugar apples	0	762	0	947	1709	0	0	0	15	15	1724	8
Coconuts(dry)	3	4	0	436	443	6	0	12	377	395	838	4
Other fruit	25	656	0	3	684	0	0	28	0	28	712	3
Sub-total fruit	4297	5883	575	7216	17971	599	13	1623	646	2881	20852	100
Vegetables	152	71	0	52	275	15	0	40	61	116	391	
Ground provisions	499	98	0	42014	42611	0	0	115	445	560	43171	
Ginger	0	0	0	160	160	0	0	110	168	278	438	
Others	0	0	0	8	8	0	0	5	76	81	89	
TOTAL EXPORTS	4948	6052	575	49450 (1)	61025	614	13	1893	1396 (2)	3916	64941	

Source: La Gra, J. and R. Marte. The fruit sub-sector in the Windward Islands diagnosis, strategy, actions. IICA, Office in St. Lucia, July, 1987, 317 pages.

Information obtained from:

- (a) Central Statistics
- (b) Statistical Unit, Ministry of Agriculture
- (c) Annual Overseas Trade of St. Lucia, Statistical Dept., Ministry of Finance, Planning and Statistics.
- (d) Office of Statistics, Ministry of Finance, Planning and Development

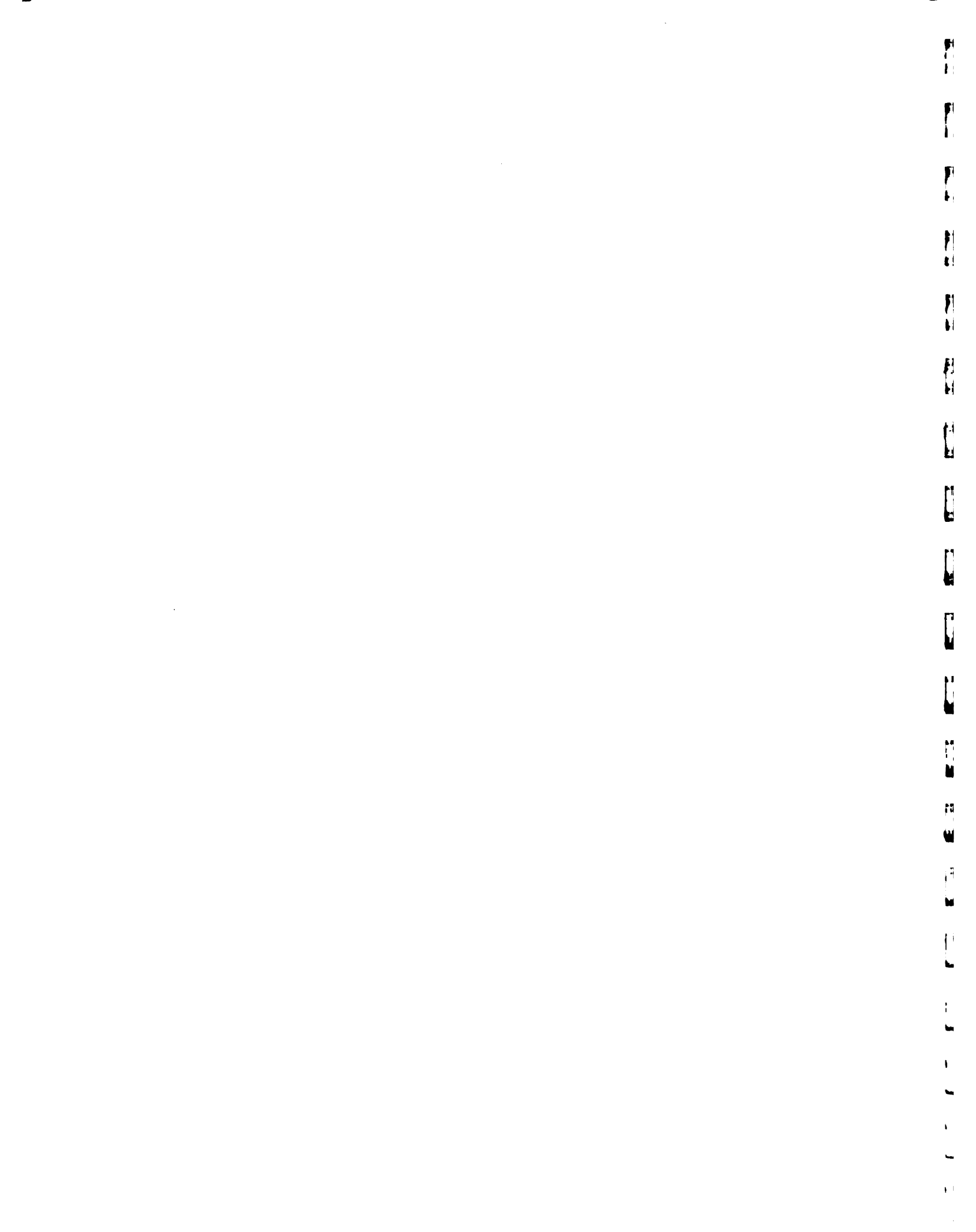


Table 4: Index of Volume of Exports of Fresh Produce by Country, Commodity Group and by Years (1975-1985)

Country: Commodity group	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Dominica:											
- fruits	100	84	80	91	42	33	38	56	61	65	67
- vegetables	100	107	213	198	71	75	95	129	204	174	123
- g.provisions	100	102	96	81	37	30	62	58	100	126	85
Grenada:											
- fruits (1)				100	226	150	190	137	385	548	556
- vegetables				100	55	38	36	2	28	14	111
- g.provisions				100	100	73	105	58	212	187	64
St. Lucia:											
- fruits	100	99	60	132	111	83	70	65	63	111	141
- vegetables	100	172	106	84	24	9	9	11	10	4	25
- g.provisions	100	77	74	45	30	31	28	15	20	29	46
St. Vincent:											
- fruits (with coconuts) (2)					100	93	101	96	88	219	237
- fruits (without coconuts) (3)					100	89	171	171	167	372	477
- vegetables					100	80	84	113	39	56	65
- g.provisions (3)					100	120	171	199	325	675	996

Source: La Gra, J. and R. Marte. The fruit sub-sector in the Windward Islands diagnosis, strategy, actions. IICA, Office in St. Lucia, July, 1987, 317 pages.

- (1) Very large jumps in indices in 1983, 1984 & 1985 may be a reflection of problems Traffickers have getting foreign exchange out of Trinidad. However, since the data for 1984 and 1985 are taken from estimates of exports made by the statistics section of the MOA, and based on observations during the loading of the schooners, they may be more accurate than official statistics based on declarations. The increase in exports do not necessarily mean that there has been an increase in production.
- (2) Index shows less change from year to year as declining coconut exports tend to offset the increase in exports of other fruits.
- (3) Big jumps in indices in 1984 and 1985 are thought to be more a result of over statements on customs declarations than of increases in actual production or exports. The over statements on customs declarations is linked to problem of getting foreign exchange out of Trinidad.

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Table 5: Some Characteristics of Farms in the Windward Islands by Country

Characteristics	Dominica	Grenada	St. Lucia	St. Vincent
Total land farm holdings (acres)	71363	34243	64228 (1)	29649
Total number farms	7922	8202	12398 (1)	6799
Average farm size (acres) (2)	9.0	4.2	5.2 (1)	4.4
Average number parcels/farm (3)	3	2.1	1.15(4)	1.4
% farms <1 acre	28	49	45 (4)	43
% land area	1	6	2 (4)	4
% farms <5 acre	47	88	82 (4)	89
% land area	11	31	14 (4)	26
% farms 50+ acres				
% land area				
Ownership (% farms)				
- owned (5)	76 (6)	66	93 (4)	70
- share tenancy	-	2	1 (4)	4
- rented	16 (5)	12	3 (4)	12
- mixed tenure	7 (5)	15	3 (4)	7
- rent free	1 (5)	0	0	3
- other	-	5	0	4
Number of crops normally grown in crop mix	4-8	6-8	2-7	4-7
Principal crops	bananas coconuts citrus	nutmeg cocoa bananas	bananas coconuts	bananas coconuts rootcrops

Source: La Gra, J. and R. Marte. The fruit sub-sector in the Windward Islands diagnosis, strategy, actions. IICA, Office in St. Lucia, July, 1987, 317 pages.

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Table 6: Estimated Production and Acreage of Selected Fruits in the Windward Islands by Country, tonnes, 1985

Fruits	Dominica		Grenada		St. Lucia		St. Vincent		Total	
	Acres	Tonnes	Acres	Tonnes	Acres	Tonnes	Acres	Tonnes	Acres	Tonnes
Bananas (1)	4220	33963	2000	8007	12500	81986	7226	40078	30446	164034
Mixed farms	9000 (2)									
Mangoes	598	600	217	1702	350	250	300	2296	1465	4848
Avocadoes	238	163	117	1549	150	20	91	315	596	2047
Oranges	1217	580	198	917	600	600	50	375	2065	2472
Grapefruit:									2960	7878
- white	1615	5042	234	2113	410	377	111	167	na	na
- red	450	156	>		140	23	>		na	na
Limes	1235	1220	68	332	100	100	180	182	1583	1834
Other cit.	50	75	50	75	75	100	16	51	191	301

Source: La Gra, J. and R. Marte. The fruit sub-sector in the Windward Islands diagnosis, strategy, actions. IICA, Office in St. Lucia, July, 1987, 317 pages.

Original information obtained from the following sources:

- Banana statistics: WINBAN
- Non-banana fruit: BDD, Review of fruit tree crop development in the Caribbean. Barbados. October 1986.

(1) 1985 exports.

(2) In the case of Dominican bananas some 9000 acres grow bananas mixed with other crops.



1.2 Requirements for Effective Joint Marketing

Successful marketing necessitates being able to supply continuous volumes of quality produce at competitive prices, making the product available at the proper place and at the proper time. The concept of joint marketing implies that two or more parties will benefit to a greater degree by marketing together than by marketing separately. While it can be argued that joint marketing is necessary in the Windward Islands to obtain sufficient volumes of quality produce on a regular basis, the exact model to follow may vary greatly with the respective commodity and market conditions. A broad definition of joint marketing therefore permits many alternatives: one might follow the WINBAN/Geest banana model, while another might simply be close coordination between organisations in different islands in the production/marketing of a specific crop for a specific market, as determined by CATCO. Joint marketing should only be undertaken when the added advantages outweigh the added disadvantages.

Joint marketing is not a panacea, it has all the complications of separate marketing plus the added problems and difficulties which tend to arise whenever integration and coordination are required between persons or organizations having distinct interests and resources. With more than one country, institution or person involved, decision making becomes more complex. This can lead to delays and other inefficiencies - which cost money.

An important point to stress here is that joint marketing of produce can only occur if satisfactory conditions for production and marketing exist at the country level. Although the lack of markets and marketing may be the critical problem, there are no "marketing" solutions, only integrated solutions, and these begin at the country level.

In summary, it can be argued that for sufficient volumes of quality produce to reach intended markets opportunely, and at competitive prices, from the Windward Islands, it will be necessary to organize production so that some type of joint marketing can be undertaken.

For joint marketing to occur a series of conditions must be met. These prerequisites are summarized below:

1.2.1 National Level

1.2.1.1 Institutional Aspects

- 1) The relevant institutions at the national level must be properly organized.
- 2) Relevant policies at the national level must be clearly defined and operative.
- 3) Facilitating services essential to effective production and marketing must be available and efficient.
- 4) Effective inter-institutional coordination must be in place.



1.2.1.2 Ecology

- 1) Crops intended for development should be selected from those best adapted to ecological conditions of each country.

1.2.1.3 Preproduction

- 1) Adequate facilities, including infrastructure for propagation (nurseries), museum plots and others, must be in place to produce quantity and quality planting materials of the right type.
- 2) Human resources with the capacity to plan and manage the propagation process must be available.

1.2.1.4 Production

- 1) Fruits of the right cultivars must be produced at the proper time and in sufficient quantities to permit market penetration.
- 2) Cultural practices must be adequate to ensure efficiency in terms of yields, fruit quality and price.
- 3) Control of pests and diseases must be feasible in economic terms.
- 4) Production costs must permit price competition on the intended market.

1.2.1.5 Harvest

- 1) Harvesting techniques must be adequate to maintain product quality.

