Agriculture in Guyana with Particular Reference to Fruits and Vegetables : A Status Paper

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Introduction

Agriculture is the core sector of the economy of the Cooperative Republic of Guyana. This is evident from the fact that on the overall, the agriculture, forestry and fisheries sector contributed around 29 per cent of the nation's gross domestic product in 2001. Of the total population of the country, 19 per cent depend directly on agriculture for their livelihood (FAOSTAT, 1998). Lying wholly in the tropics, the country has an equatorial climate characterised by high rainfall, high humidity and low variation in temperature. Besides other natural resources, the country is endowed with fertile lands, especially in the coastal plains and the riverain areas. This makes the country agro-climatically suited to the cultivation of a variety of agricultural commodities, particularly tropical fruits and vegetables.

Traditionally, the country's agriculture has concentrated on two major commodities – sugarcane and rice. Agricultural development efforts focusing on these two commodities helped the country to achieve significant increases in their production in recent years. Sugar production increased from 129.7 thousand tonnes in 1990 to 273.7 thousand tonnes in 2000. In the corresponding period, rice production went up from 93.4 thousand tonnes to 291.8 thousand tonnes. However, concentration on just these two commodities has prevented the country from realising the full potential of its agriculturally fertile land and tropical climate suited to the production of a variety of other crops, especially fruits and vegetables, thereby curbing overall agricultural development. Realising this, the "National Development Strategy (2001-2010) – A Policy Framework" envisaged in the Civil Society Document has outlined a strategy of agricultural diversification as one of the means of poverty eradication and economic development of the country. The strategy proposes a programme of diversification focusing on the production of non-traditional commodities, for both the domestic and exports markets, with a view to broaden the agricultural base of Guyana's economy.

Agricultural diversification is an important instrument of economic growth. However, successful diversification will depend upon the opportunities that it provides and the responsiveness of producer farmers to these opportunities. For inducing diversification, especially when it is being promoted in the context of export markets, sound macro-economic policies must be coupled with well thought of national, sectoral and enterprise-level strategies based on a realistic assessment of supply capabilities, domestic and international demand and an understanding of international commerce and consumer preferences in global markets. In order to successfully implement a strategy of agricultural diversification focusing on fruits and vegetables in Guyana, as envisaged in the above mentioned NDS document, it is important to assess the potential of these commodities in the domestic and export markets. As a step in this direction, this paper attempts to assess the current status of the agricultural sector in general, and the fruit and vegetable sub-sector in particular, in Guyana.

Macro-economic Status

The real gross domestic product of Guyana at factor cost at constant prices (base year 1988) increased by 64 per cent from G$ 3319 million in 1990 to G$ 5456 million in 2001, growing at a compound annual rate of 4.86 per cent. In all the years except 1998 and 2000 there was a positive change in GDP over the previous year indicating an increase in economic activity (Table 1). A marginal decline in the GDP was observed in 1998 and 2000. Several parts of Latin America and the Caribbean were in the throes of a recession during 1998 and 1999 and the marginal declines in the GDP of Guyana in these years may be the result of the generally low level of economic activity in the region.

On a sectoral basis, the services sector was the major contributor to the GDP of the nation, with a share of 40.56 per cent in the total GDP in 2001 (Table 2). The services sector was followed by the agriculture, forestry and fisheries sector that accounted for nearly 29 per cent of the GDP in 2001, up from around 24 per cent in 1990. This was followed by the mining and quarrying, manufacturing and construction sectors, in that order.

Table 1: Gross Domestic Product of Guyana – 1990 to 2001
(at constant 1988 prices)

Year	GDP at factor cost (G$ million)	Change over previous year (%)
1990	3319	--
1991	3519	+ 6.02
1992	3792	+ 7.76
1993	4104	+ 8.23
1994	4450	+ 8.43
1995	4676	+ 5.08
1996	5005	+7.04
1997	5317	+ 6.23
1998	5226	- 1.71
1999	5426	+ 3.83
2000*	5353	-1.34
2001*	5456	+ 1.92
CGR (%)	4.86	

Note: CGR refers to compound annual rate of growth.
* Indicates preliminary figures
Source: Statistical Bulletin, Bank of Guyana, December 2001.

