



ECONOMIC COMMISSION FOR LATIN AMERICA
Office for the Caribbean

AGRICULTURAL SECTOR PLAN FOR GRENADA

1977-1981

Volume 1



ECLA/CARIB 77/3: Vol. 1

Date: May 1977

ECONOMIC COMMISSION FOR LATIN AMERICA
Office for the Caribbean

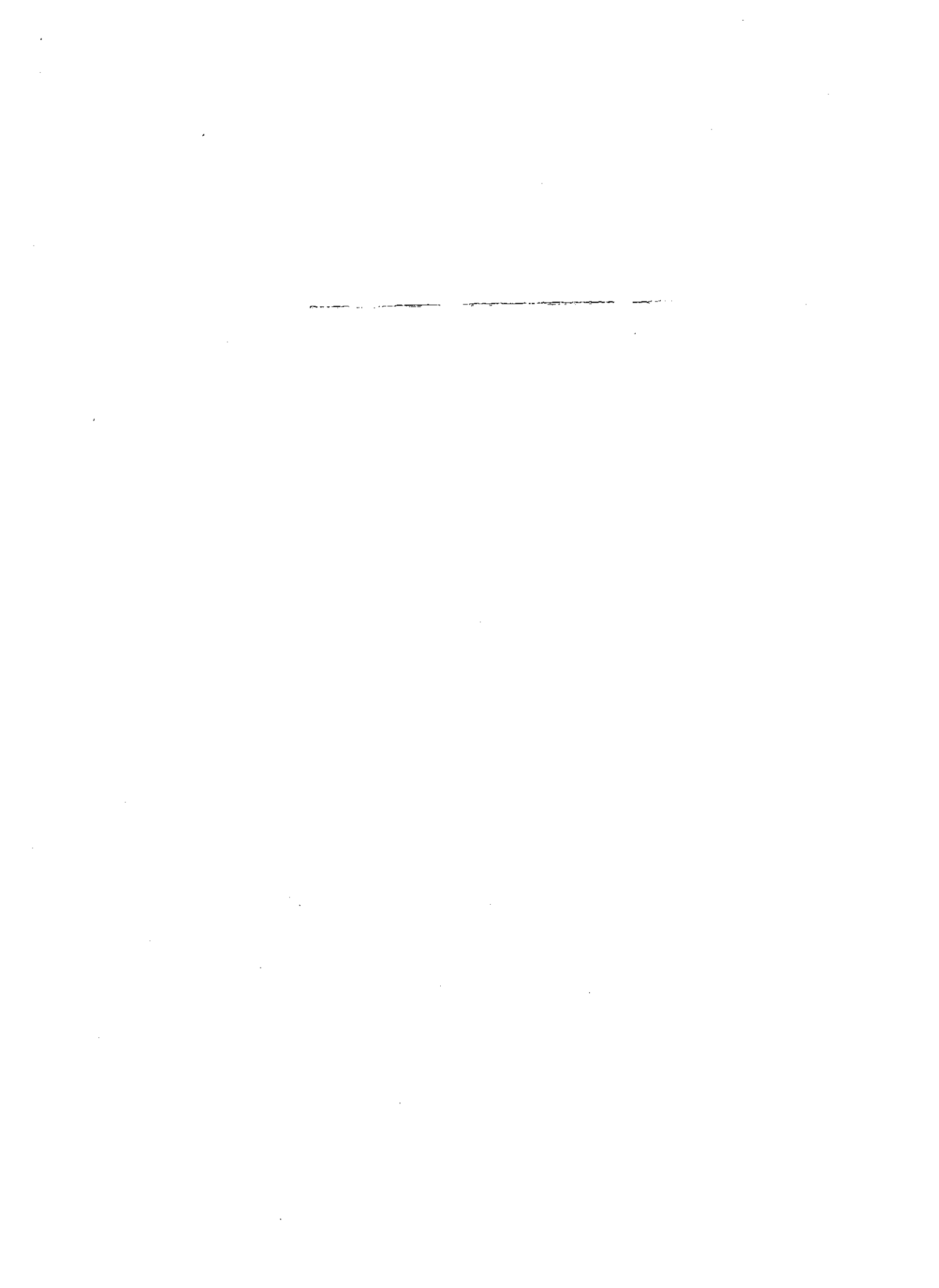
AGRICULTURAL SECTOR PLAN
FOR GRENADA
1977-1981

Volume 1

Prepared by

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This report has not been cleared either with the Economic Commission for Latin America or with the UN Office for Technical Co-operation, who therefore, do not necessarily share the views expressed.



P R E F A C E

In May 1976 the Ministry of Planning and Development of the Government of Grenada requested ECLA's assistance in the preparation of an Agricultural Sector Plan. The Regional Economic Adviser undertook this assignment and was given as an assistant, an Economist attached to the Ministry of Planning and Development. Unfortunately his assistant resigned from the Grenada Civil Service soon after his secondment and was never replaced. The Adviser, therefore, had to work on this Plan without a Grenadian counterpart. He also had no support staff in office. This had two very great disadvantages. In the first place, since no economist in the Government took part in plan preparation, the country has reaped no professional advantage from this exercise in practical economics. Secondly, the adviser, though stationed in Port of Spain had to build up a good working relationship with the Ministry of Agriculture, Forestry and Fisheries through periodic visits, with no one constantly on the scene whose sole concern was furthering plan preparation. The exercise has therefore taken much longer than was at first envisaged.

From the point of view of both an Adviser's services to the Region as a whole to which he is accredited, and the ability of a country to reap maximum benefits from an exercise of this type, it would be inadvisable for ECLA to undertake a commitment of this type in future unless the Government concerned can provide a working committee with the required technical expertise.

The fact that there was no support staff in the preparation of this Plan did not result in a reduction of the scope of the Plan conceptually, but it has affected the depth which had originally been contemplated. This is particularly so with respect to Chapter 6 - Marketing and Chapter 10 - Regional Perspectives. It had been intended to do a survey to verify information provided by the Ministry on internal movement of agricultural produce, so that detailed regional recommendations could have been made on

marketing strategy. This plan had to be dropped. It was also hoped to go into population distribution in sufficient detail to discover those clusters which are expanding rapidly and offer immediate scope for urbanization, and also to tie in regional and inter-regional economic activity in non-agricultural sectors with the agricultural economy.

The Government requested the preparation of an agricultural sector plan. Though the Grenada economy is predominantly agricultural it would be somewhat unreal to construct a programme for agricultural change while ignoring the total matrix of human activities. Therefore some attention has been paid to activities which would not fall into a narrow interpretation of the term "agricultural", but which are nevertheless important since they indicate how closely economic activity is inter-related with other aspects of human endeavour and the total environment.

In this Plan, the Government now has a basic document which outlines goals, objectives, institutional and informal structures and activities for agricultural development towards the end of the century. The fact that no Economist in the country's civil establishment was involved in plan preparation is a drawback which can be remedied to some extent in the next stage, that of preparing a Programme Document comprised of "Projects". The Government is advised to set up the Planning Units recommended in Chapter 2 in both the Ministries of Planning and Development and of Agriculture, Fishing and Forestry at the earliest possible opportunity so that they can undertake this task. Technical assistance can be sought either from the ECCM Secretariat or CARICOM, and ECLA will, of course, perform an advisory role.

The Adviser has relied heavily on the technical expertise and support staff in the Ministry of Agriculture, Forestry and Fisheries and particularly on Mr. Dennis Noel, Chief Technical Officer with whom he established a very cordial working relationship. The Agricultural Extension Staff provided invaluable assistance in field sample surveys which were conducted in July and August 1976. The information collected in these surveys has been used in the preparation of this Plan but due to lack of staff a survey report has not been

prepared. Mr. Roy Banfield, Manager of the Agricultural and Industrial Development Corporation was very helpful in many ways and made some of his staff available for preliminary computations of the questionnaires on the farm survey. Mr. Charles Francis, Land Use Officer, with the help of a small team prepared the Maps in Volume II and was the main source of information relating to the physical and climatic conditions of Grenada and its off-shore islands. Mr. Raymond Noel of the Central Water Commission and his staff were very helpful in providing background information on water supplies in-so-far as they relate to agricultural development. Dr. Courtney Henry, and Messrs. George Buckmire and Lionel James of the CARDATS team are very familiar with the problems on agricultural development in the Less Developed Countries (LDC's) and the Adviser benefited very much from discussions with them. He also held discussions with international experts in the field of agricultural development and allied subjects and owes a great debt to Messrs. Ian Stewart and Terry Beddoe, both of whom were doing practical work in the field of agricultural production. The Adviser also held discussions with Mr. V. Lumboltz, Marketing Adviser, Mr. J. Bally, Land Conservation Adviser and Dr. Carl Pederson. Other persons whose assistance was very valuable in the preparation of this Plan are:

Sir Dennis Henry	- Chairman of the Grenada Banana Co-operative Society and the Grenada Cocoa Industry Board.
Mr. Conrad Douglas	- Secretary of the Grenada Cocoa Co-operative Association.
Mr. George Quashie	- Secretary of the Grenada Banana Co-operative Association.
Mr. Robert Renwick	- Manager of the Grenada Co-operative Nutmeg Association.
Mr. Winston Bain	- Farm Improvement Officer for CDB Financing through GAIDC.
Sir William Branch	- Estate Manager.
Mr. George Brathwaite	- Demographer, Prime Minister's Office.
Mr. Conrad Mason	- Produce Chemist, Ministry of Agriculture.

- Mr. Erling Peterson - Canadian Fishery Officer.
- Dr. George Sammy - Food Technologist, UWI, Trinidad.
- Dr. Ronald Barrow - Agronomist, Centeno Research Station, Trinidad.
- Dr. Reginald Griffith - Central Experimental Station, Trinidad.
- Mr. David Buxo - Manager, Agricultural Services (North) Caroni Limited, Trinidad.
- Mr. Gary Voss - Caribbean Industrial Research Institute, Trinidad.
- Mr. Edwin Freeman - Cocoa Agronomist, Trinidad.
- Dr. Lewis Campbell - Head of the Agricultural Division of the Caribbean Development Bank.

At the administrative level thanks are due to Mr. John Samuel, Permanent Secretary in the Ministry of Agriculture, Forestry and Fisheries for the readiness with which he made the services of technical officers in his Ministry available, to Miss Gloria Payne, Permanent Secretary in the Ministry of Planning and Development who, quite apart from her official duties, rendered inestimable assistance through discussion and through arranging important meetings with other persons, and to the Ministry of External Affairs. The Adviser owes much thanks to Senator Derrick Knight, Minister without Portfolio responsible for CARICOM Affairs with whom he discussed many aspects of the problems of developing economies. Mr. Silbourne S. St. A. Clarke, Director, UN/ECLA, found time in his busy schedule to read a draft copy of the Plan and made many helpful suggestions.

The working drafts and the final report were prepared by Miss Lystra M. Seetaram who at times was assisted by other typists and Research Assistants in the office. Mr. McD. Serrant very kindly prepared some of the maps included in the Plan.

For the views, opinions and recommendations in this Plan the Adviser, of course, bears full responsibility.

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CARRIACOU

North - N1 Association Map
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South - S1 Association Map
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AGRICULTURAL SECTOR PLAN FOR GRENADA

INTRODUCTION

The State of Grenada consists of the mainland island of Grenada, and a number of off-shore islands, the most economically important of which is Carriacou. These islands are all situated in close proximity to one another within latitude 12° to $12^{\circ} .30'$ north of the Equator and West longitude $61^{\circ} .35'$ to $61^{\circ} .50'$.

Geology

The islands are almost entirely of volcanic origin and are composed mainly of pyroclastic rocks, basalt and andesite lavas. In the case of the island of Grenada basalt and andesite lava occur mainly in the centre of the island, while the pyroclastic rocks - agglomerates and ashes almost entirely composed of andestic material - occur mainly as a belt along the rim of the island, or as a mantle over underlying lava. Though all the volcanic rocks are of similar constitution, those in the west-central and north-western parts of the island are more intermediate in nature than those in other parts of the island. Deposits of limestone are found in both islands. There are small isolated outcrops in Grenada which are of little agricultural importance, but in Carriacou there are large outcrops of hard and soft limestone in the north-east and small outcrops of soft limestone in isolated patches around the coast. Tuffaceous shale occurs in broken belts along the north-west coast and in some valleys in the island of Grenada, and there are deposits of alluvia found mainly in the lower courses of rivers and streams. There are no truly alluvial soils in Carriacou but the lower slopes of steep ridges are covered by ashy or limestone colluvial material.

Topography

The island of Grenada, which is very hilly, covers an area of approximately 75,000 acres. It is 21 miles at its greatest length and 12 miles at greatest width. The dominant topographical feature, a central mountain mass, is broken up into numerous peaks and valleys which, because of the relatively small area in which they are concentrated, contribute significantly to climatic differences, thus

making possible the cultivation of crops not usually associated with a tropical climate. The highest mountain peak in the north of this mass is Mt. St. Catherine, rising to a height of 2,756 feet. On the western side the mountains rise steeply from the coast, with four significant peaks at heights of 2,512 feet, 2,412 feet, 2,300 feet and 2,347 feet. Approximately 50 per cent of the total area of the island is more than 500 feet above sea level. The remainder is a coastal belt of low undulating plains mainly on the east and south coasts. In the west, mountainous outcrops extend to the sea and there is a very narrow coast line. This mountainous compact in such a relatively small acreage results in another important agricultural feature, namely a high proportion of comparatively steep slopes - 19 per cent of the total acreage has a slope between 10-20 degrees, 46 per cent between 20-30 degrees, and 23 per cent over 30 degrees. (See Map Appendix A: Map 1).

Carriacou, which lies 21 miles north of Grenada is approximately 7.5 miles long along a north-south axis and 2.5 miles wide with a total area of 8,600 acres. There is a Central Ridge which reaches a maximum height of 980 feet above sea level, and numerous rock out-crops and hillcrests scattered at random over most of the island. Ravines and gullies, many of which are without water for most of the year are evidence that at one time the Central Ridge was tree covered and rainfall was at times heavy enough to send water cascading down the mountain slopes. There are relatively extensive areas of low lying and undulating land suitable for agricultural use.

Rainfall

All islands in the State of Grenada are in the path of the north-east trade winds and experience marked dry and rainy seasons. The island of Grenada has a rainfall distribution pattern ranging from approximately 50" to over 160" per annum. Average annual rainfall over the period 1926 to 1960 was 96.97 inches. Data for the period 1970 to 1974 show that mean monthly rainfall for each of the five years was respectively 7.27", 6.44", 5.83", 6.15" and 6.28". These data indicate that rainfall levels have been lower in recent years, but the heavy rainfall showers, concentrated mainly between July and December, and falling on steep slopes with numerous valleys result in scores of rivers and tributaries which facilitate the demarcation of distinct water-shed areas embracing more than 50 per cent of the total acreage of the island. (See Map Appendix A: Maps 2 and 3).

Carriacou which is far less mountainous has an annual average rainfall of 50". This relatively low rainfall is concentrated in the latter half of the year, so that there are many rainless months when intense heat and dry winds cause much soil erosion.

In both islands the prevailing winds are strong with a perennial consistency which suggest that they can provide a source of cheap power.

Soils

The main Central massif of the island of Grenada is comprised of Belmont Clay Loam and Capital Clay Loam both in various stages of weathering. The former are brown soils, well-drained, mainly over ash and agglomerate, in areas of good rainfall, and the latter, are red soils moderately to well-drained, mainly over deeply weathered basic igneous materials in wetter areas. The slopes in these areas are 20° and over, and the soils are moderately erodible. In the northern and north-western regions of the Central massif there are spurs of Palmiste and Betish Clay Loam. The former are moderately drained brown soils over tuffaceous shales in areas of good rainfall, while the latter are shallow grey soils over soft limestones, well to excessively drained. The range of slopes in these areas is wide, from 5° in some places, but rising to over 30° in others. Erosion is mainly slight to moderate.

There are two broad categories of soils found in the drier areas of the island. Dark well-drained soils, mainly over ash and agglomerates are found on the periphery of the Central massif but mainly on the west and south. This is the Woburn Clay Loam some of which is in a stony and bouldery phase. The other soil is very dark, of a poorly or moderately drained heavy type, mainly over ash and agglomerates. They are Concord Clay Loam, Parnassus Clay and Perseverance Clay. These soils are found mainly on the west of the island interspersed between well-drained Woburn Clay Loam, but there are also large tracts on the north and east. The slopes of both types of soils range mainly between 10° to over 30°, and erosion is mainly slight to moderate.

The other main soils found in the island are alluvial and colluvial. They are found scattered in pockets, mainly along river beds all over the island, but concentrations are predominantly in the South. Slopes are usually less than 5° , erosion is slight or not appreciable and accretions are common.

Three miscellaneous land types are worthy of mention because of their economic potential. The most important of these are Beach Sand. The island has stretches of beautiful beaches all around its coasts and these together with its climate enhance its resort potential. There are, mainly in the south, mangrove and salt swamps which are, at present, not exploited to any appreciable extent.

The main soil type in Carriacou is Woburn Clay Loam, a dark well-drained soil, mainly over ash and agglomerate. In between there are large tracts of colluvial soils and smaller, but widely dispersed locations of Perseverance Clay, a very dark poor or moderately drained heavy soil, mainly over ash and agglomerate. Land slopes in the island are predominantly 10° and over, but there are extensive areas with slopes between $20^{\circ} - 30^{\circ}$. Erosion is a common feature all over the island, most of it being severe and very severe. There are a few locations of accretions on the western half of the island. (See Map Appendix A: Maps 4, 5a, 5b, 5c, 5d).

Climate

The island of Grenada has a cool climate all the year round despite its tropical location. This is mainly because of its numerous valleys and its situation in the teeth of the north-east trade winds. There is a daily range of temperature of at least 10° , and annual minimum and maximum temperatures are 65° and 85° .

Carriacou which is wind-swept all the year round has a warmer climate because of the dryness of the wind and the lower altitude of its hilly region.

Vegetation

The natural vegetation of Grenada ranges from rain forests in the central mountainous area to shrub and grasslands in the coastal areas with low annual rainfall. The heavy tree cover is essential for soil maintenance and preservation of water courses and the drainage areas of which they form a part. The coastlands which are always exposed to high winds need the protection offered by shrubs and mangrove swamps to prevent soil erosion.

Where there are stretches of beach with no vegetative cover, however, erosion occurs during periods of high tides and rough seas. In Carriacou there is evidence that the hilly parts of the island were once covered with deciduous forests. Their indiscriminate use for boat building without regeneration has left the island bare of primary vegetation. Periods of long drought, which have resulted in part because of the loss of tree cover, have left the island with poor resources for vegetative growth, which now mainly consists of cacti, shrubs and poor pasture.

REVIEW

These main geographical and climatological features of the State of Grenada show the limits of the physical resources available for development. Geological factors make it highly improbable that mineral wealth will be discovered, and the country's economic future will therefore depend largely on its capacity to capitalise on its vegetative and animal resources on both land and water. This is paramount to the economic and social well-being of the population despite the obvious attraction which beautiful beaches and lush vegetation have for visitors from temperate climates, for maximum returns from a tourist trade can only be attained if the host country can feed its guests from its own nutritional production.

The Human Component

The population of the State of Grenada was 92,775 at Census date 1970, 93.6 per cent of whom lived on the main island, while the remainder resided on the off-shore islands. Over the period 1871 to 1970 the population had increased by $2\frac{1}{2}$ times, but the annual rate of increase which, during the inter-censal period 1881-1891 was 2.30 per cent had fallen to 0.46 per cent in the period 1960-1970 mainly due to migration.

Land Use

Of the total land area of 83,600 acres which comprise the State of Grenada in 1961, 28 per cent were under residential, industrial and infrastructural use, leaving 60,197 acres to be utilised for

vegetative purposes. Of this, 58,422 acres were in Grenada, and the remaining 1,775 acres were in the Grenadines. Changes in land utilization, between the agricultural census years 1961 and 1975 are shown in Statistical Appendix: Table 1.

Between 1961 and 1975 the area used by Man for agricultural purposes fell from 60,197 acres to 46,577, a decline of 23 per cent. The reduction in land under permanent crops was very significant, from 28,000 to 23,000 acres, a drop of 18 per cent. The loss of land under grassland was very much greater, from 6,600 to 2,100 acres, a decline of 68 per cent. Important changes in land use pattern over the period were increases in the relative proportions of land under permanent crops, from 46.7 per cent to 49.7 per cent, and under arable use, from 21.8 per cent to 27.4 per cent. On the other hand the acreage under grassland fell from 11 per cent of all land in agricultural use to 4.5 per cent.

There are many factors which may have contributed to shifts in land use during the 14 years for which data are available. Some of the alienated land undoubtedly entered the tourist sector of the economy, particularly in the Parishes of St. George and St. David. But the spread in decline in Grenada was island-wide, therefore there were other factors in operation. It is not unlikely that the agricultural land acquisition programme for land settlement schemes, influenced or contributed in some measure to estate abandon, since generally estate owners are reluctant to invest when a Government initiates such a policy. At the same time of course, the land settlement programme might well have been one of the most obvious means by which the Government could have attempted to re-activate land which had already been abandoned. It is certainly not in the national interest to have agricultural land lying idle in an economy whose wealth depends on the development of its agricultural potential and therefore deeper analysis is necessary to find out why there was such a rapid loss of land from agriculture - on average 972 acres per year - and how this can be prevented.

Land Tenureship and Distribution

Census data for 1961, the most recent data available, show the pattern of holdings by tenure in the State in Table 1.

Table 1
Holdings by Tenure in the
State of Grenada 1961

Category	No. of holdings	Area Acres	%
Holdings owned	9,740	53,132	88.3
Holdings rented	2,027	2,105	3.5
Rent free	454	558	0.9
Mixed tenure	1,875	4,402	7.3
TOTAL:	14,096	60,197	100.0

Source: West Indies Census of Agriculture 1961.

A notable feature is the very high percentage - 88.3 - of acreage owned. This should make it relatively easy to operate a loan scheme which would facilitate capital investment in the industry since the owner would be able to offer his land as security. But there are two factors which counteract this advantage. Land titles are very often not clear and ownership is frequently multiple and not singular^{1/}. Secondly and possibly of greater importance is the highly skewed distribution of holdings. This is demonstrated in Figure 1 which is a Lorenz curve based on 1961 Census data showing relationship between acreages and ownership of holdings^{2/}. The diagonal represents an equitable distribution between acreages and owners. The further away the curve, the greater is the inequality.

^{1/} See Grenada Five-Year Development Plan 1964-1968 by Demas and others. Chapter 6, para. 6.32. Recommendations were made to deal with this problem.

^{2/} Refers to ownership for use, not proprietary ownership.

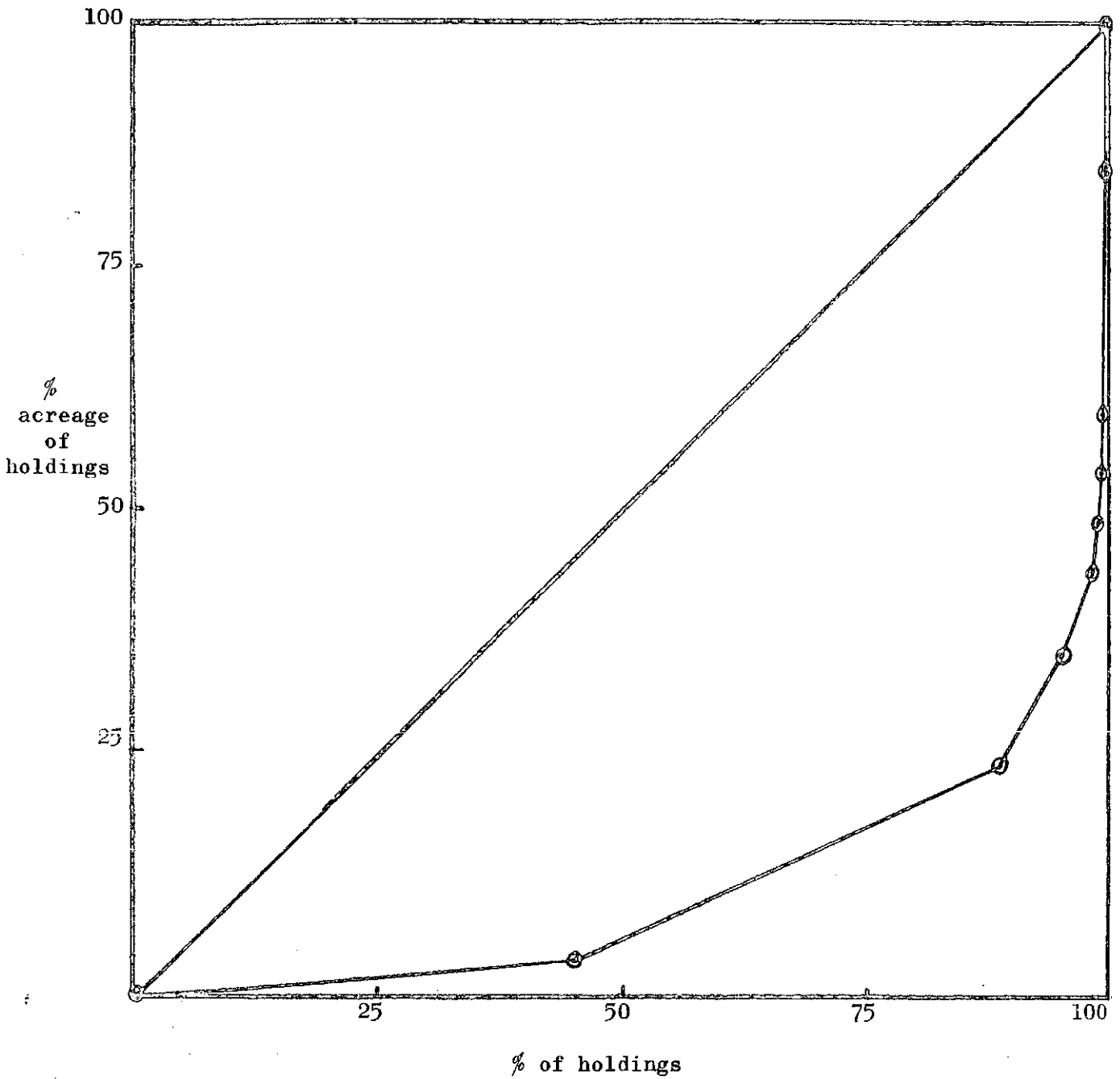


FIGURE 1 - Lorenz curve showing relationship between acreages of holdings and number of holdings in the State of Grenada.

The low gradient of the curve in its lower reaches shows that a small percentage of the total acreage in holdings was in the hands of a large number of farmers - 24 per cent of total acreage was owned by 89 per cent of farmers. At the other end of the spectrum the curve is almost parallel to the Y axis, indicating that 56 per cent of total acreage was in the hands of 1 per cent of farmers. In the middle range there were 10 per cent of farmers with 20 per cent of total acreage. Current evidence indicates that there has been no fundamental change in the relationship between these two variables since 1961. In fact the land settlement schemes of the past decade may have increased the percentage of farmers at the lower end of the curve at the expense of those at the higher end. The bulk of the farming population, therefore, though having ownership in use over land which they farm, are operating such small units that the scope for individual capital investment based on viable holdings as collateral is severely limited.

Land Fragmentation

Table 2 shows distribution of holdings and parcels by farm size in 1961 and shows the degree of fragmentation of land holdings. The number of holdings in each farm size is used as a base for calculating index numbers for the number of parcels in each farm size. In no case is the number of parcels identical with the number of holdings. For every 100 holdings under 1 acre there were 116 parcels of land, and for those between 1 and 5 acres there were 183 parcels. The peak in parcellization is in the 5-10 farm size, where for every 100 holdings there were 276 parcels. One cannot without detailed knowledge of the use to which those parcels of land are put make a valid judgement of how this structure of the industry hinders agricultural development. But on a priori grounds, it is unlikely, taking into consideration existing crop and cultivation practices, that farmers can, on this multiplicity of farmlets, earn a satisfactory income to make a long-term contribution to economic expansion. The problem is most likely, two-fold, not only one of unit size and distribution, but also one of human material. The quality of managerial skills among farmers is poor, so that possibly a farm consolidation and engrossment programme should also be accompanied

Table 2

Distribution of Farm Size
by Holdings and Parcels 1/

Farm Size acres	<u>Holdings</u>		<u>Parcels</u>	
	Number	Base	Number	Index
Under 1	6,458	100	7,497	116
1-5	6,052	100	11,066	183
5-10	934	100	2,579	276
10-25	418	100	1,124	269
25-50	100	100	226	226
50-100	42	100	75	174
100-200	28	100	32	114
200-500	52	100	81	156
500+	12	100	13	108
TOTAL:	14,096	-	22,691	-

1/ For purposes of the Census "holding" and "parcel" were defined as follows:

Farm (Holding) - One or more parcels of land, used wholly or partly for agricultural purposes, without regard for size or title.

Parcel - A continuous piece of land held under one form of tenure, irrespective of the number of fields or plots it may contain. A road passing through a plot of land does not divide the plot into two parcels.

Source: West Indies Census of Agriculture 1961.

by an upgrading in skills of farmers if the economy is to make a significant leap forward^{3/}.

Farm Population

Table 3 shows the distribution of farmers by agricultural

Table 3

Distribution of Farmers by
Agricultural Development Region
1961 and 1975

Development Region	Number of Farmers 1961	Number of Farmers 1975	% Change
North	3856	2219	- 42
East	4444	3327	- 25
West	1161	1755	+ 51
South	5092	4008	- 21
North-East	760	1256	+ 65
TOTAL:	15319	12565	- 18

Sources: West Indies Census of Agriculture 1961 and Unpublished data from sample Survey conducted by Ministry of Agriculture in 1975 with assistance from British Development Division, Barbados.

^{3/} "Economic and Social Development of Grenada 1968" by C.Y. Thomas and others of I.S.E.R., UWI, Jamaica stated that "A land reform programme appears to be the only way to counter the paradox of land shortage and land hunger among the small holders and the landless and a large amount of cultivable land idle in the larger farms". See Chapter 4, Section 1 - The Pattern of Land Use. Final paragraph, page 66.

development regions in 1961 and 1975. The data show that there was an 18 per cent decline in the number of farmers in the 14 years. The greatest loss occurred in the north where there was a 42 per cent decline, but losses in the east and south were also high, 25 per cent and 21 per cent respectively. In the west the number of farmers increased by 51 per cent and there was a 65 per cent increase in Carriacou. This 18 per cent decrease in the number of farmers was accompanied by a 23 per cent decrease in acreage under agricultural use, so that the former decline does not necessarily indicate development in the agricultural sector. On the contrary the indications are that the fall in both these variables was also accompanied by a decline in agricultural output. Table 4 shows the distribution of farm employment by parish, age and sex in 1975. Of the forty-one thousand persons employed in this sector, 78 per cent were in the age-group 15 to 64 years; 6.2 per cent were 65 and over and the remaining 16 per cent were under 15. According to the 1975 sample survey the average age of farmers was 51 years. It is doubtful if the 2500 men and women at the upper end of the age spectrum have a level of productivity which can justify their presence in the agricultural labour force. On the other hand the 6000 youths at the lower end of the spectrum give some hope, because they are a cadre from which it may be possible to recruit persons for farmer training.

SUMMARY

The physical and climatic features of the State of Grenada indicate quite clearly that agriculture is and will remain for the foreseeable future the mainstay of the economy. The contribution which this sector makes to national wealth depends very much on the institutional framework within which it operates and the quality of the human resources responsible for production. The traditional plantation system and inheritance practices have left the economy with a farm size structure which under existing conditions presents bottlenecks to expansion. Production depends mainly on a peasantry, which while being able to draw on accumulated experience, has little managerial skill and is not oriented to the higher level of control and technological application required for rapid and sustained growth.

Table 4
Distribution of Farm Employment
by Parish, Age and Sex: 1975

PARISH	AGE-GROUP AND SEX								TOTAL PARISH
	Under 15		15-64		65 & over		Total		
	M	F	M	F	M	F	M	F	
St. Mark	205	89	536	487	46	20	787	596	1383
St. Patrick	345	272	2705	2123	177	204	3227	2599	5826
St. John	193	50	1677	1282	132	138	2002	1470	3472
St. Andrew	989	875	5095	3957	291	378	6375	5210	11585
St. George	940	666	4156	3181	127	232	5223	4079	9302
St. David	716	400	2116	1670	116	208	2948	2278	5226
Carriacou	274	383	1444	1720	257	223	1975	2326	4301
Total (Sex)	3662	2735	17729	14420	1146	1403	22537	18558	41095
Total (Age)	6397		32149		2549		41095		

Source: Unpublished data from survey conducted by Ministry of Agriculture in 1975 with assistance from British Development Division, Barbados.

An agricultural development programme for Grenada has to be viewed against this background. There are severe limits to what can be achieved within the existing framework, but given that steps are taken to initiate structural changes within the industry and to inject a cadre of young persons with a more scientific approach to farming, existing horizons can be broadened and agriculture can make a valuable contribution as a base for industrial growth and improved nutritional standards.

CHAPTER 1

THE STATUS OF AGRICULTURE AND FOOD IN THE ECONOMY

Agriculture in the Gross Domestic Product

Estimates of the sectoral origin of Gross Domestic Product at factor cost, shown in Statistical Appendix: Table 2, indicate that the agricultural sector made the largest direct contribution to the GDP in each year. The trend was downwards, falling from 37.8 per cent in 1962 to a trough of 21.4 per cent in 1972 and then rising to 25 per cent in 1974. The change in the export agriculture sub-sector relative to other sectors was quite significant. In 1967 this sub-sector made the largest contribution - 20.7 per cent - to the GDP, but by 1972 its contribution had fallen to 10.2 per cent and was less than those of the construction, distribution and government. In 1971 and 1972 it contributed less than "other agriculture", but rose above it in the last two years. The data show that while agriculture as a whole commands the dominant position in the economy, the contribution of this export sub-sector, whose income is most subject to movements in world prices, fell significantly over the period and showed greater fluctuations than the non-export agriculture sub-sector which, however, also had a downward trend. The position of agriculture in the economy is further enhanced by factor costs in other sectors, which derive partly from agricultural activity, particularly manufacturing, distribution and transport.

Domestic Agricultural Exports

The dominant role of agricultural exports in foreign trade is shown in Statistical Appendix: Table 3. Between 1970 and 1975, domestic exports of food items by value accounted for 98.0 per cent to 99.3 per cent of total domestic exports, and while in 1971 they paid for only 20.4 per cent of total net imports, by 1975 they were paying for 49.0 per cent. Another relevant comparison is that between the value of domestic food exports (Row 2) and net imports of food (Row 10), Row 11 in Table 3 shows that between 1970 and 1973 the value of domestic exports of food ranged between 72.7 per cent to 99.7 per cent of net imports of this commodity group, but in 1974 there was, by value, a domestic export food balance of 19.0 per cent and a further increase to 23.1 per cent in 1975. Improvement in the purchasing power of

domestic food exports was due both to increases in commodity prices in 1974 and in 1975, (See Table 5) and as is shown in Statistical Appendix: Table 4, to significant increases in the export volume of bananas

Table 5

Average Export Unit Values of
Selected Commodities 1971-1975

Commodity	EC\$ per lb.				
	1971	1972	1973	1974	1975
Bananas	0.057	0.053	0.087	0.176	0.226
Nutmegs	0.85	0.80	1.64	2.61	2.21
Mace	1.27	0.96	3.00	4.43	4.00
Cocoa	0.58	0.59	0.59	1.01	1.41

Source: Calculated from External Trade data provided by Ministry of Finance.

and nutmegs in 1975. It is important to note that though the import food bill rose significantly in 1975, due in part to price increases, earnings from domestic food exports provided a surplus to pay for non-food imports. Grenada's exports of bananas and cocoa are but a small percentage of the volume of world trade in these commodities, but the latter fetches a premium price because it is used for flavouring. Its demand is therefore relatively inelastic. In the case of nutmeg, Grenada exports are approximately 30 per cent of world trade, but Indonesia, the main producer, supplies approximately 60 per cent of world exports.

At least in one market, that of the Federal Republic of Germany, Grenada nutmeg fetched a slightly higher price than the Indonesian quality in 1969. Towards the end of June 1969, the following prices were quoted in the Hamburg market:

West Indies Grade	DM/per kg. Spot	Indonesian Grade	DM/per kg. Spot
Unassorted	5.42	Unassorted	4.81
110 per lb.	5.70	125 per lb.	4.65
		110/115 per lb.	4.87
90/95 per lb.	5.59	105/110 per lb.	4.92
80 per lb.	5.86	90/95 per lb.	5.20
		80/85 per lb.	5.47
		70/75 per lb.	6.20

Source: Markets for Spices in North America, Western Europe and Japan - International Trade Centre, UNCTAD/GATT, Geneva 1970.

The Grenada Co-operative Nutmeg Association which is the national exporter of nutmeg and mace, markets its produce through sole agents in the U.S.A. and through brokers in European Markets. The Association fixes its price taking into consideration world supply situation, and particularly the position of its main competitor, Indonesia. In the financial year ending June 1975 the Association's earnings from exports reached an all time record of EC\$8.2 million. This was largely due to increases in average prices of 39 per cent and 32 per cent over the previous year for nutmeg and mace respectively, resulting from unfavourable dry weather conditions and crop damage caused by a volcanic eruption during the previous year on the island of Siauw, one of the main producing areas in Indonesia.

Trends in Domestic Agricultural Exports

The volume of domestic exports of agricultural and forest produce, seafood and livestock for the period 1965-1975 is shown in Statistical Appendix: Table 4. This is a sufficiently lengthy span to present a clear picture of the range of commodities which determines the level of foreign earnings of the Grenadian economy. Some minor commodities like fish, raw cotton, crude animal materials and floor coverings were exported periodically, and in some cases there have been wide fluctuations and noticeable declines in volume. Four new commodity groups - vegetable and fruit juices, sauces, fruit and vegetable preserves and preparations - were exported from 1973 onwards, but these are based primarily on imported raw material, and their long-term viability based

on domestic production is yet to be proven. The strength of the economy lies in bananas, cocoa and the spice group but here too fluctuations have been very wide. The trends in exports are best seen in Statistical Appendix: Table 5 which shows volume indices of exports based on year 1973^{1/}.

Bananas

In the first five years banana exports were more than twice the level in 1973, rising to a peak from 1965 through to 1968. Since then the trend has been downwards until 1974. There was a spurt in 1975 when quantum exports were 27 per cent above the 1973 level. Since a campaign to increase banana production through improved cultivation practices was started in 1974, increased exports in 1975 may be the beginning of an upward trend to levels attained in the 1960's.

Cocoa

From a level, in 1965, of 10 per cent above 1973 exports, there was a decline in the next three years and then a significant increase in 1969 to 50 per cent above the 1973 level. Since then the trend has been downwards reaching its lowest point in 1975 - 20 per cent below 1973 exports. The decline in cocoa exports reflects a general fall in production despite national programmes for reviving the industry.

Nutmeg

In 1965 exports were 3 per cent above the 1973 level but fell to a trough of 51 per cent in 1967 and then rose in 1969 to its highest level - 153.4 - in the eleven year period. There were two subsequent peak years, 1972 and 1975, the latter being 41 per cent above the level exports in 1973.

^{1/} This year was chosen because a new commodity classification was introduced, cinnamon and clove exports were separately identified, new commodities entered the export trade, and volume exports of traditional crops are representative of the level of exports in the 1970's. 1973 is a suitable benchmark for both past and future.

Mace

Since mace and nutmeg are produced by the same tree, this commodity tends to follow the same trend as nutmeg. 1969 was the year of peak exports after a trough in 1967. The decline in 1970 and 1971 was followed in 1972 by a rise to 68 per cent above 1973 exports. There were significant decreases in exports in 1972 and 1975.

Cinnamon and Clove

These commodities assumed such importance in export trade in pre-1973 years that it was decided to identify them separately from that year. Exports fluctuated widely in 1974 and 1975, but since these spices have a long storage life the fluctuations cannot be viewed as part of a production trend.

Pimento

There were no exports in 1973, so this commodity could not be dealt with in Statistical Appendix: Table 5, but Statistical Appendix: Table 4 shows that volume exports reached a peak of 12,000 lbs. in 1967. There were no exports between 1970-1974. Exports in 1975 of 2,000 lbs. were 14 per cent above the lowest level to which exports fell during the period under consideration. Judging from past performance this commodity cannot be regarded as a reliable export earner.

Other Spices

Since cinnamon and clove are included with other spices in pre-1973 data, the relevant exports with respect to the future are those of 1973-1975. Exports in 1974 fell to 35 per cent below those of 1973 but rose to 30 per cent above in 1975. These data are insufficient for drawing conclusions about the future, but a comparison between 1973-1975 data and 1966-1969 data when clove and cinnamon were included with "other spices" suggests that there is scope for expansion in exports under this group.