1.2.1.6 Postharvest Handling

- 1) Minimum infrastructure and equipment must be in place to allow the maintenance of product quality, at competitive costs.
- 2) Human resources must have the necessary skills to operate the infrastructure and equipment and to efficiently handle the commodity from harvest to the point of export.

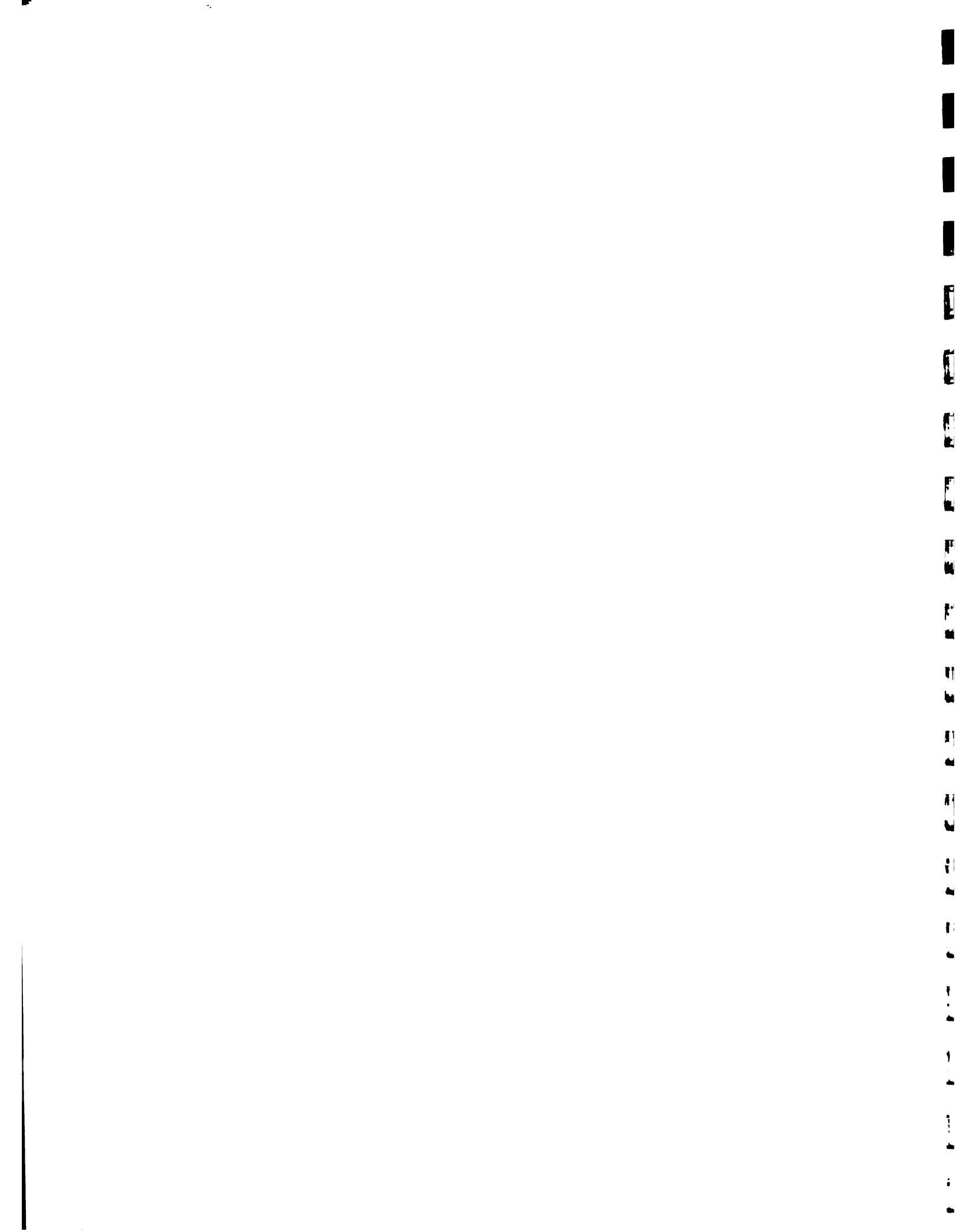
1.2.1.7 Export Marketing

- 1) Adequate infrastructure must be in place at air and sea ports.
- 2) Common regulations and standards must be clear and effectively enforced in each island.
- 3) Adequate transportation must be available.

1.2.2 Regional Level

1.2.2.1 Organization

- 1) Policies and agreements between countries must be defined and coordinated through a proper planning mechanism.
- 2) An institutional structure must be in place to execute the agreements, to handle the operational aspects and



to provide the necessary services, including market intelligence.

1.2.2.2 Transportation

- 1) A satisfactory transportation system must be operational.

1.3 Methodological Approach

In the identification of projects to implement a diversification policy, two complementary approaches can be used. The first takes a commodity, or commodity group, approach and moves horizontally from pre-production through the production, harvest, postharvest and marketing stages. The end result of this approach is commodity specific projects, e.g. development of the production and marketing of mangoes for export (Figure 1). The second approach cuts across commodity lines and identifies sectoral projects to strengthen necessary services (marketing, credit, extension, infrastructure and others). This document considers both complementary approaches, but only for fruits.

In what follows, Chapter II summarizes the problems from the sectoral view point, Chapter III provides a brief analysis by commodity and Chapter IV presents the proposed Strategy and Project Profiles related to joint marketing of fruits in the Windward Islands.

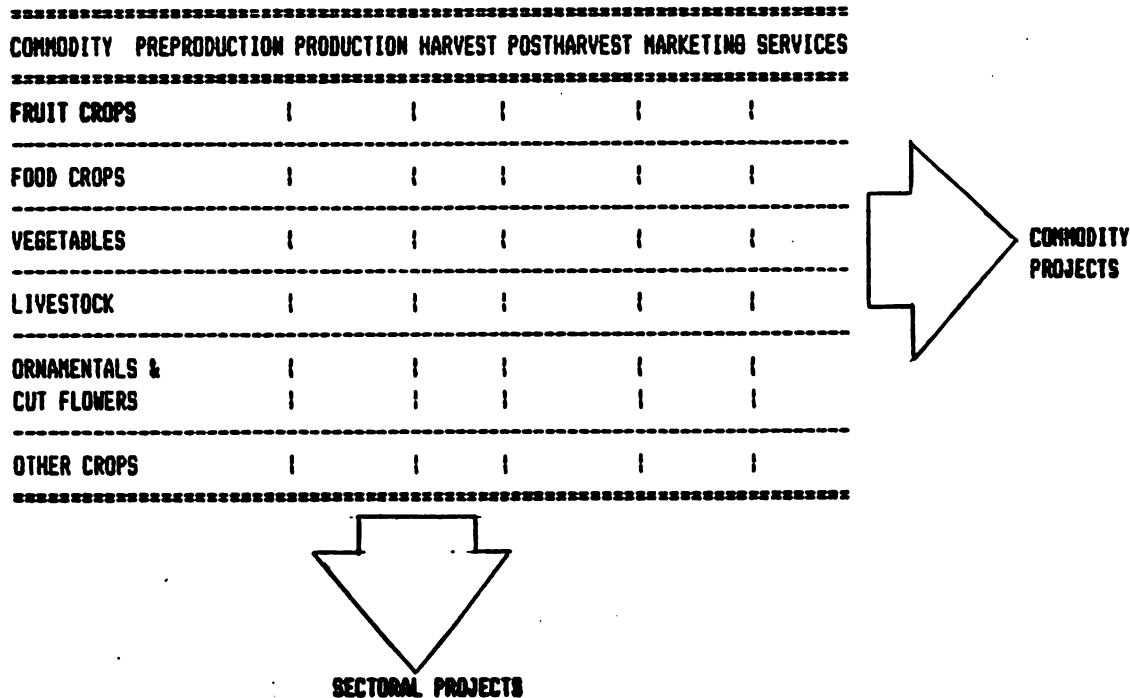


Figure 1: Complementary Approaches used in the Identification of Projects for the Development of the Tree Fruit Sub-Sector in the Windward Islands



II. SECTORAL PROBLEM IDENTIFICATION

This is a brief, not exhaustive, listing of the main problems found to be affecting the organized production and marketing of fruits in the Windward Islands, based on a recent IICA study.^{1/} For ease of presentation the problems are listed by components of the food production/marketing system.

2.1 National Level

2.1.1 Institutional Structure

2.1.1.1 Public Sector

- 1) There is a general lack of clear policy statements as related to the fruit subsector, particularly in respect to:
 - . Fruit crop priorities.
 - . Land use.
 - . Plant propagation and quality control.
 - . Generation and transfer of technology.
 - . Involvement of farmers organizations in production and marketing.
 - . Credit to small farmers.
 - . Harmonization of national policies in marketing.
- 2) Facilitating services are unavailable, or weak, particularly in the areas of market intelligence, production statistics, research and transfer of technologies in production and postharvest handling.
- 3) Chronic shortage of human and financial resources within institutions to provide services in all areas.

2.1.1.2 Private Sector

- 1) There is a lack of sufficient farmers organizations capable of carrying out organized production and marketing of fruits.
- 2) Existing farmers organizations (non-commodity associations) are weak in their planning and management capabilities and have a chronic shortage of resources (technical, physical and financial).
- 3) Little communication and coordination between existing farmers organizations.
- 4) Limited backward and forward linkages between production, processing and marketing (including both inputs and outputs).

^{1/} La Gra, J. & R. Marte. Ibid.

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2.1.2 Technical Aspects

2.1.2.1 Crop Priority Setting

Lack of clearly defined crop priorities, stemming from the following causes:

- 1) Inexistent or unreliable production statistics.
- 2) Lack of market intelligence and analysis.
- 3) Lack of information on real costs of production.
- 4) Lack of information on local ecological adaptation of main fruit crops.

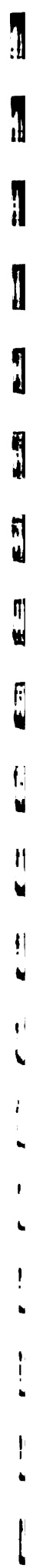
2.1.2.2 Pre-production

At the moment there are 17 nurseries in the Windward Islands, all of which are Government run. The most important problems found are:

- 1) Lack of, or poor, infrastructure, including:
 - . Shade houses in need of repair.
 - . Lack of mist houses and humidity beds.
 - . Lack of soil sterilization facilities.
 - . Inappropriate germination bins.
 - . Lack of satellite nurseries.
- 2) Insufficiently trained personnel in the following areas:
 - . Planning of nursery activities (targets, distribution systems, daily activities).
 - . Nursery Management (avoidance of plant contamination, increased rates of survival, maintenance of "standards" to guarantee plant quality).
 - . Propagation techniques (increased percentage of take, guaranteed plant quality, guaranteed tolerance to pests and diseases).
- 3) Poor sources of planting material resulting from:
 - . Buying of contaminated seeds, e.g. avocados.
 - . Lack of virus-free plots.
 - . Poor maintenance of museum plots.

2.1.2.3 Production

- 1) Lack of fruit uniformity and short harvesting seasons. Although some selected cultivars are being planted in organized orchards, the bulk of fruit production still comes from a wide variation of local seedlings. There are three main problems associated with the production from seedlings:
 - . Lack of uniformity of the fruits (size, colour, shape, taste, fiber, number of seeds, and so on).
 - . A highly concentrated production season (2-3 months).



- . The difference in management practices required because of the wide variability among them.
- 2) Establishment and cultural practices

The most common problems are:

 - . Few pure stand orchards and predominance of stands with multi-cropping patterns.
 - . Scattered trees and inefficient intercropping production systems which complicates the application of cultural practices.
 - . Marginal care of fruit trees which contributes to low yields and low quality.
 - . Lack of validated technology on efficient cultural practices.
 - 3) Pests and diseases
 - . Presence of pests of quarantine significance such as the mango seed weevil (Stenochetus mangiferae) in St. Lucia and Dominica.
 - . Unknown Fruit Fly status in Dominica and St. Lucia.
 - . While government institutions have identified their roles in the identification of pests and diseases, have designed control programmes for some of them and have established quarantine procedures, the shortage of human and financial resources has not permitted the effective development of these programmes.
 - 4) Production costs
 - . Lack of reliable costs of production studies makes it difficult to determine comparative advantages or disadvantages.
 - . Relatively high costs of labour as compared with other producing countries within the Caribbean, e.g. Dominican Republic.
 - . Relatively high costs of farm inputs.
 - . Due to low yields and high percentage of damaged fruits (low quality), the per unit costs of exportable produce is high.
 - 5) Generation and transfer of technology
 - . Little or no research to generate technology to overcome the limiting constraints.
 - . No validation of imported technology prior to its application.
 - . Ineffective model of transfer of technology.