Table 2: Contribution of Different Sectors to Gross Domestic Product – Guyana

(G$ million)

Sector	**1990**	**1995**	**2001**
Agriculture, forestry and fisheries	784 (23.62)	1412 (30.20)	1573 (28.83)
Mining and quarrying	314 (9.46)	474 (10.14)	632 (11.58)
Manufacturing	370 (11.15)	583 (12.47)	577 (10.58)
Construction	246 (7.41)	349 (7.46)	461 (8.45)
Services	1605 (48.36)	1858 (39.73)	2213 (40.56)
Gross domestic product	3319 (100.00)	4676 (100.00)	5456 (100.00)

Note: Figures in parentheses indicate per cent share in GDP.
Source: Statistical Bulletin, Bank of Guyana, 2001.

The low contribution of the manufacturing sector to the country's GDP merits serious attention. For a primarily agricultural economy, this is indicative of the potential for the development of agro-processing and ancillary industries like the packaging materials industry. A perusal of the available data shows that sugar and rice have accounted for over 46 per cent of the manufacturing sector's contribution to the country's GDP in the last three years. Except for the first two years of the nineties, sugar and rice contributed over 40 per cent to the manufacturing sector's domestic product. This again highlights the fact that, traditionally, the Guyanese economy has placed considerable importance on these two commodities and that there is a need to diversify to other commodities for the overall development of the agricultural sector in the country.

The agriculture, forestry and fisheries sector accounted for around 29 per cent of the national GDP in 2001. During 1990 to 2001, the compound rate of growth in domestic product for this sector as a whole was 6.19 per cent per annum. Table 3 shows the contribution of different sub-sectors and commodities to agricultural GDP of Guyana. Within the agriculture, forestry and fisheries sector, the crops sub-sector is a major contributor to agricultural GDP with a share of around 69 per cent in 2001. This is followed by forestry (12.52 per cent), fisheries (10.49 per cent) and livestock (7.57 per cent) sub-sectors.

Table 3: Contribution of commodities and sub-sectors to agricultural GDP - Guyana

(G$ millions)

Item	**1990**	**1995**	**2001**	**CARG 1990-2001 (%)**
Agriculture, fishing and forestry	784 (100.00)	1412 (100.00)	1573 (100.00)	6.19
Sugarcane	308 (39.28)	595 (42.14)	668 (42.47)	5.64
Rice	42 (5.36)	140 (9.91)	143 (9.09)	9.63
Other Crops	195 (24.87)	233 (16.50)	281 (17.86)	4.18
Livestock	66 (8.42)	84 (5.95)	119 (7.57)	8.34
Fisheries	102 (13.01)	132 (9.35)	165 (10.49)	4.41
Forestry	71 (9.06)	228 (16.15)	197 (12.52)	11.09

Figures in parentheses are per cent contribution to agricultural GDP.
CARG: Compound annual rate of growth
Source: Statistical Bulletin, Bank of Guyana, 2001

Among crops, sugarcane is a major commodity as is evident from the fact that it accounted for over 42 per cent of the agricultural GDP and nearly 13 per cent of the total GDP. Rice accounted for around 9 per cent of the agricultural GDP. All other crops, which include non-traditional crops like fruits and vegetables, together accounted for around 18 per cent of the agricultural GDP and 5 per cent of the overall GDP. This is once again indicative of the poor attention placed in the past on the development of commodities other than sugarcane and rice for the overall development of the agricultural sector.

Population and Human Resources

The total population of Guyana in 1991 as per the census results was 717,458 persons. For every male, there were 1.033 females. The population declined by 40210 persons in 1991 over 1980, showing an annual rate of growth of – 0.53 per cent during the decade. Information on socio-economic classification of households by head of the household indicates that 14 per cent of them were self-employed in agriculture and 15 per cent were manual agricultural labourers.

According to FAO estimates, in 1997 the total population of Guyana was 847 thousand persons. For the year 2000, FAO estimates the total population of Guyana at 874 thousand. Around 60 per cent of the population lives in rural areas. During the decade of the nineties, the annual rate of population growth was, based on the FAO population figures, 0.99 per cent. Based on the same data set, it is estimated that during the next two decades till 2020, the rate of annual growth in population will more or less stabilize around 1 per cent (Table 4).