Nutmeg Oil

Statistical Appendix: Table 4 shows that there have been occasional exports of this commodity: 1260 lbs. in 1965, 70 lbs. in 1968, and 3256 lbs. in 1975. Since this is a commodity in international trade there is a case for examining the factors which make it a periodical rather than a permanent export commodity. Certainly with the expected increases in nutmeg production,

the case for processing raw material not suited for export locally, becomes increasingly important.

Lime Oil

Exports of this commodity have been regular, with the exception of the year 1974 when there were none. From a peak index of 1081.5 in 1965 there was a steady decline to 76.9 in 1975, with 1973 as base year. The past trend suggests that the industry is in decline.

Lime Juice

This commodity was exported throughout the period, but there were wide fluctuations in the volume of exports. The trough was in 1974 at a level of 69.5 of the base year. Exports in 1975 were 17 times above the 1973 level. This is a hopeful sign, but lime trees have been attacked by a disease which has severely crippled the industry. The ravages of disease will therefore first have to be overcome if the industry is to survive.

Fresh Fruit n.e.s.

This group of commodities is important in intra-regional trade. There was a downward trend from 1965, but in 1973 exports were higher than in any of the previous 7 years, then rose by 150 per cent in 1975. The items in this group are important components in the weekly trade with CARICOM countries. Unfortunately this trade is not, at present organized in such a way as to avoid waste and ensure long-term expansion, so the high level of exports attained in 1975 does not give much of a guide to the future.

Agriculture and Central Government Revenue

Statistical Appendix: Table 6 shows the contribution which export duties on the main agricultural commodities make to Central Government Revenue. While in 1970 only 5.7 per cent of Government Revenue came from this source in 1975 the yield was 16.5 per cent. The importance of this source of revenue is further emphasised by a comparison between Rows 3 and 5 showing the annual rate of change of agricultural export duties and Total Government Revenue. Between 1972 and 1974 when the annual rate of increase of the former was 16.4 per cent and 13.8 per cent, the

latter fell by 2.2 per cent and 20.6 per cent respectively. The decline in Government revenue would have been very much greater but for increases from export duties on agricultural commodities. These data highlight the importance of the agricultural sector to Government finances.

Food and Nutrition

The nation's annual food supply is comprised of net food imports together with that part of domestic production which is consumed. The greater the country's dependence on imported food the less will be the supply of foreign earnings available for development expenditure on fixed capital and for financing foreign loans. Both the quantum and trends in the value of net food imports are therefore, in the face of an increasing population, important indicators of the viability and growth potential of the Grenadian economy.

Trends in Net Imports of Food

Net imports of the main food commodity groups are shown in Statistical Appendix: Table 7 together with annual percentage changes. The data show rising percentage changes between 1968-1970 in all items, but a decline thereafter. The change which occurred between 1971 and 1973 is of particular interest, because it was the only period when the total change was negative, -6.6 per cent. In the light of an annual population increase estimated at approximately 1 per cent, the data show that between 1971 and 1973 consumer demand for foreign food not only fell significantly but was well below the rate of population increase^{2/}. The volume decline was mainly due to decreases of 19 per cent in imports in the meat and milk groups, 8 per cent in fish, 11 per cent in cereals, 38 per cent in coffee, tea, etc. (the 07 group) and 9 per cent in animal feeds. These reductions in imports were most likely due to commodity price increases in 1973, but they might have had a salutary effect, in stimulating domestic food production, thus suggesting that the economy has

^{2/} Data on tourism during this period show that total visitors rose from 84,288 in 1971 to 165,800 in 1973. Long stay visitors fell from 35,636 to 33,500 and estimated tourist expenditure fell from EC\$17.1 million to EC\$16.2 million. These movements in tourist statistics might have been a contributory factor.

great capacity to cushion itself against significant reduction in food imports. This unfortunately cannot be verified because there are no statistical series on domestic food production.

Food Supplies and their Nutritional Value

Food supplies have to be evaluated in terms of the contribution they make to nutritional standards. Data on the volume of food consumed by the population for a given year were not available and therefore net food imports for 1973 and consumption of locally grown food for 1975 were used as a basis for calculating annual nutritional supplies. Statistical Appendix: Table 8 shows 125 food items with a total volume of 36 million pounds and their main nutritional values. Statistical Appendix: Table 9 provides the same information with respect to 66 locally produced items of food with an estimated volume of 35 million pounds. The data in these tables have been combined and are shown in Statistical Appendix: Table 10 with calculations of the main nutritional composition of estimated daily consumption per person of food in Grenada. The estimated daily intake per capita of calories was 1958.4 of which 1535.9 was supplied by net food imports and 422.6 by locally grown food. With respect to proteins the daily intake per capita was 46.03 grams, with net food imports supplying 31.72 and locally grown food 14.31. In Statistical Appendix: Table 11 the daily nutritional requirements for the estimated population for 1975 are shown together with the supplies available and nutritional balances. The data show that there is a short-fall per capita per day of 419 calories and a surplus of 25 grams of protein. These are, of course, national averages which give no information on distribution between income groups. It is likely that low income groups show deficiencies in both calories and protein, and that the surplus in the latter nutrient is due to high consumption levels in upper income groups^{3/}.

^{3/} A National Household Food Consumption Survey conducted in Trinidad in 1972 showed that when individual household nutrition requirements were compared with their respective intakes, only 61 per cent of households met their calorie requirements and 69 per cent their protein.

SUMMARY

Though the economic welfare of the State of Grenada depends primarily on its agricultural sector, an examination of available historical data shows that in terms of volume, long-term trends of main export earners have been downwards. Increased earnings have been mainly due to high commodity prices which in 1974 and 1975 made the country, in value terms, a net exporter of food (SITC 0), thus providing small surpluses for non-food imports. But this might well have been a temporary deviation from the net food importer trend of previous years.

Estimates of annual food supplies indicate that the economy grows less than 50 per cent of the food consumed and that this domestic supply accounts for only 21.5 per cent and 31 per cent of the per capita daily consumption of supplies of calories and grams of protein respectively. Data on available nutrients when compared with acceptable international requirements indicate that malnutrition is predominantly due to calorie deficiency.

CHAPTER 2

DEVELOPMENT PLANNING GOALS AND OBJECTIVES: STRATEGY AND IMPLEMENTATION

Planning - A Necessity

With its physical and human resources, Grenada has developed an economy which is primarily agricultural. The contributions of this sector to the Gross Domestic Product, export trade, domestic food supplies, Government revenue, and employment, indicate what an important role it plays in determining the living standards attainable in the society. Even during colonial times it was recognised that there were severe limitations to what free enterprise could achieve if Government did not play an active part in determining the structure within which entrepreneurial decisions were taken. As a consequence legislation has been passed over many decades, to build up a physical, legal and administrative infrastructure to promote agricultural development^{1/}. This development has been related primarily to the cultivation of cash crops for foreign markets, and food production for domestic consumption has had a very low investment rating. This has had the twin effect of making foreign grown food an integral part of the national diet and domestically grown food unattractive for long-term capital investment, since food production was not related to food consumption^{2/}. Rapidly growing population and incomes have therefore meant rapidly growing food imports, not rapidly growing food production for consumption.

^{1/} Evidence of this is: the network of public roads which meet the needs of agriculture, Produce and Marketing Boards, and technical, research, propagation and extension services provided by the Ministry of Agriculture.

^{2/} This characteristic is not peculiar to Grenada, but is common throughout the Caribbean region.

Political independence has, however, brought with it a new dimension to the economics of agriculture. Grenada like the rest of the region can no longer take it for granted that it has assured foreign markets for agricultural produce. Although, in the short run, such market assurance as is obtained through membership in the ACP group of countries may offer some respite against economic realities, in the long run, there has to be an examination of the comparative advantages of the country feeding itself as against being fed by the industrially advanced countries. Moreover within the Caribbean region, production has undergone fundamental structural changes over the past thirty years. Expanded mining, manufacturing and construction sectors have made relative incomes from agriculture so unattractive that the traditional plantation system which fed foreign factories with raw and intermediate goods has lost a substantial part of its supply of cheap labour. The level of assured income which the agricultural worker wants today is determined by what his counterpart receives in other sectors, and neither the present system of ownership and land tenureship, nor cultivation for foreign markets in the face of international competition, can guarantee this in the long run. In these circumstances, the role of Government has to be more direct than it has been traditionally. It has to become the chief agent for policies of growth, expansion and distribution, and by example and precept make a deliberate attempt to influence and if necessary control land use and agricultural investment decisions in the country.

In sum, development planning has to be a central theme of Government policy and action.

The Approach to Development

The benefits to be derived from planning are of a long-term nature, therefore it is vitally important to involve the total society in the planning process. Government cannot be cast in a role as benefactor, because in fact, achievement will depend on the degree of popular participation which it can engender, not on how much good it promises to do or says it has done. Moreover, in countries which are trying, in a life-time, to attain the structure for sustaining living standards achieved by others over many generations, the "growth process" is very slow relative to life expectancy of the individual, so that the population cannot be motivated solely on the basis of personal expectations. This calls for two main facets in stimulating human motivation.

In the first instance, the communal nature of all efforts must be emphasised. Every individual must be encouraged to take part in the exercise and identify with all intellectual and physical agents of change - discussion, publication, hoe and cutlass, pump and tractor. In particular, physical labour ought not to be viewed as degrading in the society, but rather as the means by which each individual, regardless of social status or position contributes to the physical capital of his society.

The crucial role of human resources in development planning cannot be over emphasised. There is an unfortunate tendency in developing countries to regard finance, particularly that from external sources, as a prerequisite for economic development, while within the economy there are thousands of able-bodied men and women who can, with their hands construct physical capital under technical guidance which would go a long way to improving national output. Dams, irrigation systems, embankments, roads and bridges, have all been constructed for thousands of years to meet regional needs of societies as a result of the conscious collective awareness of farmers for facilities which were to their common advantage. This self-help approach to development is what is lacking in many countries which are today trying to improve their standard of living^{3/}.

Secondly, there must be consciousness on the part of the people that the wealth, comfort and physical capital the country has today, result from efforts of past generations. The present generation enjoys the fruits of labour of the past, but also has a moral and social responsibility to preserve and create for future generations. By understanding this long-term nature of the development process, both

^{3/} Foreign financial aid schemes often become debt traps not just because of the conditions attached to the aid, but also because recipient countries seldom see this aid as supplementary to full utilization of human resources.

governors and governed can get a meaningful perspective of current activity and function in the realm of reality rather than in one of fanciful expectations.

There is another important role which Governments in developing countries have to perform, namely; to establish an ongoing dialogue in their societies to work out national concepts of development. In a world drawn closer by rapid means of transport, mass-communication and international expertise, the concept of a developed society has centred around the socio-economic, cultural and infrastructural achievements of countries like the US, Canada, most of Western Europe and the European outposts in Australasia, Africa and South America. It is often forgotten that looked at from the world at large, these are special cases, and the conditions which fostered the kind of expansion which occurred in those countries are unlikely to be duplicated. There are now few virgin spots where new migrants can destroy traditional societies and implant their own socio-cultural norms, nor can the physical and human resources of countries be exploited in an imperialist framework as they were between the 16th and early 20th centuries. Therefore most of the developing countries have to work out for themselves norms which bear a closer relationship to their own resource endowment and production potential and are more in keeping with national cultural traditions. This does not entail the exclusion of foreign ideas, advice and technology, but it does require that all these must be viewed against a background of socio-economic goals related to national resources potential and to the best cultural traditions in the society.

It is within this context that people in developing countries have important conceptual roles to perform. They have to start off with a clear understanding, that whatever the historical background of their societies, countries neither individually nor collectively, owe them a living. They have to earn one for themselves. Secondly, this entails that in attempting to attain a level of human dignity they have to establish social norms and patterns of living which are dependent primarily on the capacity of their own economy to finance their living standards. It is not inconceivable, for example, for a society to conclude that in terms of national priorities it cannot afford a system of private transport based on steam, electricity or the internal combustion engine, and therefore elects to promote and encourage the use of bicycles. Nor is it inconceivable for a society in the same context, to develop wind and solar energy which are free timeless gifts of nature on a vast scale

for heat and power instead of relying primarily on high cost fossil fuels. Such a society cannot be deemed underdeveloped because it has chosen paths different from those current in the so-called developed economies of today.

But values of this kind cannot be forced down on a people without a tradition of dictatorial rule, hence the overriding importance of establishing a dialogue to get all people involved in thinking of national priorities and, through the cost of what the society is doing, towards the cost of what the society can afford to do. It is in this sense that conscious development is a never-ending exercise. It can be started in a particular generation because of the aspirations of a people. It can be given meaning by political, administrative and managerial action. But when it has started, it cannot be stopped because Man by his very nature will continue to aspire to goals. The important question therefore is: are those goals meaningful within the context of the physical, human and spiritual resources of a people? This development plan is therefore a beginning to which there can be no end as long as the society exists. The present vision covers a twenty-five year period with a first lap of five years, which is however continuous, so that at the end of each year an additional year re-creates a five-year programme.

Goals and Objectives

The direction which Grenada's Agricultural Development Plan should take emerges quite clearly from facts produced in the previous chapter. The broad goals must be the development of human and other biological resources - agriculture, animal production, salt and fresh water foods and forestry - with a view to expanding the internal economy to its optimum potential. This general aim can be narrowed down to certain specific objectives. These are:

- (a) Increasing export earnings from both raw material and processed commodities.
- (b) Reducing dependence on foreign food supplies so that overseas earnings can be used to finance capital investments.

- (c) Providing a higher proportion of the nutritional needs of the population from domestic food supplies.
- (d) Improving internal and regional marketing facilities.
- (e) Providing the necessary socio-political climate for sounding out the needs and aspirations of the population in order to stimulate mass participation in national goals.
- (f) Providing the administrative, managerial and institutional framework which would make the attainments of national objectives possible.

While the overall national goal may be described as being vague and mainly directional, the objectives take us nearer to the core of the planning exercise. They indicate not only specific lines of action which would increase national wealth, but also stress that such an increase will be contingent on national involvement and on the structuring of systems which will facilitate efficient management of the economy. The strategy which will be adopted to attain these objectives will now be outlined.

Strategy

It was pointed out earlier that there is no universalistic concept of development and that each society ought to see socio-economic growth and expansion within the framework of national norms based on historical and cultural experiences. This approach plays down the role of international economic comparisons. It queries the importance of measuring standards of development by comparing Gross Domestic Product per capita for Grenada with that of the United States, for example. This argument does not, however, rule out the validity of comparisons of this nature which may be helpful where there are kindred socio-cultural aspirations based on similar historical experiences. From the point of view of development strategy, therefore, our thinking is pushed back to the economy itself without concern for measuring its performance against that of other economies. But how should this be measured in the economy itself?

A major characteristic of Keynesian economics was emphasis on identifying macroeconomic variables and using them as tools to determine levels of demand and output in the economy as a whole, and in this way determining levels of employment. In so far as development was concerned, little attention was paid to spatial variations in performance of the economy. Thus, if global levels of production in the economy were rising at a desirable rate, this

was commendable even though there might be depression in some of its constituent parts.

There are many limitations in this approach for developing economies. In the first instance, since they have been traditional appendages of imperial economic systems, most of them have little control over their economies and could do little to manipulate macroeconomic variables which influence internal demand and output, both of which depend largely on earnings and investments from abroad. Secondly, the macro approach tends to ignore heterogeneous characteristics of physical resources and do not give sufficient weight to the human factor as a resource upon which plan formulation and implementation depend^{4/}. Thirdly, concentration on the total economy focuses attention away from those spatial characteristics which are central to internal growth and expansion.

While macroeconomic data can facilitate international comparisons and show historical trends, they are of very little relevance as economic tools for promoting that internal development which is the central theme of this plan. What is required here is a micro development strategy which facilitates concentration on regional performances.

Such a strategy will be structured on the view that total population of a society is a discontinuous distribution of human beings scattered about in clusters of varying sizes and in varying degrees of socio-economic relationships. Apart from internal ties which make residents in an area dependent on one another for their well-being,

^{4/} There is unfortunately an undocumented body of opinion in the Caribbean which holds that the small sizes of the individual islands and their populations make a micro approach to development unnecessary. This view is founded on a misconception of development. It has to do with people and their involvement in a process. If number has anything to do with it, then the smaller the size the greater will be the problem of involvement. Since the same amount of diversity is likely to be found in any human mass, then the smaller the mass, the greater the problem of motivating a large number of persons.

there are also linkages of time and space between clusters, in some cases, because of their contiguity, but in many instances arising from specialization, uneven distribution of natural resources and advantages which derive from economies of scale. The economy can therefore be seen as a spider's web with all parts related to one another in varying degrees of intensity. Wherever a population cluster exists, however, it can be taken for granted that there are economic activities which enable its members to remain there, otherwise they would migrate.

In Grenada the dominant activity is agriculture, but it must be remembered that there are craft industries, trading, and services of one kind or another, which add to the complexity of the economic framework and need to be considered in a national development plan. This Agricultural Development Plan has therefore to be viewed as one facet in an expanding complex. For, viewing the economy as a whole, even at the margin, the choice is not between industry and agriculture, but between economic and socio-cultural activities which cut across the artificial lines separating industry from agriculture, lines which are often useful for analytical purposes, but which tend to blur the importance of the role of agro-industrial complexes in the urbanization of rural life.

Population clusters in Grenada are small, but there are relatively high density population centres such as St. George's, Grenville, Sauteurs and Victoria, which within the context of the society, are urban areas and special consideration ought to be given to their development. For our purposes, however, the five agricultural districts with their existing boundaries and sub-divisions which comprise the institutional structure for servicing and monitoring the agricultural sector will be designated five Economic Regions. There is an Agricultural Extension Officer in charge of each Region, and there are further demarcations into Districts which are supervised by District Officers. The Economic Regions together with their boundaries are as follows:

NORTHERN REGION: From the mouth of River Antoine on the East Coast running along the river's course from the sea to Mt. St. Catherine Range. On the West Coast from the mouth of the river at Gros Point running south of the river bed in an East South East direction to Mt. St. Catherine Range. The Northern District comprises the parishes of St. Mark and St. Patrick.

WESTERN REGION: From the river at Gros Point and the boundary between the parishes of St. John and St. Mark in the North to that position of St. George's West of the Grand Etang Road at its junction with the Western Main Road and to the West of this road to its junction with the Tempe Road and along the Tempe Road in a north easterly direction through Chantilly Estate continuing in the same direction south of Bon Accord Estate and in a fairly arbitrary line to the St. David's parish boundary then through the Grand Etang Reserve and Range back to the St. John's and St. Mark's boundary at the Mt. St. Catherine Range.

SOUTHERN REGION: To the south of the Grand Etang Road at its junction with the Western Main Road and along this road to its junction with the Tempe Road thence along the Tempe Road continuing in a north easterly direction through Chantilly Estate and on the south of the arbitrary line to the St. David's parish boundary and then along the boundary of St. David's and St. Andrew's which passes through Mt. Sinai then eastwards through Mt. Lebanon Range to Crochu River and along this river's course to the sea.

EASTERN REGION: Along the Crochu river from the sea through the Mt. Lebanon Range to Mt. Sinai through the Grand Etang Range and Forest Reserves to the Mt. St. Catherine's Range then along the course of the River Antoine to the sea.

NORTH-EASTERN REGION: The islands of Carriacou and other off-shore islands.

Basic characteristics and data on these regions have been collected and are shown in Map Appendix B. They are:

1. Association Map showing contours, roads and water courses.
2. Population distribution.
3. Tree crop production.
4. Other arable production.
5. Livestock distribution.
6. Distribution of social services.

7. Distribution of electricity and water.

8. Recommended land use pattern.

Map 1 - 7 series place existing agricultural and animal production against their geographical, human and infrastructural background, thus giving a complete working picture of each region as an Agricultural Plant. Map 8 series based on slope and soil types demarcate land according to its agricultural potential thereby laying the basis for recommended optimum land use.

The only data for animal and crop production on a regional basis relate to 1961 when an agricultural census was conducted. Since subsequent available data refer to total island production, regional trends cannot be quantified, though the Ministry of Agriculture has general notions of the direction of regional changes in production of major crops. For planning purposes, it is important to collect relevant and reliable regional data on farmers and production. Towards this end the Ministry of Agriculture will ensure that:

1. Regional registers of farmers will be kept showing:
 - a. those producing export crops commercially; and
 - b. those growing food crops in marketable quantities.
2. Farmers will be provided with a simple format for keeping farm records.
3. Sample Surveys will be conducted annually on a regional basis by Extension Officers to collect production and other relevant data.

These data will be used to monitor regional production in each crop and lay a basis for regional crop production and land use policy.

Maps on population distribution in each region when placed against the background of association maps indicate quite clearly that population clusters are mainly located in valleys and these are serviced by secondary and other roads which serve as feeders to the main coastal road and to roads which traverse the island from west to east. This total road system establishes direct linkages between St. George's, the most populous urban centre and all parts of the island. As a result, road communication is oriented towards the capital. This certainly has advantages for external trade, but there is need to focus attention on inter-regional communications to facilitate marketing and processing of locally grown seasonal agricultural production. This is crucial for expansion of the internal market for locally grown food.

Regional maps on water and electricity indicate the location and spread of energy available for development, but Grenada receives very heavy rainfall for many months in the year, has substantial supplies of underground water, wind speeds which during the hey-day of the sugar cane industry provided power through windmills, and many hours of sunshine during the year which can provide a source of solar energy. For development, therefore, there are alternatives, and in the long run, possibly cheaper sources of power than those now utilised.

The first step in our strategy, therefore, is concentration on optimising production in each economic region and establishing linkages internally so as to broaden the base and deepen the structure of economic activity. As a subsidiary, new and cheap forms of energy have to be developed so that expansion can take place at minimum costs.

There are, however, very definite limitations to production levels which can be attained with existing distribution and sizes of holdings which comprise the Agricultural Plant in each Region. Our strategy must, therefore, be seen in terms of the short, medium, and the long-term. The immediate requirements are to stop further fragmentation of land, either by the State or by the individual, and, with the exception of major export crops, which will be dealt with separately, to give support prices for those crops, the production of which is desirable to increase domestic and regional supplies of fresh and processed foods. In the medium-term, i.e. in a period of not less than two or three years, the Government, after a campaign to condition farmers for the change, should begin a programme of consolidation of holdings and of urbanisation of rural society. The former will be dealt with in greater detail under the Lands Commission. The latter refers to the programme to encourage the farm population to settle in villages rather than in isolated houses which pose insurmountable problems in a programme of rural transformation. In the long-term, agricultural policy will aim at engrossing farms at the lower end of the farm size spectrum and redistributing at the higher end. In both cases, minimum and maximum farm sizes will relate to land use.

Another formidable limitation to achieving satisfactory levels of production is the quality of human resources now in agriculture and the low incidence of formalised co-operation among farmers. The former will be dealt with under Farm Education and Training. With respect to the latter, the Government should mount a campaign to establish a multiplicity of localised Farmers' Clubs throughout the State. These will serve as focal points for fostering environmental and development consciousness in the farming population. The Extension Staff has a key role to play in this programme and the Co-operative Department should through lectures and guidance, encourage the growth of Farmers' Co-operatives. The aim should be to encourage farmers to co-operate in pre-production, - purchasing of inputs and services - and post-production - marketing and processing - activities, while leaving them to act in production itself on their own initiative, i.e. to use farm labour if they wish, to employ paid labour, or to rely on voluntary farm labour.

These Farmers' Clubs will be the connecting link between the Ministry of Agriculture and the farming population. All commercial farmers must be invited to form Farmers' Clubs among themselves and during the third year of the first Five-Year Programme no farmer who is not a member of a Club should be eligible for subsidies, price supports, or any production or marketing facilities extended to farmers. At this point, participation must be compulsory. Members of each Farmers' Club must elect representatives to the Agricultural District Association, the members of which must elect representatives to the Regional Agricultural Association who, in turn must elect representatives to a National Farmers' Association. This structure should embrace all farmers, irrespective of the crop they cultivate and Government should recognise the Association as an independent organization representing interests of the whole farming community. There should be a consciousness on the part of Government that active participation in farm programmes and freedom of expression in the farming community could be yardsticks for measuring the degree of involvement of farmers in the development process, and it is only by such involvement that Government will know what specific obstacles have to be overcome in modernising the agricultural sector.

Measurement

For the purpose of measuring Regional performances, each region will be viewed as a micro-economy having economic relations with the rest of the world

which comprise other regions as well as other States. Details will be dealt with in the chapter on Regional Accounts.

Implementation

This plan aims at not just saying what to do and when to do it, but more important, how to do it and what minimum structures and systems are required to secure achievement.

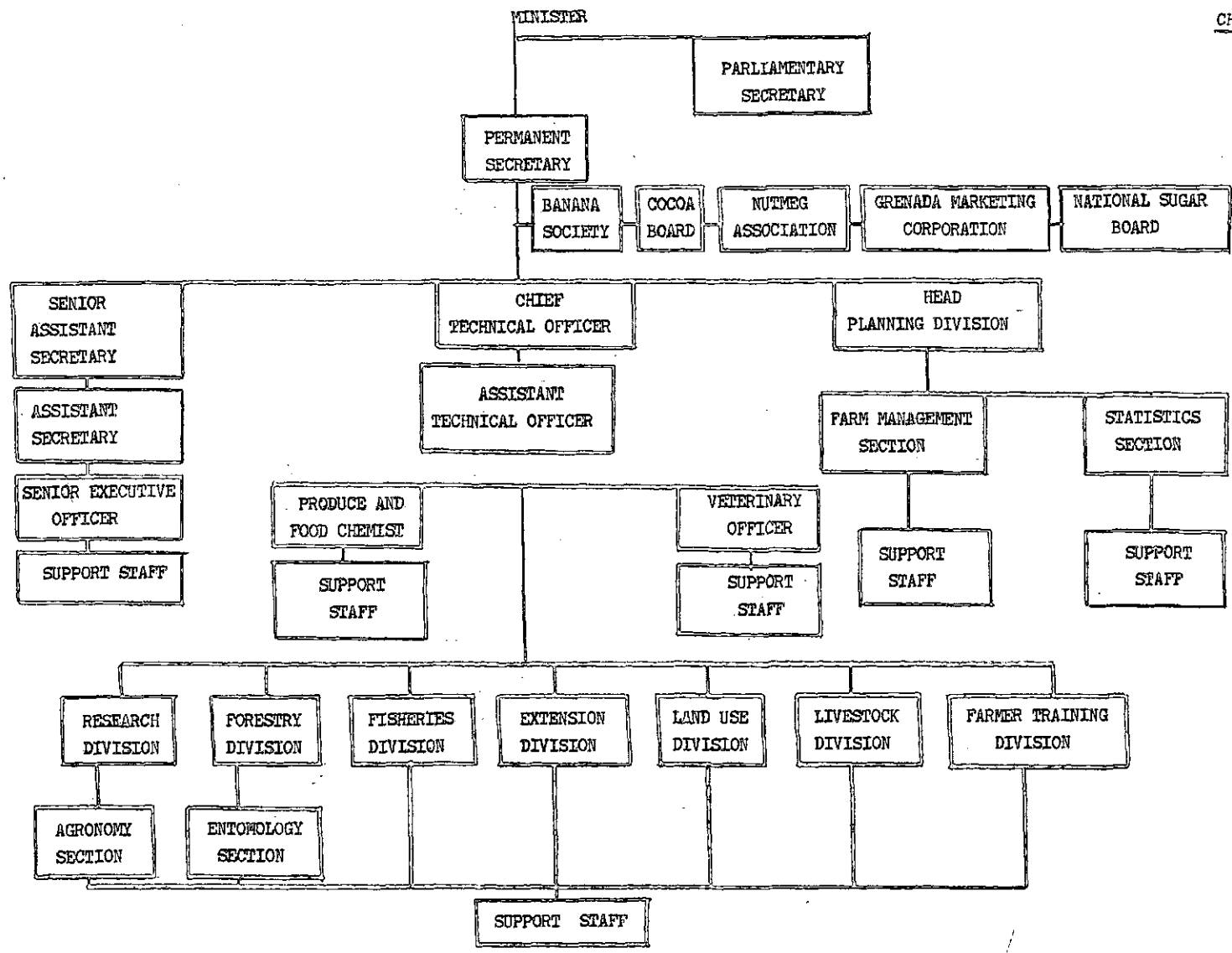
It is possible that the greatest bottleneck to rapid socio-economic change arises from the vestiges of a Crown Colony system which obscured the division between legislative and administrative functions. The Governor as Sovereign's representative sat originally in the Legislature with expatriate officers who performed the multiple functions of recommending and making laws and policies and also administering their implementation. The Colonial Secretary was senior administrator as well as advocate of the Sovereign's cause in the Legislature. Political independence has not always been accompanied by the ability to draw a clear distinction between the functions of Permanent Secretaries who have taken over the administrative role of the Colonial Secretary and other departmental heads who sat in the Legislature, and the functions of elected representatives as law and policy makers. As a result there has been little recognition of Permanent Secretaries as administrators and policy advisers to Governments and inadequate provision for them to function as such. This has an adverse effect on the development of internal advisory and decision-making systems within the Public Service at all levels. Just as the Permanent Secretary has not blossomed out as an Adviser to his Minister, so too he has been unable to delegate authority to his administrative support staff, to recognise fully the role of technical and research officers in his Ministry and to take full advantage of international technical advice. There are, therefore, numerous lacunae within the public service structure which impede policy formulation and implementation based on popular participation. Political independence while giving a State the right to determine its own future, has in many cases left it ill-equipped to implement that right.

A second impediment to achieving rapid change is that the urgency to promote such change has not only led to under-estimation of the importance of creating operational structures based on what has to be done, but also of placing over-emphasis on who has to do it. There is, as a result, great need to draw a clear distinction between the function of a citizen as a member of the public service and the right of the same citizen to exercise independent political preferences in a representative democracy. Failure of a government to recognise this difference often deprives it of the advice of qualified nationals who have first-hand knowledge of developmental problems. It is fully appreciated that due to human frailties the dividing line between political commitment and administrative and technical objectivity is often blurred, but their separation should be recognised in principle and competence of an officer should be the factor determining his suitability of a post, not his political loyalty. For it is only by recognition of administration as a specialist function that the society will be able to build up a cadre of personnel with the capacity to examine, with objectivity, the various options open to ministers and advise on the alternatives free from political expediency.

It is in these respect that the success of this plan depends primarily on the composition, organization and efficiency of those Ministries which are most closely associated with its implementation. Charts I and II show proposed organization of the Ministry of Agriculture, Lands and Fisheries and the Ministry of Planning. The former will be the main Ministry responsible for Plan Implementation. Statutory bodies responsible for the main export crops and marketing come under the Minister of Agriculture and there should be ministerial representation on each of these Boards.

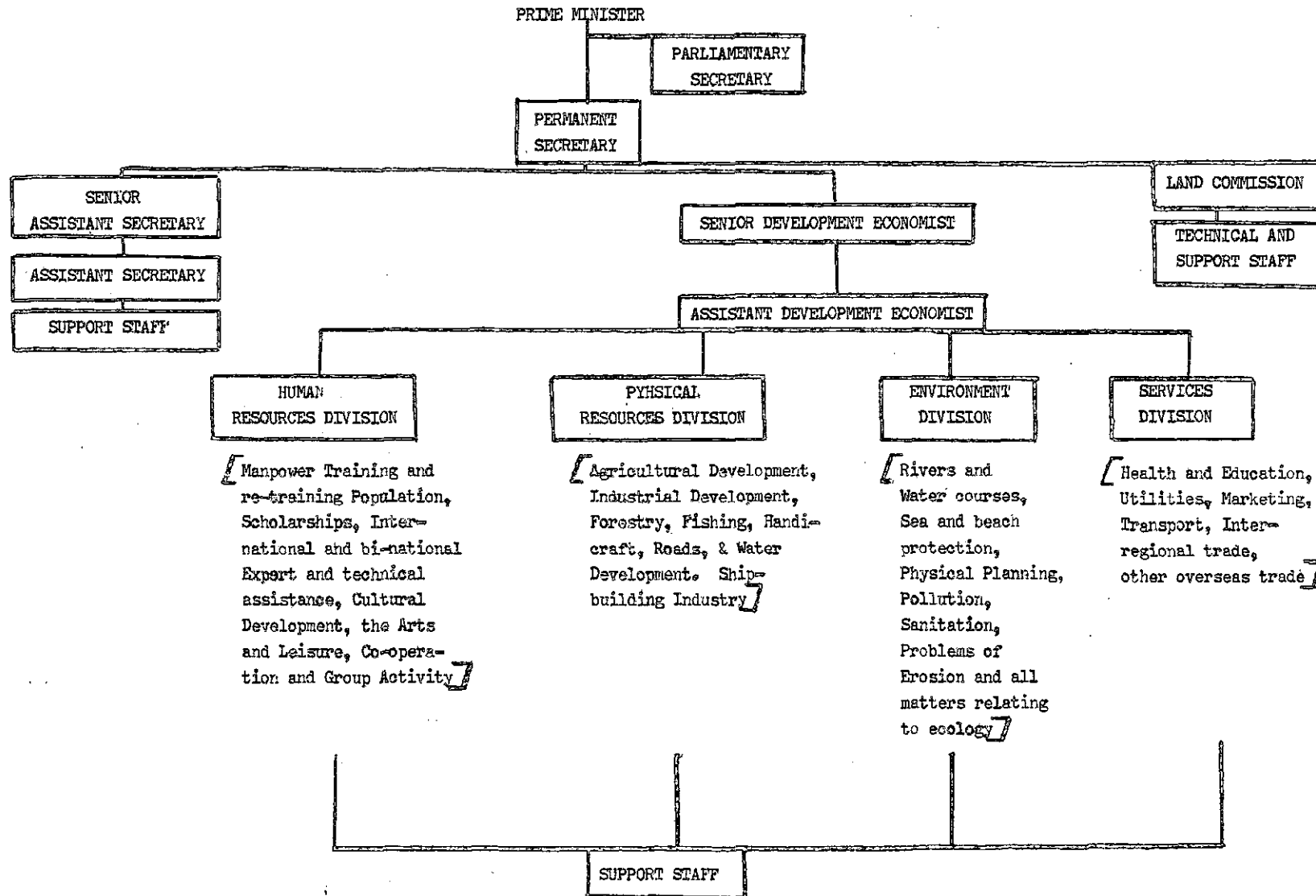
There are three operational lines from the Permanent Secretary - administrative, technical and planning. A Senior Assistant Secretary heads the first line. The second, at the head of which is the Chief Technical Officer supported by an Assistant, carries the brunt of the executive functions. Two officers perform a staff function to him, a Produce and Food Chemist and a Veterinary Officer. In a direct line-relationship to the technical officer there are the following divisions: Research, Forestry, Fisheries, Extension, Land Use, Livestock and Farmer Training. The

CHART I



PROPOSED ORGANIZATION OF MINISTRY OF
PLANNING & DEVELOPMENT IN GRENADA

CHART II



Research Division is further divided into an Agronomy Section and an Entomology Section. The third line is the Economic Planning Division which should have at the head someone trained in Economics and/or Statistics, who should also at least have a general acquaintance with Agriculture. Provision is made for a Farm Management Section headed by a fully trained Agriculture Officer and a Statistics Section headed by someone with training in Statistics. This division will have to monitor the plan and will be responsible for all economic and statistical research.

The Ministry of Agriculture though mainly responsible for the implementation of the plan is, however, subordinate to the Ministry of Planning and Development which is responsible for over-seeing all sectoral and regional planning. This Ministry falls under the Prime Minister. There are two main divisions under the Permanent Secretary; An Administrative, headed by a Senior Assistant Secretary, and a Technical, headed by a Senior Development Economist. Portfolios under the latter are as follows: Human Resources, Physical Resources, Environment and Services. These broad categories are preferable to a Ministerial Division of functions because they reflect a global approach to the problems of development and emphasize the need for officers to have a broad overview which co-ordinates the activities of many Ministries.

All other Ministries have important supporting roles to play in order to ensure the success of the plan. Each should have a Planning Division. In order to ensure proper co-ordination of planning activities the Permanent Secretary of the Ministry of Planning and Development should be Chairman of a Planning Committee comprising Permanent Secretaries and Heads of Planning Divisions in all Ministries. This Committee should meet at least once a month to ensure proper plan co-ordination and to even out difficult problems which arise in plan implementation.

Land Commission

Provision has been made for a Statutory Land Commission under the Prime Minister, but there should be ministerial representation both from the Prime Minister's Office and from the Ministry of Agriculture. There are many factors which have been responsible for the fall in agricultural production. While it cannot be said with certainty that land tenureship and the skewed distribution of land referred to in the previous chapter bear much of the blame, it is highly improbable that the long-term sustained growth which is required to achieve the objectives of this plan can be obtained if these conditions persist. The Land Commission will be the vehicle through which thorough studies will be made with a view to enunciating land and agrarian reform policies. It is expected that the Commission will be able to get outside expertise to assist in its work. The guiding principle of the Commission should be that land is a precious commodity which is and will always be in short supply in the Grenadian economy. It is not in the nation's interest to leave land idle, nor should its use or non-use left to be determined by imperfections of the market system.

This is not the place to speculate on the type of policies which would seem to be most suitable to Grenada, but it is important that the Commission should regard land reform as a tool to further internal economic development. It should reduce the inequalities in agricultural income, enable cadres of trained farmers to obtain agricultural land which they can cultivate under conditions of secure tenureship as long as they adhere to "good farming practices", and ensure that there is the machinery for the smooth transfer of land from one farm family to another. There are numerous examples of attempts of land reform in developing countries in which redistribution of agricultural land has served only to stifle socio-political discontent. It is more in the interest of the nation that the Commission should be guided by the economic goals which form the basis of this plan.

CHAPTER 3

DEMAND AND SUPPLY PROJECTIONS FOR MAJOR CROPS TO 1981

One of the main goals of development policy is to increase earnings from agricultural exports. It is, however, very difficult at this period to find a satisfactory basis for calculating future commodity prices because unprecedented increases in the prices of fossil fuels and some agricultural commodities over the past three years have given new dimensions to pricing in international trade. The success of the major oil producing countries in getting better prices for their fossil fuels and in relating those prices to inflationary movements in industrial countries has made producers of agricultural commodities recognise the advantages to be gained through joint-action in price negotiations with the major industrial consuming countries. With the exception of coffee and cocoa most commodity prices have fallen from the high levels at which they were in 1974/1975 and this has given developing countries a sense of urgency to arrive at long-term agreements which will modify price fluctuations and ensure them a more steady level of foreign earnings. Though they have not yet met with success, achievement in this direction is important for the expansion of international trade.

This urgency is further accentuated by the inability of developing countries to repay the enormous development loans made by international agencies. Can the rescheduling of payments eventually end their indebtedness? Should these loans be written off, and the flow of international funds increased not by loans and aids, but by significant increases in commodity prices? All these questions are germane to international concern for improving living conditions in developing countries and are therefore of relevance to Grenada.

Projections in this chapter are therefore based on very shaky foundations in so far as demand and foreign earnings are concerned. Certainly, the FAO demand projections for 1980 for cocoa^{1/}, for

^{1/} FAO Agricultural commodity projections 1970-1980.

example, based on the level of consumption during 1970 at a price of US\$0.40 per lb., and which on this basis assumed a demand of 1.77 million metric tons in 1980 must be revised considerably in the light of the price of this commodity over the past three years and its current market price of approximately US\$1.00 per lb.

Again, with respect to bananas, the FAO assumption of a constant price of US\$95 per ton and an import demand of 7.8 million tons based on consumption levels of 9 to 10 k per head in importing countries needs revision when the current c.i.f. price is over US\$300 per metric ton.

In order to get a fair picture of the supply side, commodity exports for Grenada over a period of 15 years where possible have been used to provide a long-term basis for projections. Since we are dealing with tree crops primarily, the projections take into consideration production levels at the end of the century though the immediate aim is to present estimates for 1981 and to calculate the expected level of foreign earnings. The tables on which cocoa, nutmeg and mace projections are based are in Statistical Appendix: Tables 12, 13, 14 and 15. Each of the major crops will be dealt with separately.

Cocoa

On the demand side, exports to a country are taken as demand in that country for Grenada's cocoa beans irrespective of whether any of these exports are re-exported from their destination. Table 12 in the Statistical Appendix shows that during those 15 years - 1961/1975 - the island exported cocoa beans to 13 countries, but 6 of these purchased annually - Belgium, Canada, Netherlands, United Kingdom, South/South West Africa and West Germany.