2.1.2.4 Harvest

Damage of fruit during the harvesting stage is one of the main causes of postharvest fruit losses. These damages are due to:

- 1) Inappropriate techniques, and
- 2) Inappropriate tools or use of tools.

2.1.2.5 Postharvest Handling

- 1) With the exception of bananas, and grapefruit in Dominica, postharvest systems have not been designed for specific crop needs and required equipment is often unavailable.
- 2) Underutilization of existing infrastructure, including marketing board facilities and banana internal buying depots.
- 3) Lack of technological packages for training extensionists, farmers and intermediaries in proper post-harvest handling for selected commodities.
- 4) Inadequate wharf facilities for inter-island shipping.
- 5) Lack of cooling facilities for extra-regional exports.
- 6) Lack of information on the principal causes of post-harvest losses of priority crops.

2.1.2.6 Domestic Marketing

- 1) Lack of information on domestic demand in terms of volumes and quality demanded and respective prices paid by each type institution.
- 2) Underdevelopment of the agro-industrial sector caused by:
 - . lack of clearly defined policies;
 - . small domestic demand;
 - . lack of market research;
 - . lack of continuity of supply of raw materials.
- 3) Weak functions of marketing boards and under-utilization of farmers organizations.

2.1.2.7 Export Marketing

- 1) Lack of well organised facilitating services including: production information, market intelligence, input supply, training and credit.
- 2) Weak coordination/communication between public sector institutions and traders, farmers organizations and other organizations involved in regional/extra-regional trade.
- 3) Tendency to export surplus produce rather than produce for export.
- 4) Lack of general awareness of the interdependency between production, postharvest handling and marketing.



- 5) Lack of transportation alternatives, both by sea and air.
- 6) Generally weak nature of farmers organizations dealing with non-traditional crops.

2.2 Regional Level

- 1) Duplication of efforts in market research and promotion and little communication of market information and opportunities between islands.
- 2) Underutilization of the services of CATCO.
- 3) Lack of well defined minimum standards regarding weights and measures, packaging and labeling.
- 4) Large number of crops being exported from the region in very small quantities.
- 5) Lack of coordination between farmer organizations on different islands.
- 6) Transportation, availability and costs, to European markets is a major constraint.
- 7) Competition between islands for same cargo space.
- 8) No established mechanism to permit planning and coordination of production for export.



III. COMMODITY ANALYSIS

3.1 TRADITIONAL FRUIT TREE CROPS

3.1.1 MANGOES (Mangifera indica)

3.1.1.1 Market

1) Demand

The demand for mangoes looks good, is growing and is expected to continue for the next decade in both regional and extraregional markets, including EEC countries and North America. Annual imports to the EEC countries exceed 17,000 tonnes while the USA imports over 45,000 tonnes per year.

2) Exports from Sub-region

Total exports of mangoes from the four Windward Islands was 1,894 tonnes in 1985. Of this, 72% went to regional markets and 28% to extraregional markets. Principal exporters to the region were St Vincent and Grenada. Principal exporters to extra-regional markets were St. Lucia and St. Vincent.

3.1.1.2 Crop Adaptability

1) Ecology

While zoning may be required to produce best quality, all four islands have regions with favourable conditions for growing mangoes on a commercial scale.

2) Pests and diseases

Mango seed weevil is present in St. Lucia and Dominica. This pest, for its quarantine significance, reduces market alternatives for these two islands as produce cannot be shipped to USA, Virgin Islands, Barbados, Trinidad and some other regional markets. Fruit fly surveys in Grenada and St. Vincent have shown these two islands are free from fruit flies. This is significant since it opens possibilities for large scale markets in the USA for mangoes and other fruits and gives these two islands certain comparative advantages. While the presence of Anastrepha obliqua has been reported in St. Lucia and Dominica, a detailed survey is pending to determine the fruit fly status on these islands. Anthracnose is the most important disease affecting mangoes in the sub-region and most cultivars and/or types of mango being grown are susceptible.

3) Cultivars

Julie, Imperial and Graham are the most important of the selected cultivars. However, the bulk of production still comes from nonselected seedlings. Evaluation of high quality cultivars, eg. Fla. cultivars, have been poor.



3.1.2 AVOCADOES (Persea americana)

3.1.2.1 Market

1) Demand

The market for avocados expanded rapidly in the last decade. Today it continues to grow but at a decreasing rate. Extra-regional demand is principally in Europe since the USA meets most of its demand with internal production and also supplies Canada. Regional demand may continue to fade away as most countries strive towards import substitution. EEC annual imports exceed 86,000 tonnes while the USA imports less than 10,000 tonnes per year.

2) Exports from Sub-region

Total exports of avocados from the sub-region was 1,596 tonnes in 1985. Of this, 98% went to regional markets. St Vincent and Grenada were the principal exporters to regional markets. St Lucia was the major exporter to extra-regional markets with only 29 tons.

3.1.2.2 Crop adaptability

1) Ecology

All four Islands have regions with favourable conditions for growing avocados in commercial stands. For future plantings, zoning is required.

2) Pest and Diseases

To date no pest or disease of quarantine importance has been recorded for this crop, within the sub-region. Root and foot rot caused by Phytophthora cinnamomi are the most important constraints to avocado production in the four islands.

3) Cultivars

Of selected cultivars, Pollock, Simmonds and Lula are the most popular. However, the bulk of the production within the subregion is derived from seedlings of a wide range of nonselected West Indian type avocados. The short season, which reduces availability, is a major problem to overcome.

3.1.3 PLANTAIN (Musa AAB Group)

3.1.3.1 Market

1) Demand

The demand for plantain is very significant in all three of the extra-regional markets, particularly the USA where over 100,000 tonnes are imported annually. Competition for this market is keen, however, with such traditional suppliers as the Dominican Republic and Central American countries. Potential exists for expanding sales to both UK and Canada ethnic markets but the extent of this demand is presently unknown.

- 2) Exports from Sub-region
After bananas, plantains is the principal fruit exported from the Windward Islands, reaching 5,670 tonnes in 1985. Of this total, only 5 percent was destined to extra-regional markets. St. Vincent is the principal exporter with 62% of total, followed by Grenada with 19% (Table 3). Nearly all of the exports from these two islands is destined for Trinidad.

3.1.3.2 Crop Adaptability

- 1) Ecology
All four islands have excellent conditions for growing plantain on commercial scale. The crop requires similar conditions as bananas and actually competes with bananas for the same lands.
- 2) Pests and diseases
No pests and diseases of quarantine importance have been recorded in Dominica, St. Lucia or St. Vincent. Moko disease is present in Grenada and represents a threat to regional trade. Pests and diseases affecting production are banana borer Cosmopolites sordidus and a number of different types of nematodes. Control methods are well known for these pests.
- 3) Cultivars
Horn (Dwarf, Horn) and French (Ordinary, Dominique) are the most common varieties. Horn plantain is the variety in demand for the extra-regional trade.

3.1.4 GRAPEFRUIT, LIMES AND ORANGES (Citrus spp.)

3.1.4.1 Market

- 1) Demand
Grapefruit: Is considered a mature market. Any large increase in supply will likely cause a significant decrease in price. Competition requires top quality, large volume and low prices.
Oranges: Demand is limited mainly to the regional market. Barbados imports significant volumes from within and outside the region. Most potential lies in processing for juice and segments.
Limes: Relatively small market showing slow growth. Competition is very keen and prices must be kept low.
- 2) Exports from Sub-region
Grapefruit: In 1985, 2,517 tonnes of grapefruit were exported from the sub-region. Of this, 77% was shipped within the region and 23% to the UK, during a two month market window. Dominica was the only exporter to extra-regional markets and shipped 94% of the exports within the region.

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Oranges: A total of 766 tonnes of oranges were exported from the four islands in 1985. Nearly all went to regional markets and 84% originated in Dominica.

Limes: Exports of limes in 1985 reached 369 tonnes and, except for trial shipments to extra-regional destinations, all sales were made within the region. Dominica accounted for 64% of lime exports. St Lucia exports of limes were near zero.

3.1.4.2 Crop adaptability

1) Ecology

All four Islands have regions with excellent conditions for growing grapefruit, limes and, to a lesser degree, oranges, on a commercial scale. A more technical zoning is required so as to obtain better quality and yield and to facilitate the delivery of services and marketing.

2) Pests and diseases

To date no pests or diseases of quarantine significance have been recorded in Grenada and St. Vincent. Although Anastrepha obliqua has been reported in St. Lucia and Dominica, surveys are pending to determine their fruit fly status. None of the Islands have a virus indexing programme so the status of viruses is presently unknown. The presence of "Citrus Tristeza Virus" in the Island of Carriacou has been mentioned but not confirmed.

3) Cultivars

Most of the good, high quality cultivars for all three citrus species are available in the sub-region. However, for future expansion these materials should not be used since they may be contaminated by viruses.

3.1.5 BREADFRUIT (Artocarpus altilis)

3.1.5.1 Market

1) Demand

Extra-regional demand looks good, is growing and is expected to continue for the next decade. Main markets are ethnic ones within the UK and Canada and a rapid growing USA market being developed by JR Brooks Company of Florida. Annual imports by the UK are on the order of 1,500 tonnes annually and the Windward Islands are the major supplier.

2) Exports from the Sub-region

Breadfruit exports (1,025 tonnes) in 1985 were destined primarily to extra-regional markets (93%). St Lucia was the principal exporter (90%) and the UK was the principal destination. St Vincent was second, accounting for 9% of total exports while Grenada only made trial shipments and Dominica did not export at all.

3.1.5.2 Crop Adaptability

1) Ecology

The four islands have natural ecological regions with excellent conditions for growing breadfruit commercially. However, the main source of production is from scattered trees spread over the islands. The existence of sheltered areas with excellent conditions for growing breadfruit opens the possibility to concentrate production on commercial size orchards.

2) Pest and diseases

No pests or diseases of quarantine importance have been reported on this crop. Very few pest and diseases of economic importance affect breadfruit production. Exceptions are Rosellinia sp. and Diaprepes sp., both affecting the root system of breadfruit in Grenada.

3) Cultivars

All production comes from non selected trees. However, in St. Vincent three types (common, cashee and cocobread) are recognised. Several other types are known in St Lucia (cream, white, among others).

3.1.6 SOURSOP (*Annona muricata*)

This crop is found throughout the islands of the Caribbean. There are no commercial orchards in the Windward Islands.

3.1.6.1 Market

1) Demand

Soursop is recognised as a fruit with potential, particularly as a juice and ice-cream flavouring. Fresh produce is exported to the ethnic markets in the UK and Canada. Demand statistics are not readily available as exotic fruits of this nature, imported in small amounts, are often lumped into the "other" category. Most soursop imports into the USA are in the form of frozen fruit pulp.

2) Exports from Sub-region

Of the 991 tonnes of soursop exported from the sub-region, 92% (914 tonnes) emanated from Grenada, 4% from St Lucia and 4% from St Vincent. Of this total, 96% was shipped to regional markets, mainly Trinidad.

3.1.6.2 Crop adaptability

1) Ecology

All four islands have significant areas with excellent ecological conditions for growing soursop on a commercial scale.

2) Pests and Diseases

No pests or diseases of quarantine importance have been recorded in Grenada and St. Vincent. Fruit fly

surveys are pending in Dominica and St. Lucia. Obtaining fruit fly free status is necessary for developing new, fresh produce markets in the USA but is not necessary if the fruit is processed.

3) Cultivars

Local seedlings are being used. Grenada has selected a number of clones with good characteristics.

3.2 Other Potential Export Fruit Crops

There are other crops with export potential, but not so well extended in the Caribbean, that can be considered as alternatives for development purposes. The main characteristics of several of them are summarised in the following table.