Another trend evident from the FAO's population projections is the increasing urbanization in the country. The proportion of urban population is expected to increase from the current level of 38 per cent to around 45 per cent in 2010 and 51 per cent in 2020 (Table 5). This has implications for the agricultural sector of the country as

Table 4: Annual growth rates of population – Guyana

Period	Annual rate of growth (%)
1960 – 1970	2.46
1970 – 1980	0.71
1980 – 1990	0.47
1990 – 2000	0.99
2000 – 2010	1.06
2010 – 2020	1.06

Source: Computed from data available in FAOSTAT, 1998

increasing urbanization implies greater pressure on the farmers to produce adequate quantities of food for off-farm workers and population and a growing domestic market for agricultural products, which will necessitate a reorientation of the marketing and distribution process in the country towards a more efficient system.

Table 5: Population dynamics – Guyana

Item	1997	2000	2010	2020
1. Total population ('000 persons)	847	874	967	1070
2. Economically active population	360 (42.50)	382 (43.71)	461 (47.67)	-
3. Agricultural population	161 (19.00)	156 (17.85)	142 (14.68)	-
4. Urban population	294* (35.40)	334 (38.21)	433 (44.78)	547 (51.12)

Figures in parentheses are percentages of total population
* Figure pertains to 1995
Source: FAOSTAT, 1998

A little over 42 per cent of the total population was economically active in 1997. This decreased slightly to around 39 per cent in 1999 but rose again to 43 per cent in 2000. It is expected to increase to 47.7 per cent by 2010. However, the country's agricultural population, that is all persons actively engaged in agriculture and their non-working dependents, as a proportion of the total population is expected to decline from the 22 per cent in 1990 and 19 per cent in 1997 to 15 per cent in 2010.

The Agricultural Sector: A Background

Land Resources

The geographical area of Guyana is 21,497 thousand hectares or 214,970 sq kms. Among the CARICOM member countries, Guyana is the largest in terms of geographical area. Around 91 per cent of the country's geographical area is land. However, of this, currently only about 9 per cent is agricultural area. Forests and woods account for 84 per cent of the land area while arable land and permanent crops constitute 3 per cent of the land area. The remaining area comprises permanent pastures.

The coastland adjacent to the Atlantic Ocean is the most important agricultural area of the country. Although this area accounts for only a little over 5 per cent of the total geographical area, it is host to the majority of the country's population. South of the coastal plains, comprising 25 per cent of the country's area is the sand belt that is not suitable for agricultural production and is sparsely populated. The interior savannahs comprise nearly 6 per cent of the area and are mostly grasslands. The remaining area constitutes the highlands where Guyana's four major mountain ranges are found. This is also the forest area of the country and is very sparsely populated.

Recent data on land utilization and cropping pattern for the country as a whole is not available. A Socio-Economic Survey conducted in the coastal areas of Guyana by the Inter-American Institute for Cooperation on Agriculture in 1994 provides some information on land utilization for the surveyed areas on the East Bank of Demerara, East Coast Demerara, the Mahaica-Mahaicony-Abary Frontlands and the Black Bush Polder Frontlands (IICA, 1994). FAO estimates that the agricultural area of Guyana is 1726 thousand hectares and arable area is 480 thousand hectares (Table 6).

Agricultural production in Guyana is mostly small-holder agriculture as is found in most developing countries. The National Development Strategy document, 1996 (Vol IV, Chapter 25) provides information on the distribution of farm households by acreage

Table 6: Land Utilisation in Guyana ('000 hectares)

Geographical area	21,497
Land area	19,685
Agricultural area	1726
Arable land	480
Arable and permanent crops	496
Forest and wood	16,500

* Indicates FAO estimate 1994
** Indicates FAO estimate 1997
Source: FAOSTAT, 1998

based on data from the Rural Farm Household Survey. Around 25 per cent of the farm households possess less than 2.5 acres (1 ha) of farm land (Table 7). Another 15 per cent of the farm households have farms of less than 5 acres or 2 hectares. Thus in all, nearly 40 per cent farmers cultivate on farms of less than 2 hectares. Around 75 per cent of the farm households have agricultural holdings of less than 15 acres or 6 hectares. These 75 per cent farmers cumulatively till 23 per cent of the total land. Since the larger farmers tend to grow more sugarcane, rice and coconuts, it is the small farmers who, it appears, grow most of the vegetables and fruits.