Australia was a buyer from 1961/1974, but in the latter year the price per metric ton for cocoa beans from Grenada rose to US\$2065.61, approximately US\$1200 above the unit price of total Australian imports, and in 1975 the country did not buy cocoa from Grenada. Even during the years when regular purchases were made from Grenada, the island's share of the Australian market declined from 0.44 per cent in 1967 at a price of US\$717 per metric ton to 0.01 per cent in 1974, though the volume of exports showed little change. The island seems, for the time being at least, to have priced itself out of the Australian market. If however f.o.b. price settles at approximately US\$2000

per metric ton Grenada should be able to regain its position as a regular supplier^{2/}. Per capita consumption in Australia rose from 1.1 kg in 1971 to 1.35 kg in 1974. Assuming that it rises to 1.5 kg by 1981, total demand will be approximately 19,000 metric tons. Grenada should aim at supplying 0.25 per cent of the market's requirements by 1981, i.e. 48 metric tons. Earnings will be in excess of US\$96,000.

Denmark was a regular market between 1961-1968 in the last year of which Grenada's exports reached a peak of 0.87 per cent of total Danish imports. But for most of the period, Denmark paid a unit price in excess of the average unit price of its total imports. There have been no imports from Grenada since 1968 and total Danish imports fell significantly in 1973 and 1974, possibly because of price increases. Since, however, Denmark is a market for flavoured cocoa, Grenada should try to recapture the 0.5 per cent of the Danish market which it had in the period 1961/1965. Consumption per capita fell from 0.82 kg in 1970 to 0.58 kg in 1974. If it falls to 0.53 kg by 1981 then Danish imports will be 2771 metric tons and Grenada exports should be about 13 metric tons. Foreign earnings should be in excess of US\$26,000 in 1981.

With respect to Italy, Grenada exported cocoa beans to that country in only 5 of the 15 years under consideration and on each occasion it received a premium price. Italy can only be viewed as an occasional buyer. The same may be said of Ireland which bought cocoa beans three times in the period under review, Japan which purchased once and France which purchased twice.

^{2/} During the preparation of this plan the price of cocoa on the New York market reached levels in excess of US\$3500 per metric ton. The trend at the beginning of April 1977 is downward but it is likely that the supply position will keep prices well above the 1974 level. It is assumed in this study that price will level off at the figure of approximately US\$2000 per metric ton with Grenada receiving a premium price above this level.

The United States bought Grenadian cocoa beans annually from 1961/1965 with a peak of 0.06 per cent of its imports coming from the island from 1961. It paid a premium price during these five years. There were only further purchases during 1970, 1971 and 1972. Though the United States paid a premium price for cocoa beans from Grenada, its percentage imports were minimal, falling from a peak of 0.06 per cent in 1961 to 0.03 per cent in 1965. Total US imports of cocoa beans fluctuated throughout the period but the trend was downward. In 1965 for example imports were 3.5 per cent above the 1961 level but during that four-year period imports from Grenada fell both relatively and absolutely. When the US market opened again in 1970 the country made its largest ever purchase from Grenada - 699 metric tons - but paid a unit price which was both significantly lower than that paid by any other purchaser and also lower than the unit price of all US cocoa bean imports. In 1971 there was only a slight increase in price, but Grenada's exports to the US fell by 75.6 per cent and there was a further fall in 1972 of 63.7 per cent when there was a significant price rise. Generally speaking, the US is a price conscious market for cocoa beans and one which is not particularly interested in a high grade product. The data do give the impression that the US market is sensitive to price, for even when buyers paid a premium price, it was less than what Grenada received from other purchasers. It is worthwhile noting however that the volume of its purchases did not move with prices. For example, a fall in unit price of approximately 50 per cent between 1963/1964 was accompanied not by an increase, but by a fall of 83 per cent in the volume purchased. In 1961, Grenada had 0.06 per cent of the US market, in 1965, 0.03 per cent and in 1974 nil. Significantly, however, the island sold cocoa beans to South Africa in the last year at an f.o.b. price lower than the average unit price of US f.o.b. imports. It is quite obvious that even in 1974 when US imports were low, Grenada could, on the basis of price, have entered the US market.

It is likely that US cocoa beans importers do not regard Grenada as a built-in source of cocoa beans for their manufacturing industry and the

island may stand to benefit from direct promotional activities with specific buyers^{3/}.

On the demand side, US imports fell from 0.35 million tons in 1961 to 0.22 million tons in 1974 with a peak of only 0.36 million in 1965. The indications are that market demand is not a function of population growth. The low level of imports for 1974/1975 were most likely due to the general downturn in the economy but there seems to be a tendency to substitute other types of confectioneries when cocoa prices rise. In 1970, consumption per capita was 1.4 kg, but fell to 1.1 kg in 1974. Since substitution is a common feature of the US economy, it is assumed that even with recovery, consumption per head will remain at the present level and national demand will be 244,515 metric tons in 1981. Grenada should be able to capture approximately 0.2 per cent of the US market by 1981 - 500 metric tons. This will in volume terms make the US, Grenada's fourth largest market. This Five-Year period will give the island an opportunity to weigh the demand for its flavoured cocoa between European and North American buyers and determine what direction its selling policy should take to the end of the century. As a small producer it may prove advisable in the long run to keep its traditional markets for "fine cocoa" and sell a "cocoa ordinaire" to the US.

If it is assumed that prices will level off at approximately US\$2000 per metric ton, Grenada should earn by 1981 US\$1,000,000 from cocoa beans exports to the US market.

^{3/} In discussion with Sir Dennis Henry, Chairman of the Cocoa Board during the preparation of this study it was learnt that the Board had carried out a recent survey of the Canadian and US markets and it is proposed to develop the trade with manufacturers in those countries.

Canada imported 16,000 metric tons of cocoa beans in 1961 of which 26.8 metric tons or 0.17 per cent of its imports came from Grenada. Imports fluctuated during the period under consideration reaching a peak of 23,000 metric tons in 1965, but Grenada's share of the market was only 0.18 per cent. Volume exports from Grenada fluctuated considerably during the period but the trend was upward, reaching a maximum of 55.7 metric tons in 1975 when the unit price was 80 per cent above the 1961 level. Grenada's share of the Canadian market reached a peak of 0.31 per cent in 1967 but fell to 0.22 per cent in 1974. With respect to price, Canada paid a premium for most of the period with average price of all cocoa bean imports only rising above the unit price of Grenada cocoa in 1973 and 1974. The data indicate that supplies of Grenadian cocoa are built into the Canadian manufacturing industry possibly because of proximity and traditional ties, so that the level of exports remains relatively high even in the face of rising prices. Consumption per capita in Canada fell from 0.8 kg to 0.59 kg between 1971 and 1974. Assuming a level of consumption of 0.6 kg in 1981, imports should be 14,574 metric tons. If Grenada regains its 0.3 per cent of the market, at a price of US\$2000 per metric ton, the island's exports will be 44 metric tons and earnings will be approximately US\$90,000.

The Netherlands has been the second best market and a regular buyer of Grenadian cocoa, paying a premium price for much of the period under consideration. Total cocoa imports fluctuated during the period but showed an upward trend with a peak of 122,365 metric tons in 1972. Grenada's share of the market reached a peak of 1.13 per cent in 1963, when the island sold 1.138 metric tons, its nadir was 0.13 per cent, to which it fell in both 1968 and 1970. Prior to 1974 the Netherlands paid a premium in every year except 1968, but in 1974 and 1975 though paying significantly higher prices for Grenadian cocoa, the unit price of its total imports was higher. Between 1971 and 1974 per capita consumption fell from 9.2 kgs to 8.5 kgs. This was most likely due to price increases between these two years. Assuming that consumption per head does not fall below 8.0 kg by 1981 then in that year demand will be 115,000 metric tons. Of this, Grenada should aim to supply 0.6 per cent - 690.0 metric tons. Earnings should be in excess of US\$1.4 million.

West Germany was a regular market during the 15 year period. Volume exports from Grenada fell during most of the 1960's from a peak of 306 metric tons in 1961, but then began a strong upward movement in 1969 reaching a peak of nearly 500 metric tons in 1975. Grenada's share of the West German market also improved during the period from a trough of 0.04 per cent in 1967 and 1968 to a peak of 0.32 per cent in 1973. West Germany paid a premium price during most of the 1960's but when commodity prices increased in 1973, the f.o.b. price for Grenada cocoa was less than the average c.i.f. unit price of the buyer's total imports. The country's imports showed an upward trend throughout the 15 year period with a peak in 1965 of 166,930 metric tons. In 1974 when the unit price was approximately three times the 1968 level there was only a 5 per cent fall in the level of imports. Consumption per capita in West Germany rose from 2.06 kg in 1970 to 2.45 kg in 1974. The market is likely to keep expanding with increasing income and population growth and may by 1981 reach the level of demand of 174,000 metric tons assuming a 2.7 kg per capita consumption. Since West Germany is the largest importer of cocoa beans in Europe, and is particularly interested in flavour, Grenada should aim at capturing a portion of the market equivalent to what it has in the Netherlands or the UK. In the long run this means winning 2 per cent of the West German market by the end of the century. The immediate aim is to capture 0.5 per cent by 1981 - 870 metric tons. It is interesting to note that exports to Germany have been increasing annually since 1970. Earnings from sales to West Germany should be in excess of US\$1.8 million by 1981.

The United Kingdom was the destination of the major share of Grenada's cocoa exports during the 15 year period. Volume exports fluctuated between a trough of 925.6 metric tons in 1964 and a peak of 2707.4 metric tons in 1969. UK imports also showed wide fluctuations but the general trend was upward. The peak year for imports was 1963 while 1968 was the lowest year. Grenada's share of the market fluctuated independently from changes in the volume of the UK imports, the range of fluctuation being very wide, between 1.79 per cent in 1965 and 0.95 per cent in 1974. The UK paid a premium price during most of the 1960's but in recent years it has paid less for Grenada's

cocoa than the average price of total cocoa bean imports. Consumption levels fell from 2.3 kgs per capita, 1964-1966 average^{4/} to 1.53 kg per capita in 1971, but rose to 1.86 kg in 1974. Assuming that by 1981 the economy recovers sufficiently to bring about a rise in per capita consumption to 1.95 kg then imports should be at a level of approximately 111,194 metric tons, Grenada should aim to capture 1.0 per cent of this market - 1111 metric tons. On the basis of our price assumption of US\$2000 per metric ton Grenada should receive foreign earnings of US\$2.2 million.

The Belgian market showed an upward trend for cocoa beans throughout the period with a peak of 19,000 metric tons in 1963. Purchases were made from Grenada annually, the island's share of the market varying from a peak of 2.52 per cent in 1973 to a trough of 0.09 per cent in 1968. The island received a premium price for its cocoa during most of the 1960's and in 1974 the unit price of cocoa beans sold to Belgium was US\$531 in excess of the unit price paid for all Belgian imports. But the market is obviously sensitive to price and Grenada's total earnings suffer at high prices. Between 1973 and 1974 the island's earnings from exports to Belgium fell by US\$2,046 when there was a unit price increase of 152 per cent, and the island's share of the market slumped from 2.52 per cent to 0.36 per cent. Though Belgium has been a sure market in the past, earnings from that source are likely to remain low at current price levels, for per capita consumption fell from 1.92 kgs in 1970 to 1.81 kgs in 1974. Assuming that per capita consumption is 1.8 kgs in 1981 then total consumption will be in the region of 19,000 metric tons. On the basis of past performances Grenada can supply 1 per cent of market requirements - 190 metric tons. At a price per metric ton of US\$2000 the island should earn US\$380,000 in 1981.

South/South West Africa was a buyer for most of the period and more often than not Grenada received a premium price for its exports. International relations with Southern Africa are uncertain and therefore, its long-term

^{4/} FAO Estimate from Agricultural Commodity Projections 1970-1980: Page 225, Table 1.

market potential is uncertain. It is likely, however, that for the plan period Grenada will continue, if it wishes, to find a market there for some of its exports. Volume exports have ranged between 90 and 7 metric tons and the island's share of the South African market reached a peak of 3.9 per cent in 1963 and a trough of 0.14 per cent in 1967. The Region's imports showed an upward trend throughout the period under consideration and per capita consumption rose from 0.19 kgs in 1970 to 0.21 kgs in 1974. Assuming that per capita consumption remains at the same level, demand in 1981 will be 6,300 metric tons. On the basis of past performances, Grenada should be able to capture 1 per cent of this market - 63 metric tons. At an average price of US\$2000 per metric ton, the country should earn US\$126,000 from exports to that region in 1981.

Future demand for cocoa beans in countries which buy regularly from Grenada is very promising. Being a small producer of high grade cocoa, there has, in the past, been greater demand for its output in European markets where flavour is more highly prized than in the US and Canada. At the same time, however, Grenada producers have not in the past paid any particular attention to North American markets. Now that they are beginning to do so the prospects are good and the country may be able to preserve its reputation for Fine Estates and Plantation Cocoa, while at the same time selling a lower grade cocoa to those North American producers to whom flavour is not particularly important.

Projected demand in 1981 for Grenada cocoa by the country's main buyers is shown in Table 6. It is estimated that the island's exports will be 3499 metric tons and earnings will be approximately US\$7 million, which will be 178 per cent more than it received from cocoa exports in 1975.

Supply

On the supply side, the Grenada Cocoa Industry reached a high point of production when it exported 4090.1 metric tons in 1969 having recovered from the devastation caused by Hurricane Janet in 1955. Since then, production has been falling, but in 1975 a programme of rehabilitation was started which it is expected will result in

Table 6

Grenada Exports of Cocoa Beans by
Five-Year averages to Main Buyers
and the island's Estimated Exports
and Earnings by Destination in 1981

Destination	Five-year averages			1981			
	1961-1965 metric tons	1966-1970 metric tons	1971-1975 metric tons	Estimated Exports metric tons	Estimated % of Buyer's market	Estimated unit price US\$	Estimated Earnings US\$
Australia	19.98	45.28	11.42 ^{a/}	48.0	2.4	2,000	96,000
Belgium	200.54	113.84	173.82	190.0	1.0	2,000	380,000
Canada	26.22	34.40	40.16	44.0	0.3	2,000	88,000
Denmark	14.88	15.30 ^{b/}	nil	13.0	0.5	2,000	26,000
Federal Germany	209.42	181.56	441.0	840.0	0.5	2,000	1,680,000
Netherlands	735.74	378.58	587.14	690.0	0.6	2,000	1,380,000
United Kingdom	1111.06	1695.90	1192.02	1111.0	1.0	2,000	2,222,000
United States	142.62	139.70 ^{d/}	40.82 ^{e/}	500.0	0.2	2,000	1,000,000
South/South West Africa	28.74	8.26 ^{b/}	24.94	63.0	1.0	2,000	126,000
Estimated Totals:				3499.0			6,998,000

^{a/} No exports in 1 year. ^{b/} No exports in 2 years. ^{c/} No exports in 3 years. ^{d/} No exports in 4 years.

Source: Ministry of Agriculture, Forestry and Fisheries.

increased production in the years ahead, assuming no severe natural disasters. There are three main features in this programme. First, the Cocoa Board has been providing fertiliser from a revolving fund financed by the Canadian International Development Agency (CIDA), and pest and disease control assistance from a revolving fund from a CDB loan, with BDD providing required counterpart funding. The level of fertiliser distribution has in the past been 1 lb. of fertiliser for every 2 lbs. of cocoa produced. During the plan period it is proposed to increase fertiliser distribution so that in the final year it attains a level of 1 lb. for every 1 lb. of cocoa produced. The average annual fertiliser requirement during the plan period will be approximately 3,000 metric tons.

Secondly, the propagation of clonal cocoa must be increased. The distribution of plants has shown a downward trend over the past five years (See Figure 11). Propagation facilities must be improved to raise annual distribution to 500,000 plants per annum by 1981 if the industry is to expand to the desired level of production.

Finally, the existing extension service must be improved in order to raise the efficiency of small cocoa producers.

The usual cultivation practice is to grow cocoa and nutmegs in mixed stands with bananas, the latter providing shade while the permanent crops mature. The equivalent pure stand acreage now under cocoa is estimated at 13,140 acres of which 729 acres have non-productive trees. Yields per acre vary widely but the average is approximately 500 lbs. (0.22 metric tons). The planned programme aims at increasing average production to a level of 1100 lbs. (0.5 metric tons) per acre by the year 2000. The annual projected increase by crop year is 5 per cent. Estimated projections on this basis to 1981/1982 are shown in Table 7.

According to these projections production will be approximately 90 metric tons in excess of estimated exports of 3499 metric tons, but it will still be lower than 1969 exports. If however expansion takes place as planned then by the end of the century production will be in excess of 6500 metric tons.

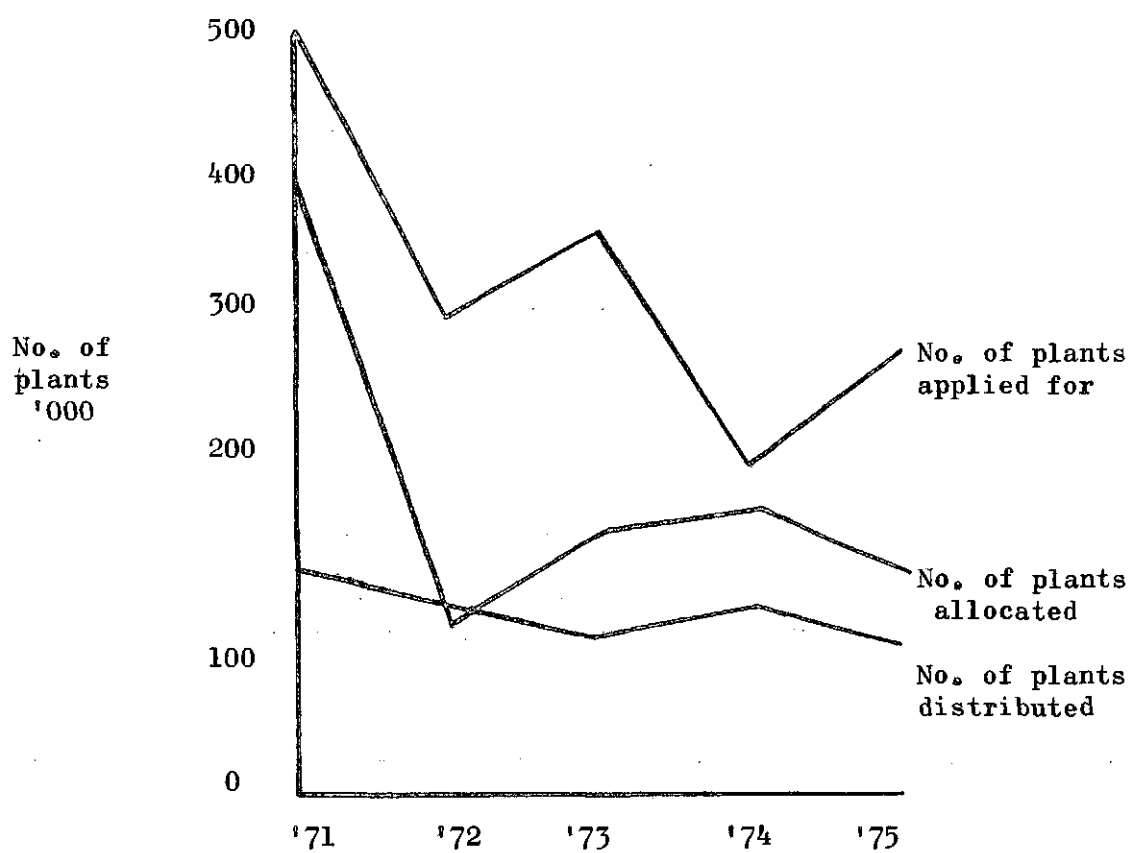


Figure II: Demand for and supply of cocoa plants 1971-1975.

Source: Compiled from data supplied by the Cocoa Plant Distribution Agronomy Division, Ministry of Agriculture.

Table 7

Estimated Production by Cocoa
to crop year 1976-1982

<u>Crop Year</u>	<u>Metric tons</u>
1976/1977	2812.3
1977/1978	2952.9
1978/1979	3100.6
1979/1980	3255.6
1980/1981	3418.4
1981/1982	3589.3

Source: Ministry of Agriculture, Forestry
and Fisheries.

The Long Run

The planned expansion of production to over 6500 metric tons by 2000 is sound strategy. Assuming general improvement in world market conditions, per capita consumption levels are likely to rise significantly with increasing incomes, and population will continue to expand though possibly at a slower rate than at present. In addition, Grenada plans to explore the market for cocoa balls and sticks among immigrant communities from tropical areas now residing in temperate climates, and will also aim at substituting cocoa in this form for the tinned powder which is now commonly used within the regional market. Avenues for using low grade cocoa in a domestic confectionery industry will also be examined. These developments will call for organization of a traditional cottage industry and produce standardisation.

The island's success in this programme for the development of the cocoa industry depends very much on how rapidly cocoa can be treated nationally as an orchard crop, which requires proper care and management, and not as an ordinary tree product of value because it gives the peasant an assured income. Increased production is not contingent on increased acreage, but on improved management of existing bearing trees and replacing old and diseased trees by new clonal cocoa. Nor does it require a land distribution programme, but cocoa growers should feel

that they are operating in a stable socio-political situation so that uncertainty will be minimal when capital investment is undertaken. If, however, the Land Commission considers that some degree of land re-distribution is desirable, a minimum acreage must be established which will enable the farmer to earn a satisfactory income, and fragmentation of such an acreage should be prohibited by law.

Bananas

The UK has been the destination of nearly all of Grenada's banana exports since the island entered the world market in this commodity, and therefore, any assessment of future demands for Grenada bananas can be based on UK consumption. Table 8 shows that consumption in the UK fell steadily from a peak of 376,000 metric tons in 1965 to 306,000 metric tons in 1974. This trend in UK consumption was not in keeping with the FAO assumptions based on average imports in 1964/1966, namely, that 1970 imports would have been 352,000 metric tons and 1980: 413,000^{5/}. The important determinant in the decline of UK consumption was price. In 1964/1966 the average c.i.f. price of UK imports was US\$171.99 per metric ton. Though the price fell below this average during the 1960's and in the early 1970's, by 1974 it had risen to US\$278.25 per metric ton.

Grenada's share of the UK market rose from 3.97 per cent in 1964 to a peak of 7.86 per cent in 1968 and then fell gradually to a low point of 2.76 per cent in 1974. The island's share in the market was largely determined by the volume of its exports not by the volume of UK imports. For between 1965 and 1968 while UK imports were falling, Grenada's exports were rising and so too was its share in the market. But in 1969 the island's exports began declining at a rapid rate

^{5/} Source: Agricultural Commodity Projections 1970-1980.

Table 8

Grenada Exports of Bananas to the
UK and total UK imports showing
Value and Volume relationships
1963 - 1975

Year	Grenada Exports in metric tons	Unit price of (1) US\$ f.o.b.	Total UK imports in metric tons	Unit value of (3) US\$ c.i.f.	1 as % of 3
	1	2	3	4	5
1963	14838.1	67.73	365030	175.50	4.06
1964	13993.8	76.84	352520	181.35	3.97
1965	20980.2	63.25	376300	171.04	5.58
1966	25107.4	59.87	369210	164.02	6.80
1967	26022.7	77.97	353280	164.44	7.37
1968	27187.5	71.06	345790	145.01	7.86
1969	22918.3	70.96	357470	148.48	6.41
1970	19131.0	65.46	335600	147.85	5.70
1971	14185.2	62.29	318972	161.04	4.45
1972	12619.9	60.14	310879	186.99	4.06
1973	10313.1	97.42	307280	226.32	3.36
1974	8445.2	188.96	306010	278.25	2.76
1975	13129.1	242.06	n.a.	n.a.	n.a.

Notes: Volume data in Grenada Trade Reports were converted as follows:

1 lb. = .45359 kilo, 1 metric ton = 1000 kg.

Value data in Grenada Trade Reports were converted as follows:

1963 - 1966 EC\$1.00 = US\$.583 1968 - 1972 EC\$1.00 = US\$.500

1967 EC\$1.00 = US\$.574

1973 EC\$1.00 = US\$.511

1974 EC\$1.00 = US\$.487

1975 EC\$1.00 = US\$.487

Sources: 1. Grenada Annual Overseas Trade Reports, and
 Unpublished data from the Statistics Department.

2. FAO Trade Yearbooks.

compared with the gradual decline in UK imports. This is shown in the following table.

Table 9

Indices of Grenada Banana Exports
and UK Banana Imports 1969-1974

	1968=100					
	1969	1970	1971	1972	1973	1974
Volume Grenada Exports 1968=100	84	70	52	46	38	31
UK Volume Imports 1968=100	103	97	92	90	89	88

The decline in Grenada's share of the market was due to the rapid fall in the volume of exports. If, therefore, Grenada increases its exports, it could possibly recapture about 7 per cent of the UK market. It is difficult in the present and foreseeable state of the UK economy to assume with any confidence a price level for bananas at which imports will level off. Consumption per capita fell from 5.75 kg in 1971 to 5.46 kg in 1974 with a 72.8 per cent increase in c.i.f. price per metric ton. Assuming that consumption does not fall below 5 kg by 1981 then in that year demand should be 300,000 metric tons, and Grenada's share of the market 21,000 metric tons. Assuming that Grenada receives an average f.o.b. price of US\$216 per metric ton between 1976-1981 (the average of 1974/1975) then foreign earnings should be approximately US\$4,525,815 in 1981, 42 per cent above earnings in 1975.

On the supply side, Grenada's exports showed an upturn in 1975 - 55.5 per cent above the 1974 level. This resulted from a rehabilitation programme which was started in 1974. This programme consists of a package of fertiliser application and chemical controls against pests and diseases. The average annual distribution of fertiliser during the plan period will be 2510 metric tons. The Grenada Banana Board

plans continuing its support programmes to the industry and estimate that exports over the period 1977/1981 will be as follows:

1977	15,500	metric tons
1978	18,000	"
1979	20,000	"
1980	22,000	"
1981	24,000	"

This relatively rapid expansion of the industry does not envisage any increase in the acreage equivalent which is now between 2,500 and 3,000 acres. But average yield per acre is low, about 5 tons. The aim of the programme is to increase average yields to 10 tons per acre.

Since Grenada as a member of WINBAN has to share the UK market with other Windward Island producers, it is likely that the island will find itself in surplus production by 1981^{6/}. No attempt will be made, however, to cut back production because of this. In the first place, little effort has been made so far to explore the regional market. There are periodic shipments to Trinidad but there is much greater market potential in Barbados. This will be explored during the Five-Year period.

Secondly, looking at the long run to the end of the century, steps will be taken to develop a Banana Flour Industry in the island and to cultivate consumer taste for the commodity in this form rather than cooking it green. This will have the nutritional advantage of yielding 1429 calories and 8.2 grams of protein per edible portion of 1 lb. as opposed to 319 calories and 4.1 grams of protein per lb. from the cooked green fruit.

Spices

There is no up-to-date information available on spices as a commodity group in world trade. All data on such trade used in this study relate to the period 1964/1968 and have been extracted from

^{6/} Limits are sometimes put on the amount of bananas loaded on ship in Grenada in order to accommodate supplies from Dominica, which is usually the last port of call.

"Markets for spices in North America, Western Europe and Japan" published by UNCTAD/GATT 1970 which cover ten countries regarded as the most important users of spices.

As a commodity group, imports of all spices showed an upward trend during the five-year period, increasing by 36 per cent in volume. The increase in value was only 11 per cent. Grenada exports many spices, all of which are of some importance in so far as foreign earnings are concerned, but nutmeg and mace are the ones of greatest importance and they will be dealt with in detail.

Import data on the ten major importers of nutmeg and mace for the period 1964/1968 are shown in Statistical Appendix: Table 13^{7/}. Both commodities, which are products of the same tree, account annually for only 4 per cent of these countries' total imports of spices. Volume imports increased over the period by 28.9 per cent but there was a 25 per cent fall in the value thus revealing that there is a greater price elasticity of demand for these two commodities than there is for spices as a group, a not unexpected situation because of the scope for substitution. Table 10 shows volume and unit price indices for nutmeg and mace for the period 1965/1968 with 1964 = 100.

Table 10

Volume Unit Price and Import Payments
Indices for Nutmeg and Mace in Ten
Major Consuming Countries
1964/1968

Item	1964=100				
	1964	1965	1966	1967	1968
Volume Index	100	119	110	114	129
Unit price index	100	104	115	85	59
Import payments index	100	124	127	97	75

Source: Ministry of Agriculture, Forestry and Fisheries

^{7/} Import data on nutmeg and mace were not given separately in all cases.

The pattern is common to many agricultural commodities in international trade. Volume and price increases in 1965 resulted in a 24 per cent increase in payments above 1964. A further price rise in 1966 was accompanied by a fall in volume but there was a further slight increase in payments. In the following years unit prices fell heavily and so too did total payments, while volume continued to increase.

In order to isolate the market for mace from that of both mace and nutmeg, indices for this commodity were calculated for seven of the ten countries under consideration. These data are shown in Table 11. The

Table 11

Volume, Unit Price and Import Payments
Indices for Mace in Seven Consuming
Countries 1964/1968

Item	1964=100				
	1964	1965	1966	1967	1968
Volume Index	100	110	95	103	119
Unit price index	100	108	118	99	66
Import payments index	100	118	112	103	78

Source: Ministry of Agriculture, Forestry and Fisheries

patterns in volume and unit price indices were similar to that of both commodities, but in import payments the downturn began in 1966, though there was less of a decline relative to 1964. In general, increases in demand for nutmeg and mace are due to increases in household consumption and the increasing use of these commodities in food processing industries. It is assumed that present rates of growth are no less than annual rates of increase during the five-year period of 3.7 per cent for mace and 2.4 per cent for nutmeg. On the contrary, it is likely that they have increased since countries excluded from the UNCTAD Study have most likely accelerated their rate of consumption. It is against this limited background of knowledge of demand for these two commodities that Grenada's exports must be examined. Volume of the island's annual exports of nutmeg and mace by destination from 1965-1975 are shown in Statistical Appendix: Tables 14 and 15. No attempt will be

made to use data on Grenada's exports to find out its share of imports into the ten countries included in the UNCTAD Study, because the data are so conflicting that one doubts if the destination given to the exporting country was in fact the port to which the commodity went. This is particularly so in the case of the Netherlands, as the following data on nutmeg show. Data in the Statistical Appendix are most meaningful in

Table 12

Data Showing Disparities between
Netherlands Imports and Grenada
Exports of Nutmeg to that country
1965-1968

Year	Netherlands Imports <u>a/</u>		Grenada Exports to Netherlands <u>b/</u>
	From Indonesia	From West Indies (including Grenada)	
1965	228	1	285.5
1966	574	2	562.9
1967	622	62	169.0
1968	573	30	168.9

Sources: a/ Spices UNCTAD/GATT 1970

b/ Grenada Co-operative Nutmeg Association
Calendar Year Exports.

showing a geographical distribution which coincides with the main food processing and consuming areas for nutmeg and mace from Grenada. The data show quite clearly that the bulk of Grenada's exports go to European and North American markets which absorbed over 99 per cent of mace throughout the period and over 90 per cent of nutmeg in every year except in 1971 and 1975 when exports to those countries were 78.5 per cent and 86.0 per cent respectively of total exports. There is no evidence to suggest that there will be any change in the direction of mace exports for the rest of the century. In the case of nutmeg exports however, there was an interesting development in 1974 and 1975. In the former year China imported 20 metric tons, and in the latter year 206.8 metric tons, which were largely responsible for the fall in

exports to traditional buyers to 86 per cent in that year. This is a new development which augurs well for the future and the Nutmeg Association should send a Mission to The People's Republic of China with a view to promoting exports to that country. Volume exports to China were nearly 40 per cent in excess of exports to the United Kingdom in 1975, but judging from the potential of the Chinese market there is no reason why exports could not be raised to the level absorbed by Mainland Europe - over 1,000 metric tons per year. This will give a long-term boost to the industry.

With respect to the traditional markets for nutmeg, volume exports to the United Kingdom fluctuated during the period, but there are no clear indications that the market has long-term potential expansion. Exports to Mainland Europe fell to a trough of 257 metric tons in 1967, but then also rose to peaks of over 1,200 metric tons in 1970 and 1975. This market absorbed over 50 per cent of exports during most of the period under review. The trend has generally been upward and its long-term importance to Grenada's future is evident. The United States of America, the second largest market, has fallen in importance both absolutely and relatively. In 1965 it imported 580.5 metric tons - 38.6 per cent of the island's exports. But by 1975 imports had fallen to 230.8 metric tons - 11.2 per cent of exports. There is every reason why Grenada should try to cement its position in its traditional markets and expand exports to those areas, but the Chinese market opens up new vistas which can make a big difference to the country's fortunes and therefore every attempt should be made to promote its trade with China.

Supply

Table 13 shows deliveries of nutmeg and mace by growers to the Grenada Co-operative Nutmeg Association for crop year from 1951-1976. The period 1951-1970 is shown in 5-year average annual deliveries and the remaining period by yearly deliveries. The data show that since 1955, the year of hurricane Janet, deliveries had remained below the 1951-1955 average and was only surpassed in 1975. The annual fluctuations from 1971 to 1976 reflect a normal production pattern in which trees go through a biennial cycle of heavy bearing followed by a

Table 13
Deliveries of Nutmeg and Mace
For crop years ending 30th June
1951-1976

Period	Nutmegs (lbs.) Equivalent Cracked	Mace (lbs.) Equivalent Cured
1951-1955 average	5 021 159	692 508
1956-1960 "	1 192 979	176 335
1961-1965 "	1 548 151	237 809
1966-1970 "	2 780 909	397 573
1971	4 115 129	552 277
1972	3 282 608	412 777
1973	4 245 321	567 259
1974	3 153 096	399 194
1975	5 339 720	769 173
1976	4 103 968	534 660

Source: Financial Statements of Grenada Co-operative Nutmeg Association for year ending 30th June 1975 and 1976

rest period. The trend in both low and high bearing years is upward. This is expected to continue during the plan period as more trees attain maturity. The Nutmeg Association is expanding its receiving, storage and marketing facilities to meet increasing deliveries and overseas sales which are expected to materialise from a market promotion programme. It is anticipated that there will be surpluses in production during the plan period and the Association is exploring the possibilities of manufacturing its "poor quality defectives" into nutmeg oil.

Conclusion

The planned expansion in production of cocoa, bananas and nutmeg will not require trade-off of any land resources from domestic food production during the plan period because under the existing crop pattern root crops are grown in mixed cultivation with tree crops while the latter are maturing. With respect to cocoa and nutmeg, increased production is expected from improved management, particularly as a result of fertiliser

application and disease control. In the long run, however, it is most likely that some low-yielding areas under cocoa cultivation will be put under permanent food crop cultivation. It is expected that by then acreage yields from nutmeg and cocoa will be much higher than they are at present.

CHAPTER 4

DEMAND AND SUPPLY PROJECTIONS FOR
DOMESTIC FOOD PRODUCTION TO 1981

Per capita food consumption for Grenada was estimated at 306 kgs in 1975, of which 154 kg were estimated to be imported^{1/}. Calculations on the nutritive content of food consumed, indicate that there is a high degree of calorie deficiency, the intake per head per day being 1958.4 calories, 82 per cent of recommended requirements of 2377 calories. There is also heavy dependence on imports for daily intake per capita of calories, 1535.9 of the intake of 1958.4 - 78 per cent. Estimated daily average intake of protein per capita was 46.03 grams, 88 per cent in excess of estimated daily requirements per capita of 24.53 grams. Seventy (70) per cent of the daily consumption of grams of protein per head are supplied from imports. Data on nutrition from a field study conducted during the preparation of this plan indicate that many low income families consume inadequate supplies of protein, so that the high level of protein consumption is most likely due to the tourist industry and to the better nutritional standards of higher income groups.

Assuming a rate of population increase equivalent to that which occurred between 1970-1975, estimated population in 1981 will be 130,200, and the volume of food required to maintain the per capita level of consumption in 1975 will be 39,060 metric tons. If no change is assumed in the percentage age distribution, then the required amount of calories and protein per person per day will be respectively 2,386 calories and 24.5 grams. With respect to calories the task is two-fold:

- i. To make up for the existing shortfall of 419 calories per capita; and
- ii. to meet demands of additional consumers.

^{1/} See Statistical Appendix: Tables 8, 9, 10 and 11 for all calculations relating to this paragraph.

In the case of proteins the requirement is to increase domestic production and effect a better distribution, but this should be accompanied by a long-term programme for reducing the heavy dependence on foreign supplies, the prices of which are beyond the means of most consumers. Domestic policy requirements therefore are:

- i. To increase domestic supplies of energy-giving foods; and
- ii. to increase the supply of protein in order to reduce dependence on foreign supplies.

These twin objectives of National Food policy are in keeping with the CARICOM Regional Food Plan. Special emphasis will be laid on the first of these objectives, for in the long run the Region as a whole must aim at reducing its dependence on wheat flour both in absolute terms and per capita consumption, and switch to flours made from tropical grain, tubers and vegetables. As long as the area has to depend on industrialised economies for a staple food it is unlikely that it will ever permanently get out of a visible trade food deficit which limits its capacity to finance industrial expansion from its own resources.

The second aspect of this programme - increasing the supply of protein - will be dealt with in Chapter 5 under livestock production. Here attention will be focused on the production of root crops, vegetables and fruit.

Root Crops

The domestic consumption of yams, tannia, sweet potatoes, eddoes and dasheen from local production in 1975 was estimated at approximately 1116 metric tons. This represents 97.6 per cent of the estimated total production of 1143 metric tons. Without increasing acreages under cultivation, production will be doubled by the use of fertiliser, better spacing and improved varieties. The plan aims at a 100 per cent increase in production by 1981. Under present conditions, few farmers can afford to use fertiliser and therefore a special fertiliser scheme will be introduced for root-crop production. All farmers who wish to benefit from this scheme must be registered as producers of these crops. Fertiliser will be distributed

through existing distribution schemes and producers must agree to follow the instructions given to them by Extension Officers, to use what plant varieties are distributed to them, and to sell their produce to the Marketing Agency at a pre-arranged price. The projected fertiliser requirement and production of these crops to 1981 are shown in Table 14^{2/}.

Table 14

Planned Expansion of Root Crop
Production 1977-1981

Year	Estimated		Estimated Production Metric tons
	Fertiliser Metric tons	Requirement US\$	
1977	85	18700.00	1245
1978	103	22660.00	1361
1979	123	27060.00	1588
1980	140	30800.00	1805
1981	160	35200.00	2268

Source: Ministry of Agriculture, Forestry and Fisheries

Yellow Crops

The estimated consumption of carrots and pumpkins from local production in 1975 was 398.7 metric tons. Total production was approximately 403.7 metric tons - 18.1 metric tons carrots and 386 metric tons pumpkins, some of which was exported to Regional markets. Without a significant increase in acreage, production of these crops can be increased substantially by 1981 through improved cultivation practices. There can be further increase through a system of crop rotation. In the case of carrots, new varieties will be

^{2/} Estimated cost for fertiliser inputs in this chapter is US\$220.00 per ton except where otherwise indicated. This is the current price (April 1977) of a fertiliser compound 12.8.24.

introduced in order to get a more marketable and durable product. Though there is a shortage within the region as a whole and the level of non-regional imports is high, the aim in the first instance will be to raise the level of local consumption of carrots to 35 metric tons by 1981 - twice the present level - and pumpkins to 590 metric tons - one and a half times the present level. Estimated production targets for both local and overseas markets are 68 metric tons of carrots and 800 metric tons of pumpkins. Increased consumption will be encouraged through a promotion campaign to improve nutritional standards^{3/}. The projected fertiliser requirement and production increases to 1981 are shown in Table 15.

Table 15

Planned Expansion of Carrot and
Pumpkin Production 1977-1981

Year	Estimated		Crop	Estimated Production Metric Tons
	Fertiliser Metric tons	Requirement US\$		
1977	1)	3520	Carrot	30
	15)		Pumpkin	485
1978	1.2)	3894	Carrot	45
	16.5)		Pumpkin	590
1979	1.4)	4268	Carrot	50
	18)		Pumpkin	650
1980	1.6)	4972	Carrot	60
	21)		Pumpkin	726
1981	1.8)	5676	Carrot	68
	24)		Pumpkin	800

Source: Ministry of Agriculture, Forestry and Fisheries

^{3/} In so far as the Regional market is concerned the long-term aim will be to meet off-season requirements of the Trinidad market.

Tomatoes

The estimated consumption of tomatoes from local production in 1975 was 52 metric tons, 95 per cent of estimated production of 54.4 metric tons. Farmers are showing increasing interest in tomato production and it is proposed to increase production by 1981 to 90 metric tons. Most of this will be accomplished through improved cultivation practices. A high proportion of current production is absorbed in the tourist trade. In order to meet the requirements of this trade and to ensure better internal marketing in those areas where scarcity often occurs, the Marketing Board will play an important part in the tomato expansion programme. Quite apart from meeting the internal needs, it will also ship to Trinidad with the long-term aim of meeting seasonal shortages in that island. The projected seed and fertiliser requirement and estimated production are shown in Table 16.