3.2 OTHER POTENTIAL EXPORT FRUIT CROPS

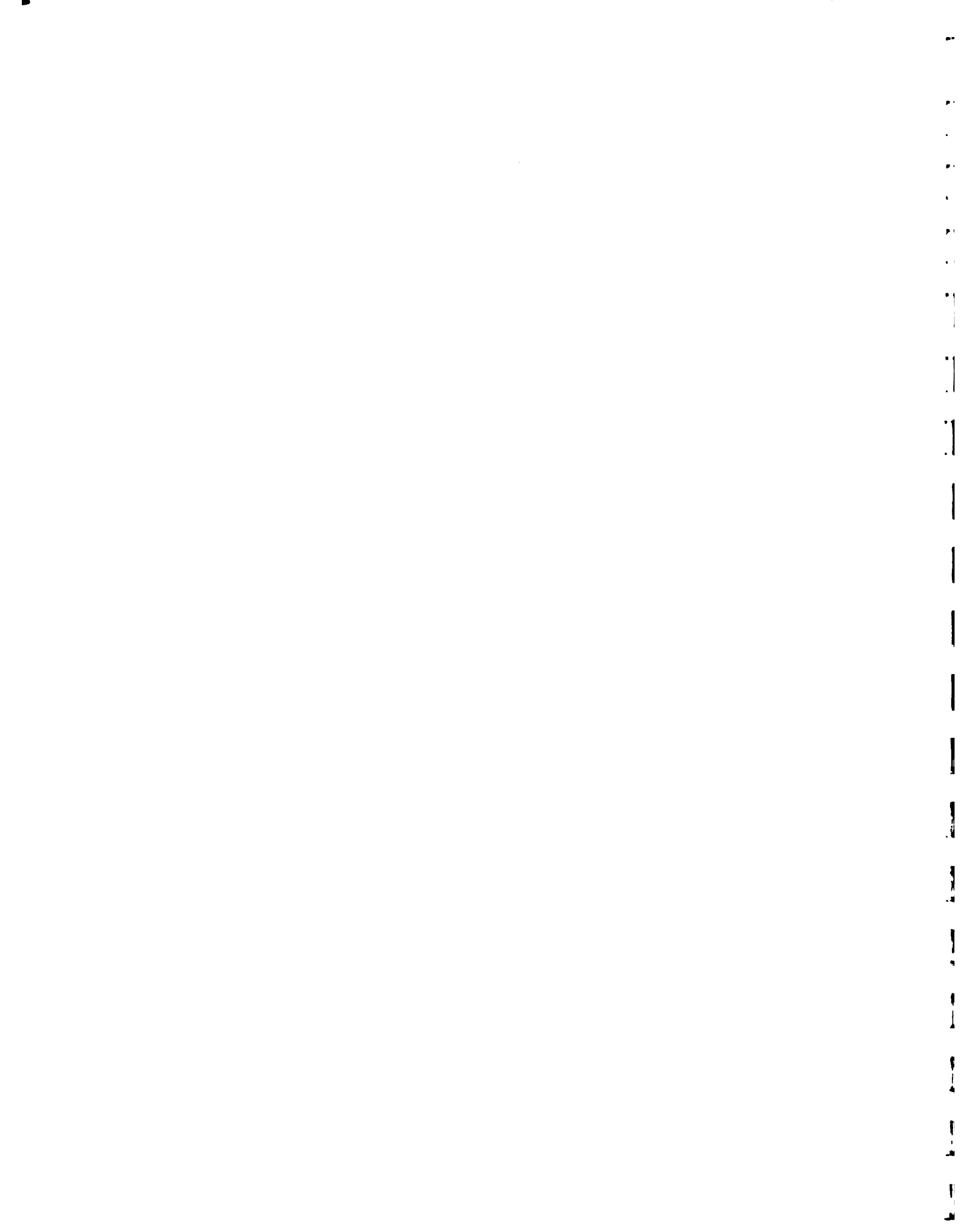
CROP	DEMAND	SUB-REGION		SERIOUS PESTS AND DISEASES		CULTIVARS
		SUPPLY	ECOLOGY	Affecting: Market	Production	
Papaya (<u>Carica</u> <u>papaya</u>)	Strong & growing USA, Canada and Europe.	Small: oriented towards domestic market.	Favourable in all 4 Islands, zoning required.	Fruit fly: Special clearance required for USA market from Dominica/St Lucia. Anthracnose: affects quality of product.	Bunchy Top Mites Anthracnose	Only selections tolerant or resistant to Bunchy Top within Solo group are recommended
Passion Fruit (<u>Passiflora</u> <u>edulis</u> var <u>Flavicarpa</u>)	Good and Growing: USA, Canada and Europe.	Limited supply, oriented to domestic market. Some regional trade.	Favourable in all 4 islands. Zoning required.	NONE	<u>Junco</u> sp.	Deep yellow. Many available. Pre- ference for self- compatible ones.
Pineapple (<u>Ananas</u> <u>comosus</u>)	Excellent but very competitive market. Unsatisfied demand within tourist sector in the region. Extremely difficult to penetrate USA market without agreement with large multi-nationals.	Small: oriented toward Domestic markets.	St Lucia has most suitable land but areas may be found within other three Islands also.	NONE	Mealybugs Nematodes	Local and regional markets prefer <u>Antigua Black</u> . <u>Smooth Cayenne</u> (Double purpose fresh & processed; well received on extra-regional market.
Carabola (<u>Averrhoa</u> <u>carabola</u>)	Rapid expanding market: USA	NONE	Favourable in all 4 Islands	Fruit fly: Special clearance required for USA market from Dominica and St. Lucia.	Nematode	Arkins and Hew are recommended for sweetness and yield. Can be imported from Fla.
Cashew (<u>Anacardium</u> <u>occidentale</u>)	Nut: Excellent in Europe, USA, Canada Pseudo Fruit: limited demand in USA	Very small	All 4 Islands have areas with favour- able conditions, St. Lucia to a larger extent.	NONE	Nematode Anthracnose	Production of producing countries based on local selec- tions. Many avail- able Brazil: Red & Yellow types.

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Continuation of Section 3.2

CROP	DEMAND	SUB-REGION SUPPLY	ECOLOGY	SERIOUS PESTS AND DISEASES		CULTIVARS
				Affecting: Market	Production	
Macadamia (Macadamia integrifolia)	Excellent and still growing in USA and Europe. High Price due to short supply and added value for agro-processing.	NONE, agroprocessing required for shelling.	Areas within highlands of Dominica, St. Vincent and Grenada have suitable conditions.	NONE	UNKNOWN	Beaumont, Pahau, Faulkner and Kohala are recommended
Asean Fruit -Mangosteen -Rambutan -Pulasan -Langsat -Durian	Mostly ethnic Asian population in USA. Air transportation required. Nearness to market gives competitive advantage to subregion.	NONE	All 4 islands have suitable areas, St Vincent & St Lucia to a lesser degree.	Fruit fly: Special clearance required for USA market from Dominica and St. Lucia.	UNKNOWN	Several available most of them from Indonesia, Malaysia, Thailand and the Phillipines.

Source: Adapted from La Gra, J. and R. Marte. The fruit sub-sector in the Windward Islands: diagnosis, strategy, actions. IICA, Office in St. Lucia. July 1987. 317 pages.



IV. PROPOSED STRATEGY

Recapitulating, the main considerations for diversification of the fruit sub-sector in the Windward Islands are:

1. Monocultural pattern based mainly on banana production.
2. Protected banana market through an agreement with the U.K. to be modified in 1992.
3. Difficulty to compete with Latin American countries in banana production on an open, competitive market.
4. High and increasing food import bill due to the development of the tourist industry and changes in the patterns of consumption of local populations.
5. Comparative advantages in the production of selected fruits in the Windward Islands.

With this situation in mind a strategy for the development of the fruit sub-sector, through diversification, has been formulated. The main goal being: to improve the trade balance of the agricultural sector through exports and/or import substitution of selected fruits.

In this document, emphasis is given to export development, acknowledging that import substitution, particularly of fruit juices and preserves in those countries with a relatively more developed tourist industry, may offer some potential, in terms of contributing to the improvement of the trade balance.

In respect to the strategy for export development, it should be emphasized that for an effective marketing thrust to be developed, and self-sustained, a joint effort of the four Windward Islands is called for. Only by joint marketing can satisfactory volumes of quality produce be made available on a continuous basis. It should also be understood that joint marketing cannot take place until certain minimum requirements are met at the country level. The proposed strategy therefore follows a bottom up approach, building upon existing strengths and overcoming priority constraints, at the country level, while developing the necessary sub-regional coordinating and operational mechanisms which will lead to eventual joint marketing.

The strategy will boost the availability of priority fruit species in two ways: first, by improving productivity of existing stands through improved cultural practices and tree rehabilitation and, secondly, by increasing the area planted.

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4.1 Crop prioritization

Because of land scarcity, on the one hand, and the need for specialization to facilitate market penetration, on the other, it is essential that joint marketing include relatively few commodities, and preferably those with the highest production and marketing feasibility. To select the priority crops for this work, besides ecological considerations, the following criteria were used:

- 1) Crops already in production in the four islands and produced in large enough quantities to permit immediate export.
- 2) Existing quarantine restrictions in potential import markets, particularly the U.S.A.
- 3) Market potential in each of the three main markets (UK, Canada, USA).

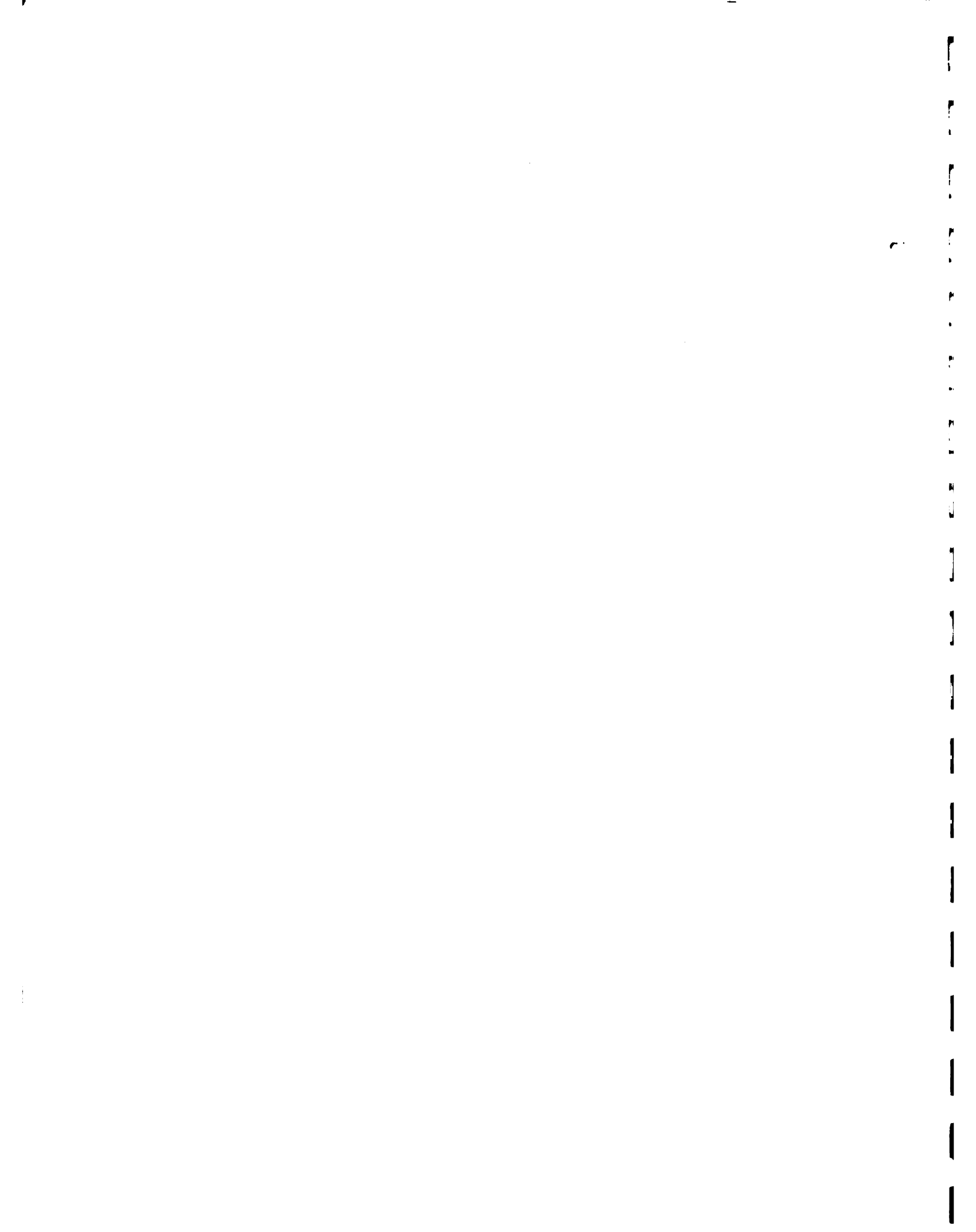
Out of the principal fruits grown in the sub-region, six were short-listed by including only those that are presently being exported in significant quantities, and have potential for increased exports, as well as having at least one good extra-regional market with limited competition from well established producers. These crops were: avocado, breadfruit, grapefruit, mango, plantain and soursop.