Table 7: Farm size distribution – Guyana

Farm size (acres)	Farm households (nos)	Cumulative percentage	Acres	Cumulative percentage
Less than 2.50	6252	25.4	7285	1.9
2.50 – 4.99	3732	40.5	12992	5.2
5.00 – 9.99	4906	60.5	32670	13.5
10.00 – 14.99	3404	74.3	38611	23.3
15.00 – 24.99	3600	88.9	63894	39.6
25.00 – 49.99	1591	95.4	52610	53.0
50.00 and over	1150	100.0	184293	100.0
Total	24635		392354	

Source: Cooperative Republic of Guyana, National Development Strategy for Guyana, (1996), Vol IV, Chapter 25

Irrigation

As the name "Guyana" (which means "land of many waters") suggests, the country has an abundant supply of water. Geographical location of the country and its proximity to the Atlantic Ocean assures it of abundant rainfall. Farming in the coastal plains is mainly irrigated. Rice, sugarcane and, to some extent, non-traditional crops are grown here. Further inland, agriculture is rain fed and generally non-traditional crops are grown there. FAO estimates that irrigated agricultural area in Guyana is 130 thousand hectares, which is around 27 per cent of the arable area.

Farming Regions

Administratively, Guyana is divided into 10 regions. In terms of the non-traditional crops, that is crops other than rice and sugar cane, Regions 1 to 6 are the major producing regions. The bulk of the vegetable and fruit production takes place in Regions 2, 3 and 4. Regions 1 to 4 account for a significant proportion of the country's production of ground provisions. Region 9 produces peanuts, bitter cassava and sweet potato while region 10 is important for corn, peanuts, coconut, and sweet cassava.

Four distinct farming regions exist in Guyana (Krause and Werner, 2000). The coastland adjacent to the Atlantic Ocean is the most important agricultural area of the country but it accounts for less than 10 per cent of the total geographical area of Guyana (NDS, 1996). The predominantly clay soils of this region make it the most fertile region in Guyana and most rice in Guyana is produced here under irrigated conditions. Some vegetables are also grown here.

The second farming system comprises the pegasse (peat) soils that predominate the area immediately behind the coastal frontline. Agriculture in this area is also irrigated with non-traditional crops, especially vegetables and fruits, dominating the cropping pattern. Livestock rearing is also an important activity in this area, especially among the landless families.

Riverain agriculture, which refers to rain fed agriculture, is the third farming system prevalent in the country. This system is found in areas further inland from the coastal plains. Vegetables, fruits and root crops are cultivated here.

The savannah areas are generally infertile and hence arable farming is not common here. Agricultural activity in the region is restricted to cultivation of some grains and rearing of small ruminants.

The Non-traditional Crops and Livestock Sector in Guyana

The non-traditional crops (NTCs) and livestock sector in Guyana, also referred to as "other agriculture", represents that component of the agricultural sector that excludes rice, sugar, forestry and fishing. The broad commodity groups included among non-traditional crops are ground provisions, vegetables, citrus, fruits (other than citrus), seasonings, oil crops, grain legumes and grains. The livestock sub-component of other agriculture includes dairy, poultry, beef, pork, sheep and goats. The major non-traditional crops cultivated in Guyana are:

Cereals and legumes	Corn, blackeye, manica, and others
Oilseeds	Peanut and coconut
Ground provisions	Cassava, sweet potatoes, eddoes, yam, tania/dasheen, plantains
Vegetables and greens	Tomatoes, cabbage, pumpkin, bora, ochro, boulanger, squash, cucumber, and other vegetables
Spices and seasonings	Eschalot, hot pepper, ginger, turmeric and other spices
Fruits	Banana, pineapple, pear, carambola and watermelon
Other fruits	Mangoes, genip, cherry, awara
Citrus	Lime, grapefruit, orange, other citrus
Other crops	Coffee, cocoa and cotton

The "other agriculture" sector produces commodities both for the domestic market and exports. However, production systems in this sector are essentially small in scale with production being concentrated among small farmers. The small size of holdings may restrict farmers from adopting modern production technology. Use of modern inputs is low and production is labour intensive. The continued subsistence nature of production of the non-traditional crops and absence of the application of modern production techniques has been an important reason why the full potential of these commodities has not been exploited so far. Given the favourable agro-climatic production environment for these commodities in Guyana, the opportunities now offered by the opening up of new international markets as a consequence of the changing global trading arrangements and the proximity of the country to several Latin American countries, Central and North America and Europe, the proposed national development strategy of diversification and development of this sector is an important national initiative that can help the country to expand production of fruits and vegetables through the use of modern cultural practices, the development of new varieties suitable for the domestic and export markets and expansion of area under cultivation. For the farmers, this will help to break the perpetual low production - low income - low investment - low output cycle.