Table 16

Planned Expansion of Tomato
Production 1977-1981

Year	Estimated Seed Requirement		Estimated Fertiliser Requirement		Estimated Production Metric Tons
	(kg)	US\$	metric tons	US\$	
1977	0.34	22.50	3	660	60
1978	0.45	30.00	4	880	70
1979	0.57	37.50	5	1100	80
1980	0.68	45.00	6	1320	85
1981	0.79	52.50	7	1540	90

Source: Ministry of Agriculture, Forestry and Fisheries

Green Vegetables

This group includes ochroes, cabbage, christophene, cauliflower, patchoi, lettuce, cucumbers, watercress, egg-plant, spinach and other green leaves. Consumption of this group of vegetables was estimated at 620 metric tons in 1975, 94 per cent of a total production of 662 metric tons. The scope for expansion is very great. The plan calls for the

increase of items such as cabbage and cauliflower by at least 200 per cent by 1981. Increased production of the latter will be mainly for the tourist trade. In the case of lettuce, improved variety will be introduced which will give a higher yield, and a 300 per cent increase is therefore anticipated. A programme will be undertaken to encourage more widespread consumption of green vegetables locally. This, it is expected will result in further increases in home garden production. The projected fertiliser requirement and production expansion to 1981 are shown in Table 17.

Table 17

Estimated Production of Green
Vegetables 1977-1981

Year	Estimated		Estimated Total Production Metric Tons
	<u>Fertiliser Volume</u> Metric tons	<u>Requirement</u> US\$	
1977	5	1100	700
1978	10	2200	750
1979	12	2640	825
1980	15	3300	925
1981	17	3740	1050

Source: Ministry of Agriculture, Forestry and Fisheries

Green Bananas and Plantains for Domestic Consumption

Consumption of these two items from local production was estimated at over 3815 metric tons in 1975, 99.9 per cent of a total production of 387 metric tons. These commodities which include rejects and surpluses from bananas grown for export are part of the daily diet of a large percentage of the population, but they are consumed as a cooked vegetable, the calorie content of which is much less than when consumed in powdered form. The programme for expansion aims, therefore, not only at increasing the total tonnage, but at producing in sufficiently large quantities to make processing a feasible project and encourage consumption as a vegetable flour, which

can either be consumed separately or used for making a composite bread with wheat flour. The expansion programme will be facilitated by a fertiliser scheme which will be an adjunct to the scheme now operated by the Grenada Banana Producers' Corporation. The projected fertiliser requirement and planned production programme to 1981 are shown in Table 18.

Table 18

Estimated Production of Green Bananas
and Plantains for Domestic Consumption
1977-1981

Year	<u>Fertiliser</u>	<u>Estimated Requirement</u>	<u>Estimated Total Production</u>
	Metric tons	Value US\$	Metric tons
1977	500	110000	4000
1978	575	126500	4600
1979	690	151800	5500
1980	800	176000	6300
1981	870	191400	7000

Source: Ministry of Agriculture, Forestry and Fisheries

Pigeon Peas and Beans

In 1975 domestic production was estimated at 770 metric tons, 748 metric tons of which was consumed locally either green or dry. It is proposed to increase the area under pigeon peas by 1,000 acres with a view to raising production by 460 metric tons by 1981. The programme envisages the introduction of dwarf pigeon peas dependent on the availability of supplies, but whether this variety is available or not, it is proposed to import seed. String bean production which is now estimated to be 68 metric tons will be increased to 350 metric tons by 1981. The string bean expansion programme will be promoted by encouraging home garden production and carrying out a campaign to increase the use of fresh beans in the daily diet. Planned production

to 1981 is shown in Table 19.

Table 19

Estimated Production of Pigeon
Peas and Beans 1977-1981

<u>Year</u>	<u>Estimated Total Production Metric Tons</u>
1977	1000
1978	1100
1979	1250
1980	1400
1981	1580

Source: Ministry of Agriculture, Forestry
and Fisheries

Avocado Pears

The estimated consumption of avocado pears from local production in 1975 was 635 metric tons. Total production was possibly in the region of 907 metric tons, 25 per cent of which was shipped to regional markets. This is a tree crop which grows very well in Grenada and the plan provides for an increase of 20 acres per annum over a five-year period with a plant density of 69 trees per acre, making a total of 6,900 trees by 1981. Other than the internal and regional markets, it is intended to export this vegetable to North American markets. At present, there is no organised system for propagating new plants. Such a programme, will, however, be undertaken during 1977 and the rate of plant propagation proposed is shown in Table 20. The fertiliser requirement and the proposed programme for new plantings and estimated production to 1981 are shown in Table 21.

Peanuts

The estimated consumption from domestic production of 2.5 metric tons in 1975 was 2.3 metric tons. Peanuts have a high Regional demand, most of which is now met by supplies from extra-regional

Table 20
Proposed Estimated Propagation of
Avocado Pears 1977-1981

Year	Proposed Propagation (No. of plants)	Planned Distribution
1977	2000	1500
1978	2000	1800
1979	2000	1800
1980	2000	1800
1981	2000	1800

Source: Ministry of Agriculture, Forestry and Fisheries

Table 21
Planned Expansion of Avocado
Pears Production 1977-1981

Year	Estimated		Estimated Total Production Metric Tons
	<u>Fertiliser</u> Metric tons	<u>Requirement</u> US\$	
1977	2.0	440	nil
1978	3.0	660	nil
1979	4.0	880	nil
1980	5.0	1100	12
1981	6.0	1320	37

Source: Ministry of Agriculture, Forestry and Fisheries

sources. Both Grenada and Carriacou, but particularly the latter, have much potential for peanut production and the target for 1981 is to put 20 acres under this crop. The programme depends on getting a suitable

supply of planting material. The projected acreage, fertiliser requirement and production to 1981 are shown in Table 22.

Table 22
Estimated Production of Peanuts
1977-1981

Year	Acreage	Estimated Fertiliser Requirement		Estimated Production Metric Tons
		Metric Tons	US\$	
1977	10	1.0	220	6
1978	12	1.4	308	7.2
1979	14	1.6	352	8.4
1980	16	1.8	396	9.6
1981	20	2.0	440	12.0

Source: Ministry of Agriculture, Forestry and Fisheries

Citrus Fruit

Estimated domestic production of grapefruit, oranges, limes and tangerine in 1975 was 4,783 metric tons, of which 4551 metric tons were estimated to have been consumed locally. The planned programme to 1981 aims at increasing the acreages under grapefruit, limes and oranges by 25 acres per year per crop. A plant propagation scheme will be operated from 1977 to provide a regular supply of improved planting material during the plan period. The planned expansion programme is shown in Table 23. This programme will increase domestic production of all citrus fruit to 4800 metric tons by 1981, but production will be much greater between 1981-1986 when the plantings during the next five years begin to bear fruit.

Other Fruit Production

The approach to all fruit production will be identical with that of vegetable and tuber production, namely: that the mature fruit must be viewed as raw material for a processing industry, the produce of which will then be consumed, rather than as a commodity for direct

Table 23

Planned Programme for Expansion of Citrus
Fruit Industry 1977-1981

Commodity	Year	Cumulative acreage per year	No. of Plants propag- ated per year	Plant Density per acre	Ferti- liser required Metric tons	Estimated production Metric tons
Oranges ^{a/}	1977	25	2800	109	0.5	nil
	1978	50	2800	109	1.5	nil
	1979	75	2800	109	4.0	nil
	1980	100	2800	109	6.5	nil
	<u>1981</u>	125	2800	109	8.0	5.7
Limes	1977	25	5000	193	0.5	nil
	1978	50	5000	193	1.5	nil
	1979	75	5000	193	4.0	2.8
	1980	100	5000	193	6.5	5.6
	1981 ^{b/}	0	5000	193	8.0	8.4

a/ Also applies to grapefruit.

b/ No new acreages, new plants to be used for replacing existing old trees.

Note: Production of oranges and grapefruit based on assumption of a yield of 500 lbs. per acre; limes, 250 lbs. per acre. Tahiti variety of limes will be propagated mainly for the fresh fruit trade.

Source: Ministry of Agriculture, Forestry and Fisheries.

consumption. There are many fruits grown commercially in Grenada, but with a view to increasing the fresh fruit export market and developing a domestic fruit juicing industry, special attention will be given to the following: mangoes, papaw, guavas, sapodilla, soursop and sugar apple. These are all fruit trees which grow luxuriantly in valleys and on hillsides, but little attempt has been made to develop them as orchard crops. The proposed programme will aim at:

- i. Increasing output from existing trees. This involves improving reaping practices to reduce the high percentage of waste when fruit fall to the ground.
- ii. Propagating new varieties.
- iii. Developing mixed and pure fruit orchards.

In the case of mangoes two new varieties will be introduced: Tom Atkins and Haden, both of which are acceptable on the North American and European markets. Table 24 shows the proposed propagation and expansion programmes:

Sugar Cane

In 1973 Grenada paid US\$300,220 for 2164 metric tons of imported dark and grey crystals, 83 per cent of which was imported from Trinidad^{4/}. These are the only types of unrefined sugar which can be manufactured in the island. Assuming that imports per capita remain at the 1973 level of 41.5 kg, then imports in 1981 will be 2701 metric tons. In keeping with the policy of import substitution, it is planned to resuscitate the sugar industry so that it can in the long run meet domestic requirements of both unrefined sugar and syrup for agro-industrial use. The immediate goal, however, is to achieve the former by 1981.

Sugar-cane production fell from a peak of 27,453 metric tons in 1957 to 3,900 in 1974. During this same period the acreage from which cane was reaped fell from 1800 to 300 acres. The collapse of the industry was due to many factors none of which was so determinate as to prevent its resuscitation. In 1976 sugar-cane production rose to 10,343 metric tons which were reaped from 600 acres. Now that there is obvious interest among cane farmers, the Government plans to give the necessary assistance and encouragement to effect long-term resuscitation of the industry. The main sugar-cane growing areas and related data are shown on page 78. Their locations are the counties

^{4/} Source: Annual Overseas Trade Report for Grenada 1973.

Table 24
Proposed Proagation and Expansion
Programmes for Fruit Trees 1977-1981

Year	Fruit	Cumulative Acreages	No. of Plants Propagated per year	Plant density per acre	Fertiliser requirement Metric tons	Estimated Production Metric tons
1977	Mangoes	25	2000	Pure stand	0.5	nil
1978		50	2000	(spacing 25' x 25'	1.5	nil
1979		75	2000	69 trees	4.0	nil
1980		100	2000	per acre)	5.5	43
1981		125	2000		6.5	86
1977	Sapodilla	25	2000	Pure stand	0.5	nil
1978		50	2000	(spacing 25' x 25'	1.5	nil
1979		75	2000	69 trees	4.0	nil
1980		100	2000	per acre)	5.5	nil
1981		125	2000		6.5	43
1977	Guava	25	8000	Pure stand	0.25	nil
1978		50	8000	(spacing 12' x 12'	0.75	nil
1979		75	8000	302 trees	2.0	8.5
1980		100	8000	per acre)	2.75	22.7
1981		nil	nil		3.2	68
1977	Soursop [*]	12.5	3800	Pure stand	0.25	nil
1978		25	3800	(spacing 12' x 12'	0.75	nil
1979		37.5	3800	302 trees	2.0	nil
1980		50.0	3800	per acre)	2.75	15
1981		62.5	3800		3.2	40

^{*}/ The expansion programme for sugar apples will be the same as for soursop. Most of the expansion will take place in Carriacou.

Source: Ministry of Agriculture, Forestry and Fisheries.

of St. George and St. David in the South and St. Patrick in the North. The programme for 1977-1981 will focus on the South - areas A, B and C - where concentrations of both farmers and sugar mills are greatest. The total acreage in these locations is 1550, and the membership of the Grenada Farmers' Sugar Association is 200^{5/}. There are many other farmers in the area who can be recruited to join the Association. Table 25 shows the planned expansion of the industry. The resuscitation

Table 25

Planned Expansion of the Sugar-
Cane Industry 1977-1981

Year	Acres Supplying Canes	Estimated Production	Estimated Sugar Output
1977	800	13,600	1133
1978	1000	17,000	1417
1979	1200	21,600	1964
1980	1400	26,600	2418
1981	1500	30,000	2727

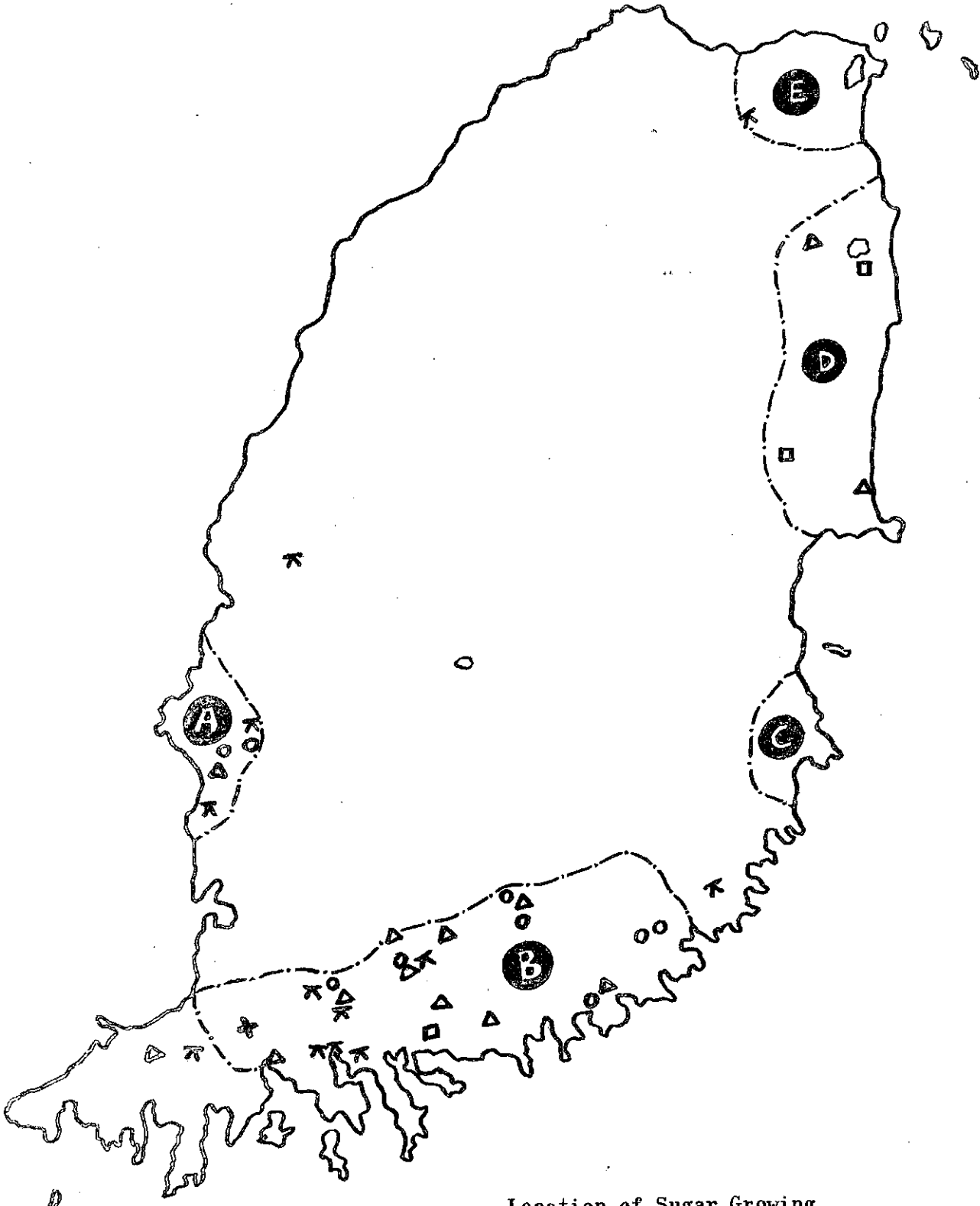
Source: Ministry of Agriculture, Forestry and Fisheries

of the sugar-cane industry on a long-term basis will require a new industry structure, improved cultivation practices and new organizations for management and marketing.

New Industry Structure

Two factors which contributed to the demise of the industry in Grenada were disputes over wages to labour and growers' prices. At

^{5/} See reports: Programme for the Resuscitation of the Sugar-Cane Industry in Grenada by David West and Peter Gooding, 1976.



Location of Sugar Growing Areas and Related Data

- + Grenada Sugar Factory
- Syrup Mills
- Distilleries
- △ Farmers Groups
- ★ Discarded Syrup Mills

Source: See report: Programme for the Resuscitation of the Sugar-Cane Industry in Grenada by David West and Peter Gooding, 1976.

present there is one sugar factory in the island, the Grenada Sugar Factory with approximately 800 acres under sugar-cane and a production capacity of 3000 tons of sugar per year^{6/}.

In the existing labour situation, the estate may have no difficulty in getting a supply of labour, but one can foresee unionised labour making greater demands for wages because of inflationary factors over which the economy can exert little control. While some mechanical aids can increase labour productivity thus permitting some improvement in wage rates, it will not be possible for the factory to use any of the current methods of mechanised harvesting. It is likely, therefore, that in due course of time wage disputes may bring the industry once more to a standstill.

Secondly, the factory grows only approximately 25 per cent of its needs, and is therefore very dependent on farmers' canes. The net return to farmers must therefore be such as to stimulate production. This return has been traditionally a bone of contention in the Caribbean. In Grenada the situation is further aggravated by the poor condition of roads and the high cost of motorized transport. Road improvement in the island is a major and very costly exercise which it will take many years to accomplish. In the meantime there will be further deterioration of both road surfaces and foundations by the transport of thousands of tons of cane by motor vehicles. In addition to this, the high cost of petrol has increased the cost of road transport considerably over the past few years and future trends of petrol prices suggest that there may come the time when transport cost will be so high that the net farm gate price to the farmer will make it uneconomic for him to continue cultivating sugar-cane. It is estimated on the basis of 1976 data that the transport cost of a ton of cane over a distance of 10 miles exceeds the cost of the canes.

^{6/} There are 11 small mills in the South which extract cane syrup but do not process it into sugar.

These problems in the industry call for a double-pronged attack. In the first case the traditional socio-economic relationship which placed the factory owner at one end of the spectrum and the small farmer and wage earner at the other must be terminated. All participants in the sugar industry whether they supply capital, labour or entrepreneurship, or whether they own or lease land must see themselves as being integral parts of an enterprise, the success of which depends on their co-operation. The industry, therefore, has to move from its present capitalist framework to a co-operative one. The traditional group behaviour of small farmers in cultivation and harvesting lay a sound basis for the development of small farmer co-operatives which can form larger regional bodies and at a higher level a single National Sugar Cane Farmers' Co-operative with shares in the Grenada Sugar Factory, and with representation on the Board of Management.

If all cane growers join the Co-operative then their returns from growing cane will be, not only their earnings from sale of the raw product but also whatever dividends are paid out by the Company. There may be human problems in attaining this re-organization but they must be overcome if the bitter relationships of the past are to be avoided.

The transport problem is one which calls for long-term planning. The sugar factory has in the past made its transport facilities available to farmers but rising costs have made them withdraw this assistance though it is fully aware that without farmers' canes the industry cannot be resuscitated. It is anticipated that increased prices of petrol and rising costs of maintenance will make motorized truckage too costly for the farmer. There are two alternatives both of which can be tried. Tractors and trailers can be used for transporting cane to the factory. These can be owned co-operatively. Or again individual farmers can revert to draught animal transport failing technological development which facilitates small-scale processing of canes in the field^{7/}. The use of

^{7/} It is understood that research work is now being conducted at CARIRI in Trinidad to develop small economic sugar-cane factories which can be located nearer to the source of raw material. It is likely therefore that within the coming decade there will be technological developments more appropriate to Caribbean needs. This will not, however, obviate the need for developing cheaper transport facilities.

animals and carts went out of fashion many years ago, but it is a cheap form of transport, and possibly the only type some small farmers can afford. There is, too, the additional advantage of having little or no problems in finding feed for horse-power since grasses grow luxuriantly over the island and cane tops are good animal feed. What may pose the greatest problem is educating farmers to facing the realities which put severe limitations to what the economy can afford. But this is only a specific example of a general problem which the whole society will have to face. There are severe limitations to growth and socio-economic stability in any society which has visions of development which conflict with its socio-cultural tradition and are beyond the levels of technology and capital formation which in the long run it can afford.

Cultivation Practices

Sugar-cane cultivation facilitates the planting of quickly maturing tuber and vegetable crops during the early growing season. This practice will be encouraged as part of the general programme to increase food supplies. Sugar-cane yields per acre will depend considerably on fertiliser application. The programme for expansion provides for a fertiliser scheme which it is hoped will be financed by the Canadian Government. The quantity and cost of fertiliser inputs are shown in Table 26. The main pest which attacks sugar-cane in Grenada is the

Table 26

Volume and Cost of Fertiliser Inputs in Sugar-Cane Production 1977-1981

Year	Sulphate of Ammonia */		Compound 12.8.24	
	MT	US\$	MT	US\$
1977	20	2820	203	44660
1978	61	8601	229	50380
1979	102	14382	305	67100
1980	142	20022	432	95040
1981	61	8601	508	111760

*/ US\$141.00 per metric ton.

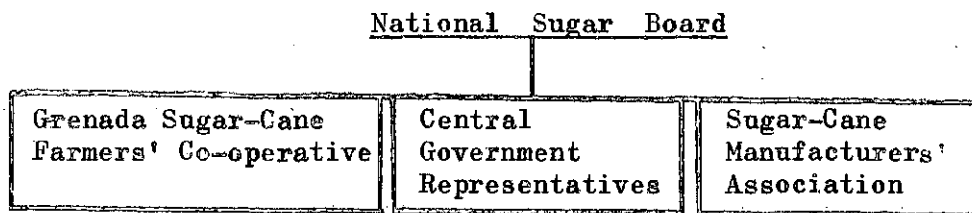
Source: Ministry of Agriculture, Forestry and Fisheries

froghopper. There will be a froghopper spraying programme during the plan period. The total estimated cost is US\$54,000. It is expected that the Canadian Government will finance this scheme.

Management and Marketing

A Grenada Sugar-Cane Farmers' Association has been recently established. It seems to have sprung out of a desire of the farmers themselves for co-operative activity and should be designated a "Co-operative" instead of an "Association". Everything will be done to encourage its operation as an independent organization representing the interests of farmers on an island-wide basis. This "Association" will be one component of a National Sugar Board, the others being a Sugar-Cane Manufacturers' Association and Government. The Sugar-Cane Manufacturers' Association should comprise representatives from factories which process sugar-cane into products for either final or intermediate use. The following is the proposed structure of the organization for managing the sugar-cane industry.

National Structure for
Management of the Sugar-
Cane Industry



The National Sugar-Board will be an autonomous body charged with responsibility for administration of the sugar-cane industry. It should comprise seven (7) members. Three from the "Co-operative", and three from the Association all of whom should be elected to office by their members. The other member should be nominated by Government to represent the Ministry of Agriculture. The National Sugar-Board should elect a Chairman from among its members. The Board will be financed by contributions from both the "Co-operative" and the Association, and will qualify for a subvention from the Central Government. It will

employ staff to perform its function. The main duties of the Board will be as follows:

1. To determine the volume and frequency of imports of sugar into Grenada.
2. To determine the prices which manufacturers shall receive for sugar and molasses while at the same time taking into consideration the effect which such remunerations are likely to have on retail prices to the consumer.
3. To ensure equitable payments to both farmers and manufacturers from the sale of sugar and molasses.
4. To examine, and if necessary make alterations to the existing distribution system of sugar to ensure economic and efficient distribution to the consumer.
5. To encourage and promote joint ownership of sugar-cane manufacturing capacity by existing owners and the National Sugar-Cane Grower's Co-operative.
6. To organise the bulk purchase of fertiliser, pesticides and other inputs for farm use in the sugar-cane industry and to ensure adequate distribution.
7. To establish or promote service industries to the sugar-cane industry.
8. To promote the training of young persons in the sugar-cane industry through an apprenticeship system.
9. To arrange for credit facilities for the industry from both internal and external sources.

Coconuts

Available data on coconut production indicate a decline in the number of nuts harvested from 11.6 million in 1965^{8/} to 1.8 million

^{8/} Source: Current estimates of Agriculture; April 1965 - March 1966 - British Development Division in the Caribbean, Barbados.

in 1976^{9/}. This fall seems to have been due to many factors - disease, poor management, neglect and the inability of farmers to undertake the heavy capital costs required for rehabilitation. The country is however importing an increasing amount of vegetable oils and the planned expansion of the livestock industry will require increased supplies of coconut meal. The Government has, therefore, decided that a long-term programme for rehabilitation of the industry must be an integral part of the development plan.

Coconut trees are grown mainly in coastal areas, but most cultivation is found on the East and South as mixed stands with sugar-cane and tree crops. The programme for expansion will not bring new areas under cultivation, but will aim at increasing tree population and production, both in existing pure and mixed stands.

The programme calls for action along three fronts:

1. Cultivation practices to improve yields and combat diseases and pests which affect the plant.
2. The establishment of nurseries to lay the basis for introducing new disease resistant varieties.
3. Growing fodder for livestock in pure stand cultivation.

Cultivation Practices

The Ministry of Agriculture will conduct campaigns to encourage farmers to make more use of fertiliser and to improve the level of field sanitation through weed control. This will make a significant contribution to increasing yields per tree. One of the main hindrances to long-term development of the industry is red ring disease. Trials carried out in Trinidad indicate that the phyto-sanitation practice of destroying diseased trees is the best way to

^{9/} Supplied by the Ministry of Agriculture, Grenada.

control the spread of the disease. The recommended poisons are Silvisar 510 and Weedicide 100. Lannate has also been used successfully as a poison to which the weevils are attracted. In Grenada, farmers have been reluctant to destroy bearing infected trees. Since however, the destruction of such trees is essential to the survival of the industry, the Government will introduce an incentive scheme to promote tree destruction and replacement. Tree nuts are subject to mite infestation and this seems to have been a major factor affecting production in Grenada in recent years. The Government will introduce a programme to achieve effective mite control as soon as a satisfactory solution has been determined from on-going research.

Establishment of Nurseries

The population of old trees in Grenada is high. Many of these plants are of the tall variety which is most susceptible to common diseases. The old plants are also poor bearers. The industry needs, therefore, to be revived through a process of new plantings of strains which are more resistant to some of the known diseases in the Caribbean. The dwarf species offers some hope in this direction. The Government will, therefore, establish nurseries for multiplication of these types for new plantings in the industry and will also work along with other Caribbean Governments on a research programme to identify other types suitable for the area.

Fodder Cultivation

One of the main requirements for the success of the livestock development programme is increasing the local supply of feed. It is felt that pure stand coconut cultivation gives much scope for planting suitable fodder grasses, which can be reaped for feeding cattle and that sheep can then be pastured under the trees to crop the remaining growth.

At this stage the coconut rehabilitation programme cannot be quantified because there are too many factors which need further investigation, but it is hoped that by 1981, the fertiliser programme will have made a significant contribution to increasing copra production.

Coffee Production

Coffee has been grown for many years as a traditional crop at high altitudes in mixed stands with nutmeg. After the 1955 hurricane the planting of robusta coffee was encouraged as a hedge plant and a wind-break, and by 1970 total coffee production was between 30 - 40 thousand pounds per annum. Most of this cultivation was on Government farms, and since this ensured a regular supply of berries, a hulling plant was erected at Mirabeau, and roasting, grinding and packaging facilities were installed at Grenville. To supplement its own production, the Government bought coffee berries from farmers, either dried and delivered at the factory, or on the tree with Government making its own arrangements for picking. The finished product was marketed by the Ministry of Agriculture until 1976 when the factory at Grenville was destroyed by fire. As part of its programme in self-sufficiency in food the Government has decided to seek assistance from the Canadian Government to re-establish the factory at Grenville. Response from the donor country has been encouraging, and it is expected that plant operations will begin again during 1978. In the meantime the Government is buying and storing beans so that a supply will be available when the plant is erected. The Government also intends to cultivate arabica coffee on its own farms. Beans have already been bought from Jamaica, and propagation is now underway at Mirabeau Agricultural Station. It is estimated that the country now imports 30,000 pounds of prepared coffee per annum at a cost of approximately EC\$150,000. The plan is to replace these imports by local production and produce surpluses for export to other CARICOM countries.

SUPPLY PROBLEMS

Praedial Larceny

Praedial larceny which is very wide-spread, acts as a disincentive to farmers, and in some cases severely reduces their incomes. The range of products stolen is wide, from all types of arable crops to live animals. This area of risk in farm production has led many planners to advise that farmers should live on their holdings since this is the only way they can keep watch on the fruits of their labour. In the present situation this is hardly a solution available to the Grenadian peasant, since his holding very often comprises more than one parcel of land. In many cases the parcel he lives on

is small and he can exercise some surveillance over it, but this still leaves the remainder of his production at the mercy of thieves. Looking at the total programme for agricultural development, which includes land reform, the establishment of economic farm units, and the urbanization of rural life, it would appear that in the particular geographical conditions of Grenada, many farmers will live in a communal environment thus precluding the personal surveillance over farm property which most likely will give the farmer greatest assurance against theft. But it is interesting that in the field survey which was undertaken during the preparation of this plan, farmers gave a positive response to the question if they would be prepared to undertake group activity to keep watch over their farms to prevent praedial larceny. It would appear that this is the kind of action which offers a long-term solution to this problem. The State can however perform a vital role in deterring this type of offence by improving its police surveillance and imposing heavy penalties on offenders who are apprehended and found guilty.

Rat Infestation

There was at one time a rat control programme which freed the farmer from worry and kept losses from these vermin at a minimum. This programme has lapsed in recent years, and now rat destruction of surface, underground and tree crop production is very great. There is no estimate of income loss from this infestation, but it must be considerable. Moreover, Grenada's reputation as a fruit supplier is severely tarnished by the marketing of produce in Trinidad which have quite obviously been attacked by rats. In the present situation some farmers use poisons to reduce their level of losses, but this has limited effect when one's neighbour is taking no action. The Government should therefore mount a nation-wide rat control programme under the supervision of the Ministry of Health and Housing.

CHAPTER 5

LIVESTOCK, FISHERIES AND
FORESTRY PROGRAMME

As in other fields of agricultural activity there is no systematic collection of information on livestock population through time, and therefore, firm historical data on which a programme can be formulated is lacking. Map series 5 in the Map Appendix B were compiled from field studies done by Agricultural Extension Officers and show the spread of livestock in each region. The following quantitative data referring to four years between 1961 and 1975, have been used for mapping out future growth of livestock^{1/} shown in Table 27.

Table 27

Estimates of Livestock Population
in the State of Grenada in specified
Periods

Class of Animals	No. of Animals			
	1961	April 1965- March 1966	1971 ^{*/}	1975
Cattle	7999	6774	4058	6000
Sheep	6248	6869	3347	9000
Goats	5673	4491	4537	7500
Pigs	8301	10156	10149	10000
Chicken	106361	151109	176470	143629

^{*/} Excluding Carriacou

Sources: 1961: West Indies Census of Agriculture,
British Development Division in the
Caribbean, Bridgetown, Barbados.
1965-1966: Same as 1961.
1971+1975: Ministry of Agriculture Estimates.

^{1/} The aspects of these data open to question are: (i) the increases of cattle, sheep and goat population in 1975 which are contrary to the 1961-1971 trend; and (ii) the fall in chicken population in 1975.

Assuming that the regional livestock distribution reported in the West Indies Census of Agriculture 1961 is still applicable, then distribution in 1975 was as shown in Table 28. South region, where

Table 28
Estimated Livestock Population
Distribution by Agricultural
Region and Category of
Animal 1975

	North	South	East	West	North- East	TOTAL
<u>CATTLE</u>						
Total	<u>1338</u>	<u>2256</u>	<u>1416</u>	<u>570</u>	<u>420</u>	<u>6000</u>
Immature Males	108	326	165	42	80	721
Immature Females	349	739	493	106	109	1796
Mature Males	177	149	152	57	44	579
Mature Females	704	1042	606	365	187	2904
<u>SHEEP</u>						
Total	<u>1485</u>	<u>3861</u>	<u>909</u>	<u>198</u>	<u>2547</u>	<u>9000</u>
Females	1113	2363	661	164	1058	5359
Others	372	1498	248	34	1489	3641
<u>GOATS</u>						
Total	<u>1380</u>	<u>2122</u>	<u>923</u>	<u>690</u>	<u>2385</u>	<u>7500</u>
Females	994	1240	683	378	1129	4424
Others	386	882	240	312	1256	3076
<u>PIGS</u>						
Total	<u>1980</u>	<u>4170</u>	<u>2230</u>	<u>820</u>	<u>800</u>	<u>10000</u>
Females	996	1886	1345	483	315	5025
Others	984	2284	885	337	485	4975

Source: Ministry of Agriculture, Forestry and Fisheries

savannah land predominates, has the largest population while West region which is noticeably hilly has the least. In general, small stock - sheep, goats, pigs and poultry - predominates over cattle. The island of Carriacou in the Grenadines is noted for its production of sheep and goats both of which are exported to other Caribbean islands, mainly Trinidad. The programme for increasing livestock and milk production is central to the broader long-term aim of achieving self-sufficiency in food supply and more particularly of reducing dependence on foreign supplies of meat protein. During the 1977-1981 period the progress which can be made in this direction will depend largely on improvement in such infrastructural requirements for growth as pasturage, water supply, abattoir facilities, preparation of hides, dairy management training, and the marketing and distribution of milk. In so far as these requirements are met there can be significant increases in animal production based on existing herds and animal extension facilities. The animal population programme will be further expanded by introducing bulls from Jamaica and by extending existing artificial insemination and animal care programmes. Projected increases in animal population shown in Table 29 during the period 1977-1981 are based on the assumption that the infrastructural improvements already referred to will be carried out.

Table 29

Projected Increases in Animal
Population to 1981 based on
1975 Estimates 2/

Category	1975	1977	1978	1979	1980	1981	Numbers	
							% increase 1975/1981	
Cattle	6000	6794	7099	7777	8469	9142	52	12.3
Sheep	9000	11279	12630	12140	15832	17729	97	12.0
Goats	7500	9397	10519	11783	13194	14768	97	12.0
Pigs	10000	11953	13149	14464	15910	17501	75	9.8

Source: Ministry of Agriculture, Forestry and Fisheries

2/ The method used in estimating population increases is shown in an Appendix to this chapter.

Infrastructural Improvements

Improved pasturage is a severe limiting factor to increasing animal production. While some progress can be made in heavy rainfall areas, the success of a pasturage programme will depend primarily on ground-water supplies. Winning underground supplies of water through bore-holes and a well-planned irrigation system are therefore key facets in the plan for increasing animal production. This applies particularly to the Southern Region of Grenada and to Carriacou.

It is estimated that capital cost per acre for established pastures, other than that required for irrigation, will be \$216 for improved and \$120 for unimproved pastures. Details are shown in Table 30.

Table 30

Estimated Capital Cost/Acre
of Establishing Pastures

	EC\$	
	Improved \$	Unimproved \$
Land Cleaning	80	120
Ploughing	40	-
Harrowing	30	-
Planting Material	16	-
Planting	50	-
	216	120

Source: Ministry of Agriculture, Forestry
and Fisheries

The estimated recurrent cost of maintaining improved pasturage is shown in Table 31.

Table 31

Estimated Recurrent Cost
for Pasture Maintenance per
Acre/Year

Input	Quantity lb _a	EC\$
		Value \$
Fertiliser		
Sulphate of Ammonia	400	68
Phosphatic/Potassic	100	27
Weed Control	-	20
		115

Source: Ministry of Agriculture, Forestry
and Fisheries

The estimated acreages of improved and unimproved pastures required to meet projected animal population through to 1981 are shown in Table 32. The programme for improved pasturage will be

Table 32

Estimated Acreage of Improved
and Unimproved Pastures 1977-1981

Year	acres	
	Pasturage	
	Improved	Unimproved
1977	1124	5238
1978	1210	5624
1979	1335	6223
1980	1471	6855
1981	1611	7515

Source: Ministry of Agriculture, Forestry
and Fisheries

concentrated in South Region, but it will also be implemented in other regions especially where there are pure coconut stands. The following are the locations for pasture improvement in the South.

1. In the Parish of St. George:

Calliste Woodlands	Grande Anse Springs	Woburn Tempe
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2. In the Parish of St. David:

Calivigny Corinth La Tante	Westerhall La Sagasse Crochu	Bacolet St. David's Village
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Meat and Milk Production

Estimated meat production in 1975 was 1,304,280 lbs. comprised as follows:

beef - 287,350 lbs.;	Mutton - 42,390 lbs.;
lamb - 51,540 lbs.;	Pork - 923,000 lbs.

Estimated milk production in 1975 was 261,330 gallons. Projected meat and milk production for 1977 to 1981 are shown in Table 33.

Table 33

Projected Meat and Milk
Production 1977-1981

Commodity	Unit	1977	1978	1979	1980	1981
Beef	lb.	424900	448350	477400	506450	550900
Lamb	lb.	64590	72270	80910	90660	101490
Mutton	lb.	53130	59490	66690	74670	83580
Pork	lb.	1116750	1228375	1351125	1486250	1634875
Milk	gal.	293100	305700	335400	366000	395400

Source: Ministry of Agriculture, Forestry and Fisheries

There are no estimates of egg and chicken production, but poultry are kept in most backyards and there are a few commercial producers in the country. It is proposed during the plan period to expand poultry and egg production. The Livestock Division of the Ministry of Agriculture will take an active part in developing poultry associations in each

region. Since economies of scale will not justify the establishment of an egg hatching unit in Grenada, the Government will encourage the importation of day old chicks from within Caricom or from elsewhere until demand reaches a level which will make a domestic hatching unit economically feasible.

The cattle industry is widely spread throughout the island with numerous small farmers owning one or few animals. Milk production is therefore also wide spread with output per farm being rather low. While it may be attractive to conceive of the establishment of large dairy herds, there are few locations where this can be done^{3/}, and it is unlikely that there will be any attempt at developing such herds on a large scale. The existing pattern of milk production must therefore be taken as given in the programme for dairy expansion. In these circumstances limiting factors to expansion are a multiplicity of small localised markets and the low net returns which would accrue to farmers if they sold milk to the existing processing plant. Once again, as in all other cases of agricultural expansion, transport cost is a real barrier to growth. It is therefore recommended that the programme for increased milk production should be as follows.

Localised demand should be developed by Government undertaking to purchase milk from farmers' co-operatives for use in Government institutions, such as schools, health centres and hospitals. The pasteurization of this milk can be done by traditional methods by farmers individually or by co-operatives. As the number of dairy cows in regions increase and it becomes apparent that there will be local milk surpluses, a National Dairy Co-operative should be formed, which should be shareholders in the existing processing plant. The collection and transporting of surplus milk to the dairy plant can then be organised on a national basis, with the plant meeting the needs of the tourist industry and urban areas. As part owner of the factory members of the co-operative will have an incentive to sell milk to the factory.

^{3/} Suitable areas are located in Southern areas of the island of Grenada.

Fishery Programme

Fishing is a full or part time activity for many coastal residents in Grenada. It is estimated that in 1976 the number of fishermen was 1450 and the number of boats 850. In addition there were at least 300 fish vendors and about 50 to 60 boat builders. The average annual catch for the three year period 1973-1975 was estimated to be 4.8 million pounds as well as sizeable quantities of such other seafood as turtles, lambie and lobsters. Most of the seafood caught is landed at Grenville on the East Coast and Gouyave and St. George's on the West. There are, at present, cold storage facilities at Grenville and Gouyave and ice-making plants at St. George's and Grenville.

The waters around Grenada abound in fish, and coastal as well as open sea fishing yield returns all the year round. Fishing practices have however undergone little change over the years and therefore the programme for self-sufficiency in fish and fish products will require at least modest technological improvements and increased financing facilities. At present loans are available from the Grenada Agricultural and Industrial Development Corporation, but the loan scheme might be more effective if it is closely integrated with a programme for technological improvements. Staff Officers from the Fisheries Division have recently returned from training in Korea through a technical co-operation scheme between the Governments of Grenada and South Korea and are at present working on a programme for technical improvements appropriate to the present state of the industry.