By considering the prioritization criteria presented, crops were assigned, arbitrarily, a priority ranking in each country, with the highest priority crop receiving the lowest number. Table 7 presents the final outcome of this prioritization exercise, as well as the total number of points, from a subregional perspective. In this way, the sub-regional crop priority was determined as follows:

- 1: Mango
- 2: Plantain
- 3: Breadfruit
- 4: Grapefruit
- 5: Avocado
- 6: Soursop

Although mango received 8 points, compared to 9 for plantain and 11 for breadfruit, it is not necessarily of highest priority in Dominica and St. Lucia, for the USA market, due to the existence of the mango seed weevil which effectively closes that market.

The strategy also proposes to look into crops that have not been grown in the Windward Islands, or produced only in small quantities in one or more of the countries. These fruits include cashews, carambola (5 fingers, star fruit), papaya, passion fruit and pineapple and in this paper are referred to as "new" fruit crops. Following a similar exercise as with the more traditional



fruits, Table 8 was prepared, resulting in the following regional prioritization for "new" crops:

- 1: Passion fruit
- 2: Carambola
- 3: Papaya
- 4: Pineapple
- 5: Cashew

While carambola received a higher ranking than papaya, the latter may have greater potential over the short run due to its relatively short production cycle and existing experience with this crop within the region. Although pineapple and cashew came out with the same number of points, considering the experiences of the French Islands in the production of pineapple, and pilot projects in St. Lucia and Grenada, this fruit should be ranked before cashew.

Table 7: Prioritization of Existing Fruit Crops in the Windward Islands

CROP	St. Lucia	St.Vincent	Dominica	Grenada	TOTAL
Avocado	4	4	5	5	19
Breadfruit	1	3	4	2	11
Grapefruit	5	5	1	6	17
Mango	3	1	3	1	8
Plantain	2	2	2	3	9
Soursop	6	6	6	4	22

Note: Lowest numbers mean highest priority.

Table 8: Prioritization of "New" Crops in the Windward Islands

CROP	St. Lucia	St.Vincent	Dominica	Grenada	TOTAL
Papaya	4	3	3	3	13
Passion fruit	1	1	1	1	4
Pineapple	3	4	5	4	16
Carambola	5	2	2	2	11
Cashew	2	5	4	5	16

Note: Lowest numbers mean highest priority.



4.2 Project Identification

The constraints identified in Chapter II have been organized into a tree diagramme with the major problems towards the top and the causes of these problems at lower levels (Figure 2). In this way it was possible to organize the problems and causes into groups which can be resolved through specific actions presented in project format. An analysis of the tree diagramme indicates three major problems:

- 1) Low volumes of exportable quality fruits;
- 2) Lack of a sub-regional coordinating/implementing body;
- 3) Lack of adequate transportation.

Since the transportation problem can only be effectively resolved once there exists larger volumes and continuous supplies, and since these two elements are a function of national production, this strategy proposes to concentrate at overcoming the production constraints at the country level while building an adequate marketing and coordinating mechanism at the sub-regional level.

From the analysis of the tree diagramme and considering the requirements for joint marketing presented in Chapter I, the following projects have been identified. For each of these project ideas a profile is presented in the appendix.

1. Creation of Windward Island Fruit Sub-sector Coordinating Committee.
2. Identification of Suitable Areas for Production of Selected Fruit Crops in the Windward Islands.
3. Strengthening Farmer Organisations in the Windward Islands.
4. Development of National Production Statistics.
5. Strengthening Plant Protection Capabilities in the Windward Islands.
6. Technology Generation and Transfer for Priority Fruit Tree Crop Production in the Windward Islands.
7. Improving the Supply of Quality Planting Material in the Windward Islands.
8. Fruit Crop Germplasm Bank for the Eastern Caribbean.
9. Rehabilitation of Standing Fruit Trees in the Windward Islands.
10. Pilot Projects for the Development of New Fruit Crops in the Windward Islands.

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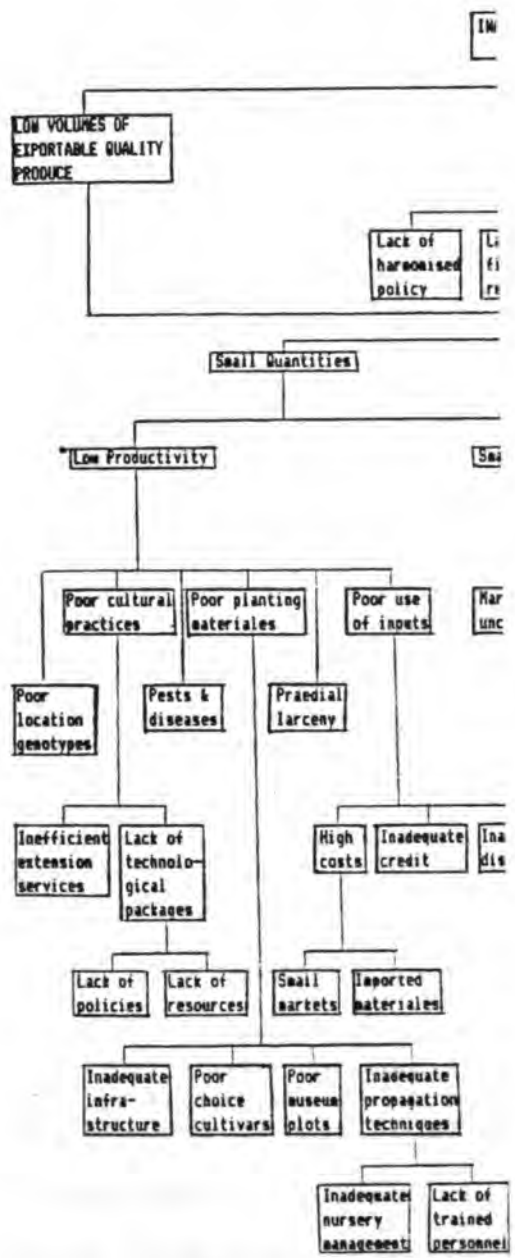


Figure 2: Tree Diagram of Problems and Causes of the Fruit Sub-Sector in the

market facilitator. CATCO has developed a great deal of valuable expertise over the past few years which should not be lost. This expertise can play a crucial role in the sub-regions diversification efforts. CATCO's goals should be reoriented or strengthened in 1988 towards the development of the following facilitating services:

- Assistance to exporters in the identification and development of specific markets for specific crops.

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4.3 Complementary Actions

The starting point and sine-qua-non condition for the implementation of the strategy is that a political decision be made to initiate a co-operative program along the lines herein proposed.

Once this is done, the following actions are envisioned:

1) Sub-regional coordination

It is necessary to have a sub-regional body with the responsibility for coordinating the diverse projects and activities comprising the strategy (Project 1). It is proposed that this Windward Islands Fruit Diversification Coordinating Committee (WINCO-OR) be composed of one representative from MOA and one from farmer organizations in each island, in addition to a representative from CATCO.

The main tasks of the body would be to determine production and marketing targets and to coordinate with regional, bilateral and international organisations, active in the Eastern Caribbean, the allocation of resources and specific responsibilities for the implementation of the diverse projects and actions. Recommendations would be made to governments for the harmonization of policies at country level.

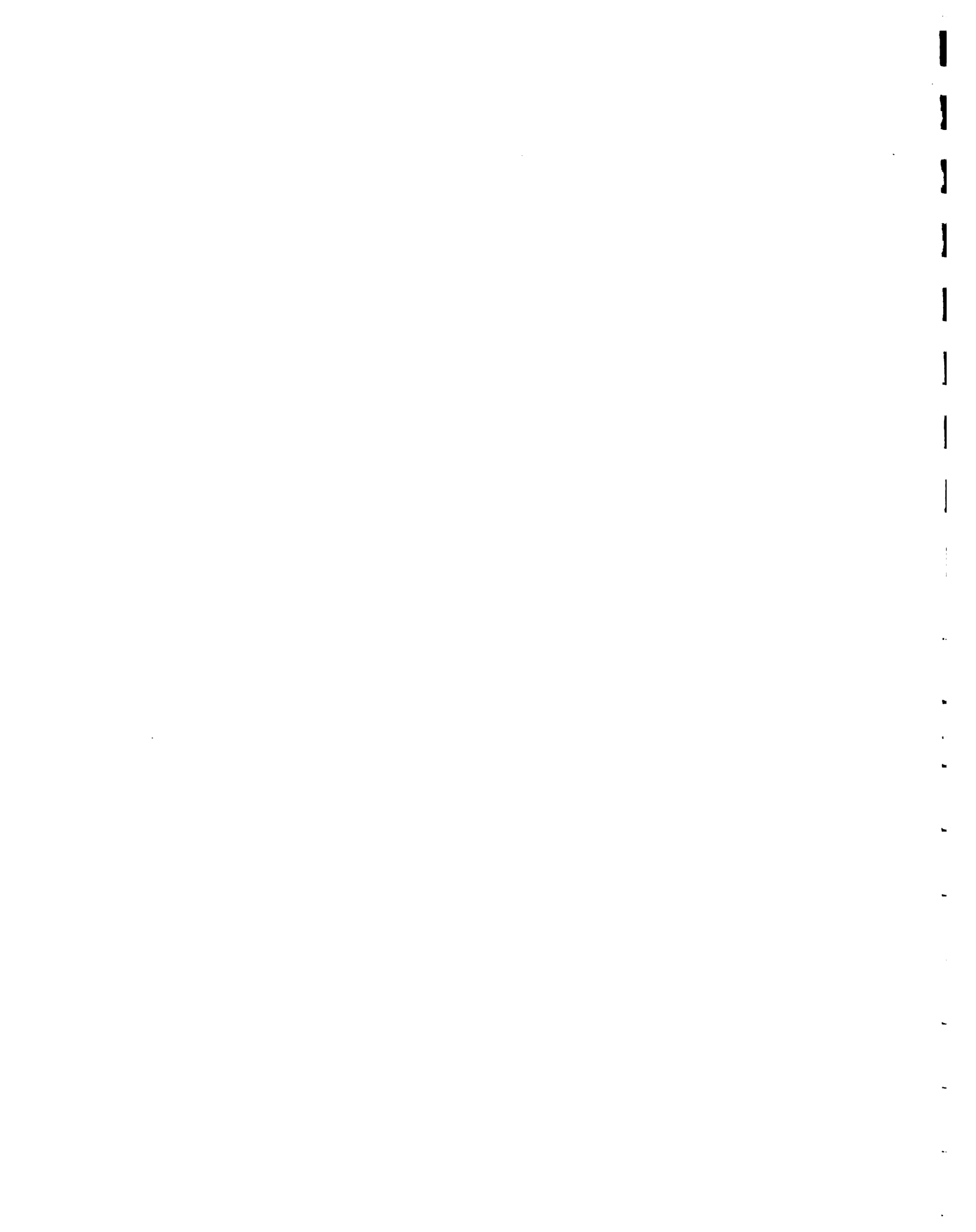
2) Project formulation and implementation

Through the Coordinating Committee, assistance would be obtained from regional and international organisations in the realisation of necessary feasibility studies and the formulation of the final development projects.

3) Strengthening of CATCO role as facilitator

CATCO presently carries out three distinct, but closely integrated, activities: developmental, facilitating and trading. However, CATCO is not the most adequate organisation within the region to organise production and strengthen farmer organisations, and as a trading company it often finds itself competing with local exporters for the same cargo space and/or supply and markets. The area where CATCO's services are most urgently required are as market facilitator. CATCO has developed a great deal of valuable expertise over the past few years which should not be lost. This expertise can play a crucial role in the sub-regions diversification efforts. CATCO's goals should be reoriented or strengthened in 1988 towards the development of the following facilitating services:

- Assistance to exporters in the identification and development of specific markets for specific crops.



- The development of a sub-regional market information service/network to satisfy the needs of producers and exporters.
- The establishment of central packing house facilities, where appropriate, which will rent space to exporters and where postharvest services can be offered, including technical assistance, supply of packaging materials and field crates, market intelligence, inspection and/or control and others.
- Test marketing for developmental purposes.
- Follow-up in the importing countries in respect to product control and payments to exporters.