With the exports markets now opening up for agricultural products, Guyana needs to lay more emphasis on the exports of its fruits and vegetables, both fresh and processed. The domestic market does not appear to be expanding very fast in view of the negative or low rate of growth of population. Hence it is important that the potential for exports be fully tapped. The country has the advantage of being close to the United States of America, Canada and Europe, which can be important markets for horticultural and floricultural products. The advantage of a tropical climate suited to fruit and vegetable production already exists for the country. What is required is to translate this advantage into production.

Production of Non-traditional Commodities

Data on the production of non-traditional commodities is available from the Planning Division of the Ministry of Agriculture. However, data on the area under different crops is not reported by the Ministry. The availability of data on area under different crops, along with their production, is essential for making a true assessment of the yields obtained on farmers' fields as well as to evaluate the impact of policies implemented to improve agriculture in the country.

The data on production shows mixed trends in the production of almost all non-traditional commodity groups with marked fluctuations between years during 1991 to 2000 (Figures 1 to 5 and Appendix A). Analysis of the production data revealed that, with the exception of coffee, citrus, plantain and cereals, all commodities showed positive and generally high compound annual rates of growth (Table 8).

Table 8: Compound annual growth rates production of Non-traditional commodities, 1991-2000.

Commodity / commodity group	CARG (%)
Cereals	- 0.37
Ground provisions	16.72
Plantain	- 1.78
Peanuts	4.02
Coconuts	7.31
Spices	7.96
Vegetables (total)	9.41
Fruits	1.55
Citrus	- 4.91
Coffee	-33.88
Cocoa	35.72

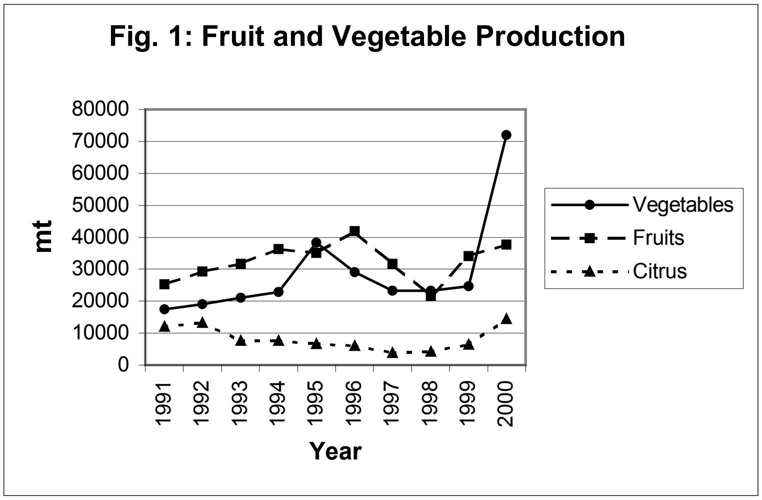


Fig. 1: Fruit and Vegetable Production
80000
70000
60000
50000
40000
30000
20000
10000
0
mt
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Vegetables
Fruits
Citrus

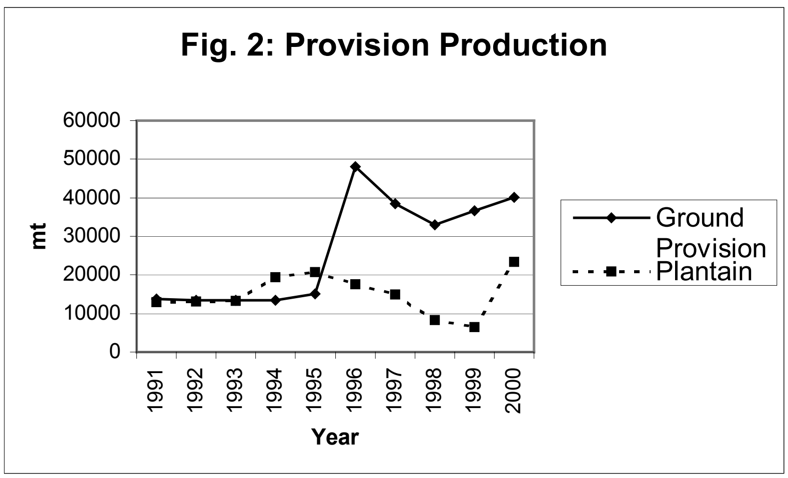


Fig. 2: Provision Production
60000
50000
40000
30000
20000
10000
0
mt
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Ground Provision
Plantain