The boats in current use are 26-28 feet long, 6 feet wide and $2\frac{1}{2}$ - 3 feet deep. Sail boats are still in use but most boats are mechanised. Fishermen use drag-net for in-shore fishing and draw lines for off-shore. The productivity of fishermen can be increased considerably by using 33 - 34 feet boats with insulated hulls which can carry a large supply of ice for increased fish storage. These boats could be powered with 35 h.p. engines which should be used not only for driving the boat through water but also for handling fishing gear at the rear end of the boat, thus enabling fishermen to pull in larger size catches. Drag-nets which are used as beach seines

should be replaced by purse seines which will facilitate fishing out in the open sea. The main requirements for success in the proposed fishing programme are:

1. Improved credit facilities.
2. Design and specifications for larger boats which can carry satisfactory supplies of ice for increased fish storage.
3. Provision of adequate storage facilities and the efficient management of such facilities. Discussions should be held with fishermen, marketeers and consumers to ensure that the facilities provided accord with marketing arrangements which satisfy all parties concerned.
4. Improved marketing and distribution systems. At present fishermen market most of their catch. This they do by coming to port when consumers are home-ward bound. Fishermen should be freed from this burden. They should be able to come in to port at any time knowing that their catch will be bought by a Fishing Co-operative which has storage facilities and which undertakes marketing and distribution responsibilities.
5. A thorough study of the types of fiscal concessions which should be made to the industry to provide incentives for expansion.

A preliminary requirement however is registration of all bona fide fishermen, their boats and equipment. This exercise has already been started by the Ministry of Agriculture.

Though boats have been built in Grenada and in many Caribbean territories for well over a century, there has never been any attempt to build up a marine industry based on indigenous boat building skills. Efforts in this direction are long overdue and it is the Government's intention to discuss this matter at Regional level with a view to setting up a small committee to make a study of this industry and examine the potential for its expansion with the long-term objective of building modern types of sailing vessels with auxilliary engines which can meet the needs of inter-island Caribbean trade and security requirements. Such an industry will open new perspectives for employment in the area, and demonstrate a capacity for Caribbean Governments to utilise their

own labour force in developing a marine industry instead of the existing orientation of giving employment to labour in this industry in other countries. It will also be a boost to lumber industries in Guyana and Belize. These boats will form the nucleus of a Caribbean Merchant Navy.

An area for increasing the supply of proteins which has to-date been mainly neglected in the Caribbean is fish farming, though the facilities for this type of cultivation both in fresh and salt water abound. Grenada has many sheltered coves and bays, particularly on the South Coast where there are fine natural locations for breeding and multiplying salt water fish. There are, also, coastal locations around the island where lobsters, conchs, lambie, shrimps, seaweed and other sea foods are harvested, but there has been no attempt to cultivate these foods. Inland, there are natural fresh water courses where fish cultivation can be practiced. The Government intends during the plan period to take positive steps to develop a fish farming industry with a view to increasing domestic supplies of protein. It will also take action at the regional level, to develop greater consciousness among all Caribbean Governments of the vast potential for increasing the supply of fish and other sea foods which is now more or less neglected.

Forestry Programme

Natural hardwood forest lands in Grenada and Carriacou, most of which are located in the centre of the former island cover approximately 10,000 acres of which Government forest reserves comprise 4,000 acres. The forested areas comprise a wide variety of tropical hardwood, and there are, in addition, extensive coastal areas covered by shrub and brushwood. The hurricane of 1955 destroyed much of the commercial timber and in an attempt to rehabilitate the industry, experimental commercial forests were established between 1957 and 1969 on State owned lands. These plantings were mainly: teak, blue mahoe, red cedar, white cedar, mahogany and Caribbean pine. At present teak, blue mahoe and pine cover about 700 acres in Grenada, but most of the white cedar planted in Carriacou was destroyed by goats. Within more recent times, however, afforestation has suffered from lack of capital investment, and the industry has been more or

less on a caretaker basis with mainly recurrent expenditure. It is not clear from available data how much private land has commercial forest trees, but information of this kind is necessary before undertaking a long-term plan. There were recommendations made in 1944 and again in 1973 for a forest inventory. The Government intends as a first step in long-term planning to seek technical assistance for a comprehensive study of existing forest resources.

Government is fully conscious of the importance of its forests for water-shed protection and also the part which local woods can play in the development of a timber industry. It will therefore early in the plan period allocate capital expenditure for a reforestation programme aimed at increasing the population of commercial trees in established forest areas and also planting suitable trees on hills in South Region now covered with shrub. The task of rehabilitation will be undertaken by a Forestry Commission with responsibility for planning and implementing forestry policy. The Commission will comprise persons in the private sectors who own forests and officers from the public sector representing the Ministry of Agriculture and the Water Commission. All members will be nominated by Government. There will be a Manager to carry out the policy of the Commission. The broad lines which the Commission will pursue are as follows:

1. Fifty acre lots of denuded forest lands will be planted annually with bananas and forest seedlings by groups of farmers to whom these lands will be allotted. Income from banana cultivation will go to the farmers. No pesticides or chemicals other than fertiliser will be used in catchment areas which provide domestic water supply.
2. Five acre lots of shrubland will be allotted to farmers for consumption as firewood or charcoal. These lots will be replanted with suitable commercial trees with corn and food crops as temporary cultivation. Proper soil and water conservation practices must be incorporated into this programme and strictly adhered to by farmers.

3. The cultivation of anthurium lillies will be promoted in those forested areas where the climate is suitable for such propagation. There is a good overseas market for these flowers and their cultivation can make a valuable contribution to farmers' incomes.

Carpentry and Cabinet-making

A successful forest development programme will take care of the future, but there is a current problem of providing raw material for building and furniture industries in the island. Due to inadequate accessibility, harvesting and transportation of existing timber is laborious and expensive, and therefore immediate steps need to be taken to provide access roads in forested areas. The sawmilling industry is at present suffering from poor supplies and steps will be taken to improve this industry since its output is important to the growth of employment in furniture making and carpentry.

There are numerous small furniture shops scattered all over the country. Some of them are well-equipped and run by master craftsmen, but because of shortages in wood supply they are unable to take full advantage of the domestic furniture market. At the same time there are other shops which produce rustic articles of furniture with a low level of technology. The Government will, during the plan periods:

1. Examine the feasibility of importing lumber in bulk from Regional sources for sale, on a cost basis, to furniture manufacturers whose levels of skill meet a required standard.
2. Encourage the introduction of appropriate technological expansion in wood-working industries through fiscal incentives.
3. Establish a system of apprenticeship to accredited master craftsmen as a means of increasing employment opportunities in the short run, and in the long run increasing the number of skilled craftsmen in the country.

4. Establish controls on the importation of metal and plastic furniture to encourage the expansion of the domestic furniture industry.
5. Give to the Ministry of Trade and Industry the responsibility of overseeing the woodwork industry to ensure that satisfactory standards of production are established and maintained and that the system of apprenticeship does not give rise to the exploitation of labour.

NOTES ON ESTIMATING POPULATION INCREASES AND LEVELS OF PRODUCTION^{a/}

<u>CATTLE</u>	-	Reproduction	:	60 per cent calving	
		Mortality	:	10 per cent calves; 2 per cent yearlings	
		Culling	:	15 per cent	
		Cows in Milk/year	:	60 per cent of Breeding cow population	
		Average lactation	:	150 gallons	
		Slaughter Cattle	:	Cull cows and 2 year old males	
		Average Carcass weight	:	350 pounds	
	<u>SHEEP/GOATS</u>	-	Breeding Females	:	40 per cent of total female population
			Lambings	:	Three in 2 years
		Lambing per cent	:	80 per cent	
		Mortality	:	15 per cent lambs; 10 per cent weaners	
		Culling	:	Mature ewes - 20 per cent Weaner ewes - 30 per cent	
		Slaughter stock	:	Estimated at 80/year/100 breeding ewes	
		Population increase	:	12 per cent/year for breeding population	
		Average Carcass weight	:	30 pounds	
<u>PIGS</u>		-	Breeding Females	:	30 per cent of total female population
		Farrowing	:	1 litter/year	
		Total Reared/Litter	:	5	
		Culling	:	Sows 20 per cent	
		Population increase	:	Breeding sows - 10 per cent	
		Carcass weight	:	Average 125 pounds	

^{a/} Supplied by Technical Officers in the Ministry of
Agriculture, Forestry and Fisheries

CHAPTER 6

MARKETING

The marketing of export crops is conducted by Produce Boards which have been in operation for many years. It is assumed that they will continue to carry on their business and provide the services which they now give to farmers in the same way as they have been doing in the past. From the point of view of involvement of farmers in the developmental exercise, however, there are a few conditions which should be met in order to achieve the degree of farmer participation which this plan envisages.

First, farmers who grow crops commercially and sell them to the Produce Boards should all be registered on a crop by crop basis, i.e. a separate register each for cocoa farmers, nutmeg and mace producers and banana growers. The register should provide data on number, location and sizes of holdings, volume and frequency of deliveries, payments etc.^{1/}

Secondly, the production of each farmer must be related to the size and use of the "plant" under his control. Where a crop is grown in pure stands, this can very simply be done on the basis of acreage, but since most of the cultivation is mixed, the only meaningful type of record which would reflect productive capacity is the number of trees as in the case of cocoa and nutmeg or of mats as in the case of bananas. This kind of information is vitally important so that crop production can be monitored and adequate forecasts made, both in the short and in the long run.

^{1/} The present system used in the Banana Co-operative Society which can provide data on suppliers, the volume of bananas they supply and the amount of fertiliser they receive, has limited value for land use planning. One of the requirements of the data collected is that they should permit identification of marginal and inefficient suppliers who can then be given incentives to improve production or diversify.

Thirdly, group activity on a village basis is important to get the farming community completely oriented towards the adoption of improved farming methods, therefore there should be elected village councils at the lowest range of the organizational ladder. Each village council should elect representatives to District committees, thus forming the second tier in building a co-operative chain between the Government and the farming community. At a higher level, farmers should be elected to represent their Districts at the Regional level in each of the five Agricultural Regions. There should be at least two representatives from each Region elected to each National Produce Board or Association, at least one of whom should represent the small farmer^{2/}. This type of structure will ensure that National Produce Organizations, comprising a combination of farmer population through an elective process and Government nominees, are structurally designed to achieve national involvement.

Our main concern in this plan, is, however, not existing produce marketing organizations but the steps which need to be taken to improve both internal marketing of food crops and present marketing methods of produce exported to CARICOM countries.

Regional Marketing

At present, fruit and vegetables are shipped weekly by schooner from St. George's and Grenville to Trinidad. The packaging methods used are crude and losses are very high. Traders, knowing that they will lose much of the produce which they purchase from farmers, give the farmer a relatively low return for produce at the farm-gate. On arrival in Port of Spain, the traders sell at a wholesale price which covers losses resulting from poor packaging, shipment and handling practices.

^{2/} Qualification for "small farmer" status for any particular crop will depend on a number of factors e.g. volume of commercial production, number and sizes of holdings and income.

The produce which eventually gets to the market at the retail end is not standardised, the seller cannot guarantee quality, and as a result the reputation of Grenada as a fruit and vegetable supplier within the region suffers. This is an immediate problem which the island has and which should be dealt with without delay by the new Marketing Agency.

The first requirement is to secure improvement in harvesting methods to eliminate spoilage through bruising. This must be followed by greater care in handling and transporting fruit from field to packaging depot for export. A relatively high standard has already been set by the banana industry and this must be the minimum acceptable level. In preparation for export, banana boxing plant facilities can be used for grading and packaging on the days when they are not in use. The existing facilities are located as follows:

District Location	Ownership	
	Banana Association	Privately owned
North	2	1
South	1	1
East	2	4
West	1	2

Secondly the Marketing Board must acquire reusable containers preferably made out of cardboard which can be folded when empty for return shipment to Grenada. Fruit and vegetables must be graded and packed in these cartons between reusable trays indented to accommodate the shape of the fruit or vegetables. These cartons should be sold to huskers who should not be allowed to transport produce in other containers. The required cartons can be purchased from another ECCM or CARICOM country but the trays to be used in the cartons can be manufactured in Grenada from paper wastes and other materials. Care must be taken to ensure that material used is free of spores and disease organisms. Starch which is manufactured in the island can be used as an adhesive. The programme of improved packaging, therefore, gives scope for industrial expansion in the island. For the time being, no other restrictions should be put on the

huskers' trade. They should be allowed, as they do at present, to travel with their produce. But the long-term aim should be that produce should be shipped under the supervision of the Grenada Marketing Board to the Trinidad Central Marketing Agency or to one or more accredited private wholesalers in Trinidad^{3/}.

Finally schooners which are the carriers of agricultural produce to the consuming territories must be better equipped to handle perishable cargo. The main improvements required are suitable storage facilities and the provision of a cool-air circulation system to reduce humidity and temperature build-up during transportation. The Ministry of Trade and Industry should after consultation with the Ministry of Agriculture, the Schooner Association and the Marketing Board establish the conditions which schooners must meet, and must be responsible for carrying out inspections and ensuring that the requirements laid down are adhered to.

Internal Marketing

Though Grenada has a very good road system, most motorized traffic moves between St. George's and main population clusters situated in other parts of the island. As a result, movements of agricultural produce have a relatively fixed pattern. Commodities for export go to St. George's and Grenville and those for domestic consumption move primarily to St. George's and adjacent tourist areas. It is not uncommon, therefore, to find an over supply of fruit, food crops and vegetables in one part of the island while in other parts there is scarcity. In some cases, with respect to green vegetables, retail outlets in areas where demand is high, reject increased supplies in

^{3/} The important point which cannot be over-emphasised here, is that, in so far as the Grenada Government is concerned, it is in its own interest to ensure that Trinidad buyers are satisfied with the fresh fruit they purchase. The Government will therefore be paving the way for a processed fruit market. The St. Vincent agro-industrial laboratory now ships bottled soursop nectar to Barbados. There is no reason why Grenada should not eventually do the same with respect to Trinidad.

order to keep prices at an artificial level and since there are no transport facilities to convey the produce to areas of scarcity they remain and rot in the field^{4/}.

There is urgent need to ensure that when there are agricultural surpluses they flow to areas in the island where they are most needed so that farmers will not be discouraged from producing by seeing output rotting in the field or piling up at their farm-gates. The high priority accorded to improving internal marketing is possibly the main justification for establishing the Marketing Board and this should be seen as its prime function.

A model Marketing System for improving internal distribution of agricultural produce require:

1. A thorough knowledge of the location of all food crop production in the island and of variations in seasonal production.
2. Knowledge of the areas where surpluses either occur or can occur and those areas where there will be shortages because of the inability of local production to meet demand requirements.
3. Adequate packaging facilities.
4. Adequate transport facilities, provided either directly by the Marketing Board or indirectly by private firms with such facilities through agreements with the Marketing Board ^{5/}.

^{4/} This occurred last year with respect to green vegetables and tomatoes grown in Calivigny, just a few miles outside of St. George's.

^{5/} There are commercial firms with vehicles which travel to different parts of the island distributing their commodities to outlets. The Marketing Board should explore the possibilities of getting these firms to transport farm produce when they have unused space.

5. Outlets for disposal of produce at the wholesale or retail end. These must be identified and must contract with the Marketing Board to serve as outlets.

In sum, the Marketing Board must have a good marketing intelligence system and be able to organise collecting, grading, packaging and transportation of produce from producing to consuming areas. It is important that this Agency should concentrate on establishing a viable long-term system in marketing agricultural produce both within the island and CARICOM. Unless this is done, there will be little incentive for increasing production of locally consumed foods, and the tendency to rely on imported foods will continue to remain dominant, thus defeating the whole programme of import food substitution. The Agency's activity is also crucial to the food processing programme, for little headway can be made in this until the island begins to produce national and not regional surpluses. For starchy foods such as yams, pumpkins, cassava and sweet potatoes all of which are more nutritious in powdered form than as fresh foods, an efficient Marketing Agency will stimulate production thus contributing to the long-term objective of processing these products for national consumption thereby giving the fresh product a different status viz., that of raw material for industry.

The Marketing Board also has an important role to play in agro-industrial development. It is expected that the expanded production programme for food, will, under an energetic and resourceful Ministry of Agriculture result in increased output of root crops and cereals. Production of the latter would most likely pose no problems since grinding can continue along traditional lines in the areas where there are surpluses. Root crops, however, present greater complexity and there must be a new framework for processing. The Produce Chemist Laboratory will have an important research and advisory role to play and the Marketing Board should only act after making a thorough study of alternative lines of action. A possible framework which ought to be given some consideration is one in which peeling, chipping and drying of root crops and bananas are done either on individual farms, or at stations serving a number of farms, by the use of solar energy,

as is now done in the case of cocoa^{6/}. This will obviate the movement of bulky raw material and at the same time provide a cheap source of energy. Dried chips which will have lost much of their weight can then be transported to central places at much lower cost for processing into powder. Additives can be used during processing to improve the nutritional value of the powdered food.

Organization

The Marketing Board has to work in close collaboration with the Ministries of Agriculture and Trade and Industry, and more particularly with the Agricultural Extension Service. This Service, extended as it is throughout the island, and in close contact with all production units is the "eyes and ears" of agricultural production. To avoid duplication the Marketing Board should not be involved with the farmer at this level. Distribution of farm inputs, for example, is not a function of this Board. At the same time however, the Extension service because of its operations will know the harvesting period of all crops throughout the island. There must therefore be proper linkage between the Extension Service and field officers of the Marketing Board. The Board should have at least one field officer for each Agricultural Region, and each such officer should hold regular weekly meetings with the corresponding Senior Regional Extension Officer. This linkage will ensure a flow of information from the producer which will be a major input for island-wide market intelligence. There should be monthly meetings between the Board and the Extension Division. At the other end of the marketing chain, the Board has to build up consumer information. While Extension Officers can also be of some assistance here since production data will reveal both areas of gluts and scarcity, the officers of the Marketing Board must know all market conditions and outlets, and be familiar with

^{6/} Direct solar energy which is now used for cocoa will most likely be unsuitable for these produce, which will have to be dried rapidly to avoid mould, therefore some form of indirect solar heating will have to be developed.

consumer attitudes and behaviour. This will be a further input to the Board's Market Intelligence. The Board must through regular weekly broadcasts on Radio Grenada provide the national link between itself and all consumers and producers in the island.

Linkages with the Ministry of Trade are important with respect to CARICOM trade. This will ensure that the conditions laid down for packaging, handling and transshipment meet the requirements of both the Ministry and the Board. An officer representing each authority should be present when produce is being loaded on to schooners.

Marketing Board Functions

Many developing countries, in setting up Marketing Boards, have been torn between two admittedly desirable objectives:

1. To have control over the importation of food thus monitoring imports as part of a food import substitution programme; and
2. to organize the handling and marketing of domestic food production primarily for internal consumption, but sometimes also for export.

In order to achieve the first they have to confront traditional importers with a view to replacing them or leave these importers and function as an intermediary between them and foreign suppliers. The first course often challenges particular vested interests and the second either increases the price of food or calls for Government subsidies. An argument which is often advanced in support of the import control approach is that the Marketing Board can, through its operations derive an income which can then be used for organising domestic production. This however very seldom happens. The more common occurrence is that the Marketing Board becomes a bureaucratic institution without the drive, initiative and forward planning essential for efficient marketing, and eventually receives a subsidy.

It is undoubtedly important that there must be some control mechanism over food imports if domestic food production is to expand to meet internal food demand, but this mechanism should be handled through the Ministry of Trade, which should work in close

collaboration with the Marketing Board.

All the Board's energies should be spent on the second objective. Admittedly, this is the really difficult exercise, for it requires building up from scratch an institutional framework which is far more complex and difficult to handle than the relatively simple exercise of handling imports and exports. It calls for structuring easy flow systems of produce from the farmer to the housewife and accumulating a body of knowledge about marketing and distribution which can serve both as a guide to the Board in its operations and as information for producers and consumers. The success of the whole programme for expansion of domestic food supplies and agro-industrial development will flounder if the Marketing Board does not make the handling and marketing of domestic food for the internal market its central theme of action.

CHAPTER 7

AGRO-INDUSTRIAL DEVELOPMENT

An industrial programme based on processing domestic agricultural produce is the corner stone for the expansion of the internal economy. While there is undoubtedly some scope for manufacturing products from imported and non-agricultural domestic raw material, internal demand from such production can only be sizeable if net incomes of agricultural producers are good and relatively stable. The key to long-term growth and expansion therefore lies in agro-industrial development. Traditionally, agro-industrial growth has been mainly an off-shoot of trade in export commodities. Thus, sugar, cocoa, nutmegs, cotton, coconuts and limes were first exported in their raw state and later processed into crystals, rum, chocolate sticks, cocoa powder, nutmeg oil, cotton linters, edible oil, lime juice and lime oil, with some of these products being consumed on the domestic market, as both intermediate and end-use goods. These processing industries, in-so-far as they were based on factory production, have all had checkered histories. Sugar processing, had virtually ground to a halt with rum and syrup production being the only surviving operations mainly to meet internal demand for the former. Efforts are now being made to revive the industry. The resuscitation programme has been dealt with under Chapter 4, and therefore, repetition will be avoided.

Cocoa Processing

Some consideration has been given to processing cocoa beans into chocolate liqueur and cocoa butter, but preliminary studies indicate that since the island produces a flavoured cocoa bean, its economic advantage lies in exporting the raw material rather than in processing it, a refinement which is likely to result in loss of its special quality. It would appear, therefore, that if cocoa processing could be expanded, this should be done along traditional lines, i.e. the cottage industry manufacture of chocolate sticks and balls for domestic and regional consumption primarily, but also for export to Caribbean migrant communities in Europe and North America. This will require research on the shelf-life of the product, establishing uniform standards of

production, carrying out regular checks to ensure that these standards are maintained and mounting an advertising campaign in overseas potential markets. The Produce Chemist Laboratory in the Ministry of Agriculture, will have an important role in this development. It will also call for programmes of mass education to encourage the use of chocolate in this form rather than as a powder, and may require the placing of restrictions on imports of powder so that an efficient system of production, marketing and distribution could be developed internally.

Nutmeg and Lime Processing

Nutmeg and lime processing will be considered jointly because though nutmeg oil was produced from defective nuts in the mid-1960's for export to the United Kingdom, in more recent times processing has been a subsidiary activity of the lime factory. Of the tree grades into which nutmegs are classified - good, defective and very poor quality defective - studies done indicate that it is only economically feasible to process the last into oil^{1/}. In 1974 the Grenada Co-operative Nutmeg Association produced 25 drums of oil from this poor quality nut, only 8 drums of which found a market at EC\$10.88 per lb., and up to the time of writing most of the product had remained unsold. There are two factors which seemed to have been responsible for this. First, the price was considered high by traders in the light of the fact that Indonesian oil was sold on the US market at a relatively stable price of US\$9.00 or US\$10. per kilo, which suggests that oil from Grenada should have been about EC\$8.60 per lb. at 1974 exchange rates. Forty per cent (40%) of the f.o.b. value of the Grenadian produce was paid as export duty to the Government.

Secondly, Grenadian nutmeg oil has a flavour very distinct from Indonesian nutmeg oil which has already established itself in most consuming countries. The product therefore has a problem of acceptance.

^{1/} See for example, "Agro-industry Project Proposals for Grenada" preliminary draft, May 10, 1976 by Department of Rural and Urban Development, O.A.S.

Since the economy is primarily agricultural the Government has to rely on export duties for some of its revenue, but it will not impose a level of duty which could in effect inhibit agro-industrial development. It will therefore lower the existing duty since the present level makes nutmeg oil too highly priced a product to gain a foothold in international markets. It is likely that if the industry overcomes its second problem, the demand for its oil may be so elastic that Government total revenue from this source will be significantly higher than it is at the present level of duty. The task of producing a product with market acceptance requires a fair amount of product and market research which the Nutmeg Association proposes to undertake. It is possible, in the first instance that a market can be created in non-traditional nutmeg oil consuming countries for the product as it is. This possibility should be fully explored. Failing success in this direction the Produce Chemist Laboratory in the Ministry of Agriculture can explore the possibilities of making the oil more acceptable to existing consumers. With expected increases in nutmeg production and the rejection of poor quality defective nuts on the international market the country will have increasing supplies of nuts for an oil processing industry. Every effort will therefore be made to establish this industry on a long-term basis.

The island produces pepper and many minor spices which are exported as raw material. The Nutmeg Association will during the plan period, explore avenues for processing and packaging these products for external markets.

The Lime Factory in St. George's has produced lime juice and lime oil at varying periods in the past. Its most recent operation was started in 1970. In the crop-year 1974/1975 the plant processed half million pounds of limes and produced 14400 gallons of settled lime juice and 1200 pounds of oil. In the following year, though the production of juice increased, the raw juice was shipped to Dominica for processing into oil and juice concentrate. There is another Lime Factory in Carriacou, but long periods of drought and disease have greatly reduced lime production and the factory is no longer used. On the whole, fresh lime production has been falling in both islands

and the future of the industry depends on the destruction of diseased trees and the introduction of new disease-resistant varieties. The proposed plan for rehabilitation of the lime industry has been outlined in Chapter 4. The Tahiti lime variety will be cultivated mainly in Grenada for the fresh fruit market and for lime juice while lime oil will be produced from the disease-resistant West Indian lime variety which will be cultivated in Carriacou.

Cotton Processing

Carriacou is the cotton growing island. Acreage under this crop has been falling over the past three decades and so too has production. Raw cotton and cotton linters have been exported to Trinidad and Tobago periodically and cotton seed has been sent to St. Vincent for oil extraction. The future of the industry depends very much on a reversal of production trends which in turn depends on cultivating drought resistant varieties and improving the water supply through irrigation. Since Carriacou is only one of a group of islands in CARICOM which grows cotton, a study should be undertaken of cotton production in all the islands to ascertain what contribution, if any, this commodity can make to long-term agro-industrial development in the Caribbean region^{2/}. It is possible that despite the fact that most cotton fabric is mass produced, the area can develop a cottage industry and enter international markets with hand woven products with designs which are characteristic of the Region, thus giving scope for the development of a new skill with indigenous creativity.

^{2/} Barbados, for example, exported 200,000 lbs. of non-carded cotton in 1974. While in the current state of world cotton production, this crop may be an attractive substitute for sugar, in the long run the problems of price fluctuation of raw commodities will arise. It is therefore more in the long-term interest of the area to process its raw material, and export finished goods rather than continue in its traditional role of suppliers of raw material for industrial countries. But the approach to this problem must be Regional.

Coconut Processing

Coconut production has provided the raw material, copra, for the manufacture of edible oil and other products. Oil is produced at cottage industry level throughout the island and there is one Factory in St. George, Tempe Manufacturing Company Limited, which produces oil, soap and coconut meal for domestic consumption when it can get raw material. Copra production in the island has been declining over the past decade for reasons which have been dealt with in Chapter 4, and therefore the future of processing depends very much on the success of the programme for coconut rehabilitation. There is a small cottage industry using coconut shell for making artefacts and articles for interior decoration. At present the range in the quality of products is very wide. Standards of production need to be set and rigorously adhered to, so that the country can develop a reputation for neatly manufactured and attractively hand carved products. There is also wide scope for the development of a coconut fibre industry which at present is not being explored. The importation of rubber and plastic door mats into the Caribbean area ought to be prohibited and incentives given for the development of a fibre mat manufacturing cottage industry. It is at this level that industrialisation in the Caribbean has greatest meaning: namely, the use of indigenous raw material for making items required for everyday domestic use.

Summary

Agro-industrial development based on the processing of traditional cash-crops, depends very much on programmes for revitalising the agricultural sector. In the short run, the sugar industry offers greatest scope. There is a Sugar Factory already in existence and many small mills producing syrup, therefore, given that production can be stepped up, the economy can begin its programme for self-sufficiency in sugar during 1977. With respect to nutmeg oil production, extraction will depend on whether or not the Lime Processing Plant is in operation. The Lime Factory is in a delapidated condition

and there is limited scope for action in the short run. The most desirable approach would be to view extraction from limes, nutmeg and other spices as a single project and examine its economic feasibility if raw material supplies can be assured. Towards this end, the Government will seek technical assistance for a comprehensive study on this project.

Self-sufficiency in Food

The problems of achieving self-sufficiency in food supply in the Caribbean is rather complex. It is not just simply one of increasing the volume of domestic food but it also entails the substitution of staple foods which come from temperate countries and which the population regard as necessary for their daily diet. The Caribbean, being primarily tropical or sub-tropical, is unlikely to be ever able to grow wheat, but millions of pounds of this commodity are consumed every year and reliance on it has been reinforced by the establishment of flour mills in some islands. As the population in the area increases, wheat imports increase and foreign supplies of food eat up more and more of the area's foreign earnings, thus limiting its capacity to finance its own development. Since wheat is also a major staple for consumers in temperate zones the price which countries within the tropics pay for wheat grain depends primarily on the success or failure of wheat crops in Canada, U.S., Russia, China and Australia. A poor Russian harvest increased the price of wheat to the Caribbean consumer in 1974. Any realistic attempt at development in the Caribbean, therefore, requires a regional consciousness that little of lasting value can be achieved as long as wheat grain is central to the nutritional levels which the population can attain.

It follows from this that there must be a cultural orientation within Caribbean society to appreciate that grains and food crops which are natural to the tropics can provide the nutritional requirements of the population and that agro-industrial development from domestic food resources creates new dimensions for expansion of the internal economy. Flour can be processed from tropical grains, banana, pumpkin, cassava and other root crops and fortified if necessary to make a substitute for wheat flour or can be used in conjunction with wheat flour to make

composite bread, biscuits and pasta products^{3/}. The incentive for growing these crops in large enough quantities to provide raw material for processing industries must, however, be inextricably bound with a programme of shifting away from dependence on wheat grain, if necessary, by controlling imports. There is also the supplementary need for practical research and implementation of programmes for achieving greater uniformity, in size and quality in sweet potatoes, cassava, yams, eddoes, tannia and dasheen and for developing strains which are more disease-resistant and suited for large scale production.

Regional programmes for self-sufficiency in food which are not based on supplying a very high proportion of food staples from Caribbean production will be dealing with the fringes and not with the core of the Caribbean food problem. The economic validity of existing programmes for Regional cultivation of corn and soya bean is the direct contribution they can make to human food, thereby saving foreign exchange through this channel, and not their direct contribution to animal feed. The provision of the latter is supplementary.

This approach gives an entirely new dimension to agro-industrial development. In the first place, it gives the farmer an important role within the economy and a social status in keeping with his function. His responsibility for feeding the nation will be obvious to him and there will be a base for pride in his economic activity.

All production functions in the agricultural sector will change. There will be new incentives to increase the supply of grain, root crops, fruit, vegetables and animal production, for these will all

^{3/} "Composite Flour Technology Bibliography" by Dendy, James and Clarke, published by the Tropical Products Institute, September 1972; presents a wide range of literature on this subject.

G.M. Sammy, Food Technologist at UWI, Trinidad, has written extensively on this subject with specific reference to the Caribbean.

be raw material for an indigenous industrial sector which feeds the nation. Consumers will see the direct links between themselves and farmers whose net incomes must serve as an incentive for production. There will be a sound base for an internal flow of capital into agriculture, for its produce will have a ready market, both immediately and through time. And the movement of both raw material and processed foods will add a new dimension to the development of the tertiary sector of the economy.

Farmers must not only be producers of raw material, they must also have vital interests in its processing. They must, therefore, be members of co-operatives which should own shares in agro-industrial enterprises. Past experience in the Caribbean has shown that when private entrepreneurs enter the food processing industry, they very seldom if ever succeed in getting farmers to sell their output for processing^{4/}. In the event, the industrialist turns to overseas sources of raw material and the domestic agricultural industry gets no impetus from industrial expansion. As a result, increasing food demands arising from population and income growth are not met by local food supplies, and the domestic agricultural sector stagnates while the foreign agricultural producer reaps the benefit from regional growth. The Government intends, therefore, to promote new industrial enterprises only on a co-operative basis. Processing industries must be owned and managed by farmers either co-operatively or as joint co-operative and private or public enterprise ventures. Farmers will then reap economic benefits both from the sale of their produce as fresh foods and as raw material for food processing.

There is yet an entirely new area with potential for development which needs to be explored. This is the introduction of new plants suitable for food and industrial use. Bamboo is a very good example.

^{4/} The successes met with tobacco cultivation in Trinidad and in Tobago are special cases, since the product would not have been grown commercially in the first instance if there were no manufacturer.

Throughout the island of Grenada and in most of the other Caribbean territories, this grass is grown along river banks. It performs the twin function of binding the soil, thus preventing erosion, and providing shade over water courses thereby reducing loss through evaporation. The species grown are used primarily in agricultural engineering to retain soil, for building bridges, for the construction of sheds and for cottage industry products. There are, however, other species grown in India, Malaya and China which can be used for food and for making furniture, household articles and ornaments. These can most likely be all grown in the Caribbean. It is also known that the culm of bamboo can be used for making paper. Experiments conducted in London over 50 years ago yielded a pulp from which was produced a light brown paper, and this, when bleached, produced an opaque paper of good strength and quality. In its programme for conserving the nation's water supply and for developing its water courses, the Government will explore the possibility of getting technical assistance for the introduction of suitable bamboo stock that can be used for food and industrial purposes^{5/}.

^{5/} Tinned bamboo shoots are imported into the Caribbean from China.

CHAPTER 8

INFRASTRUCTURE

Although Grenada is richly endowed as an agricultural country, it can only capitalise on its resources if there is a sound infrastructural base for agricultural development. At present this is not the case and much of the expansion envisaged in this plan depends mainly on what improvements can be made to existing roads and bridges, the construction of new feeder roads, improved water, irrigation and transport facilities and the expansion of energy supplies.

Roads and Bridges

The island has a very good network of main, secondary and "other" roads in each of its Agricultural Regions, but lack of a planned maintenance programme and periodic erosion and damage from natural phenomena have had disastrous effects on bridges, road foundations and surfaces. The first stage of a feeder road programme financed by the Caribbean Development Bank is now in progress. While this will be of some help, it will make little change to the total situation. The Government has been aware of the high losses in agricultural produce suffered from the present unsatisfactory state of the roads and has been holding discussions at both national and international levels aimed at finding a long-term solution to this problem. This subject does not fall within the scope of this plan, but it is worthwhile noting that while road improvement is essential for sustained development in the long run, in the immediate future the programme has to be tailored as far as possible to meet existing conditions. This further emphasizes the importance of group activity among farmers and the part which local interests must play to maintain roads, clear water courses, and generally halt further deterioration of local roads and bridges.

Transport and Energy

At present both inputs and outputs of the agricultural sector are moved primarily by motorised transport. Due to poor road conditions there is a high percentage of loss in transporting some

commodities, especially bananas, other fruits and vegetables. Losses can be reduced somewhat by better packaging, but they will be high as long as the roads remain in their present conditions. At present transport cost is high, not only because of the high percentage of loss, but also because of high depreciation costs of vehicles and high costs of fuel and maintenance. There is every indication that fuel costs will remain high in the foreseeable future, and will be such a high percentage of wholesale commodity prices that farm-gate prices for some commodities will be too low to act as incentives to the farmer. In the medium term and the long run, transport costs can only be kept under control if, where possible, both agricultural inputs and outputs are transported by draught animals and tractors and trailers^{1/}. This has been dealt with at some length under "Sugar-cane production" in Chapter 4 and therefore further elaboration here is unnecessary.

The energy problem is a further extension of part of the transport problem, in the sense that our concern is once more to look for alternative sources of energy for developing the agricultural sector. Apart from animal power which was at one time in common use in agriculture, there are the natural sources of energy, - sun and wind, which have been used by Man for time immemorial, but which questionable concepts of modernization have led many developing countries to abandon^{2/}. The Government intends to initiate a thorough investigation into the scope for using wind and solar energy in its overall development programme. It will not act independently, but

^{1/} It is possible that in the long run motor vehicles with low fuel consumption to load ratio may be developed. This will make a significant difference to cost.

^{2/} This is particularly applicable to the Caribbean where wind power was, for well over a century, the main source of energy used to develop a sugar economy, and to convey the raw material to overseas markets by sailing vessels.

will through CARICOM encourage regional governments, to seek assistance from foreign countries which have been doing work in these fields^{3/}. The Government will also, during the plan period, examine thoroughly the feasibility of developing hydro-electric power for localised use in watersheds where there is a perennial water supply^{4/}.

Water and Irrigation

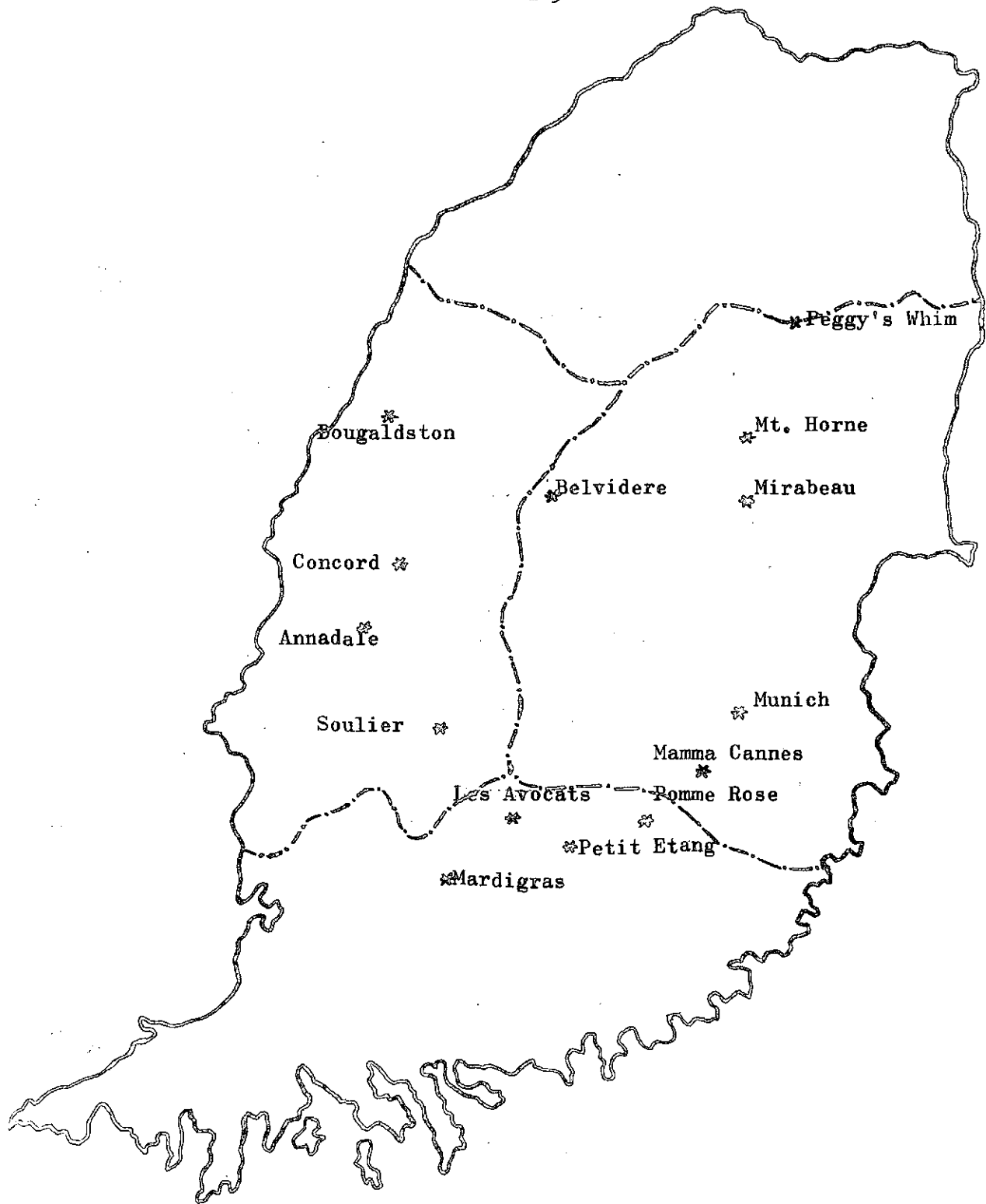
Grenada has a marked rainy season during which rainfall is very heavy and months of dry weather when there is little rainfall. The island also has numerous rivers most of which have water all the year round. The major drainage areas are shown in Map Appendix A Map 3. A programme for water development for agricultural use must have the following elements in it:-

1. To reduce the off-flow of water during the rainy season.
2. To preserve watershed areas against erosion and to facilitate the accumulation of underground supplies of water.
3. To control flooding and to reduce evaporation loss along natural water courses to a minimum by suitable tree cover.
4. To bring underground supplies of water to the surface for irrigation and other purposes.

Dams and reservoirs in Grenada are shown on the following page. These are well located, but an increase in their number at lower levels may be able to reduce excessive flooding during the rainy

^{3/} Recent reports from the Australian National University in Canberra indicate that scientists have developed the world's first system for storing huge quantities of solar energy for commercial use. They foresee the day when entire towns can be powered by solar energy. These developments can make significant changes to the quality of life in tropical countries.