4.4 Strategy Implementation

The principal steps in the execution of the proposed strategy are summarized in Figure 3. The effectiveness of the strategy will depend upon the dynamism of the Co-ordinating Committee. Many of the human and financial resources to implement the strategy are thought to be already available, or attainable over the short-run. Therefore, a dynamic executive arm of the Co-ordinating Committee is a must to identify, commit and monitor the use of these resources.

The total estimated cost of the 10 projects is approximately US\$8.6 million over 10 years. The time frame for implementation of the projects is presented in Figure 4. As can be noted, nine of the ten projects are initiated in the first year, thus another reason for having a versatile and effective Co-ordinating Committee. Project numbers 3, 5 and 6 can be initiated immediately as there are already actions underway in these three areas.



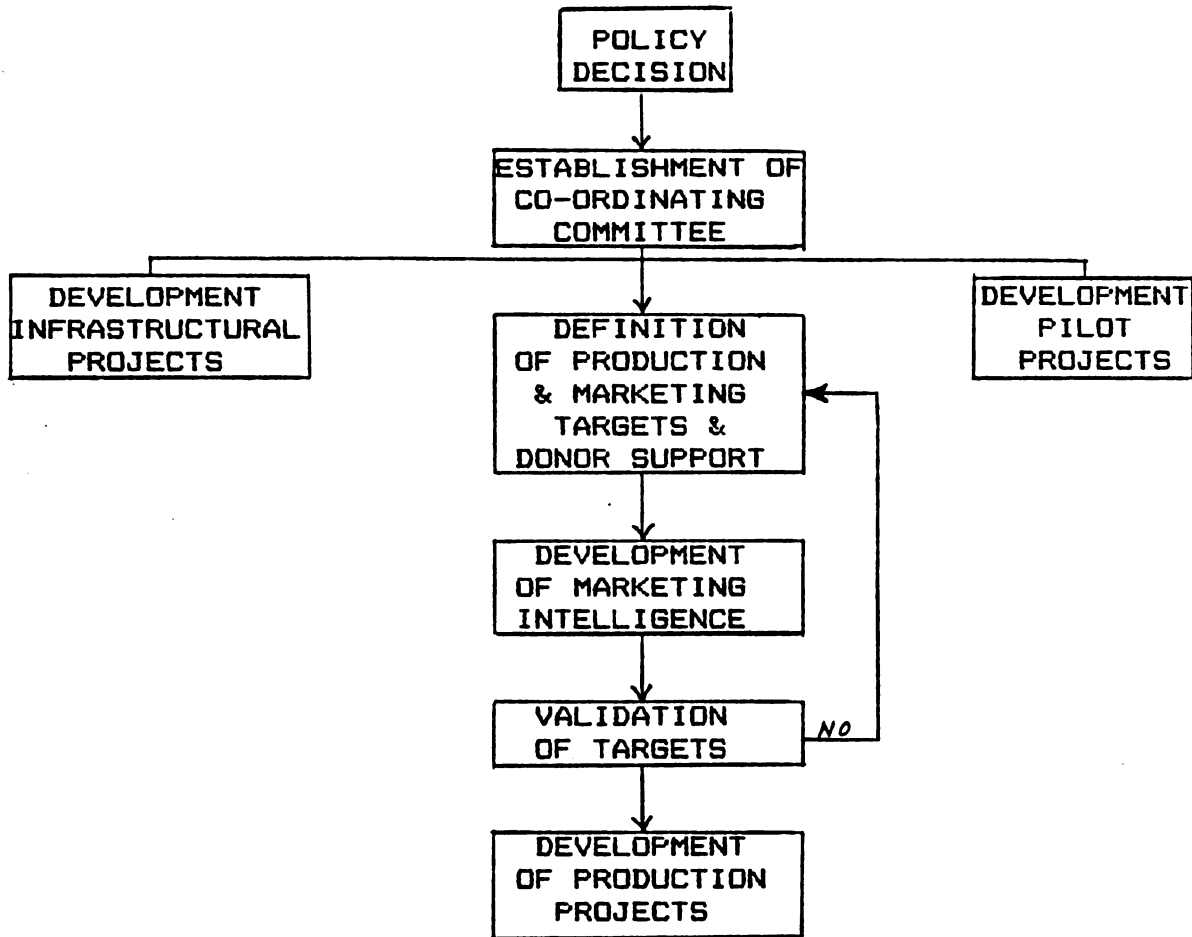
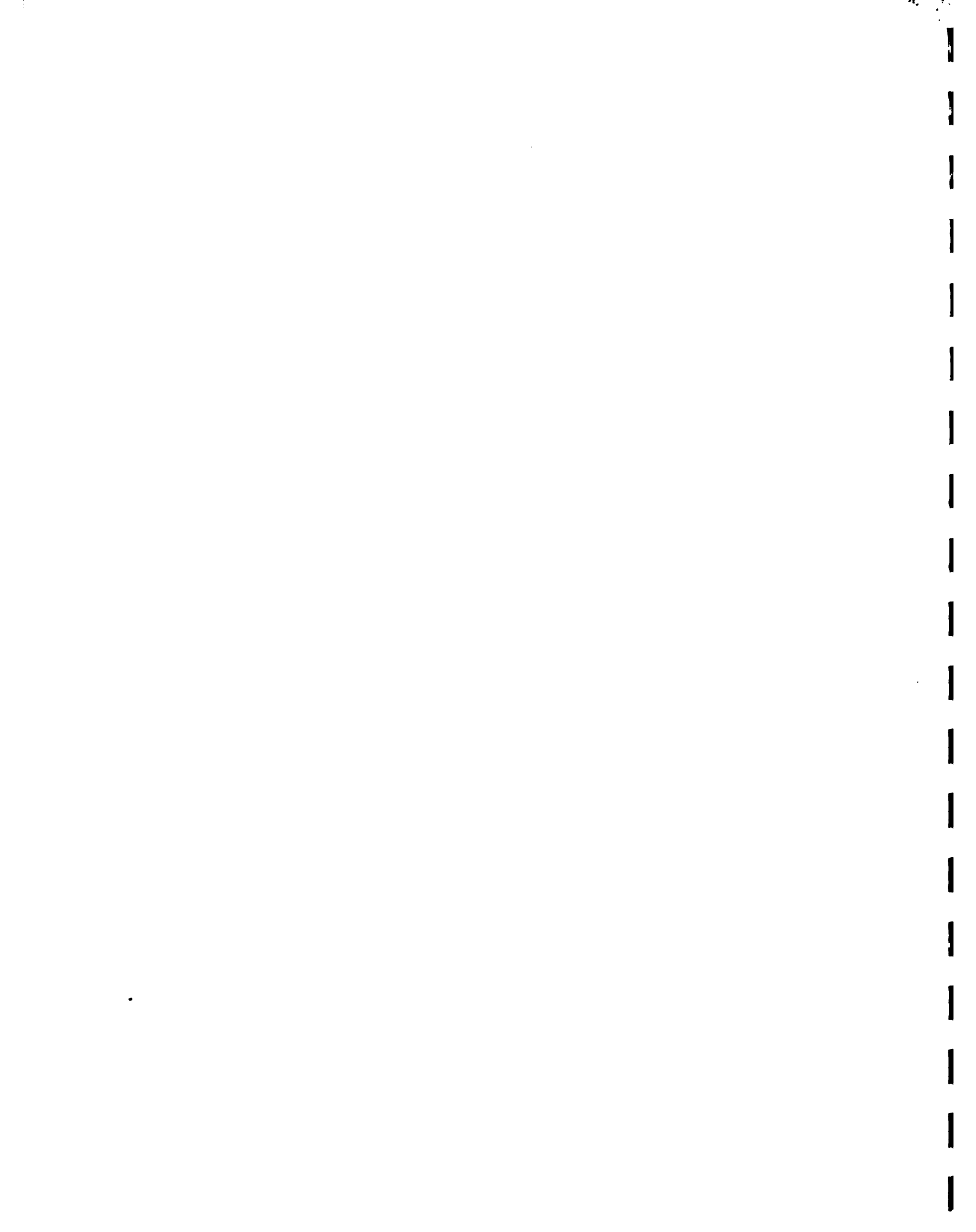


Figure 3: Principal Steps for Implementation of the Windward Island Fruit Sub-sector Development Strategy



Name of Project	Years of Duration										
	0	1	2	3	4	5	6	7	8	9	10
1. Creation of Windward Island Fruit Sub-sector Coordinating Committee.	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx (to be continued as needed)										
2. Identification of Suitable Areas for Production of Selected Fruit Crops in the Windward Islands.	xxxxxxxx										
3. Strengthening Farmer Organisations in the Windward Islands.	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										
4. Development of National Production Statistics.	xxxxxxxxxxxx										
5. Strengthening Plant Protection Capabilities in the Windward Islands.	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										
6. Technology Generation and Transfer for Priority Fruit Tree Crop Production in the Windward Islands.	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										
7. Improving the Supply of Quality Planting Material in the Windward Islands.	xxxxxxxxxxxx										
8. Fruit Crop Germplasm Bank for the Eastern Caribbean.	xxxxxxxxxxxxxxxxxxxxxxxxpermanent installationxxxxxxxxxxxx										
9. Rehabilitation of Standing Fruit Trees in the Windward Islands.	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										
10. Pilot Projects for the Development of New Fruit Crops in Windward Islands.	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										

Figure 4: Implementation Periods for the Proposed Projects Conforming the Windward Island Fruit Sub-sector Development Strategy



APPENDIX

**CREATION OF WINDWARD ISLAND
FRUIT SUB-SECTOR COORDINATING COMMITTEE**

1. OBJECTIVES

General: To contribute to export development and import substitution through agricultural diversification with fruits.

Specific: To create a coordinating mechanism to achieve an effective integration of all actions executed by national, regional, and international organisations leading to the development of the fruit sub-sector in the Windward Islands.

2. EXPECTED OUTPUTS

- 1) Co-ordinating committee in operation.
- 2) More effective utilisation of available resources.
- 3) Prioritisation of actions and constant monitoring of projects for the development of the fruit sub-sector in the Windward Islands.
- 4) Improved market intelligence.
- 5) Infrastructural projects formulated.

3. DESCRIPTION OF THE PROJECT

An interinstitutional committee with representatives from the public and private sectors of each island and CATCO will be established with powers and responsibilities for harmonising country policies and supervising the implementation of the fruit sub-sector strategy. The principal components include:

- 1) Planning of the fruit sub-sector development strategy.
- 2) On-going coordination of actions for implementation.
- 3) On-going monitoring of project components of strategy.

4. IMPLEMENTATION PLAN (five years)

<u>Key Activities</u>	<u>From Month</u>	<u>To Month</u>
1) Formation of Committee	1	1
2) Analysis of available resources	2	4
3) Validation of problem areas	4	5
4) Project formulation	5	end of project
5) Supervision, monitoring, coordination	1	end of project

For financing purposes the project will have a duration of five years, however, in practice the Committee should be established on a permanent basis.

5. ESTIMATED PROJECT COSTS

US\$350,000.00



**CREATION OF WINDWARD ISLAND
FRUIT SUB-SECTOR COORDINATING COMMITTEE**

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- 2) On-going coordination of actions for implementation.
- 3) On-going monitoring of project components of strategy.

4. IMPLEMENTATION PLAN (five years)

<u>Key Activities</u>	<u>From Month</u>	<u>To Month</u>
1) Formation of Committee	1	1
2) Analysis of available resources	2	4
3) Validation of problem areas	4	5
4) Project formulation	5	end of project
5) Supervision, monitoring, coordination	1	end of project

For financing purposes the project will have a duration of five years, however, in practice the Committee should be established on a permanent basis.

5. ESTIMATED PROJECT COSTS

US\$350,000.00



**IDENTIFICATION OF SUITABLE AREAS FOR PRODUCTION OF SELECTED
FRUIT CROPS IN THE WINDWARD ISLANDS**

1. OBJECTIVES:

General:To contribute to export development and import substitution through agricultural diversification with fruits.

Specific:To identify and prioritize areas for specific fruit crop development schemes, within each country.

2. EXPECTED OUTPUTS

- 1) Areas best suited for the concentration of production of specific fruit crops identified; based on ecological factors and considering infrastructural factors.
- 2) Production potential for each priority fruit established by country and regions within each country.
- 3) Compilation of area/crop suitability index and map.