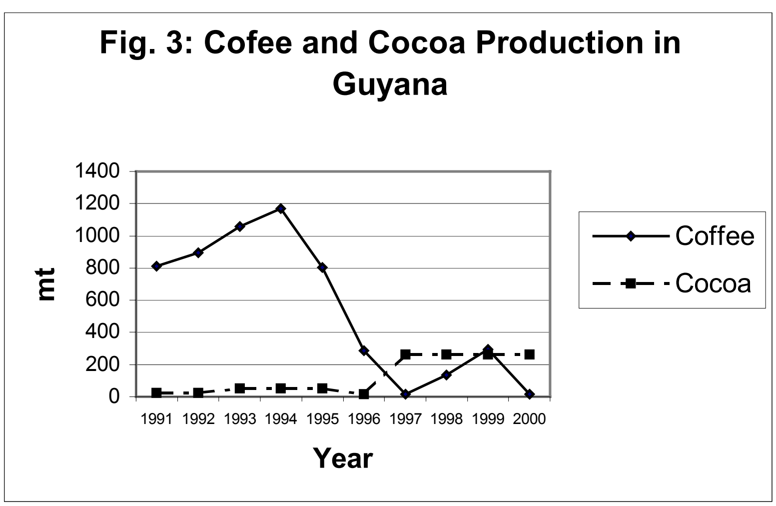


Fig. 3: Cofee and Cocoa Production in Guyana
1400
1200
1000
800
600
400
200
0
mt
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year
Coffee
Cocoa

Fig. 4: Cereals, Spices and Peanut Production

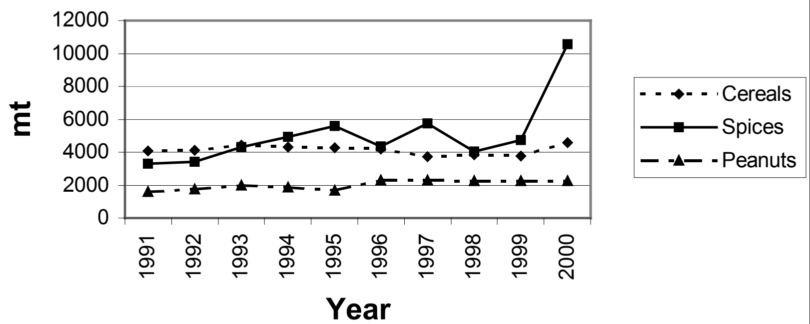
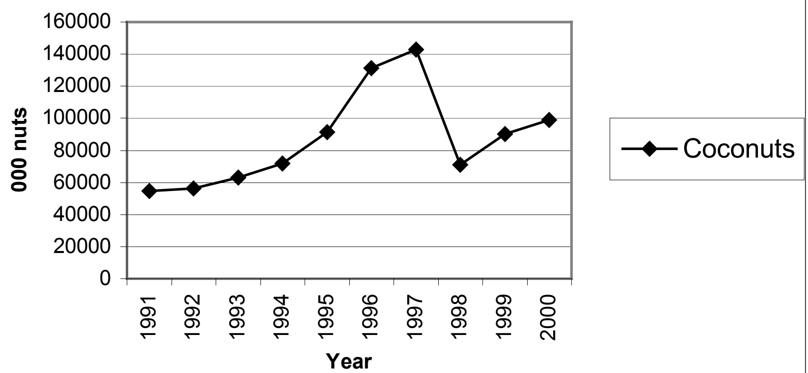