^{4/} Micro-dams can be built with many small generators which feed power into a grid system.



Existing Dams in Grenada

season considerably. The Government will therefore, during the plan period make a thorough study of the following river courses to determine if they could be tapped for the construction of surface dams and reservoirs: St. Francis River, River Antoine, Black Bay River, Great River and St. Louis.

The programme to preserve watershed areas against erosion and contamination is linked with the forestry programme. There will therefore be a representative of the Water Commission on the Forestry Commission to ensure co-ordination of activities. This will be a safeguard against the use of chemicals which can contaminate water in conservation areas during the re-afforestation programme.

Dams and reservoirs at high altitudes will reduce the flow of water in rivers, but it will still be necessary to make additional provision for using rivers for gravity flow irrigation where land slope makes this possible.

Measures to increase the availability of water must be accompanied by steps to increase water supply. While surface supplies from dams, reservoirs and rivers can make a valuable contribution to agricultural and agro-industrial development, underground supplies of water are crucial in those parts of the island, like South Region where annual rainfall is relatively low. This water is for irrigation and therefore a high level of purity is not essential. Shallow bore holes to depths not exceeding 200 feet will be sunk in the Calivigny Valley, La Sagasse, Westerhall and Bailles Bacolet. Though there are no data on wind speeds in this part of the island, from observation, it can be said that the force of winds is high enough to propel windmills. Furthermore, it is known that in earlier times this type of power was used for sugar-cane grinding. Windmills will be used in South Region to provide a cheap but efficient means of increasing ground water supplies. Auxilliary diesel pumps will be used where necessary with these mills as a stop-gap when wind power is low. Water will be stored at surface level for irrigation.

One of the drawbacks to comprehensive planning of a water policy is lack of hydrological and hydrogeological data. There has been spasmodic collection of rainfall data by the Ministry of Agriculture over many years, but more recently the Central Water Commission has placed rainfall gauges at the following locations: Les Avocats, Petit Etang, Pomme Rose, Vendome, Annandale, Maribean, Tufton Hall, Clozier, Mount Horn, Mount Reuil, Peggy's Whim and Mardigras.

There are also evaporation pans at Mardigras, Mamacannes and Peggy's Whim. No stream gauging is done at present on a continuous basis, therefore there are no available data on changes in the flow of water. During the plan period stream gauging will be started at strategic points on Rivers Antoine, Paradise and Pearls.

The Water Commission which is responsible for water development in the territory will be expanded so that it can undertake greater data collection. Overseas financing will be necessary for some parts of this programme. This will most likely be available from Canada which has shown interest in water development where it can contribute to agricultural development or improve living conditions of non-urban populations. There are, however, certain areas where self-help activity can play an important part. This is particularly so in the case of storage tanks which can be built out of stones scattered about the countryside. Thatch may be used as a covering for these tanks.

CHAPTER 9

THE HUMAN FACTOR

The decision of the Government to plan the development of the economy can be taken as evidence that both the political and administrative leadership are aware of the importance of forward planning if the society is to work towards its stated goals. It does not follow that at any other level in the society, there is the will or the capacity for that degree of involvement which is necessary for plan implementation. On the contrary, there are features which may act as impediments to voluntary mass participation in the development exercise. In the Caribbean, generally, there are two main factors which appear to inculcate negative attitudes to sustained developmental effort in agriculture by the labour force. The first, and undoubtedly most powerful, historically, is the content of education at the elementary level, and secondly, a factor of more recent origin, is the ease with which young people of working age can earn higher relative incomes with little effort, either as beachcombers - a spin-off from the tourist trade - or as unskilled labourers in "crash programmes", than can the agricultural labourer.

These observations are not based on studies conducted in Grenada but on familiarisation with the total Caribbean scene. Since they may, however, be applicable to that island, some consideration must be given to the type of educational orientation which could foster positive developmental attitudes. The second problem stems largely from the lack of a long-term vision at the decision-making level for full employment in the economy. This cannot be dealt with in the Plan, but it is hoped that the possible directions indicated for agro-industrial development will suggest ways in which there could be increased job opportunities in the different Regions.

Education

The population can be broken down between those who are too young to be part of the labour force, those who are in the labour force, and the remainder who have ceased to be a part. The first group will one day be part of the labour force, and how they are then, will depend on

the content of their educational experience. In considering human resources for development, therefore, the nation's first concern should be that a child's educational experience is in concert with the society to which he belongs. The main requirement of the educational system, at primary school level is that the child's experience should be such as to enable him to acquire the basic requirements for mental development in relationship to the environment of which he is a part. The school should be seen as the centre, through which the total environment of the society is brought to the child's attention in his learning process. It is a laboratory in which all biological processes - plant, bird, animal and fish life - as well as a country's physical features - soils, rocks, mountains, rivers, lakes and beaches - are part of a child's world, and reading, writing, arithmetic and all other arbitrary divisions for acquiring knowledge, are vehicles through which he becomes acquainted with his immediate surroundings. Libraries, museums, and the whole armoury of mass communications - press, radio and television - are all important adjuncts to what is done in the school, and the child should, through field visits to farms, factories, docks, market places, public buildings and institutions, residential and shopping areas, get first hand knowledge of the working of his society. Every school should have gardens and ponds where children can learn through observation and practical involvement, the reproductive cycles in plant and animal life^{1/}.

The purpose of this approach in education is to make children conscious of their own society and to lay the basis for an understanding of the importance of natural resources in human development and that education is a process which enables them to develop skills which are essential for such development.

^{1/} In urban areas where land is scarce hanging gardens and fish tanks can be used.

An educational programme of this type is not to be viewed as making agriculture part of the school's curriculum^{2/}. Our interest here is to make the young mind conscious that within his society, there are the basic tools to provide him with an understanding of the world at large. He will, as a result, become more conscious of the relationship between himself as a human being with resource potential and other resources, not only in his own country, but in the world at large. He will understand that his country's resources as well as those of the world can be destroyed, polluted and damaged by indiscriminate human action and that he has a responsibility to preserve the world's natural resources for future generations and to assist in their development in the same way as past generations did for him. All participants in the educational process, teachers, parents and pupils are to see this as the beginning of a life long programme for participation in the working force between the ages of 15 to 64.

The working Population

Grenada is at present faced with a problem which is common to the area and also to many developing economies. There are many young people who after the age of 15 did not go to an educational institution nor have they proceeded to apprenticeship of a trade. Though able and capable of working they are unable to find jobs. Exhortation to go back to the land does not solve this problem because in the first instance the educational system gave them no orientation to the importance of natural and physical resources within their own community; secondly, they have no agricultural

^{2/} One of the mistakes which have been made in the past was to include "gardening" as a subject in the curriculum. This injected an occupational content into the school syllabus which was resented by teachers who felt they were not gardeners and by parents who did not send their children to school to learn how to work the land. The attitude does not change by calling the subject "agriculture". The point is that there can be no justification for an occupational slant in education at primary school level, but there must be an orientation, and that should be environmental-animal, plant, spiritual and physical.

training, and finally, patterns of land ownership and tenure discourage capital investment so that productivity is low and so too are wages. In fact, their total educational experience has made them aspire to the type of work which the economy cannot provide.

Though we are concerned primarily with agriculture, it is in order to make a general statement about this problem. There is need to examine the existing institutional framework through which young people can acquire trades in the society. How are carpenters, cabinet makers, masons, brick layers, plumbers, welders, boat builders, mechanics, seamstresses, electricians produced? Since these are all skills which are required in a society, it might be worthwhile from the general viewpoint of planning to institute an apprenticeship system which clearly indicates the number of years of training which a youth has to go through in order to acquire any of these crafts. Such a system should be based on craftsmen who are now running their own shops and it is in these shops that students should be apprenticed. Formal training in trade schools should be seen as supplementary to practical work under a craftsman.

Farm Schools

Our main concern here, however, is with training required for employment in the agricultural sector. Traditionally, the society has depended on a peasant labour force for agricultural production. Peasantry is unfortunately synonymous with poverty and deprivation, therefore, youths will not be attracted to an industry with reminiscences of hardship.

The society must aim at producing farmers and these must be trained just as craftsmen are trained. There has been too much emphasis in the Caribbean on training agricultural extension personnel and too little on training farmers. This is because there is no vision of replacing the peasantry by a population of farmers, but unless this is done agriculture will remain a cinderella industry irrespective of the ratio of extension officers to peasants. In some respects developments in mass communication through transistor radios have greatly reduced one aspect of the extension officer's work, that of getting news and information to the farmer.

Farm schools are, therefore, important. There is at present one farm school in Grenada. The existing facilities at the school will be used for training young people to be farmers. A curriculum will be prepared which will provide practical training in all aspects of agricultural sciences, and throughout the course the advantages of co-operative action will be brought home forcibly to the student. Each trainee will undergo a year's practical training at the farm school during which time he will be assigned a quarter acre of land on which he will do practical farming. This will serve as his productive unit and his laboratory. He will apply the techniques of management and get an insight into the co-ordinative nature of agricultural management. At the end of his course the young farmer will be given a lease of an acreage of land either by the Government or by a private entrepreneur and he will then be able to test his management skills in the field.

An important requirement for the success of this programme is, in the first instance, choosing the right type of person for training in the farm school. If on leaving school a youth shows an interest in farming, then he should be apprenticed to a farmer with whom he should work for at least two years so that his long-term interests can be tested. Such a youth should then qualify for a place in the farm school. It is very important to ensure that those who enter the school have been already exposed to farm work and have shown some interest in making farming a career.

The importance of co-operative activity has been stressed in other chapters in the Plan. It is, however, important to emphasize this once more because while entrepreneurial attitudes must be preserved, and every individual should be encouraged to use his initiative, it must be appreciated that there is a point beyond which the individual's interest can be contrary to the national good. Co-operative action is the ameliorating factor which makes the individual subordinate his personal ambitions to the welfare of the group. In the case of farmers, this welfare will obviously be seen in terms of what is good for the farming community. But since the country is predominantly agricultural, then the welfare of numerous groups will tend towards the good of the society as a whole.

Extension Training

An important supplement to training in farm schools is the training of Extension Officers. These are the link between technical, scientific knowledge and know-how, and the farmer. Beyond the productive process they also provide links between the farmer and the consumer through the Marketing Board. Agricultural Extension Officers are currently trained within the region for work in the field. Some of them are products of the Grenada Farm School and this institution can continue to function as a preparatory ground for recruits to the extension programme but its main orientation should be training personnel to be farmers. It is expected that the Eastern Caribbean Institute of Agriculture and Forestry in Trinidad (ECIAF) will continue to be used to upgrade the qualifications of the Extension Staff.

Planning

An important aspect of the Agricultural Extension Officer's duties is the collection of field data and conducting periodic surveys to build-up a body of information in the Agricultural Planning Unit and in the Ministry of Planning. The manning of these Ministries was dealt with in Chapter 2. It is important to stress here that personnel required for planning in these Ministries need not be qualified economists, but must at least be intelligent young people who have acquired a sound education up to secondary school level, and who can work under guidance from economists or other social scientists who need not be permanent employees of the Grenada Government. Technical assistance can be easily attained periodically from regional institutions to advise and direct work to be carried out by the planning section. This is a very important consideration not simply because there are in fact many young and intelligent but unqualified people within the Caribbean area who can make a valuable contribution, but also from the point of view of cost, it will be better for the Government to rely on a cadre of young people to whom non-professional salaries can be paid.

Consumer Education

It has been emphasized in other parts of this Plan that there is need for a re-orientation of consumer thinking towards the society. Like most developing economies, consumers tend to be foreign-oriented because growth in these economies depended upon trade with the outside world. The parameters which were necessary for internal expansion of the economy and the part which the consumer played in this expansion, never received much attention. For this plan to succeed, however, consumers have to be made to see the part which they play in making it a success. Increased earnings from agricultural exports are not all to be used to purchase foreign food but to build up the nation's productive capacity for further development. Increased food production is designed to reduce the dependence on foreign supplies of food, thus developing the internal production-consumption process. The consumer must be made to understand that his orientation to consumption of domestic, rather than imported food, is crucial to the development of the economy. At every stage in the economic process in the agricultural sector, the common interest of producers and consumers must be understood if the programme for internal expansion of the economy is to be successful.

Both producers and consumers should be able through savings and investment institutions to invest in the programme for Agro-industrial Development.

CHAPTER 10

REGIONAL PERSPECTIVES

In this chapter an attempt will be made to break down the national programme to regional proportions so that each region can be seen as a socio-economic entity making its contribution to the national good. This aim cannot be achieved in its entirety because of lack of statistical data in the form in which they are required. For example, data on population distribution are available on a Parish basis, which is not always equivalent with the boundaries of the agricultural regions. Nevertheless, since the plan is mainly concerned with the development of the internal economy, it is important to lay the foundation for a regional approach to planning. The limitations at this point in time, will be removed when data are collected during the plan period on a regional basis.

The following shows the relationship between Agricultural Regions and Parishes:

<u>Agricultural Regions</u>	<u>Parishes</u>
North	St. Patrick and St. Mark
South	St. David and South St. George
East	St. Andrews
West	St. John and North St. George
North-East	The Grenadines

Map Appendix B comprises a series of Maps on each agricultural region showing the main geographical features and the distribution of population, agricultural production, and social services^{1/}. Map 1 series show the main contours, roads and water courses in each region. These, when related to the Map 2 series which deal with population distribution, show the rationale for such distribution. Map series 3, 4 and 5 show areas of crop and animal production. The first of

^{1/} There are omissions in the case of Carriacou.

these three sets of Maps deals with tree crop production which is the economic base for international trade. The other two series of Maps show production which is mainly for domestic consumption, namely: food crops, fruit and livestock production. Map 6 series show the distribution of social services facilities while Map 7 series show the location of power and water supplies. Map 8 series have been compiled on the basis of known soil types and land slopes and show recommended land use patterns for each agricultural region.

Household Population

Table 34 shows regional household distribution by town and rest of region, and population distribution by age-group in 1970^{2/}. The most populous urban areas were St. George with 1507 households; Gouyave, 639; Victoria, 438; and Grenville, 421. The households in the other urban areas, Sauteurs and Hillsborough, were much smaller in number and were in many cases less than the number of households found in population clusters distributed throughout non-urban areas.

The data show that 16,351 (83.2%) of all households were in non-urban areas and 79,376 (85.6%) of the household population resided in these areas. Age distribution of the population between urban and non-urban areas is shown in Table 35. In the under 15 age-group 87.4 per cent of the population lived in non-urban areas, and in each other age-group the proportion was 83.9 per cent.

This heavy bias of all age-groups towards non-urban residence occurred in all parishes with the single exception of St. Mark, as can be seen in Table 36. St. David is the extreme case where the total population of just under 11,000 live without an urban concentration.

^{2/} Source: 1970 Census data supplied by the Ministry of Planning.

Table 34

Regional Household Distribution by
Town and Rest of Region and
Population Distribution by
Age-Group Census 1970

Agricultural Region	Parishes	Towns and rest of Region	No. of households	POPULATION BY AGE-GROUP				TOTAL	
				Under 15	15-44	45-64	65 & over		
North	St. Mark & St. Patrick	Sauteurs	133	318	182	61	44	605	15.5
		Victoria	438	759	546	240	128	1673	
		Rest of St. Patrick	2165	5276	3427	1295	653	10651	
East	St. Andrew	Rest of St. Mark	467	1101	790	255	123	2269	22.5
		Grenville	421	796	577	241	109	1723	
South	St. David & South half of St. George	Rest of Region	4173	10403	6761	2541	1108	20813	40.0
		St. George town	1507	2262	2811	864	376	6313	
		Parish of St. David	1995	5326	3532	1244	516	10618	
West	St. John & North half of St. George	Rest of St. George*	4923	10793	8923	2736	1095	23547	8.0
		Gouyave	639	1104	856	363	175	2498	
North-West	Carriacou & Petit Martinique	Rest of St. John**	1372	2896	2050	763	403	6112	5.9
		Hillsborough	153	259	202	80	43	584	
		Rest of Carriacou & Petit Martinique	1256	2428	1491	789	658	5366	
Not regionally identified			-	-	-	1	2	-	
TOTAL			19642	43721	32148	11473	5433	92775	92.

*/ This includes the northern half of St. George which is part of West Agricultural Region.

**/ The northern half of St. George which is part of West Region is included under Rest of St. George.

Source: Ministry of Planning, Prime Minister's Office.

Table 35
Age Distribution of Population between
Urban and Non-Urban Areas in 1970

Region		Age-Group			
		Under 15	15-44	45-64	65 & over
Urban	nos	5498	5174	1849	875
	%	12.6	16.1	16.1	16.1
Non-Urban	nos	38223	26974	9624	4558
	%	87.4	83.9	83.9	83.9
TOTAL	nos	43721	32148	11473	5433
	%	100.0	100.0	100.0	100.0

Source: Ministry of Planning, Prime Minister's Office.

Table 36
Percentage break-down of Parish Population by
Age-Group and Urban and Non-Urban Distribution:
Census 1970

Parish	Under 15		15-44		45-64		65 & over	
	Urban	N. Urban	Urban	N. Urban	Urban	N. Urban	Urban	N. Urban
St. Patrick	5.7	94.3	5.0	95.0	4.5	95.5	6.3	93.7
St. Mark	40.8	59.2	40.9	59.1	48.5	51.5	51.0	49.0
St. Andrew	7.1	92.9	7.9	92.1	8.7	91.3	7.6	92.4
St. John	27.6	72.4	29.5	70.5	32.2	67.8	30.3	69.7
St. George	17.3	82.7	24.0	76.0	24.0	76.0	25.6	74.4
St. David	nil	100.0	nil	100.0	nil	100.0	nil	100.0
Grenadines	9.6	90.4	11.9	88.1	9.2	90.8	6.1	93.9
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Ministry of Planning, Prime Minister's Office.

Data on household and population distribution in urban areas between 1960 and 1970 show that there has been a decline in the number of households in each of the five urban centres in the island of Grenada and in three cases there was also a corresponding fall in population. Hillsborough in Carriacou registered an increase in both these variables. These data are shown in Table 37. While in urban areas the total number of households fell by 6.1 per cent and the population by 8.2 per cent, there was an inter-censal national increase in household population of 6.5 per cent.

Table 37

Number of Households and Population in
Private Households in Urban
Centres in Grenada:
Censuses 1960 & 1970.

Urban Centre	1960		1970	
	Households	Population	Households	Population
Sauteurs	238	925	133	605
Victoria	439	1687	438	1673
Gouyave	644	2350	639	2498
Grenville	453	1720	421	1723
St. George	1587	6521	1507	6313
Hillsborough	145	561	153	584
TOTAL	3506	14589	3291	13395

Source: Ministry of Planning, Prime Minister's Office.

These data indicate quite clearly that household and population distribution are widespread throughout the territory in every Region and are not heavily concentrated in urban areas. A meaningful programme for development of the internal economy must be heavily biased towards regional planning techniques because this is the only way to tap the whole market potential and to achieve total involvement of the farming population. The striking feature about non-urban distribution is that there is a multiplicity of population clusters, relatively small in

size, and located in watersheds and valleys. There are therefore many small markets and production units. A prime requirement of the programme therefore is to develop both their consumption and production capacities.

Because of its predominance in size, the urban area of St. George is a large consuming population cluster and produce from most parts of the country flow into that town. This movement has to be facilitated since the programme for expansion will produce regional surpluses. But there are other consuming areas to which movement of goods is difficult because of poor communication. This is a factor which must be taken into consideration in increasing internal production. It requires the establishment of improved marketing and lines of communication to permit the flow of localised surpluses to other sizeable consumer centres. (See Chapter 7 - Marketing).

The data also show that in terms of age-groupings the population is also widespread between urban and non-urban areas, therefore there must be adequate distribution of social and health facilities in both urban and non-urban areas if the educational, training and health needs of the young and the welfare of the aged are to be met. For the working population, its full productive capacity can only be realised if preventative and curative health facilities are easily available.

Map 6 series in the Map Appendix show among other things existing education and health facilities. No attempt is being made to determine if they are adequate to meet the needs of the agricultural population and no provision is made in this development programme for education, sanitation and health during the planned period. This is so not because it is described as an agricultural sector plan but because of lack of personnel to look into these aspects of planning which are regarded as important adjuncts to this development exercise. Each agricultural region, however, has a vital contribution to make to the nutritional needs of children of school age both as a preventative measure against disease, and also as a means of developing their mental capacities thus enabling them to reap full benefits from their schooling. In so far as the working population is concerned, it is too often over-looked that nutritional deficiencies make the worker an easy prey to diseases of one kind or another, hence reducing his capacity for

sustained effort and imposing severe limitations on his productivity.

Production

Map series 3 in the Appendix show the distribution of tree crops and of sugar-cane by Agricultural region. There are pure stands of some crops but the common pattern is one of multiple cropping.

Table 38 shows the estimated regional distribution of national production

Table 38

Estimated Production of Specified
Tree Crops by Region 1975 a/

Tree Crop	Unit	Total	North	South	East	West	N. East
Cocoa	%	100.0	22.1	20.9	40.4	16.6	nil
	M.T.	2819.1	622.4	59.0	1139.0	47.0	nil
Nutmeg & Mace	%	100.0	26.4	12.7	41.4	19.4	nil
	M.T.	563.5	149.0	71.4	233.5	109.6	nil
Bananas ^{1/}	%	100.0	20.0	10.0	35.0	35.0	nil
	M.T.	17129.8	3426.0	1713.0	5995.4	5995.4	nil
Copra ^{2/}	%	100.0	15.0	20.0	55.0	10.0	nil
	M.T.	28.4	4.2	5.7	15.7	2.8	nil
Sugar-cane	%	100.0	nil	74.0	21.0	5.0	nil
	M.T.	3900.0	nil	2886.0	819.0	195.0	nil
Citrus	%	100.0	5.0	15.0	50.0	10.0	20.0
	M.T.	478.2	23.9	71.7	239.2	47.8	45.6
Cotton	%	100.0	nil	nil	nil	nil	100.0
	M.T.	n.a.	nil	nil	nil	nil	n.a.

^{1/} For Crop Year 1976/1977

^{2/} For Calendar Year 1976

a/ Regional distribution for all crops not available

Source: Ministry of Agriculture, Forestry and Fisheries

of some of these crops in 1975. Production is highest in East Region for each major export crop - cocoa, nutmeg and bananas - and lowest is in South Region. Expansion of these crops in the plan period will be focused in North, East and West Regions. It is expected that relative growth in South Region will fall because climatic conditions are more

suited to vegetable and animal production. Sugar-cane production, most of which will be in the South and East, will, it is expected bring increased incomes to these farmers.

Map 4 series in the Appendix show the distribution of other "Arable Production". These are all food crops which provide most of the energy needs of the population. Corn, sweet potatoes, yams, pumpkins, cassava, tannia and dasheen are grown in all Regions but estimates of their relative contribution to total production are not available. The programme for food expansion, however, envisages significant increases in production during the plan period in all Regions. The long-term aim is to produce root crops in such large quantities as to change these commodities from freshly consumed foods to raw material for flour industries, thus improving the nutritional composition of staples in the daily diet.

Green and Yellow vegetables, legumes and tomatoes are not all grown in every region, and the levels of production in the areas where they are grown is unknown. It is clear, however, that South and East Regions have the best conditions for expanded production, particularly on alluvial soils along river courses, and therefore internal marketing which will facilitate movement of surpluses to other regions will be very important to stimulate high levels of production. (See Chapter 7 - Marketing). Some of these commodities are apparently not consumed by large members of the population, in part, because they do not know how to prepare them. In some cases overcooking destroys the food value. Improving the national diet will also call therefore for educational programmes on cookery through the mass media and also at village level.

Map 5 series show the regional distribution of Livestock. The quantitative distribution between regions of cattle, sheep, goats and pigs for the year 1975 which is shown in Table 28 has been used for making projections for growth in animal population to year 1981 on a regional basis. This is shown in Table 39. According to the plan, South Region will continue to be a major supplier of meat and dairy produce and it is in that region that development of pasturage will be concentrated.

Table 39

Estimated Animal Population
Increases 1977 to 1981

Total Population		1977	1978	1979	1980	1981
<u>CATTLE</u> -	North	1376	1392	1536	1671	1789
	South	2620	2761	2995	3238	3484
	East	1731	1848	1988	2147	2310
	West	570	570	663	746	822
	Grenadines	497	528	595	667	737
	Total	6794	7099	7777	8469	9142
<u>SHEEP</u> -	North	1861	2082	2330	2607	2920
	South	4836	5416	6065	6792	7608
	East	1138	1272	1424	1593	1783
	West	252	282	315	352	394
	Grenadines	3192	3578	4006	4488	5024
	Total	11279	12630	12140	15832	17729
<u>GOATS</u> -	North	1729	1938	2170	2430	2722
	South	2658	2974	3333	3735	4179
	East	1152	1290	1446	1618	1811
	West	863	963	1078	1205	1347
	Grenadines	2995	3354	3756	4206	4709
	Total	9397	10519	11783	13194	14768
<u>PIGS</u> -	North	2412	2653	2919	3210	3532
	South	5042	5546	6100	6710	7382
	East	2713	2984	3283	3611	3972
	West	901	991	1090	1199	1319
	Grenadines	885	974	1071	1178	1296
	Total	11953	13149	14464	15910	17501

Note: No provision has been made for exports of sheep and goats which occur on a fairly large scale from the Grenadines. The rate of growth with respect to these two animals, is, therefore, somewhat inflated.

Source: Ministry of Agriculture, Forestry and Fisheries.

Carriacou will continue to be a major supplier of sheep but this growth is premised on improvement in pasturage, and more effective control on exports. The planned improvement in pasturage on a regional basis is shown in Table 40.

Table 40
Estimated Pasturage Requirement
by Agricultural Region 1977 to 1981

	Acres									
	1977		1978		1979		1980		1981	
	Imp.	Unimp.	Imp.	Unimp.	Imp.	Unimp.	Imp.	Unimp.	Imp.	Unimp.
<u>N. District</u>										
Cattle	138	642	140	649	153	717	168	780	179	835
Sheep	40	186	45	208	50	233	56	260	63	292
Goats	37	173	42	194	47	217	52	243	58	272
Total	215	1001	227	1051	250	1167	276	1283	300	1399
<u>S. District</u>										
Cattle	262	1223	276	1288	300	1398	324	1511	348	1626
Sheep	104	484	116	541	130	606	145	680	163	760
Goats	57	266	64	297	71	333	80	374	89	418
Total	423	1973	456	2126	501	2337	549	2565	600	2804
<u>E. District</u>										
Cattle	173	808	185	862	199	928	215	1002	231	1078
Sheep	24	114	28	127	31	143	34	159	38	178
Goats	25	115	28	129	31	145	35	162	39	181
Total	222	1037	241	1118	261	1216	284	1323	308	1437
<u>W. District</u>										
Cattle	56	266	57	266	66	309	75	348	82	348
Sheep	6	25	6	28	7	32	8	35	9	39
Goats	19	86	21	96	23	108	26	120	29	135
Total	82	377	84	390	96	449	109	503	120	558
<u>Grenadines</u>										
Cattle	50	232	53	246	60	278	67	311	74	344
Sheep	68	319	77	358	86	400	96	449	108	502
Goats	64	299	72	335	81	376	90	421	101	471
Total	182	850	202	939	227	1054	253	1181	283	1317
Grand Total	1124	5238	1210	5624	1335	6223	1471	6855	1611	7515

Source: Ministry of Agriculture, Forestry and Fisheries

It is estimated that milk production will be 50 per cent higher than it was in 1975. The anticipated regional increases vary from one region to the next. In the North, it will be 31 per cent; South 54 per cent; East 62 per cent; West 42 per cent and North-East 76 per cent. Quantitative data are shown in Table 41.

Table 41

Projected Regional Milk, Beef, Lamb
Mutton and Pork Production 1977-1981 based
on Production Estimates for 1975

Commodity	Regions	'000 Gals. (Milk) '000 Lbs. (Meat)					
		1975	1977	1978	1979	1980	1981
Milk	Northern	63	65	66	73	79	85
	Southern	94	109	115	124	134	145
	Eastern	55	67	71	77	83	89
	Western	33	33	33	38	43	47
	North-East	17	20	21	24	27	30
	Total	261	293	306	335	366	395
Beef	Northern	82	103	103	108	112	113
	Southern	82	158	170	182	194	209
	Eastern	71	93	103	112	120	129
	Western	35	46	46	47	50	56
	North-East	17	25	27	29	31	35
	Total	287	425	448	477	506	551
Lamb	Northern	11	14	15	17	19	21
	Southern	23	28	32	36	40	45
	Eastern	6	8	9	10	11	12
	Western	2	2	2	2	3	3
	North-East	10	13	14	16	18	20
	Total	52	65	72	81	91	101
Mutton	Northern	10	12	13	15	17	19
	Southern	12	15	17	19	21	23
	Eastern	7	8	9	10	11	13
	Western	4	5	5	6	6	7
	North-East	11	14	15	17	19	21
	Total	42	53	59	67	75	84
Pork	Northern	183	222	244	268	295	324
	Southern	346	419	461	507	557	613
	Eastern	247	299	329	361	398	437
	Western	89	107	118	130	143	157
	North-East	58	70	78	94	103	114
	Total	923	1117	1228	1351	1486	1635

Source: Ministry of Agriculture, Forestry and Fisheries

The milk expansion programme has a vital role to play in improving nutrition of the school-age population. Production within each agricultural division of a Region will be promoted in relation to specific schools to which the milk is to be supplied. Inter-regional marketing and distribution will only be encouraged when regional needs for domestic, commercial and school consumption are met. Suckling of calves, which at present, is a factor limiting the supply of milk for human consumption, will be discouraged and will become increasingly unnecessary as fodder production increases.

In 1975 total milk consumption from local and foreign sources was estimated at 2.3 million lbs., only 9.3 per cent of which was from domestic supplies. On a per capita basis consumption was 23.8 lbs., but distribution was highly skewed both by the bias of high consumption of foreign supplies among the urban population, and by low and in some cases negative consumption by low income groups. Even if the goal of 50 per cent increase is attained, therefore, the island will be very far from self-sufficiency. A prime requirement to get the milk programme moving will be a support price for this commodity, and the Government plans to introduce this measure together with its fodder and multiplication programmes.

Planned regional projection of meat - beef, lamb, mutton, pork - to 1981, based on production in 1975 is as follows: North Region - 67 per cent, South Region - 92 per cent, East Region - 76 per cent, West Region - 28 per cent, North-East - 85 per cent. The proposed high increases in South and North-East (Carriacou) will depend very much on improved pasturage. At present existing abattoir facilities are very poor. There is one each in St. George and Grenville, both of which need renovation and improved hygienic facilities. There is also need for an additional abattoir in St. George and for new ones in Gouyave, Sauteurs, Victoria and Carriacou. These infrastructural installations for expanded meat production will open new avenues for the development of a hides industry in each region. At present many skins are damaged in flaying animals and are either eaten or disposed of as waste. The Government will, through its abattoir programme, assist in laying the base for the development of a leather industry in the Less Developed Countries (LDC's).

The provision of abattoir facilities will not in itself promote use of these facilities. The Government will have, on the one hand, to promote use of these facilities through an educational campaign emphasizing the importance of public hygiene, and make non-use of abattoirs for slaughtering of animals a punishable offence. On the other hand it will have to impose a fee for the use of abattoirs. Animals skins will be bought by abattoir authorities and cured for sale to leather tanneries within CARICOM. This will be an additional incentive to encourage butchers to use the facilities provided.

The expansion of the poultry industry was dealt with under "Meat and Milk Production" in Chapter 5. The available data do not permit a Regional breakdown, but it is known that birds are kept all over the territory. At present, there is little general interest in improving the quality of bird with a view to increasing egg and meat production. There are a few poultry farms, but the Government intends, through the development of poultry associations to promote greater interest in poultry rearing over the country as a whole.

Map series No. 8 show recommended land use which is based on soil type and land slope. Crops which are suitable for the different categories of agricultural land are shown on the following page. The programme towards an optimum land use pattern in agriculture is a long-term one and is tied up with the whole programme of farm engrossment, land tenureship and land reform. It is not expected that much progress will be made in these areas during the present plan period.

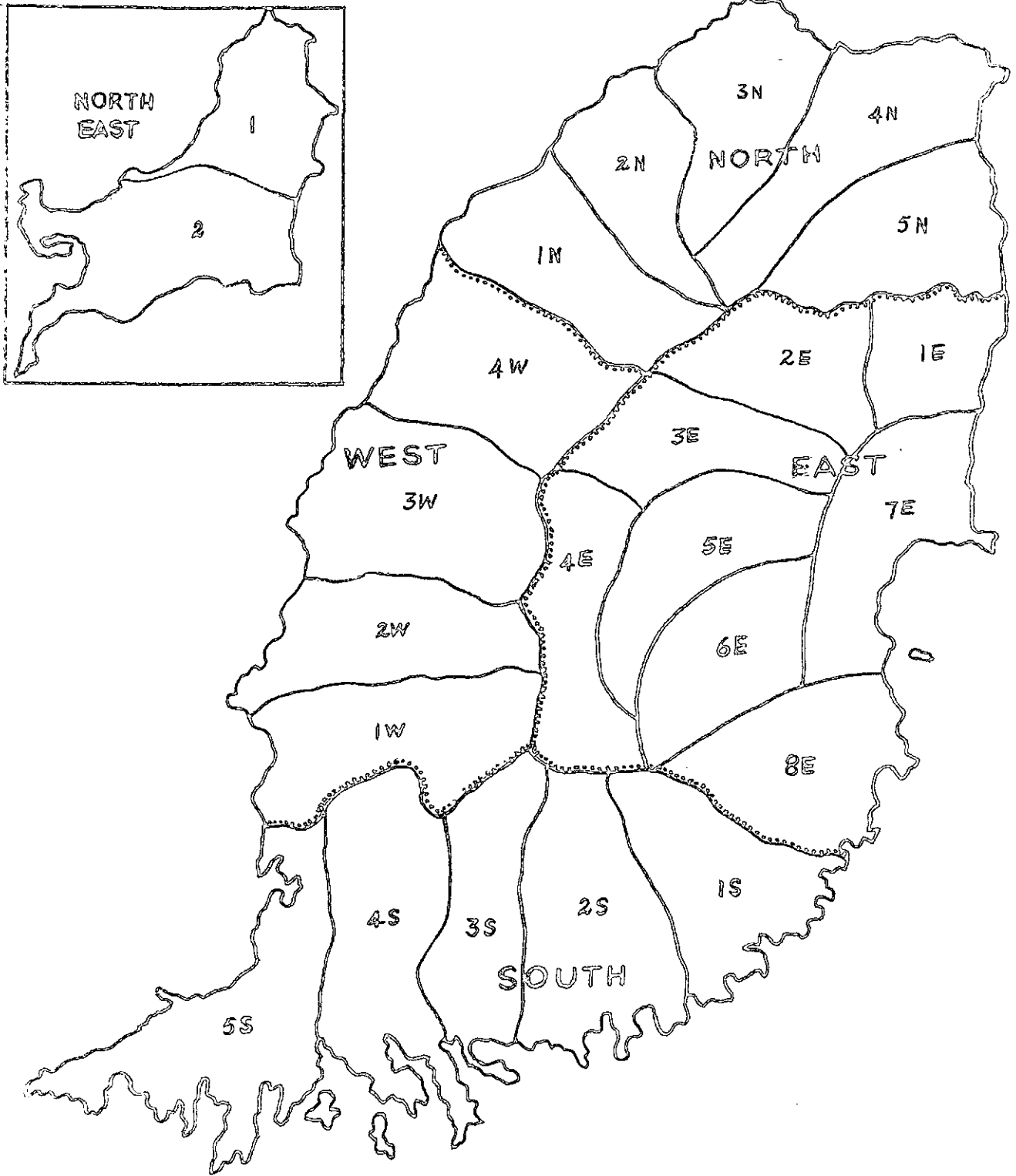
It was stated at the beginning of this chapter that an important impediment in trying to regionalise global projections was the absence of regional data. Even where such data have been used they are more guesstimates than estimates. Present deficiencies will, however, be remedied during the plan period. The map on page 147 shows both Agricultural Regions and Districts within Regions. There is an Extension Officer in charge of each Region with District Officers working under his supervision. Under the guidance of the Planning Division in the Ministry of Agriculture annual sample Surveys will be conducted in each Division to provide up-to-date information on production, income, crop acreages and other data relevant for monitoring plan performance.

Recommended Land Use Pattern
by Region in Grenada

Land Classification	Recommended Use	Suitable Regions
A. Good agricultural land (Classes I & II)	Cocoa, bananas, sugar-cane, food crops, coconuts, vegetables, fruit trees and food trees. Fruit and food trees, sugar-cane.	North, East West
B. Medium agricultural land (Classes II & III)	Nutmegs, cocoa, bananas, sugar-cane, food crops, vegetables, fruit and food trees, coconuts, improved pastures.	North, South East, West
C. Medium agricultural land (Classes III & IV)	Cotton, corn, sugar-cane, coconuts, limes, peanuts, fruit trees, livestock, improved pastures.	North-East
D. Marginal agricultural land (Classes IV & V)	Improved pasture, fodder, grasses, sugar-cane, cocoa, nutmegs and coconuts, but returns will be moderate. Also food and fruit trees.	North, South East, West, North-East
E. Poor agricultural land (Classes V & VI) Highly erosive area. Soil should not be disturbed.	Natural forest, food forest, timber, Strip cropping where cultivation is necessary.	North, South East, West, North-East

Notes: (1) Terracing should be done on all hilly land under cultivation, especially for tree crops.

(2) Marginal lands are those areas where the soil is not very shallow and there are marked slopes 10° - 20° . Annual rainfall is approximately 89" with about 3 dry months per annum. In such areas terracing and irrigation are important and water conservation should be practiced e.g. pond cultivation.



Agricultural Regions and their district boundaries

————— Districts
----- Regions

CHAPTER 11

REGIONAL ACCOUNTS^{1/}

A most important aspect of planning is the construction of a system of accounts structured to permit monitoring of plan performance against stated goals. Since this plan is concerned, not simply with increasing agricultural production, but with the widespread utilization of agricultural potential and expansion of the internal economy, then our tools for measurement must provide data which can facilitate regular assessments on the attainment of these objectives. It will be possible, for example, by a regular flow of data, to influence regional disparities which are contrary to overall national objectives. In this chapter, a system of income and product accounts will be presented, which can facilitate ready identification of regional agricultural income and production.

Our accounts can be designed to show inter-regional transactions, so that movements of goods for intermediate and final use within the economy from one region to another could be easily identified. This will, however, add complexities to our model and defeat the main purpose of designing a relatively simple system for the agricultural sector on a region by region basis. Table 42 can, of course, be used for all regional production, but in keeping with the sectoral nature of the Plan, it will be treated as a tool only for the agricultural sector. East Agricultural Region will be used as an example. There will be no provision for inter-regional transfers. Each agricultural region will be regarded as a micro-economy having transactions with a macro-economy, viz.; all agricultural regions in the State and the rest of the world.

^{1/} This chapter draws very heavily on J.R. Stone's "Social Accounts at the Regional Level" in Regional Economic Planning by Isard and Cumberland, and adaptations made by H.W. Richardson in "Regional Economics".

Government activities within a region will be treated as a separate set of accounts. Table 42 presents a complete regional accounts system in matrix form with government in an open economy. The following are the subscripts used with their references:

Table 42

Regional Agricultural Accounts matrix
with Government in an open economy for
East Agricultural Region in Grenada a/

	to	east agric- ultural region			central government		all regions & rest of world			
		1 P	2 Y	3 K	4 P	5 Y	6 K	7 P	8 Y	9 K
from east agricultural region										
1. production		0	Cee	Vee	0	Ceg	0	Xer	0	0
2. income		Yde	0	0	0	Geg	0	Yer	Ger	0
3. capital		0	See	0	0	0	Teg	0	0	0
central government										
4.	P	0	0	0	0	0	0	0	0	0
5.	Y	Ige	Dge	0	0	0	-Sgg	Ygr	0	0
6.	K	0	0	Bge	0	0	0	-Vgr	0	Bgr
all regions & rest of world										
7.	P	0	0	0	0	Crg	0	0	0	0
8.	Y	0	0	0	0	Grg	0	Mrr	0	0
9.	K	0	0	Bre	0	0	Trg	0	Nrr	0

a/ See Appendix for Key to Table 42.

e refers to East Region which is being used as a model.

g refers to Central Government.

r refers to all regions and the rest of the world.