3. DESCRIPTION OF THE PROJECT

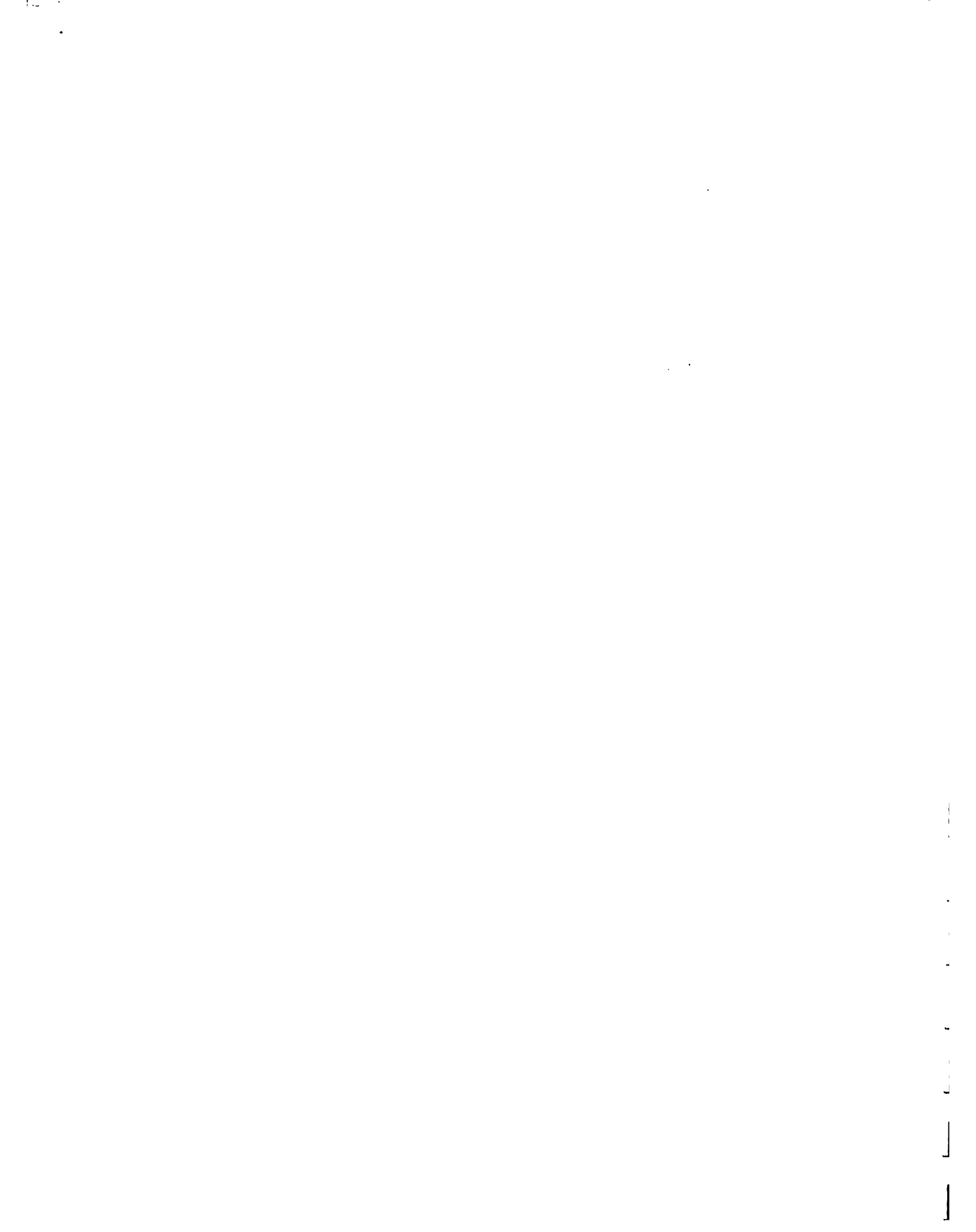
An international organisation with expertise in this area will form and supervise technical teams in each island to generate the necessary information. The principal components are:

- 1) Ecological studies to determine best suited growing areas for priority crops in each country.
- 2) Revision and synthesis of information and preparation of maps and recommendation.

4. IMPLEMENTATION PLAN (18 months)

<u>Key Activities</u>	<u>From Month</u>	<u>To Month</u>
1. Ecological studies:		
- Grenada and St. Vincent	1	8
- Dominica and St. Lucia	9	15
2. Preparation of area/crop suitability information	16	18

5. ESTIMATED PROJECT COSTS **US\$200,000.00**



**STRENGTHENING FARMER ORGANISATIONS
IN THE WINDWARD ISLANDS**

1. OBJECTIVES

General: To contribute to import substitution and export development through agricultural diversification with fruits.

Specific: Improve the quantity and quality of production and marketing services offered by farmer organisations in the Windward Islands.

2. EXPECTED OUTPUTS

- 1) Windward Island farmer organisation coordinating committee established.
- 2) Leaders of targeted farmer organisations with management and organisational capabilities to plan and manage their affairs and monitor and evaluate their performance.
- 3) Systems established, within selected farmer organisations, to generate necessary production and planning information.
- 4) Production/marketing projects for selected crops formulated.

3. DESCRIPTION OF PROJECT

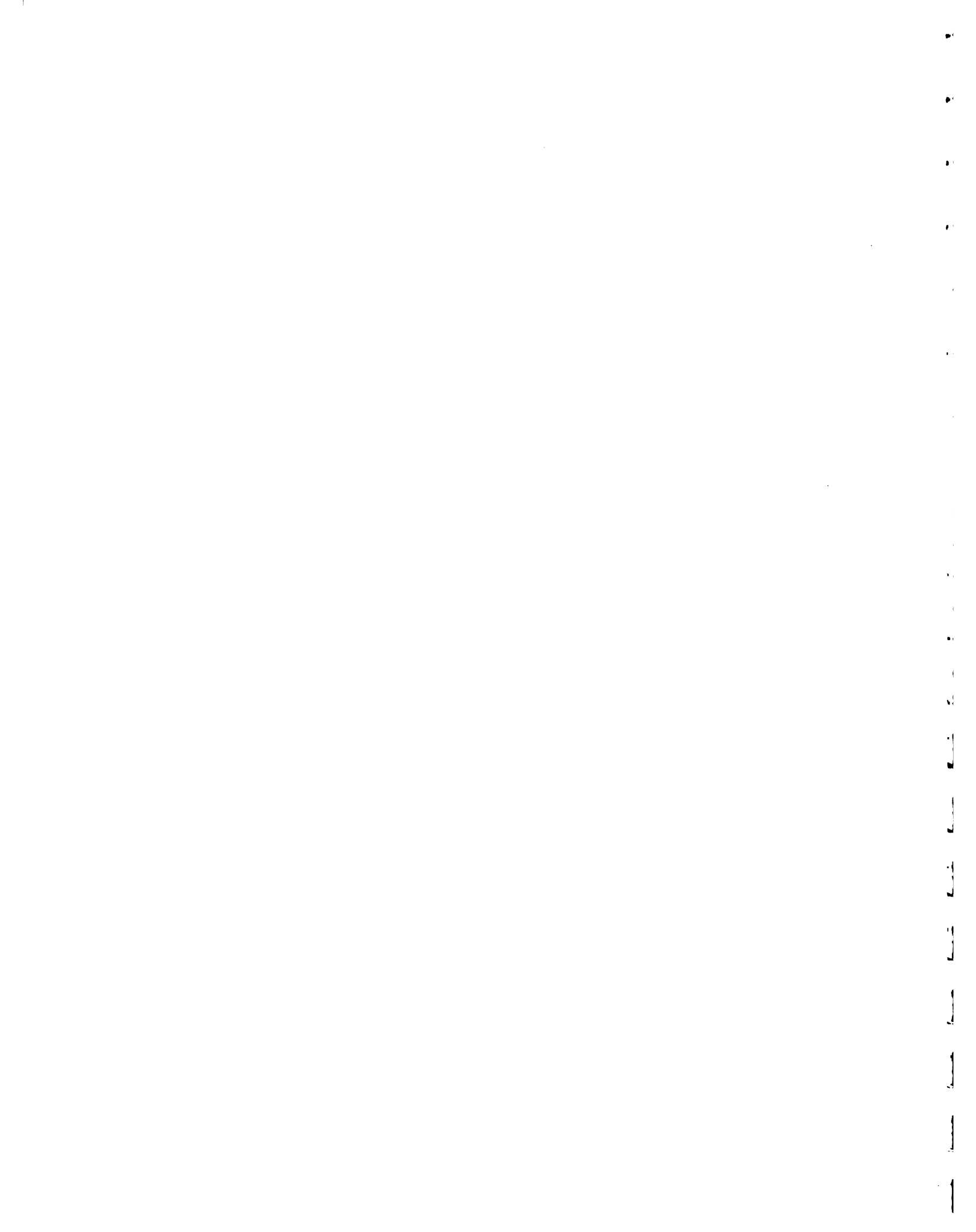
Representatives from farmer organisations in each island will form a co-ordinating committee to determine priorities, make recommendations and monitor project implementation and training. Technical assistance and training activities will be provided to farmer organisations to overcome specific production/marketing constraints. Components of project include:

- 1) Establishment of inter-island communication network (news-letter and radio programmes).
- 2) Establishment of production information systems.
- 3) Developing managerial and planning potential.
- 4) Technical assistance in production, marketing, postharvest, processing and financial management.
- 5) Formulation of crop specific production/marketing projects.

4. IMPLEMENTATION PLAN (four years)

Key Activities	From Month	To Month
1) Inter-island coordination	1	48
2) Inter-island communication system	3	48
3) Horizontal technical cooperation	3	48
4) Training in business management	6	48
5) Production information systems	13	48
6) Project formulation	6	24

5. ESTIMATED TOTAL COSTS US\$1,100,000.00



DEVELOPMENT OF NATIONAL PRODUCTION STATISTICS

1. OBJECTIVES

General: To contribute to import substitution and export development through agricultural diversification with fruits.

Specific: To develop agricultural production information systems in each Windward Island.

2. EXPECTED OUTPUTS

- 1) Compatible information systems in place and operational in each country of the sub-region.
- 2) Available and reliable production information on selected agricultural crops in each of the four islands.

3. DESCRIPTION OF PROJECT

Technical assistance will be provided to design common software to meet the needs of farmers, traders and public sector institutions for information on national production of selected crops. Financial assistance will be provided to obtain, install and train personnel in the use of compatible micro-computers. This activity will be closely coordinated with the production information component of the project to strengthen farmer organisations. The principal components of this project are:

- 1) System design.
- 2) Purchase of equipment.
- 3) System implementation.
- 4) Training.
- 5) Follow-up.

4. IMPLEMENTATION PLAN (two years)

<u>Key Activities</u>	<u>From Month</u>	<u>To Month</u>
1) System design	1	6
2) Purchase of equipment	4	6
3) System implementation	7	12
4) Training	10	14
5) Follow-up	16	24

5. ESTIMATED TOTAL COSTS

US\$160,000.00

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**STRENGTHENING PLANT PROTECTION CAPABILITIES IN THE
WINDWARD ISLANDS**

1. OBJECTIVES

General: To contribute to export development and import substitution through agricultural diversification with fruits.

Specific: To strengthen plant protection capabilities of the countries in the Windward Islands.

2. EXPECTED OUTPUT

- 1) Strengthened institutional structures in plant protection.
- 2) Establishment of an information system in plant protection.
- 3) Establishment and maintenance of appropriate plant quarantine systems.