The first three rows and columns in the table represent the set of three accounts for East Region. Let us examine the first row in detail. All imports into the Region are routed through production and the first row

shows incomings into the region's production account. A zero in the first row shows where there were no incomings into East Region:

- Cee = Consumption by residents in East Region [Consumption of local authorities, if any, would be included here].
- Vee = Gross investment in East Region in fixed assets and stocks including stock appreciation but excluding Central Government investment. For example, a new tractor bought by a farmer will be an addition to the fixed assets of East.
- Ceg = Sales by East Region to Central Government for consumption. These will result in an inflow into the Region's production account.
- Xer = Inflows to East Region from net exports to all other regions and the rest of the world.

Incomings into East Region are matched by outgoings shown in the first column.

- Yde = Gross domestic agricultural product at factor cost of East Region. This includes appreciation in stock. For example, the value of cocoa held in a store-room in Grenville can increase in value, simply because of a rise in world value of cocoa.
- Ige = Indirect taxes less subsidies paid by East Region. These payments are part of revenue which Government receives from the Region.

The income and outlay account of East Region is derived from the second row and column. To take the row first:

- Yde = Gross domestic agricultural product at factor cost of East Region (including stock appreciation).
- Geg = Current transfers, gifts and grants received by East Region from Central Government.
- Yer = Net receipt of factor income by East Region from all other regions and rest of world.
- Ger = Current transfers received by East Region and rest of world.

The column shows:

- Cee = Consumption by residents in East Region.
- See = Gross savings by East Region.
- Dge = Direct taxes on income paid by East Region to Central Government.

The third row and column give the incomings and matching outgoings of the capital transactions account of East Region.

To take the third row first:

See = Gross savings of East Region.

Teg = Net capital transfers received by East Region from Central Government.

The column shows:

Vee = Gross investment in East Region in fixed assets and stocks, including stock appreciation (not including Central Government investment).

Bge = Net borrowing by Central Government from East Region.

Bre = Net borrowing by all other regions and rest of world from East Region.

These three accounts include 14 entries for each region. The totals of the three accounts yield:

1. For the production account, gross regional domestic product at market prices;
2. For the income account, gross regional income plus net current transfers; and
3. For the capital account, gross addition to regional wealth in the form either of investment in stocks and fixed assets or of a net increase in claims on others.

Central Government accounts are shown in rows 4 - 6 and columns 4 - 6 of Table 2. All Central Government productive activity is included in the regional production accounts, so there are only zeros in row and column 4. Row and column 5 show the incomings and outgoings of Central Government income and outlay account, that is, the Central Government's current account. Row and column 6 represent the Central Government's capital account. Finally, rows and columns 7 - 9 represent the production, income and outlay and capital accounts respectively for all regions and the rest of the world.

These accounts of individual regions can be aggregated to give the standard domestic and national totals which are usually used for regional and international comparisons.

Provision has been made for a re-organization of the Ministries of Planning and Agriculture, Forestry and Fisheries which will create new planning components within the Grenada Public Service. The Planning Division in the Ministry of Agriculture will be the vehicle, which, in collaboration with the Agricultural Extension Service and the Produce Boards, will collect data on Regional agricultural production. This will not be as difficult as might appear at first sight because the main export crops are already marketed through a number of collecting stations. At present, farmers cross regional boundaries with their produce, but it is very easy to record the source of all produce delivered at these collecting points. These data when collected by the Ministry of Agriculture should be passed on to the Ministry of Planning. The aim should be, first and foremost, to prepare production accounts for each Region.

KEY TO TABLE 42

- Yde = Gross domestic agricultural product at factor cost of each region (including stock appreciation).
- Ige = Indirect taxes less agricultural subsidies paid by east region.
- Cee = Consumption by residents (and local authorities, if any) in east region.
- Vee = Gross investment in east region in fixed assets and stocks including stock appreciation (Central Government investment excluded).
- Ceg = Sales by east region to Central Government for consumption.
- Xer = Net exports by east region to all other regions and the rest of world.
- See = Gross saving of east region.
- Dge = Direct taxes on income paid by east region to Central Government.
- Geg = Current transfers, gifts and grants received by east region from Central Government.
- Yer = Net receipts of factor income by east region from all other regions and rest of world.
- Teg = Net capital transfers received by east region from Central Government.
- Bge = Net borrowing by Central Government from east region.
- Bre = Net borrowing by all other regions and rest of world from east region.
- Org = Government current expenditure abroad on goods and services.
- Ger = Current transfers received by east region from all other regions and rest of world.
- Grg = Government current transfers abroad net.
- Sgg = Dissaving of Central Government.
- Ygr = Net factor income payments received by Central Government from all regions and rest of world.
- Trg = Net capital transfers paid to rest of world by Central Government.
- Vgr = Gross disinvestment in fixed assets and stocks by Central Government.
- Bgr = Net borrowing by Central Government from rest of world.
- Mrr = Balancing transfers to income and outlay account, i.e. net receipts from the country from the sale of goods and services in the form of factor incomes.
- Nrr = Balancing transfers to capital transactions account, i.e. rest of the world's balance on current account with the country.

CHAPTER 12

FINANCING THE PROGRAMME

The success of a national agricultural plan depends on commitment of both private and public sectors. Unfortunately, since there was no national machinery with representatives from both sectors, it has not been possible to build projections of the private sector into the plan. It is likely that this deficiency is not very important with respect to traditional export crops since policy is in the hands of Produce Boards on which the private sector is represented, but it might be of some importance in agro-industrial enterprises, which have been traditionally privately financed. In this chapter, however, though it is fully appreciated that private sector decisions will be very important in determining the flow of capital into agriculture, only public sector financing will be considered.

Data on sectoral distribution of the Gross Domestic Product show that during the period 1970-1974, wages and salaries paid by the Government were annually, approximately 20 per cent of GDP^{1/}. With a general orientation towards development, the Government will be concerned with ensuring that these factor payments are making their maximum contribution to the country's development. In the first instance, therefore, Government expenditure, whether current or capital must find its justification within the framework of national socio-economic development policy. The distribution of current expenditure, between Ministries and Departments must reflect an overriding concern with efficient administrative and executive action related to fulfilment of development objectives. Unless this is assured, the Government may find itself unable to take full advantage of both local and foreign technical expertise and to reap maximum benefit from its capital financing programme.

^{1/} See Statistical Appendix: Table 2.

Government Operations

Government operations for 1970-1974 are shown in Table 43. Current expenditure exceeded current revenue annually with the deficit fluctuating between EC\$1.1 million in 1970 and EC\$5.6 million in 1974. The fall in revenue in the latter year and the accompanying 100 per cent increase in the deficit above 1973 were no doubt due to dislocation of the economy by political unrest, but the pattern, however, is clear, that current revenue fell short of current expenditure in every year. The former bore the following relationships to the latter - 94.6 per cent, 82.9 per cent, 92.8 per cent, 87.1 per cent and 73.3 per cent. Though projected increases in agricultural exports will, on the basis of estimated price levels, result in higher earnings from export duties, it is unlikely that this will result in a surplus in Government current account. There should be some attempt, however, to make a comprehensive review of fiscal policy with a view to at least balancing revenue and expenditure. The more ambitious aim of achieving a budget surplus will be unattainable during the plan period because of the increases in recurrent expenditure resulting from the capital expenditure programme.

In the capital account there is really only a symbolic contribution from revenue of one or two hundred thousand dollars, but capital expenditure increased the overall fiscal deficit to levels of four to eight million dollars during the period. This deficit was financed mainly by borrowing from internal and external sources and grants. Since the Government's capital expenditure depends primarily on bilateral and international loans and grants, the scope of the plan was not limited by what funds are known to be available. Rather, the approach was to examine the structure of the economy and on the basis of national objectives to set specific targets towards economic expansion which would put the country on a long-term development course. The Government would then try to interest donor countries or International Agencies in specific aspects of the plan. This approach is realistic in the circumstances, because the Government has financed projects in this way in the past, and many appeals for foreign financial assistance have been met by requests for the preparation of a comprehensive long-term plan. This has now been done for the main productive sector of

Table 43
Summary of Central Government Operations
1970-1974

Items	EC\$ million				
	1970	1971	1972	1973	1974
<u>Current Account</u>					
1. Current Revenue (b)	19.1	18.4	19.3	18.3	14.8
2. Current Expenditure	20.2	22.2	20.8	21.0	20.2
3. Surplus (+) or deficit (-)	- 1.1	- 3.8	- 1.5	- 2.7	- 5.6
<u>Capital Account</u>					
1. Capital Revenue	0.1	0.1	0.2	0.2	0.1
2. Capital Expenditures	3.1	4.6	3.3	4.6	2.6
3. Fiscal deficit (-)	- 4.1	- 8.3	- 4.6	- 7.1	- 8.1
4. Financing the deficit	<u>4.1</u>	<u>8.3</u>	<u>4.6</u>	<u>7.1</u>	<u>8.1</u>
a. External borrowing	0.5	0.4	- 1.1	0.3	2.9
b. Domestic borrowing	1.8	2.5	3.8	- 0.5	2.2
c. East Caribbean Currency Authority	nil	0.5	0.1	nil	0.9
d. Grants	1.8	3.7	3.7	4.8	2.1
Statistical discrepancies	nil	1.2	- 1.9	2.5	nil

Source: Official Financial Statistics.

the economy. Table 44 shows volume and value of fertilizer required during the plan period. Total costing of individual projects will require detailed study which will be undertaken as the need arises.

External Financing

The Government has already held discussions with United Nations Agencies, individual Governments, the Caribbean Development Bank (CDB), the British Development Division (Devdiv), OAS, CIDA and the EEC on funding different aspects of its development programme. All projects under consideration directly relating to agriculture have been included in the Plan, but the major infrastructural requirement of reconstructing main roads, has been treated as falling outside of its scope. It is hoped, however, that an overall road construction programme will be given the priority it deserves.

Table 44

Volume and Value of Main
Fertilizer Requirements
for Plan Period 1977-1981 a/

Crop	US\$ '000									
	1977		1978		1979		1980		1981	
	mt	US\$	mt	US\$	mt	US\$	mt	US\$	mt	US\$
Cocoa	3,000	660	3,000	660.0	3,000	660	3,000	660	3,000	660
Bananas & Plantains	2,500	550	2,875	633.0	3,190	702	3,550	781	3,870	851
Root Crops	85	19	103	23.0	123	27	140	31	160	35
Yellow Crops	16	3.5	18	4.0	19	4.2	23	5.1	26	5.7
Tomatoes	3	0.7	4	0.9	5	1.1	6	1.3	7	1.5
Green Vegetables	5	1.1	10	2.2	12	2.6	15	3.3	17	3.7
Avocado Pears	2	0.4	3	0.7	4	0.9	5	1.1	6	1.3
Peanuts	1	0.2	1	0.2	2	0.4	2	0.4	2	0.4
Citrus	1	0.2	3	0.7	8	1.8	13	2.9	16	3.5
Fruit Trees	2	0.4	6	1.3	14	3.1	19	4.2	21	4.6
Sugar-cane	223	49.1	290	63.8	407	89.5	574	126.3	569	125.2
Pastures:										
Sulphate of ammonia	204	28.8	220	31.0	242	34.1	267	37.6	292	41.2
Phosphatic/ Potassic	51	11.2	55	12.1	61	13.4	67	14.7	73	16.1
TOTAL:	6093	1324.6	6588	1432.9	7087	1540.1	7681	1668.9	8059	1750.7

a/ This refers only to artificial fertilizer. It is hoped that during the plan period there will be significant increases in existing types of organic manure and that steps will be taken to process human waste so that there will be less dependence on imported fertilizer.

The main external financing agency for agricultural and industrial development in Grenada is the Caribbean Development Bank (CDB). The channel through which funds from this Bank will in future enter the economy is the Grenada Agricultural and Industrial Development Corporation (GAIDC), a body established by

Act No. 11 of 1976, with amendments passed in 1977^{2/}. Prior to the passing of this Act, loans from the CDB for agricultural and allied activities were funnelled through the Grenada Agricultural Bank and the Grenada Development Corporation which have now been replaced by the GAIDC. These loans were made under the Farm Improvement Credit Scheme (FICS), which was, for the domestic lending agencies, their foreign window. Sub-loans made under this scheme between 1972 and 1977 are shown in Table 45 by type of loan. The percentage distribution of loans during the period

Table 45

Loans Approved and Disbursed under the
Farm Improvement Credit Scheme 1972-
1977 by type of Loan

Year	Type of Loan			Total
	Agriculture	Fishing	Agro-industry	
1972	8261	7508	nil	15770
1973	69743	21569	nil	91311
1974	80590	21317	nil	104755
1975	92252	18756	16239	127248
1976	84600	4923	9894	99416
1977	9843	363	700	14005
Total:	345288	74437	26833	452506

Source: Agricultural and Industrial Development Corporation.

^{2/} According to the first schedule of the Act the Permanent Secretary of the Ministry of Agriculture, Fisheries and Forestry or his nominee, is not an Ex-Officio member of the Board. This seems to be an oversight and should be remedied. It is inconceivable that a Bank charged with the function of financing agricultural development can do this efficiently without access to the body of technical and administrative experience in the Ministry of Agriculture.

was as follows: 77 per cent, agriculture; 17 per cent, fishing; 6 per cent, industry. The total number of loans made was 72, and the sum total of disbursements over the six-year period was approximately \$453,000.

To be eligible for a sub-loan under this scheme the net worth of a farmer and his wife could not exceed EC\$150,000. The sums which could be borrowed ranged between EC\$3,000 and \$275,000 for individuals, and up to EC\$300,000 for co-operatives. The collateral requirements which borrowers had to meet were not particularly stringent. In practice, however, well over 80 per cent of the farming population could not take advantage of these facilities because of the small sizes of their farm operations. CDB, FICS loan facilities will still be available under the new Ordinance, but in addition CDB funds for short-term loans, for a period normally up to 18 months, ranging from EC\$540 to \$6,750, will now be available to the domestic lending agency for sub-loans to farmers against a crop lien.

There is, however, one aspect of this additional facility which the Corporation should adapt to meet one of the objectives of the development plan. The minimum and maximum sums of these two types of loans overlap in the region of EC\$3,000 to \$6,750. Short-term loans to small farmers will carry a higher rate of interest than FICS loans. This is understandable because risks will be higher, but then most of these farmers have small holdings, and the normal uncertainties in agricultural enterprises may make repayment a heavy burden. Since as a general policy the development plan aims at fostering co-operative activity, it might be worthwhile considering making small farmer loans of EC\$3,000 to \$6,750 available exclusively to co-operative enterprises, many of which will not be able to meet FICS loan requirements within this range. This will reduce risk to the individual farmer and spread it over a group of farmers. Moreover, if small co-operatives can, through this programme be fostered in large numbers, a national or regional co-operative may then be able to borrow relatively large sums for agro-industrial development through the FICS.

The GAIDC can also raise funds for domestic agriculture from the CDB under the hard window for large farmers. No loans have yet been made to Grenada through this window, but it is expected that sub-loans to farmers from this supply of funds will now become available. In the past, because the local lending agency was only able to finance agriculture from CDB funds through the FICS, loans through its domestic window were relatively high - approximately 70 per cent of total annual loans. In future, the ratio of loans through its foreign window to total loans will, it is expected; rise to at least 50 per cent because of the powers given to the Corporation under the new Ordinance.

It is worthwhile emphasizing that it does not necessarily follow that plan objectives will be achieved as a result of successful financing. Far more important determinants are the quality of the human resource - its technical input and the degree of moral commitment, the operational structures and systems which are established for plan implementation with effective co-ordination at all levels, the degree of involvement of all farming communities and frequent and intelligent use of the mass media to educate the population on the need for change and the roles which they have to play to bring it about.

CHAPTER 13

CONCLUSION

Development plans relating to biological production are in many ways steps into a vast unknown because there are numerous areas of uncertainty. This has for long been recognised with respect to agriculture and forestry where weather conditions, fire and natural disasters can frustrate Man's attempts to increase production. But in more recent times, fresh and salt water pollution from industrial wastes and oil slicks have added areas of doubt in marine production also. The fact that there are these limits in planning, is however, not an argument against planning as such, but rather an indication of the nature of the exercise. Its success or failure cannot be judged on whether the targets aimed at, at a given point in time, have been achieved because of the number of imponderables which can frustrate their attainment. Moreover, since this plan will be constantly monitored, current targets may be modified or extended during implementation. The really important criteria is whether the structures and systems which are essential for plan implementation have been established and are working well. If the answers to these questions are in the affirmative, then the institutional framework for rapid expansion will have been laid down, and in-so-far as Man is concerned, he will have created the conditions for success.

Our starting point in the preparation of this plan was to establish broad goals and specific objectives based on an examination of the past performance of the economy and the human and physical resources available. In practical terms, the country is aiming at achieving two main objectives:

- i. To increase its earnings from agricultural exports; and
- ii. to increase domestic food production at the expense of food imports while at the same time improving the nutritional standard of the population. The long-term aim is self-sufficiency in food.

No annual rate of increase is being set for the first objective because in practice this will be meaningless. The island is fortunate, in that cocoa, nutmeg, mace and bananas, its main export crops have good marketing histories, so that demand prospects for the future are encouraging. The main requirement is to improve the supply position, and the Plan has shown how it is intended to do this. However, since increased earnings and not increased production is the main goal, there must be constant appraisal of raw material, intermediate and end-use market conditions, to ensure that the domestic industry can adjust in keeping with changes in the world demand situation. The development of agro-industries based on these products is therefore an important part of total strategy.

With respect to the second, production targets for many commodities and the type and volume of some inputs required for increased production have been specified. But these are merely exercises which must be undertaken in formulating an agricultural plan. Achievement really depends on the human factor, and the depth of its commitment, at all levels, to set up the institutional framework required for success, to make the short-term sacrifices which the mere concept of commitment implies, to be flexible enough to change traditional dietary habits, and to work co-operatively towards the economic satisfaction which any nation feels when it knows that it does feed itself.

It does not follow however, that the goal of self-sufficiency in food implies an isolationist policy. Just as co-operation is essential internally, so too is interdependence a sine qua non both regionally and internationally. In the case of the former, the Grenada Government is already a member of the Eastern Caribbean Common Market (ECCM), the Caribbean Development Bank (CDB) and CARICOM. The Bank plays a crucial role in financing development projects and CARICOM has drawn up a food plan for the region. Any advance which the Grenada Government makes in raising its own nutritional standards from domestic production will be in keeping with the general aim of the regional food plan. In many respects the island will have to depend on regional technical advice and assistance, regionally propagated plant and animal breeding

stock, and on results of on-going research programmes in problems of tropical agriculture. At the same time the Government can make an important input at working party and at conference levels in influencing the general direction of regional agricultural policy and fostering the kind of orientation which it regards as vital to the long-term development of a viable Caribbean economy.

At the international level, interdependence is two-tiered. First, there are regional developmental organizations which are mainly sponsored and financed by non-regional nations or groups of nations. These include the Organization of American States (OAS), the British Development Division (Devdiv) and the Caribbean Delegations of the European Economic Community Countries. All these organizations are important sources of finance, but in addition they perform essential supervisory, advisory and technical roles which are crucial to plan implementation. From their wider experience of agricultural activities in other economies they can also advise on national plan objectives and by so doing both impart knowledge and learn how to overcome stumbling blocks to development within the Caribbean.

Secondly, there are the United Nations and its many agencies. Grenada has had very much technical and financial assistance from these international bodies in the past. It was pointed out in Chapter 2 that optimum returns do not always flow from foreign aid, but at the same time recommendations have been made which could make such assistance more effective. Basically the main requirements are:

1. The creation of administrative systems which facilitate easy communication, the free flow of advice and inter-action between technical assistants and local administrative and executive officers; and
2. Viewing technical and financial aid as catalysts required for creating immediate and long-term economic expansion. The emphasis here is on immediate, for this means that technological inputs will be considered from the point of view of their contribution to existing unemployment situations. The Caribbean is replete with examples of "development works" where hundreds of

unemployed look on at heavy equipment operated by a single worker doing construction which was previously done by groups of workers. The eventual social cost of this type of assistance is very high. The whole cost structure of projects would be vastly different if emphasis were put on the human factor and not on creating instant technological and construction solutions.

Increasing domestic food production will not lead necessarily to improved nutritional standards because of present dietary habits and poor internal distribution. The plan has emphasized the importance of food processing as a means of increasing both the calorie and protein content of traditional domestic staple foods, but it is unlikely that this type of agro-industrial development will occur before there are national food surpluses. These in turn will depend on the creation of an efficient internal marketing agency. The crucial role which this agency has to play has been dealt with in the plan. If the institutional framework for production operates perfectly, while that for marketing and distribution is inefficient, then this plan will be no more than just another document. Marketing, the task of moving production from the farmer at the right time and eventually making it available to the consumer, in many respects, holds the key to the success of this plan.

The Plan places very heavy emphasis on people, both as producers and consumers in a representative democracy. They have, and do in fact periodically exercise the right to choose leadership which they feel can satisfy their collective ambitions. Emphasis has also been placed on the extent to which easy access to "North American" standards of living have given Grenadians ambitions towards a life style which the country cannot afford. The task of pulling the society round to facing reality is not an easy one. But it has to be attempted, because even the so-called industrial countries have now come to realise that time is not on their side. Man has to be more disciplined than he has been in the past if gains in civilization are to be handed on to future generations.

Concepts of development in the island have therefore to be more in tune with what kind of society the country can develop in the long run. The importance of dialogue in this exercise cannot be over-emphasized. Not a flow of rhetoric from those at one end of the socio-political spectrum to those at the other, but a meaningful process of first encouraging expression, listening to it, raising it to the level of discussion, then to the level of action which involves everybody, examining the results of action, criticising and starting all over again if necessary, and keeping the discussion going while getting the society on the move. Development has to do with movement of people, not simply physical movement, but spiritual, cultural, technical and intellectual. Grenada, as a part of a Caribbean scene which has for four hundred years been experiencing a socio-cultural and spiritual fusion within an enclave of the Western industrial world, can neither afford to look, nor to move backwards. But if it is to move forward it has to examine critically its present direction and build up the moral resource to face the reality that the level of living it can sustain in the long run depends on the development of its own resources and not on international goodwill, though the importance of the latter in achieving the former cannot be over-emphasized.

STATISTICAL APPENDIX

STATISTICAL APPENDIX

Table 1
Land Use in the State of Grenada
by Parish 1961 and 1975

CATEGORY	ST. MARK		ST. PATRICK		ST. JOHN		ST. ANDREW	
	1961	1975	1961	1975	1961	1975	1961	1975
1. Land in Agricultural use	5132	4361	12834	7317	5744	5671	16166	11934
2. Land under Permanent Crops	2386	2168	6997	4322	3235	3382	8919	8303
3. Arable land under								
(a) temporary crops		142		1117		331		1307
(b) under temporary pasture		206		176		159		308
(c) temporary fallow	896	200	2720	140	871	137	3199	117
(d) other arable land		255		434		230		216
4. Grassland								
(a) cultivated	54	nil	37	59	32	10	225	21
(b) un-cultivated	239	439	581	87	217	4	766	327
5. Forest/Woodland	1426	856	2422	836	1280	1354	1514	1005
6. All other land	131	104	77	146	109	64	1543	330

Table 1 Cont'd

CATEGORY	ST. GEORGE		ST. DAVID		CARRIACOU		TOTAL	
	1961	1975	1961	1975	1961	1975	1961	1975
1. Land in Agricultural use	11350	7444	7196	5202	1775	4648	60197	46577
2. Land under Permanent Crops	2659	1751	3256	2732	639	495	28091	23153
3. Arable land under								
(a) temporary crops		1949	)	915	)	1233	)	6994
(b) under temporary pasture		548	)	57	)	1086	)	2540
(c) temporary fallow	3015	109	)	1807	)	593	549)
(d) other arable land		527	)	110	)	61	)	1833
4. Grassland								
(a) cultivated	194	168	131	13	32	120	705	391
(b) un-cultivated	3114	113	547	233	475	509	5939	1703
5. Forest/Woodland	1935	2196	897	863	30	525	9504	7635
6. All other land	433	83	558	133	6	70	2857	930

Sources: 1961 data - West Indies Census of Agriculture 1961
 (British Development Division in the Caribbean, Barbados).
 1975 data - Unpublished data from sample survey conducted
 by Ministry of Agriculture with assistance from BDD,
 Barbados.

Table 2

Estimates of Industrial Origin of Gross Domestic Product
at Factor Cost for Specified Years at Current Prices

SECTOR	1962		1967		1970	
	\$000	%	\$000	%	\$000	%
Export Agriculture	11030	37.8	7870	20.7	8457	13.8
Other Agriculture			5300	13.9	6098	10.0
Construction	2961	10.2	3222	8.5	8906	14.5
Manufacturing	651	2.2	1195	3.1	2317	3.8
Distribution			5200	13.7	9998	16.3
Finance & Insurance			1593	4.2	2112	3.4
Transport	6905	23.7	1292	3.4	3431	5.6
Services & Professions			1852	4.9	2196	3.6
Hotels			1591	4.2	1801	2.9
Rent of dwellings	2170	7.4	2807	7.4	4218	6.9
Government	5450	18.7	6090	16.0	11757	19.2
TOTAL:	29167	100.0	38012	100.0	61271	100.0

Table 2 Cont'd

SECTOR	1971		1972		1973		1974	
	\$000	%	\$000	%	\$000	%	\$000	%
Export Agriculture	6329	10.7	6210	10.2	8407	13.0	10440	15.2
Other Agriculture	6371	10.8	6825	11.2	6820	10.5	7488	10.4
Construction	6194	10.5	6165	10.1	6369	9.8	5328	7.4
Manufacturing	2467	4.1	2508	4.1	3191	4.9	3384	4.7
Distribution	11112	18.8	10041	16.5	10723	16.6	11592	16.1
Finance & Insurance	2321	3.9	3013	4.9	3143	4.9	3888	5.4
Transport	3424	5.8	3412	5.6	3469	5.4	4176	5.8
Services & Professions	1927	3.3	2198	3.6	2348	3.6	2736	3.8
Hotels	1934	3.2	1903	3.1	2338	3.6	2016	2.1
Rent of dwellings	4324	7.3	6008	9.8	5972	9.2	6552	9.1
Government	12757	21.5	12780	20.9	11959	18.5	14400	20.0
TOTAL:	59160	100.0	61063	100.0	64739	100.0	72000	100.0

Sources: 1962: Extract from Table 2.1; Grenada Five-Year Development Plan 1964-1968.

1967: Table 11 Report on Economic & Social Development of Grenada by I.S.E.R.

1970-1974: Official Estimates.

Table 3
Specified Data on Value of
Merchandise Trade 1970-75

		EC\$'000					
ITEM	1970	1971	1972	1973	1974	1975	
1.	Total Domestic Exports	10953	9291	9955	13637	17759	25888
2.	Domestic Exports: SITC 0	10797	9222	9809	13440	17495	25366
3.	2 as % of 1	98.6	99.3	98.5	98.6	98.5	98.0
4.	Total Imports	44632	46051	42812	42487	38114 ^P	52818 ^P
5.	Total Re-exports	1122	902	576	875	1605 ^P	1027 ^P
6.	Total Net Imports	43510	45149	42236	41612	36509 ^P	51791 ^P
7.	2 as % of 6	24.8	20.4	23.2	52.3	47.9 ^P	49.0 ^P
8.	Imports: SITC 0	10997	12986	13284	14540	15000 ^P	21233 ^P
9.	Re-exports: SITC 0	171	302	211	173	300 ^P	620 ^P
10.	Net Imports: SITC 0	10826	12684	13073	14367	14700 ^P	20613 ^P
11.	2 as % of 10	99.7	72.7	75.0	93.5	119.0 ^P	123.1 ^P

P - Provisional

Sources: Basic data supplied by Ministry of Finance.

Table 4
Volume of Domestic Exports of Agricultural and
Forest Produce, Sea Food and Livestock
1965-1975

COMMODITY		1965	1966	1967	1968	1969
Bananas ^{a/}	lbs.	46272616	46835072	57348503	59914723	50506177
Cocoa	lbs.	6610374	4962482	5444046	3930945	9017090
Nutmeg	lbs.	3276990	1989160	980490	2964176	4877516
Mace	lbs.	459370	245844	160263	362254	630780
Cinnamon	lbs.	n.a.	n.a.	n.a.	n.a.	n.a.
Clove	lbs.	n.a.	n.a.	n.a.	n.a.	n.a.
Pimento	lbs.	2585	5118	11989	1815	2295
Other spices ^{b/}	lbs.	13505	2770	5057	17485	28958
Nutmeg oil	lbs.	1260	nil	nil	70	nil
Lime oil	lbs.	5624	4778	2842	4608	1720
Lime juice	lbs.	30000	183640	245280	595910	118140
Fresh fruit n.e.s. ^{c/}	lbs.	293373	139958	71587	42876	140752
Vegetable & fruit juices ^{d/}	lbs.	nil	nil	nil	nil	nil
Copra ^{e/}	lbs.	nil	nil	5170	7267	403380
Sauces-mixed seasonings ^{d/}	lbs.	nil	nil	nil	nil	nil
Fish	lbs.	7436	473	557	172	864

Table 4 Cont'd

COMMODITY		1970	1971	1972	1973	1974	1975
Bananas ^{a/}	lbs.	42176749	31273211	29166545	22742669	16040145	28942884
Cocoa	lbs.	6204290	5774413	5811096	6022380	5351074	4871600
Nutmeg	lbs.	2992398	3811660	4137674	3177981	2309550	4490020
Mace	lbs.	420917	557512	951928	567545	317890	356330
Cinnamon	lbs.	n.a.	n.a.	n.a.	14441	25105	13446
Clove	lbs.	n.a.	n.a.	n.a.	14440	52115	5550
Pimento	lbs.	nil	nil	n.a.	nil	nil	2068
Other spices ^{b/}	lbs.	61423	46895	37520	5029	3273	6513
Nutmeg oil	lbs.	nil	nil	nil	nil	nil	3256
Lime oil	lbs.	2469	1656	1642	520	nil	400
Lime juice	lbs.	1700280	76130	n.a.	23600	16440	403776
Fresh fruit n.e.s. ^{c/}	lbs.	33720	63580	n.a.	175675	101487	469720
Vegetable & fruit juices ^{d/}	lbs.	nil	nil	n.a.	288810	34718	122020
Copra ^{e/}	lbs.	nil	nil	n.a.	740653	20000	nil
Sauces-mixed seasonings ^{d/}	lbs.	nil	nil	n.a.	860472	nil	154750
Fish	lbs.	nil	715	n.a.	656995	nil	nil

Table 4 Cont'd

COMMODITY		1965	1966	1967	1968	1969
Live animals chiefly for food	nos.	6267	3374	1049	310	1219
Raw cotton	lbs.	30561	71671	23287	77843	nil
Fruit, preserves - preparations ^{d/}	lbs.	nil	nil	275	nil	nil
Vegetables: preserved or prepared ^{d/}	lbs.	nil	nil	nil	nil	nil
Crude animal material including hides and skins <u>f/</u>	lbs.	16880	800	6860	3680	620
Floor covering mostly from crude vegetable material	sq.yd.	1064	417	1933	nil	5897

COMMODITY		1970	1971	1972	1973	1974	1975
Live animal chiefly for food	nos	528	1752	n.a.	1237	nil	2787
Raw Cotton	lbs.	46654	6460	n.a.	24618	nil	29017
Fruit, preserves - preparations ^{d/}	lbs.	nil	nil	n.a.	125123	21289	15843
Vegetables: preserved or prepared ^{d/}	lbs.	nil	nil	n.a.	48925	10230	59441
Crude animal material including hides and skins <u>f/</u>	lbs.	156	1100	n.a.	790	nil	nil
Floor covering mostly from crude vegetable material	sq.yd.	2436	nil	n.a.	945	nil	nil

Table 4 FOOTNOTES

- a/ Adjusted downwards for 1965-1969 by 0.04%, the estimated weight of stems when whole bunches were exported.
- b/ Cinnamon and clove included up to 1972.
- c/ Includes plantains, pumpkins, vegetable roots and tubers and other citrus fruit. A new classification of some of these items was started in 1973 but discontinued thereafter.
- d/ Manufactured foods based mainly on imported raw material.
- e/ Not normally exported since 1969. Exports in 1973 and 1974 were due to destruction by fire of processing plant.
- f/ No exports of hides and skins since 1969. The following were exports recorded:
1965 - 13780 lbs.; 1966 - 800 lbs.; 1968 - 3020 lbs.;
1969 - 620 lbs.

Source: Ministry of Finance records of Overseas Trade.

Table 5
Volume Indices of Domestic Exports of Agricultural
and Forest Produce, Sea Food and Livestock
1965 - 1975
 Base Year 1973 = 100

COMMODITY	1965	1966	1967	1968	1969
Bananas	203.5	205.9	252.2	263.4	222.1
Cocoa	109.8	82.4	90.4	65.3	149.7
Nutmeg	103.1	62.6	50.8	93.3	153.4
Mace	80.9	43.3	28.2	63.8	111.1
Cinnamon	-	-	-	-	-
Clove	-	-	-	-	-
Other spices ^{a/}	268.5	55.1	100.6	347.7	575.8
Lime oil	1081.5	918.8	546.5	886.2	330.8
Fresh fruit n.e.s.	166.9	79.6	40.5	24.4	80.1
Lime juice	127.1	778.0	1039.4	2525.0	500.4
Vegetable & fruit juices	-	-	-	-	-
Sauces: mixed seasonings	-	-	-	-	-
Fish	1.1	0.0	0.0	0.0	0.0
Live animals chiefly for food	506.6	272.8	84.8	25.1	98.5
Raw cotton	124.1	291.1	94.6	316.2	nil
Fruit, preserves & preparations	nil	nil	0.0	nil	nil
Vegetables, preserved & prepared	nil	nil	nil	nil	nil
Crude animal material including hides and skins	2136.7	101.3	868.4	465.8	78.5
Floor covering mostly from crude vegetable material	112.6	44.1	204.6	nil	624.2

Table 5 Cont'd

COMMODITY	1970	1971	1972	1973	1974	1975
Bananas	185.1	137.5	128.2	100.0	70.5	127.3
Cocoa	103.0	95.9	96.5	100.0	88.9	80.1
Nutmeg	94.2	119.9	130.2	100.0	72.7	141.3
Mace	74.2	98.2	167.7	100.0	56.0	62.8
Cinnamon	-	-	-	100.0	173.8	93.1
Clove	-	-	-	100.0	360.9	38.4
Other spices ^{a/}	1221.4	932.5	746.1	100.0	65.1	129.5
Lime oil	474.8	318.5	315.8	100.0	nil	75.9
Fresh fruit n.e.s.	19.2	36.2	n.a.	100.0	57.7	267.7
Lime juice	7204.7	322.5	n.a.	100.0	69.5	1711.0
Vegetable & fruit juices	-	-	-	100.0	12.0	42.2
Sauces: mixed seasonings	-	-	-	100.0	nil	15.6
Fish	nil	0.0	n.a.	100.0	nil	nil
Live animals chiefly for food	42.7	141.6	n.a.	100.0	nil	225.0
Raw cotton	189.5	26.2	n.a.	100.0	nil	117.9
Fruit, preserves & preparations	nil	nil	n.a.	100.0	17.0	12.6
Vegetables, preserved & prepared	nil	nil	n.a.	100.0	20.9	121.5
Crude animal material including hides and skins	19.7	139.2	n.a.	100.0	nil	nil
Floor covering mostly from crude vegetable material	257.8	nil	n.a.	100.0	nil	nil

^{a/} Cinnamon and Clove included to 1972.

Table 6

Central Government Revenue from Export
Duties on Main Agricultural Commodities

ITEM	UNIT	1970	1971	1972	1973	1974	1975
1. Sources: Cocoa	EC\$000	491.1	338.8	329.1	454.0	777.9	n.a.
Nutmeg	EC\$000	460.7	490.2	499.9	837.6	1042.0	n.a.
Mace	EC\$000	76.7	92.1	99.4	206.6	250.6	n.a.
Banana	EC\$000	62.6 (est)	46.4 (est)	43.3 (est)	21.4	27.6	44.7 (est)
2. Total agriculture	EC\$000	1091.1	967.4	928.4	1519.6	2098.2	3031.8
3. Annual rate of change of (2)	%	-	-11.3	-4.0	+16.4	+13.8	+14.4
4. Central Government Revenue (excluding external grants)	EC\$000	19200	17900	18400	18000	14300	18400
5. Annual rate of change of (4)	%	-	-6.8	+2.8	-2.2	-20.6	+28.7
6. 2 as % of 4	%	5.7	5.4	5.0	8.4	14.7	16.5

Table 7
Volume of Net Imports of Specified Food Commodity
Groups with Annual Percentage Changes
1968-1971 and 1973 */

SITC CODE	COMMODITY GROUP	Unit	1968	1969	1970	1971	1973
01	Meat & meat preparations	lbs.	1903078	2459100	3013666	3379508	2738877
	% change p.a.		29.2%	22.6%	12.1%	-19.0%	
02	Milk & other dairy products excl. 025	lbs.	2513807	3126437	3658050	3433328	2769562
	% change p.a.		24.3%	17.0%	-6.2%	-19.3%	
03	Fish & fish preparations	lbs.	1458662	1562006	1619993	1668563	1535281
	% change p.a.		7.1%	3.7%	3.0%	-8.1%	
04	Cereals & cereal preparations	lbs.	15073518	15342545	17196679	16271669	14408942
	% change p.a.		1.8%	12.1%	-5.4%	-11.4%	
05	Fruit, fruit juices & vegetables	lbs.	2643981	3264370	2966986	3641145	4581816
	% change p.a.		23.4%	-9.1%	22.7%	25.8%	
06	Sugar etc.	lbs.	5388214	6745792	6665377	8363237	8418266
	% change p.a.		25.2%	-1.2%	25.5%	0.7%	
07	Coffee, tea, cocoa, spices & manufactures thereof	lbs.	141739	130793	131119	220392	136011
	% change p.a.		-7.7%	0.2%	68.1%	-38.3%	
08	Animal feeds	lbs.	4150547	3045949	3573778	5050766	4588516
	% change p.a.		-26.6%	17.3%	41.3%	-9.1%	
09	Margarine, lard, lard substitutes & other edible fats(091.01-02.3)	lbs.	708901	783494	860790	930470	945497
	% change p.a.		10.5%	9.9%	8.1%	1.6%	
	Total all items	lbs.	33982447	36460486	40043648	42959478	40122778
	% change p.a.		7.2%	9.8%	7.2%	-6.6%	

*/ Data for 1972 not available.

Source: Original data extracted from Annual Overseas Reports 1968-1971 and 1973.

Table 8
Main Nutritional Composition of Imported Food
Available to the Population of Grenada in
1973 by Commodity Source

Source and Items <u>Net Imports 1973</u>	Net Imports lbs.	Calories per lb. of edible portion	Total Calories available	Grams of Protein Per Lb.	Total Proteins available (Grams)
1.	2	3	4	5	6.
1. Meat of bovine animals	130660	1021	133403860	66.7	8715022
2. Mutton & Lamb	51472	1093	56258896	54.1	2774635
3. Pork	201489	1827	368120403	36.3	4370628
4. Poultry, whole	33601	524	17606924	56.1	1885016
5. Poultry, neck, back & wings	1007849	341	343676509	44.1	44446140
6. Poultry, other parts	206970	381	64053730	62.4	1738548
7. Poultry, liver	390	585	228150	89.4	34866
8. Other meat	150	472	70800	81.5	12225
9. Other edible meat offals	423	649	274527	72.6	30710
10. Pork, salted or in brine	428212	3410	1460202920	17.0	4581868
11. Bacon	4645	3016	14009320	38.1	176974
12. Ham	46280	1100	50908000	68.3	3160920
13. Other salted meat	540	679	366660	20.0	10800
14. Beef & veal, salted, smoked & dried	90691	1329	120528339	71.7	6501545
15. Sausages, canned	94484	1002	94672968	60.8	5744627
16. Sausages, not canned	47862	1402	67102524	56.7	2713775
Sub-total:	2345718		2791484530		86898299

Table 8 Cont'd

Source and Items <u>Net Imports 1973</u>	Net Imports lbs.	Calories per lb. of edible portion	Total Calories available	Grams of Protein Per lb.	Total Proteins available (Grams)
1	2	3	4	5	6
Sub-total(brought forward)	2345718		2791484530		86898299
17. Ham, canned	52333	875	45791375	83.0	3343639
18. Cornbeef, canned	93840	980	91963200	114.8	10672832
19. Luncheon meat canned	177908	1334	237329272	68.0	12097744
20. Ham, uncanned	13875	1100	15262500	68.3	9476625
21. Luncheon meat uncanned	52272	1061	55460592	86.2	44958464
22. Evaporated milk	408856	626	255943856	31.8	13001622
23. Condensed milk	1015391	1452	1474347732	36.7	37264850
24. Dry whole milk	425366	2295	5341744970	117.9	49950651
25. Dry skim milk	324418	1633	529674594	163.3	52967459
26. Milk, fresh	173812	299	51969788	15.9	2763611
27. Cream, fresh	18871	957	18059547	13.6	256646
28. Butter, fresh & salted	163412	3248	530672176	2.7	441212
29. Cheese and curd	239436	1696	406083456	113.4	27152042
30. Eggs	5250	658	3454500	52.1	273525
31. Figs, dried	4	1243	4972	19.5	78
Sub-total:	5510762		11849247060		351519299

Table 8 Cont'd

Source and Items <u>Net Imports 1973</u>	Net Imports lbs.	Calories per lb. of edible portion	Total Calories available	Grams of Protein Per lb.	Total Proteins available (Grams)
1	2	3	4	5	6
Sub-total (brought forward)	5510762		11849247060		351519299
32. Grapes, dried	19814	1311	25976154	11.3	223898
33. Other dried fruit	24725	1211	29941975	12.5	309062
34. Jams, marmalades, etc.	69561	1216	84586176	1.8	125209
35. Grapefruit juice	267490	240	64197600	2.3	615227
36. Orange juice	152569	236	36006284	3.2	488220
37. Orange & grapefruit juice	510	227	115770	2.3	1173
38. Lime juice	1501	118	177118	1.4	2101
39. Other fruit juices	58770	205	12047850	2.3	135171
40. Fruit preserved	1181	1234	1457354	2.7	3188
41. Fruit preserved	21852	1234	26965368	2.7	59000
42. Peanuts, roasted & salted	47892	2654	127105368	117.9	5646466
43. Potato, Irish	1235369	316	390376604	7.7	9512341
44. Red kidney beans	4413	1529	6747477	99.0	436887
45. Pigeon peas	231487	1529	353943623	87.1	20162517
46. Lentils & legumes	9210	1545	14201820	107.5	990075
47. Split peas (other)	96282	1579	152029278	109.8	10571764
48. Pigeon peas (fresh)	197063	209	41186167	12.4	2443581
49. Other peas (fresh)	70926	223	15816498	15.2	1078075
Sub-total:	8021377		13232125544		404323254

Table 8 Cont'd

Source and Items <u>Net Imports 1973</u>	Net Imports lbs.	Calories per lb. of edible portion	Total Calories available	Grams of Protein Per lb.	Total Proteins available (Grams)
1	2	3	4	5	6
Sub-total (brought forward)	8021377		13232125544		404323254
50. Onions	499670	169	84444230	5.9	2948053
51. Garlic	23027	547	12595769	22.6	520410
52. Carrots	13730	125	1716250	3.4	46682
53. Cabbage	230	78	17940	5.0	1150
54. Beets	3025	141	426525	6.0	18150
55. Other vegetables	14337	57	817209	4.5	64516
56. Vegetables frozen	12900	295	3805500	15.0	193500
57. Hops	2218	123	272814	11.4	25285
58. Vegetables, dehydrated	664	1547	1027208	29.9	19854
59. Flour & meal of roots & tubers	3140	1613	5064820	30.2	94828
60. Vegetables (pickled)	1444701	1106	1597839306	7.0	10112907
61. Sugar, dark grey	4771760	1692	8073817920	0	0
62. White, other	804944	1746	1405432224	0	0
63. Icing & refined sugar	2604351	1501	3909130851	0	0
64. Honey	838	1315	1101970	0	0
65. Molasses	720	966	695520	0	0
Sub-totals	18221658		28330331600		418365589

Table 8 Cont'd

Source and Items <u>Net Imports 1973</u>	Net Imports lbs.	Calories per lb. of edible portion	Total Calories available	Grams of Protein Per lb.	Total Proteins available (Grams)
1	2	3	4	5	6
Sub-total (brought forward)	18221632		28330331600		418368589
66. Other sugars & syrups	9246	1660	15348360	0	0
67. Codfish, salted	574670	1018	585014060	153.1	87981967
68. Salmon	9476	5355	5074398	90.0	852840
69. Mackerel	104162	1188	123745456	95.9	9989135
70. Herring	108214	957	103560798	100.7	10897150
71. Other fish	365013	1220	445315860	214.6	78331789
72. Crustacea, fresh	754	269	202826	54.1	40791
73. Crustacea, prepared	280	1329	372120	283.5	79380
74. Sardines	124403	1153	144436659	89.1	11084307
75. Herring	65346	871	55174366	81.0	5131026
76. Others (Tuna)	157670	1306	205917020	109.8	17312166
77. Sardines (not canned)	8854	324	2868696	43.7	386919
78. Herrings (not canned)	2740	407	1115180	40.0	109600
79. Others not canned	2978	281	836818	40.1	119417
80. Crustacea canned	1681	735	1235535	119.1	200207
81. Crustacea other	449	1329	596721	283.5	129311
82. Rice (glazed or polished)	1848491	1647	3044444677	30.4	56194126
Sub-total:	21604059		33065591150		697208720

Table 8 Cont'd

Source and Items <u>Net Imports 1973</u>	Net Imports lbs.	Calories per lb. of edible portion	Total Calories available	Grams of Protein Per lb.	Total Proteins available (Grams)
1	2	3	4	5	6
Sub-total (brought forward)	21604059		33065591150		697208720
83. Rice (husked)	91394	1633	1492248402	34.0	3107196
84. Corn (unmilled)	30001	1637	49111637	42.6	1278042
85. Oats (unmilled and cereals)	59032	1769	104427608	64.4	3801660
86. Flour of wheat	10641191	1597	17493982027	42.2	449048260
87. Flour of corn	263825	1642	433200750	40.8	10764160
88. Cereal preparations (breakfast foods)	91124	1718	156551032	62.0	5649688
89. Malt (including malt flour)(0105)	165000	1665	274725000	27.2	4488000
90. Macaroni and other pasta	184610	1674	325777140	56.7	10467387
91. Biscuits (unsweetened)	743070	1991	1479452370	41.7	30986019
92. Biscuits (sweet)	290411	2014	584877754	31.8	9235070
93. Infant foods	13648	364	4967872	25.9	353483
94. Apples	29918	232	6940976	1.2	35901
95. Grapes	715	197	140885	3.7	2645
96. Coconuts desiccated	109	1355	147695	28.0	3052
97. Other edible nuts	6307	2566	16183762	76.7	483746
Sub-total:	34484414		55488326060		1226913029

Table 8 Cont'd

Source and Items <u>Net Imports 1973</u>	Net Imports lbs.	Calories per lb. of edible portion	Total Calories available	Grams of Protein Per lb.	Total Proteins available- (Grams)
1	2	3	4	5	6
Sub-total (brought forward)	34484414		55488326060		1226913029
98. Pears	3440	216	743040	2.5	8600
99. Unspecified tropical fruits	823	186	153078	2.4	1975
100. Sugar confectionery without cocoa	224851	1600	359761600	1	224851
101. Syrups, flavoured	1556	1143	1778508	0	0
102. Coffee, not ground	225	254	57150	36.3	8167
103. Coffee, instant & dry powder	11525	585	6742125	0	0
104. Coffee, without sugars	17701	9	159309	1.4	24781
105. Cocoa Powder	23794	1338	31836372	76.2	1813102
106. Chocolate, sweetened	62846	2395	150516170	20.0	1256920
107. Chocolate, unsweetened	143	2291	327613	48.5	6935
108. Tea	12695	1334	16935130	-	-
109. Pepper	8559	1574	13471866	54.4	465610
110. Pimento	457	522	238554	20.9	9551
111. Ginger	4287	1365	5851755	34.5	147901
112. Pork fat	713	3701	2638813	13.6	9697
113. Margarine	626735	3266	2046916510	2.7	1692185
Sub-total:	35484764		58126453653		1232583304

Table 8 Cont'd

Source and Items <u>Net Imports 1973</u>	Net Imports lbs.	Calories per lb. of edible portion	Total Calories available	Grams of Protein Per lb.	Total Proteins available (Grams)
1	2	3	4	5	6
Sub-total (brought forward)	35484764		58126453653		1232583304
114. Shortening	318049	3951	1256611599	0	0
115. Mustard	5055	340	1718700	21.3	107671
116. Coffee substitutes	886	585	518310	0	-
117. Tea concentrates	5824	1334	7679216	-	-
118. Sauces	264017	303	79997151	19.0	5016323
119. Soups and broths	78728	353	43536584	28.3	2228002
120. Yeast	34676	1279	44350604	167.4	5804762
121. Baking powder	106520	472	50277440	0.5	53260
122. Vinegar	2390	54	129060	-	-
123. Ice-cream	32077	875	28067375	20.4	654371
124. Flavourings	7873	54	425142	-	-
125. Other food preparations	351905	2217	780173385	3.8	1337239
Grand total:	36692764		60419938219		1247784932

Source: Basic data extracted from Annual Overseas Trade Report 1973.

Table 9
Production and Consumption of Locally Grown Food
in Grenada in 1975 Showing their Contribution
to Main Nutritional Requirements ^{a/}

COMMODITY	Production lbs.	Domestic Consumption lbs.	Calories per lb. of edible proportion	Total Calories available	Grams of Protein per lb.	Total Proteins available (grams)
1	2	3	4	5	6	7
Beet	2000	1800	141	253800	6.0	10800.0
Cabbage	70000	45000	78	3510000	5.0	225000.0
Carrot	40000	39000	125	4875000	2.7	105300.0
Callaloo	1000100	1000000	122	122000000	11.0	11000000.0
Celery	3000	2000	53	106000	3.1	6200.0
Christophene	160000	140000	108	11232000	3.1	434000.0
Lettuce	40000	28000	52	1456000	3.8	106400.0
Ochro	30000	24000	100	2400000	7.2	172800.0
Green pigeon peas	775000	750000	209	156750000	12.4	9300000.0
Dry pigeon peas	770000	750000	1529	1146750000	87.1	65325000.0
Hot pepper	60000	54000	123	6642000	4.3	232200.0
Sweet pepper	10000	9500	82	779000	4.5	42750.0
Pumpkin	850000	840000	72	60480000	1.4	11760000.0
String beans	155000	150000	128	19200000	7.6	11400000.0
Tomatoes	120000	114000	93	10602000	3.6	410400.0
Sub-total:	4085100	3947300		1547035800		110530850.0

^{a/} Compiled with the assistance of Ministry of Agriculture, Grenada.

Table 9 Cont'd

COMMODITY	Production lbs.	Domestic Consumption lbs.	Calories per lb. of edible proportion	Total Calories available	Grams of Protein per lb.	Total Proteins available (grams)
1	2	3	4	5	6	7
Sub-total b/f	4085100	3947300		1547035800		110530850.0
Ripe bananas	480000	478800	282	135021600	3.5	1675800.0
Green bananas	8005000	8000000	319	2552000000	4.1	32800000.0
Green plantain	335000	330000	413	136290000	3.8	1254000.0
Yams	1005000	1000000	410	410000000	9.4	9400000.0
Tannia	501000	500000	483	241500000	7.3	3650000.0
Sweet Potatoes	700000	650000	440	286000000	4.9	3185000.0
Eddoes & dasheen	315000	310000	391	121210000	6.7	2077000.0
Ginger	85000	61440	207	12718080	7.0	430080.0
Sapodilla	381000	120000	264	31680000	1.4	168000.0
Papaw	120000	100000	119	11900000	1.8	180000.0
Mangoes	2400000	1200000	266	319200000	2.3	2760000.0
Grapefruit	2700000	1342000	177	237534000	2.3	3086600.0
Oranges	1700000	1447000	162	234414000	3.3	4775100.0
Tangerine	193000	191000	154	29414000	2.7	515700.0
Limes	190000	151000	87	13137000	1.1	166100.0
Sub-total:	23195100	19828540		6319054480		176654230.0

Table 9 Cont'd

COMMODITY	Production lbs.	Domestic Consumption lbs.	Calories per lb. ¹ of edible proportion	Total Calories available	Grams of Protein per lb.	Total Proteins available (grams)
1	2	3	4	5	6	7
Sub-total b/f	23195100	19828540		6319054480		176654230.0
Breadfruit	3000000	1532000	250	383000000	4.0	6128000.0
Avocado	2000000	1434000	500	717000000	5.6	8030400.0
Cucumbers	120000	100000	46	4600000	2.6	260000.0
Dry coconuts	1305000	981000	3003	2945943000	32.7	32078700.0
Water coconuts	541000	540000	100	54000000	1.4	756000.0
Water cress	5500	5000	90	450000	11.4	57000.0
Granadilla	2500	2000	212	424000	5.2	10400.0
Mamee apple	660000	431000	212	91372000	2.7	1163700.0
Plums	1000000	377005	104	39208520	0.9	339304.5
Sour sop	250000	88000	161	14168000	2.7	237600.0
Sugar apple	250000	100000	187	18700000	3.1	310000.0
Tamarind	500000	191565	605	115896825	6.9	1321798.5
Corn, green	263000	261000	157	40977000	5.7	1487700.0
Corn, dry	705000	500000	1637	818500000	42.6	21300000.0
Cassava	3600000	2100000	493	1035300000	4.1	8610000.0
Sugar-cane juice	n.a.	816	331	270096	1.4	1142.4
Sub-total:	37397100	28471926		12598863921		258745975.4

Table 9 Cont'd

COMMODITY	Production lbs.	Domestic Consumption lbs.	Calories per lb. of edible proportion	Total Calories available	Grams of Protein per lb.	Total Proteins available (grams)
1	2	3	4	5	6	7
Sub-total b/f	37397100	28471926		12598863921		258745975.4
Cauliflower	550	500	60	30000	6.0	3000.0
Egg plant	25000	18000	89	1602000	4.5	81000.0
Peanuts	5500	5000	2654	13270000	117.9	589500.0
Pineapples	2000	1500	123	184500	0.9	1350.0
Guavas	300000	157000	300	47100000	3.9	612300.0
Patchoi	2500	2000	50	100000	5.0	10000.0
Parsley	1530	1500	195	292500	14.5	21750.0
Spinach	2000	100	86	8600	10.0	1000.0
Onions	12000	10000	169	1690000	5.9	59000.0
Water melon	35000	25000	49	1225000	1.1	27500.0
Sorrel, raw	33000	27000	249	6723000	7.7	207900.0
Custard apple	3000	2500	153	382500	3.9	596.7
Ripe plantain	200000	82000	382	31324000	3.1	254200.0
Beef	287350	285000	746	212610000	69.1	19693500.0
Pork	923000	921000	1827	1682667000	36.3	33432300.0
Mutton	42390	42100	1093	46015300	54.1	2277610.0
Lamb	51000	50000	1093	54650000	54.1	2705000.0
Poultry	915000	910000	524	476840000	56.1	51051000.0
Fish	4520000	4500000	281	126450000.0	40.1	180450000.0
Milk	218090	218090	295	64336666	15.9	3467631.0
Eggs	n.o.s.	180000	658	118440000	52.1	9378000.0
GRAND TOTAL:	44976010	35910216		16622854987		563070113.1

Table 10
Main Nutritional Composition of Estimated
Daily Consumption per person
of Food in Grenada

Source of food	Volume of Food Consumed	Supply of Calories	Daily Consumption of Calories	Daily Consumption of Calories per head of population	Supply of Proteins (Grams)	Daily Consumption	Daily Consumption of grams of Protein per head of Population
Net Imports	36692764 lbs. 16643 m.t.	60419938219	165534077	1535.9	1247784932	3418588.9	31.72
Locally grown	35910216 lbs. 16289 m.t.	16622854987	45542068	422.6	563070113	1542657.8	14.31
TOTAL:	72602980 lbs. 32932 m.t.	77042793206	211076145	1958.4	1810855045	4961246.6	46.03

Notes: Net import figures are for 1973. They give total volume of 125 items of net food imports.
 Estimates of locally grown food consumed are based on estimated consumption of 67 items in 1975.
 Estimated population for 1975 was 107779.
 The nutritional content of calories and protein for each individual item of food was taken from food consumption tables compiled by Caribbean Food and Nutrition Institute, 1974.

m.t. = metric tons

Table 11
Daily Nutritional Requirements for the Population
of Grenada in 1975 Compared with Daily Available
Nutrition Per Capita

Age Groups ^{1/}	Population Estimate	Calories Required per day per Person	Calories Required and available for Population per day	Grams Protein required per day per Person	Grams Protein required and available for Population per day
Under 1 year	3000	820	2460000	14.00	42000.0
1 - 4 years	11442	1595	17271699	6.65	76089.3
5 - 14 years	36429	2500	91072500	9.50	346075.5
15 and over					
males	25280	3000	75840000	37.00	935360.0
females	31628	2200	69581600	29.00	917212.0
Total population ^{2/}	107779	-	-	-	-
Total population requirements of calories per day	-	-	256225799	-	-
Requirements of calories per person per day	-	-	2377	-	-
Total population requirements of grams protein per day	-	-	-	-	2316736.8
Requirements of grams of protein per person per day	-	-	-	-	21.5
Daily nutritional supplies available	-	-	1958.4	-	46.03
Daily nutritional balance	-	-	-418.6	-	+24.53

^{1/} Based on percentage distribution by age in 1970 Census.

^{2/} Based on Census 1970 taking into account births, deaths and migration from Census data to Dec. 31, 1975.

NOTE: Nutritional requirements of calories and protein based on recommended intake of nutrients in Handbook on Human Nutritional Requirements W.H.O. Monograph Series, No. 61.

Table 12

Grenada Exports of Cocoa Beans to Specified Importing
Countries and Total Imports of those Importing
Countries Showing Value and Volume Relationships*

1961

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	30.9	13650	0.23%	478.00	562.71	- 84.71
	Belgium	203.2	14750	1.38%	595.25	546.97	+ 48.28
	Canada	26.8	15960	0.17%	721.59	482.14	+239.45
	Denmark	22.4	3960	0.57%	427.65	546.97	-119.32
	Netherlands ^{+/}	521.7	109140	0.44%	524.17	463.72	+ 60.45
	Italy	5.1	36010	0.01%	627.70	552.93	+ 74.77
	U.K.	979.4	92960	1.05%	612.20	503.08	+109.12
	West Germany	306.7	125470	0.24%	526.29	574.83	- 48.54
	Ireland	nil	4780	n.a.	n.a.	534.52	n.a.
	U.S.A.	217.7	347780	0.06%	550.89	458.56	+ 92.33
	Japan	2.5	15590	0.02%	751.60	517.89	+233.71
	South Africa/ South West Africa	24.9	2800	0.90%	640.88	512.85	+128.03

Total Exports - 2341.3

^{+/} Including Surinam

^{*/} See notes at end of table.

Table 12 Cont'd

1962

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	30.1	11890	0.25%	774.71	475.61	+ 299.1
	Belgium	55.1	14900	0.37%	684.59	523.45	+ 161.14
	Canada	11.8	16360	0.07%	727.17	288.38	+ 438.79
	Denmark	3.9	5220	0.07%	13823.38	507.47	+13315.91
	Netherlands	546.7	103180	0.53%	1285.35	452.93	+ 832.45
	Italy	59.0	36420	0.16%	671.87	523.66	+ 148.21
	U.K.	959.9	114960	0.83%	680.88	471.72	+ 209.15
	West Germany	261.0	136980	0.19%	647.78	502.58	+ 145.20
	Ireland	nil	nil	nil	nil	nil	nil
	U.S.A.	258.5	290070	0.09%	751.39	453.02	+ 298.37
	Japan	nil	nil	nil	nil	nil	nil
	South Africa/ South West Africa	10.4	5630	0.18%	723.20	485.97	+ 237.23

Total Exports - 2196.7

Table 12 Cont'd

1963

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	17.9	10890	0.16%	714.58	445.09	+269.49
	Belgium	158.5	13420	1.18%	711.64	572.43	+139.21
	Canada	34.5	15160	0.23%	728.60	494.42	+234.18
	Denmark	20.3	3630	0.56%	746.90	537.19	+209.71
	Netherlands	1138.0	100880	1.13%	705.22	507.49	+197.73
	Italy	nil	39350	-	-	530.92	-
	U.K.	1214.4	115850	1.05%	724.80	484.80	+240.00
	West Germany	87.5	134140	0.07%	708.16	515.87	+192.29
	Ireland	nil	8360	-	-	459.81	-
	U.S.A.	108.9	286090	0.04%	897.32	472.42	+424.90
	Japan	nil	30080	-	-	557.48	-
South Africa/ South West Africa	91.6	2330	3.93%	720.98	535.62	+185.36	

Total Exports - 2871.6

Table 12 Cont'd

1964

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	17.9	15330	0.12%	655.63	524.20	+131.43
	Belgium	320.8	16430	1.95%	613.36	550.88	+ 62.48
	Canada	17.2	17820	0.10%	619.27	512.68	+106.59
	Denmark	5.1	4310	0.12%	668.28	559.86	+108.42
	Netherlands	669.4	106420	0.63%	578.09	499.56	+ 78.53
	Italy	nil	37890	nil	nil	550.33	n.a.
	U.K.	925.6	78410	1.18%	584.61	528.11	+ 56.50
	West Germany	122.8	143350	0.09%	605.19	538.61	+ 66.58
	Ireland	nil	8990	nil	nil	511.90	n.a.
	U.S.A.	18.1	270740	0.07%	464.27	483.07	- 18.8
	Japan	nil	32200	nil	nil	522.83	n.a.
	South Africa/ South West Africa	7.3	6490	0.11%	667.02	519.26	+147.76
	France [±]	39.5	60080	0.07%	565.54	522.47	+ 43.07

Total Exports - 2143.7

[±]/ Including Martinique

Table 12 Cont'd

1965

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	3.1	8230	0.04%	514.54	469.50	+ 45.04
	Belgium	265.1	17130	1.55%	458.54	424.23	+ 34.31
	Canada	40.8	23180	0.18%	492.08	380.28	+111.80
	Denmark	22.7	5170	0.44%	499.61	455.71	+ 43.90
	Netherlands	802.9	119340	0.67%	487.53	346.45	+141.08
	Italy	nil	41590	n.a.	n.a.	485.65	n.a.
	U.K.	1476.0	82320	1.79%	404.23	417.35	- 13.12
	West Germany	269.1	166930	0.16%	641.47	447.23	+194.24
	Ireland	nil	7130	n.a.	n.a.	432.54	n.a.
	U.S.A.	109.9	360090	0.03%	430.89	334.62	+ 96.27
	Japan	nil	25300	n.a.	n.a.	401.78	n.a.
	South Africa/ South West Africa	9.5	3450	0.28%	769.68	389.28	+380.40

Total Exports - 2998.4

Table 12 Cont'd

1966

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	15.0	14680	0.10%	691.89	370.71	+321.18
	Belgium	86.2	16650	0.52%	496.58	475.74	+ 20.84
	Canada	41.0	16760	0.24%	510.19	456.56	+ 53.63
	Denmark	22.7	4480	0.50%	607.20	460.04	+147.16
	Netherlands	351.2	116550	0.30%	604.80	403.23	+201.57
	Italy	nil	40840	n.a.	n.a.	476.40	n.a.
	U.K.	1512.1	107770	1.40%	616.78	387.51	+229.27
	West Germany	200.2	148240	.14%	518.54	420.75	+ 97.79
	Ireland	nil	10660	n.a.	n.a.	403.28	n.a.
	U.S.A.	nil	324390	n.a.	n.a.	376.73	n.a.
	Japan	nil	37310	n.a.	n.a.	487.64	n.a.
	South Africa/ South West Africa	22.7	4080	0.56%	531.02	417.16	+113.86

Total Exports - 2550.9

Table 12 Cont'd

1967

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	82.0	18500	0.44%	716.94	523.46	+193.48
	Belgium	48.0	17180	0.28%	738.94	583.93	+155.01
	Canada	54.4	17680	0.31%	710.29	539.76	+170.53
	Denmark	20.4	4520	0.45%	674.70	593.58	+ 81.12
	Netherlands	648.6	109970	0.32%	693.22	560.81	+132.41
	Italy	45.0	45150	0.10%	751.85	578.14	+173.71
	U.K.	1501.4	88570	1.70%	707.45	556.78	+150.67
	West Germany	60.1	137780	0.04%	783.35	555.02	+228.33
	Ireland	nil	11220	n.a.	n.a.	548.57	n.a.
	U.S.A.	nil	287260	n.a.	n.a.	512.60	n.a.
	Japan	nil	32540	n.a.	n.a.	593.73	n.a.
	South Africa/ South West Africa	9.0	6300	0.14%	665.84	552.54	+113.30

Total Exports - 2478.9

Table 12 Cont'd

1968

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of	Unit Value of	6 - 7 US\$
					Grenada Exports US\$	total Imports US\$	
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	37.1	12660	0.29%	727.60	553.24	+174.36
	Belgium	14.6	15960	0.09%	714.18	662.97	+ 51.21
	Canada	36.3	18030	0.20%	641.12	625.90	- 15.22
	Denmark	33.4	3800	0.87%	722.81	662.37	+ 60.44
	Netherlands	141.3	112880	0.13%	527.74	650.74	-123.00
	Italy	90.7	40710	0.22%	696.43	637.85	+ 58.58
	U.K.	1357.1	77410	1.75%	653.05	563.79	+ 89.26
	West Germany	59.0	137210	0.04%	656.64	657.20	- 0.56
	Ireland	13.6	9430	0.14%	641.69	547.61	+ 94.08
	U.S.A.	nil	231860	n.a.	n.a.	586.69	n.a.
	Japan	nil	35460	n.a.	n.a.	656.51	n.a.
	South Africa/ South West Africa	nil	6490	n.a.	n.a.	694.76	n.a.

Total Exports - 1783.1

Table 12 Cont'd

1969

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of	Unit Value of	6 - 7
					Grenada Exports US\$	total Imports US\$	US\$
1	2	3	4	5	6	7	8
Cocoa	Australia	77.1	10710	0.72%	708.27	716.43	- 8.16
Beans	Belgium	149.7	15920	0.94%	789.83	924.81	-134.98
	Canada	11.3	13590	0.08%	673.67	783.96	-110.29
	Denmark	nil	4010	nil	nil	949.38	n.a.
	Netherlands	606.0	109730	0.55%	720.85	871.75	-150.90
	Italy	102.5	42460	0.24%	842.95	913.47	- 70.52
	U.K.	2707.4	102320	2.65%	693.06	766.70	- 73.64
	West Germany	344.7	131460	0.26%	761.14	896.16	-135.02
	Ireland	nil	11340	n.a.	n.a.	678.13	n.a.
	U.S.A.	nil	221950	n.a.	n.a.	757.60	n.a.
	Japan	nil	31770	n.a.	n.a.	953.45	n.a.
	South Africa/ South West Africa	nil	4360	n.a.	n.a.	880.28	n.a.
	France	90.7	39620	0.23%	731.39	982.58	-251.19

Total Exports - 4089.4

Table 12 Cont'd

1970

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	15.2	13560	0.11%	709.84	793.73	- 83.89
	Belgium	270.7	18617	1.45%	709.62	766.24	- 56.62
	Canada	29.0	17177	0.17%	875.98	803.40	+ 72.58
	Denmark	nil	4037	n.a.	n.a.	792.42	n.a.
	Netherlands	145.8	115997	0.13%	715.93	770.93	- 55.00
	Italy	nil	42372	n.a.	n.a.	837.82	n.a.
	U.K.	1401.5	81792	1.71%	866.77	812.99	+ 53.78
	West Germany	243.8	124863	0.20%	866.19	811.21	+ 54.98
	Ireland	nil	8143	n.a.	n.a.	809.28	n.a.
	U.S.A.	698.5	283691	0.25%	569.10	707.52	-138.42
	Japan	nil	34891	n.a.	n.a.	744.29	n.a.
	South Africa/ South West Africa	9.6	4162	0.23%	660.16	804.42	-144.26
	France	nil	39664	n.a.	n.a.	710.29	n.a.

Total Exports - 2814.1

Table 12 Cont'd

1971

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	22.2	14070	0.16%	589.80	709.95	-120.15
	Belgium	107.6	20357	0.53%	669.46	651.47	+ 17.99
	Canada	40.8	17456	0.23%	659.71	634.28	+ 25.43
	Denmark	nil	4416	n.a.	n.a.	638.13	n.a.
	Netherlands	646.1	120045	0.54%	582.19	611.95	- 29.75
	Italy	nil	39668	n.a.	n.a.	703.16	n.a.
	U.K.	1314.6	84841	1.55%	656.22	665.28	- 9.06
	West Germany	299.6	144279	0.21%	666.40	650.10	+ 16.30
	Ireland	nil	7918	n.a.	n.a.	683.62	n.a.
	U.S.A.	149.7	320904	0.05%	574.26	565.06	+ 9.2
	Japan	nil	38658	n.a.	n.a.	619.69	n.a.
	South Africa/ South West Africa	38.6	4989	0.77%	739.27	697.74	+ 41.53

Total Exports - 2619.2

Table 12 Cont'd

1972

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	15.0	14905	0.10%	666.66	548.21	+118.45
	Belgium	78.0	21401	0.36%	673.08	620.20	+ 52.88
	Canada	38.6	21239	0.18%	673.58	577.24	+ 96.34
	Denmark	nil	5155	nil	nil	578.47	n.a.
	Netherlands	771.6	122365	0.63%	675.22	597.29	+ 77.93
	Italy	45.4	40573	0.11%	660.79	613.96	+ 46.83
	U.K.	1168.0	110736	1.05%	641.27	594.52	+ 46.75
	West Germany	462.2	142286	0.32%	652.32	628.71	+ 23.61
	Ireland	13.6	8326	0.16%	698.53	591.04	+107.49
	U.S.A.	54.4	286702	0.19%	698.52	525.58	+172.94
	Japan	nil	35894	nil	nil	624.95	n.a.
	South Africa/ South West Africa	24.9	6737	0.37%	702.81	580.82	+121.99
	France	nil	45321	nil	nil	612.01	n.a.

Total Exports - 2671.7

Table 12 Cont'd

1973

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	17.9	16275	0.11%	746.15	632.63	+113.52
	Belgium	478.3	19013	2.52%	772.49	891.92	-119.43
	Canada	36.3	15655	0.23%	773.13	923.73	-150.60
	Denmark	nil	3513	n.a.	n.a.	789.92	n.a.
	Netherlands	321.8	119229	0.27%	845.78	821.28	+ 24.50
	Italy	nil	42928	n.a.	n.a.	959.09	n.a.
	U.K.	1340.1	94997	1.41%	537.11	967.64	-430.53
	West Germany	487.6	151605	0.32%	790.10	868.49	- 78.39
	Ireland	9.1	11831	0.08%	732.81	678.78	+ 54.03
	U.S.A.	nil	251943	n.a.	n.a.	841.32	n.a.
	Japan	nil	38930	n.a.	n.a.	1073.90	n.a.
	South Africa/ South West Africa	40.8	5105	0.8%	769.56	908.13	-138.57

Total Exports - 2731.9

Table 12 Cont'd

1974

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Exports US\$	Unit Value of Total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	2.0	18000	0.01%	2065.61	833.33 F(est)	+1232.28
	Belgium	63.5	17831	0.36%	1946.66	1415.74	+ 530.92
	Canada	29.4	13175	0.22%	1233.02	1540.34	- 307.32
	Denmark	nil	2924	n.a.	n.a.	1714.43	n.a.
	Netherlands	854.7	115542	0.74%	1157.85	1472.67	- 314.82
	Italy	nil	36300	n.a.	n.a.	1534.19	n.a.
	U.K.	993.4	104044	0.95%	992.58	1479.51	- 486.93
	West Germany	474.0	151969	0.31%	1028.72	1305.97	- 277.25
	Ireland	nil	9842	n.a.	n.a.	1550.70	n.a.
	U.S.A.	nil	224617	n.a.	n.a.	1408.54	n.a.
	Japan	nil	25481	n.a.	n.a.	1728.11	n.a.
	South Africa/ South West Africa	10.2	5314	0.19%	1349.18	1364.51	- 15.33

Total Imports - 2427.2

Table 12 Cont'd

1975

Commodity	Importing Country	Grenada Exports in metric tons	Total Imports in metric tons	3 as % of 4	Unit Price of Grenada Imports US\$	Unit Value of Total Imports US\$	6 - 7 US\$
1	2	3	4	5	6	7	8
Cocoa Beans	Australia	nil	-	-	n.a.	-	-
	Belgium	141.7	-	-	1801.60	-	-
	Canada	55.7	-	-	1299.07	-	-
	Denmark	nil	-	-	-	-	-
	Netherlands	341.5	-	-	1523.31	-	-
	Italy	nil	-	-	-	-	-
	U.K.	1144.0	-	-	1510.34	-	-
	West Germany	481.6	-	-	1465.22	-	-
	Ireland	nil	-	-	-	-	-
	U.S.A.	nil	-	-	-	-	-
	Japan	nil	-	-	-	-	-
	South Africa/ South West Africa	10.2	-	-	1186.32	-	-
	France	nil	-	-	n.a.	-	-

Total Exports - 2174.6

N O T E S

1. Imports into the following countries are in f.o.b. values:

Australia, Canada, South Africa/South West Africa and
the U.S.A.

Import values for the other countries are c.i.f.
Grenada exports are in f.o.b. values.

2. The following are the conversion values for the
EC\$1.00 in US currency:

1961 to 1966 -	US\$0.583
1967 -	0.574
1968 to 1972 -	0.500
1973 -	0.511
1974 & 1975 -	0.487

3. To convert X pounds of Grenada exports to metric tons
 $\frac{X \text{ by } .45359}{1000}$

4. n.a. = not applicable

Sources: 1. Grenada Annual Overseas Trade Reports.
2. FAO Trade Yearbooks.

Table 13

Volume and Value Imports of Mace and Nutmeg in
Ten Major Importing Countries 1964 - 1968

Countries		1964		1965		1966		1967		1968	
		MT Volume	US\$000 Value	MT Volume	US\$000 Value	MT Volume	US\$000 Value	MT Volume	US\$000 Value	MT Volume	US\$000 Value
U.S.A.	Mace ^{a/}	295.	781	282	746	241.	663	289.	651	229.	265
	Nutmeg ^{a/}	1593.	2497	2396.	3754	1900.	3494	1671.	2332	1867.	1625
Canada	Mace										
	Nutmeg	118.	285	178.	417	123.	376	153.	345	176.	202
Fed. Germany	Mace	227.	507	267.	697	216.	641	228.	569	358.	570
	Nutmeg	1206.	1711	1281.	1832	1162.	1870	1037.	1261	1494.	1173
France	Mace	20.	53	20.	53	25.	82	22.	59	29.	48
	Nutmeg	171.	289	164.	276	165.	317	202.	290	211.	191
Italy	Mace	30.	77	37.	109	38.	129	37.	117	36.	77
	Nutmeg	141.	312	156.	366	182.	405	181.	368	200.	254
Netherlands	Mace	65.	127	83.	230	96.	277	83.	221	100.	161
	Nutmeg	436.	640	332.	530	625.	1093	755.	829	718.	564
Belgium	Mace	21.	49	33.	84	21.	64	22.	60	30.	53
	Nutmeg	179.	304	184.	340	207.	423	264.	397	237.	204
U.K.	Mace										
	& Nutmeg	481.	974	587.	1207	449.	843	472.	721 ^{est.}	493.	792
Switzerland	Mace										
	Nutmeg & Cardamon	112.	210	109.	221	124.	279	118.	212	180.	217
Japan	Nutmeg	215.	287	232.	307	247.	363	290.	294	284.	205
	Mace & Cardamon	60.	138	66.	249	78.	399	290.	231	284.	374
TOTAL:		5370.	9240	6406.	11419	5899.	11716	6113	8955	6924.	6976

a/ 1965 unit prices assumed for 1964. MT = metric tons

Note: Cardamon imports in Switzerland and Japan could not be extracted, but they are estimated to be a small percentage of this group of spices.

Source: Market for Spices in North America, Western Europe and Japan by International Trade Centre: UNCTAD/GATT, Geneva 1970

Table 14
Destination of Exports of Nutmeg from Grenada
Showing Volume and Percentage Distribution
Calendar Years 1965-1975

Destination	1965		1966		1967		1968		1969	
	mt	%	mt	%	mt	%	mt	%	mt	%
United Kingdom	151.0	10.0	82.3	9.3	96.3	15.7	231.1	13.8	145.7	19.5
Mainland Europe	711.4	47.3	631.6	71.2	257.2	41.9	983.8	58.9	395.7	53.0
U.S.A.	580.5	38.6	118.2	13.3	170.6	27.8	270.6	16.2	89.4	12.0
Canada	47.0	3.1	26.9	3.0	57.9	9.4	74.3	4.5	64.4	8.6
Arabic Countries	1.0	0.0	nil	nil	5.6	0.9	20.7	1.2	4.6	0.6
South America	12.9	0.9	26.7	3.0	12.9	2.1	80.5	4.8	35.9	4.8
Caribbean	n.a.	n.a.	1.0	0.0	13.2	2.2	8.5	0.5	11.3	1.5
Other Countries	1.6	0.1	-	-	-	-	-	-	-	-
Total:	1505.4	100.0	886.7	100.0	613.8	100.0	1669.4	100.0	747.0	100.0

Table 14 Cont'd

Destination	1970		1971		1972		1973		1974		1975	
	mt	%	mt	%	mt	%	mt	%	mt	%	mt	%
United Kingdom	234.1	12.2	231.1	10.7	226.0	11.7	287.4	19.6	171.3	15.4	148.9	7.2
Mainland Europe	1225.1	63.7	983.3	45.4	1126.8	58.5	789.6	54.3	753.4	67.7	1354.5	65.5
U.S.A.	299.3	15.6	368.3	17.0	334.9	17.4	252.8	17.4	73.4	6.6	230.8	11.2
Canada	41.1	2.1	116.1	5.4	69.2	3.6	38.7	2.7	42.8	3.8	42.6	2.1
Arabic Countries	49.4	2.6	373.0	17.2	58.4	3.0	11.2	0.8	nil	nil	10.5	0.5
South America	64.4	3.3	70.2	3.2	94.0	4.9	62.6	4.3	59.7	5.4	60.8	2.9
Caribbean	10.0	0.5	19.5	0.9	17.8	0.9	9.3	0.6	8.8	0.8	13.1	0.6
Other Countries	-	-	2.2	0.1	2.2	0.1	3.4	0.2	23.4	1.5	206.8	10.0
Total:	1923.3	100.0	2163.9	100.0	1927.4	100.0	1455.0	100.0	1112.8	100.0	2068.0	100.0

Note: Volume data from GCNA differs from data in Annual Overseas Trade Reports because the latter relate to date on which duty is paid while the former indicates date of shipment.

Source: Grenada Co-operative Nutmeg Association.

mt = metric tons

Table 15

Destination of Exports of Mace from Grenada
Showing Volume and Percentage Distribution
Calendar Years 1965-1975

Destination	1965		1966		1967		1968		1969	
	mt	%	mt	%	mt	%	mt	%	mt	%
United Kingdom	110.9	53.2	58.5	53.2	77.3	75.7	94.6	55.1	78.2	41.3
Mainland Europe	38.0	18.2	36.8	33.5	12.9	12.6	59.5	34.6	84.8	44.7
U.S.A.	44.7	21.5	3.0	0.3	nil	nil	nil	nil	13.0	6.7
Canada	14.2	6.8	11.7	10.6	11.8	11.6	17.5	10.2	13.5	7.1
Other Countries	0.5	0.2	0.0	0.0	1.3	0.0	0.1	0.0	0.0	0.0
Total:	208.3	100.0	110.0	100.0	102.1	100.0	171.8	100.0	189.5	100.0

Table 15 Cont'd

Destination	1970		1971		1972		1973		1974		1975	
	mt	%	mt	%	mt	%	mt	%	mt	%	mt	%
United Kingdom	78.9	43.2	104.0	38.0	147.6	45.3	95.0	36.9	79.4	54.6	45.6	28.3
Mainland Europe	73.6	40.3	130.2	47.6	138.6	42.5	128.2	49.8	44.6	30.6	100.8	62.6
U.S.A.	17.1	9.4	15.4	5.6	17.4	5.3	14.6	5.7	6.1	4.2	6.1	3.8
Canada	12.8	7.0	23.8	8.7	19.7	6.0	17.5	6.8	15.3	10.5	8.5	5.2
Other Countries	0.3	0.0	0.2	0.0	2.7	0.8	2.0	0.7	0.6	0.4	0.1	0.1
Total:	182.7	100.0	273.6	100.0	326.0	100.0	257.3	100.0	145.9	100.0	161.1	100.0

Note: Volume data from GCNA differs from data in Annual Overseas Trade Reports because the latter relate to date on which duty is paid while the former indicates date of shipment.

Source: Grenada Co-operative Nutmeg Association,

mt = metric tons