3. DESCRIPTION OF PROJECT

Technical assistance and training in plant protection, plant quarantine and postharvest handling of fresh produce will be provided to Ministry of Agricultural staff and farmers, through their organisations. Effective plant quarantine programmes will be developed in each island to reduce the threat of spread of pests and diseases between islands. Control programmes will be carried out with farmers to increase the volume of quality produce. Project components include:

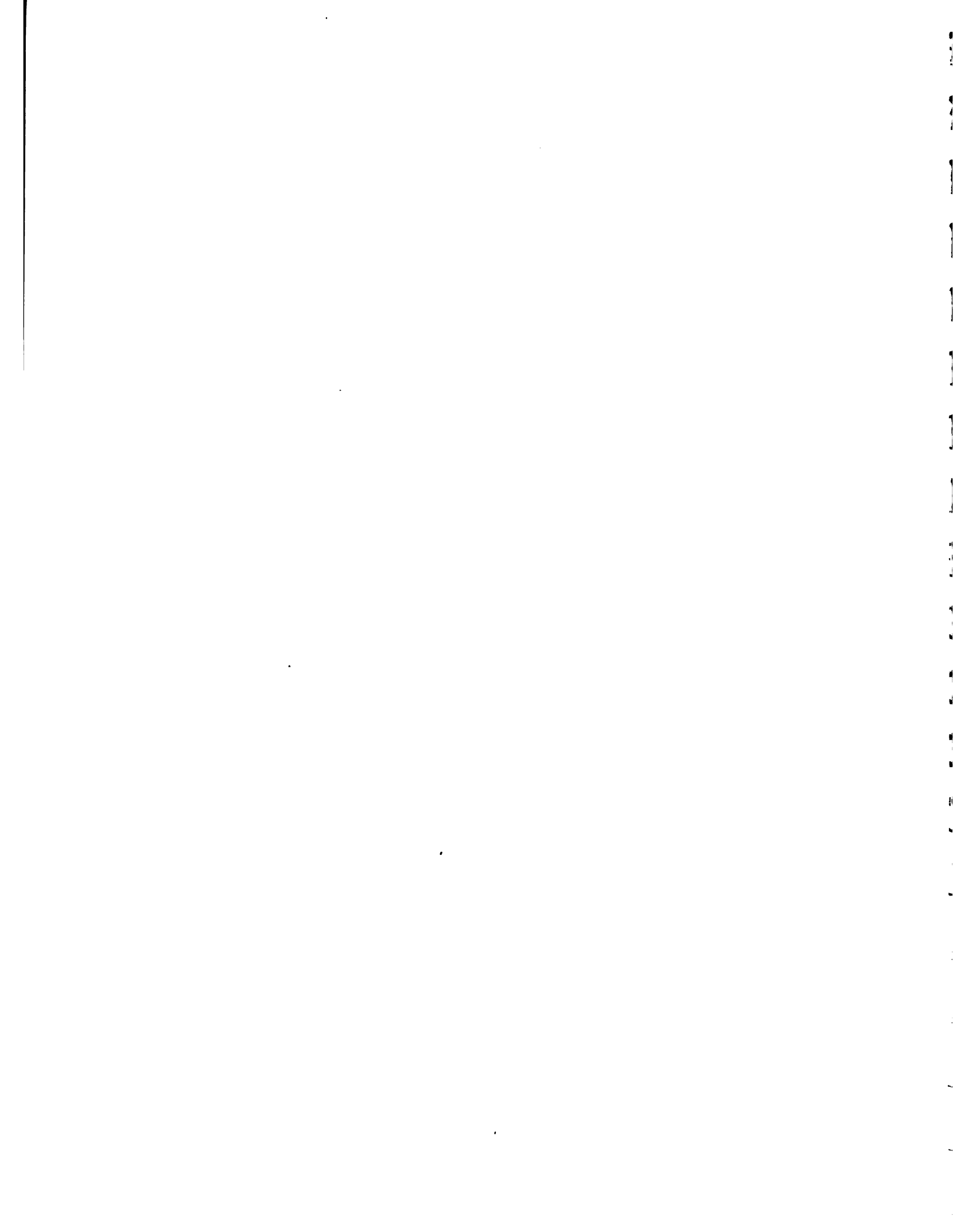
- 1) Training in plant protection.
- 2) Information system in plant protection.
- 3) Plant quarantine system.
- 4) Foster cooperation in plant protection.

4. IMPLEMENTATION PLAN (five years)

<u>Key Activities</u>	<u>From Year</u>	<u>To Year</u>
1) Training in Plant Protection	1	5
2) Information Systems in Plant Protection	1	5
3) Plant Quarantine System	1	5
4) Inter-island Cooperation	1	5

5. ESTIMATED PROJECT COSTS

US\$800,000.00



**TECHNOLOGY GENERATION AND TRANSFER
FOR PRIORITY FRUIT TREE CROP PRODUCTION IN THE WINDWARD ISLANDS**

1. OBJECTIVES

General: To contribute to export development and import substitution through agricultural diversification with fruits.

Specific: Develop and transfer valid technology for the production and postharvest handling of selected priority fruit tree crops.

2. EXPECTED OUTPUTS

- 1) Technological options for the production, harvest, and postharvest handling in fruit tree crops of priority economic importance.
- 2) Improved transfer of technology to farmers for more efficient production, harvest and postharvest handling of selected fruit tree crops.
- 3) Increased horizontal cooperation for technological development in fruit tree crop production in the region.
- 4) Personnel of public and private sector institutions trained in production, harvest, and postharvest techniques, organization and management of fruit tree crops.
- 5) Established systems for increased and improved distribution of technical information for fruit tree crop development in the region.

3. DESCRIPTION OF PROJECT

Existing and new technology will be validated and organized in technological options which will serve as the basis for training technicians and farmers in the production and postharvest handling of priority fruit crops through a sub-regional network. Experiences and resources will be shared among the four islands. The principal components are:

- 1) Adaptation, generation and validation of technology.
- 2) Transfer of valid technology to farmers.
- 3) Training.
- 4) Production and distribution of technical information and documentation.

4. IMPLEMENTATION PLAN (Duration 5 years)

<u>Key Activity</u>	<u>From Year</u>	<u>To Year</u>
1) Research	1	5
2) Technology transfer	2	5
3) Training	1	5
4) Production and distribution of information and documenttion	1	5

5. ESTIMATED TOTAL COSTS US\$1,000,000.00

**IMPROVING THE SUPPLY OF QUALITY PLANTING MATERIAL
IN THE WINDWARD ISLANDS**

1. OBJECTIVES

General: To contribute to export development and import substitution through agricultural diversification with fruits.

Specific: To increase the quantity and improve the quality of plants produced in the nurseries of the Windward Islands.

2. EXPECTED OUTPUTS

- 1) Adequate and sufficient nursery infrastructure and equipment in each of the Windward Islands.
- 2) Nursery personnel trained in planning of production targets, nursery management and fruit production and maintenance techniques.
- 3) Standards in place for the release of plants of guaranteed quality.
- 4) Production of sufficient plants, of the right type, to satisfy national production targets for priority crops.
- 5) Control and preventive measures, to avoid the spread of pests and diseases through nurseries, in place.

3. DESCRIPTION OF PROJECT

Technical assistance, physical and financial resources will be provided through this project to adequate the infrastructure and personnel of the existing 17 nurseries in the Windward Islands to the needs for the development of the fruit sub-sector. The principal components of the project are:

- 1) Improving infrastructure and equipment for plant propagation.
- 2) Training of technicians and nursery personnel.
- 3) Virus indexing.
- 4) Improvement and maintenance of museum plots.

4. IMPLEMENTATION PLAN (two years)

<u>Key Activities</u>	<u>From Month</u>	<u>To Month</u>
1) Infrastructural work	1	10
2) Equipment of nurseries	2	12
3) Training of personnel	2	24
4) Improvement of museum plots	3	12
5) Virus indexing programme	2	24

5. ESTIMATED TOTAL COSTS

US\$600,000.00



FRUIT CROP GERMPLASM BANK FOR THE EASTERN CARIBBEAN

1. OBJECTIVES

General: To contribute to export development and import substitution through agricultural diversification with fruits.

Specific: Establishment and maintenance of a germplasm bank for the selection, propagation and distribution of local, regional and extraregional fruit clones of outstanding characteristics for the Eastern Caribbean.

2. EXPECTED OUTPUTS

- 1) Outstanding fruit clones identified and selected.
- 2) Mechanism in place for the introduction, from reliable sources, of fruit species and cultivars with highly desirable characteristics and market potential.
- 3) Infrastructure in place to propagate and maintain the selected and/or introduced clones.
- 4) Trained technicians in the collection, handling and distribution of fruit seeds and budwood.
- 5) Reduced probability of introducing new pests and diseases into the region and their spread through nurseries.
- 6) Availability of seeds and budwood of outstanding quality at lower cost, to meet the demand from member countries.

3. DESCRIPTION OF PROJECT

A germplasm bank will be located in one of the islands of the Eastern Caribbean. Proper infrastructure, tools and equipment will be provided and necessary personnel trained. Outstanding clones will be identified and established and a distribution network set up to supply nurseries of the region. Applied research will be conducted. The principal components are:

- 1) Infrastructure and Equipment.
- 2) Selection of local and regional fruit clones.
- 3) Introduction of planting material from extra-region sources
- 4) Training.
- 5) Fruit plot establishment and maintenance.
- 6) Distribution of planting material.
- 7) Research.

4. IMPLEMENTATION PLAN (10 years +)

<u>Key Activities</u>	<u>From Year</u>	<u>To Year</u>
1) Site selection/infrastructural work	1	2
2) Introduction of planting material	1	3
3) Establishment of fruit plots	1	5
4) Selection of local clones	1	5
5) Distribution of planting material	2	10+
6) Training/research	1	10+
7) Maintenance	1	10+

5. ESTIMATED PROJECT COSTS

- Establishment	US\$630,000.00
- Annual operation costs	230,000.00

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REHABILITATION OF STANDING FRUIT TREES IN THE WINDWARD ISLANDS

1. OBJECTIVES

General: To contribute to export development and import substitution through agricultural diversification with fruits.

Specific: Increase, over the short run, the availability and quality, of selected priority tree fruit crops.

2. EXPECTED OUTPUTS

- 1) A core group of technicians, field personnel and farmers trained in proper methods of rehabilitation and top-working fruit trees.
- 2) Best suited patterns of rehabilitation and top-working adapted/developed to specific regions.
- 3) Increased availability, in quantity and quality, of fruit suitable for export (mangos, avocados, breadfruits and citrus).

3. DESCRIPTION OF PROJECT

Areas of higher densities of priority fruit trees with favourable ecological conditions will be identified in each country. Specific projects for the rehabilitation and/or top working of selected species will be prepared in conjunction with MOA and groups of farmers and based on market conditions. Participating personnel will be trained in the proper techniques. Records will be kept to determine changes in productivity and costs. Principal components of this project are the following:

- 1) Training.
- 2) Rehabilitation of fruit trees.
- 3) Top-working of mangos, avocados and citrus.
- 4) Research.

4. IMPLEMENTATION PLAN (five years)

<u>Key Activities</u>	<u>From Year</u>	<u>To Year</u>
1) Training of personnel	1	5
2) Rehabilitation of trees	1	5
3) Top-working of trees	1	5
4) Research	1	5

5. ESTIMATED TOTAL COSTS

US\$1,340,000.00 *

Estimated costs for the rehabilitation and/or top-working of 20,000 trees in each country. Only the cost of nontechnical staff is included.



**PILOT PROJECTS FOR THE DEVELOPMENT OF NEW* FRUIT CROPS
IN THE WINDWARD ISLANDS**

1. OBJECTIVES

General: To contribute to export development and import substitution through agricultural diversification with fruit crops.

Specific: Test the economic adaptability, performance and marketing possibilities of selected new fruit crops (passion fruit, papaya, carambola, cashew, pineapple, macadamia and ASEAN fruits) in selected regions within the Windward Islands.

2. EXPECTED OUTPUTS

- 1) Economic feasibility of producing selected new crops determined.
- 2) Information on establishment, management, harvesting, packing and marketing of these crops generated.
- 3) A core group of technicians and field personnel trained on the establishment, management and marketing of these crops.

3. DESCRIPTION OF PROJECT

Based on the most suitable areas for growing the respective fruits in each island, pilot plots of one acre or less of each fruit will be located in each island. These will be managed by competent, selected farmers who will be trained in the proper cultural practices and who will provide the required labour. At opportune times, selected extension workers or university students, in collaboration with the respective farmers, will collect the required production and marketing data. Components of this project are the following:

- 1) Introduction and establishment of new crops.
- 2) Evaluation of the performance and marketing of new crops.
- 3) Training.

4. IMPLEMENTATION PLAN (five years)

<u>Key Activities</u>	<u>From Year</u>	<u>To Year</u>
1) Introduction and Propagation	1	2
2) Selection of specific areas	1	1
3) Establishment	1	2
4) Evaluation of performance	1	5+
5) Marketing	2	5+
6) Training	1	5+

5. ESTIMATED TOTAL COSTS

US\$200,000.00 **

* The term "new" is in reference to crops which at present are not in commercial production. Exceptions to the latter are passion fruit in Dominica and Pineapple in St. Lucia.

** Based on a projection of the planting of approximately 10 acres of fruits in each island.

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Autor

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