Fig. 5: Coconuts Production



Many of the growth rates appear to be unrealistic. The high rates of annual growth observed in the case of most commodities may be on account of a few very high or very low production values in the available data. One reason for some very high values in the time series data on production is that the sample from which the data is collected is not uniform throughout. In some years, especially in the recent period, new areas were included in the sample by the Ministry of Agriculture to broaden the coverage. These areas were not included in the sample in other years. For instance, the production data on coconuts provided by the Ministry of Agriculture reports a production of 435612.9 thousand nuts in the year 1997, which is very high relative to production in other years. It is indicated that the data for this particular year includes production from the Pomeroon River, implying that this area's production was not reported in earlier or later years. Another report by Krause and Werner reports a production of 143 million nuts, also quoting Planning Division, Ministry of Agriculture as the source of the data. Presumably, the figure of 143 million nuts does not include the production from Pomeroon River and hence this value has been considered for the present analysis. Similarly, the very high production of some vegetables in 2001 relative to the preceding years, is on account of the fact that a large number of new areas were included in the sample from which data were collected. For any realistic economic or statistical analysis for purposes of policy formulation as well as for making projections of future production, it is important that data be collected regularly from the same areas. This underlines a strong and urgent need to streamline the data collection process to ensure uniformity and broad national coverage in the process of data collection.

Vegetable and Fruit Production

Agro-climatic conditions make Guyana suitable for the cultivation of a wide variety of fruits and vegetables. The major vegetables grown here are bora, pumpkin, ochro, cucumber, corilla and tomato. Total vegetable production in Guyana increased at an annual compound rate of 9.41 per cent. This high rate of production growth appears to the result of very high production in the year 2000 when production went up to 71.9 thousand mt, a threefold increase over the previous year (Fig 1). It appears that increase in production is the result of additional areas, not so far considered, being included in the data set.

Banana, mango, pineapple, orange and grapefruit are the important fruits grown in the country. During 1991 to 2000, production growth in fruits was only 1.55 per cent per annum. As in the case of vegetables, a declining trend in production was evident during 1996 to 1998, possibly on account of the causal factors mentioned above. Though a slight increase in citrus production was observed in 2000, the production of this group of commodities has shown a persistently declining trend since 1993. This has resulted in a negative growth rate of 4.91 per cent per annum in case of citrus. The persistently declining trend in citrus needs to be reversed in order to expand domestic availability and exports. Exports of limes, oranges and grapefruit have consistently declined during the nineties.

Generally, for most commodities and commodity groups, a sharp decline in production was evident during 1996 to 1998. This was the period when the country faced adverse weather conditions first on account of the El Nino phenomenon and later floods in several producing regions. This was also the period when the country faced the pink mealy bug pest epidemic that led to reduced exports and consequently reduced production.

Vegetable and fruit producers in Guyana are mostly small producers. Household gardeners grow vegetables in and around their homes mainly for own consumption. The surplus after the household’s requirement is sold in the local market (Kumar, 1999). On a larger scale than home gardens, high value vegetables are produced by specialized vegetable producers in and around cities. These farmers sell their vegetables mostly in local markets. The third type of vegetable growers are the specialized large scale vegetable producers who mainly sell vegetables in major markets.

Domestic Supply and Utilization

Ensuring food security for its people is a major concern of all countries today, especially the developing countries which cannot always depend on food imports for a variety of reasons. In Guyana, the domestic supply of cereals in 1992-94 was 167244 mt resulting in a fairly high per capita supply of 158 kg per year. Of the total supply, around 76 per cent was utilised as food while the remaining went towards feed, seed, food manufacture and wastage. Cereals are a major source of calories for the people of Guyana. Per capita per day calorie intake from cereals during 1992-94 was over 1200 calories, which is over half the daily calorie requirement of an adult person (Table 9).

A comparison with other CARICOM member countries revealed that Guyana ranks third in total domestic supply of cereals after Jamaica and Trinidad and Tobago. It ranks second in per capita supply of cereals after Suriname, which has the highest per caput cereal supply in the region. It similarly ranks second in terms of calorie intake from cereals, Suriname being the first (Table 9).

The situation in terms of vegetables and fruits was not so encouraging. In vegetables, Guyana ranked lowest for per capita availability with all 12 other member states for which data were available having a higher availability (data were not available for Montserrat). Similarly, the per capita supply of fruits in Guyana was also low in comparison to other member countries, with the availability being higher in 9 of the 12 CARICOM members. Guyana is geographically and agro-climatically suited to the production of a variety of fruits and vegetables and the above finding highlights the need to make concerted efforts to diversify into the production of fruits and vegetables which have a potential not only for the domestic market but also for exports.

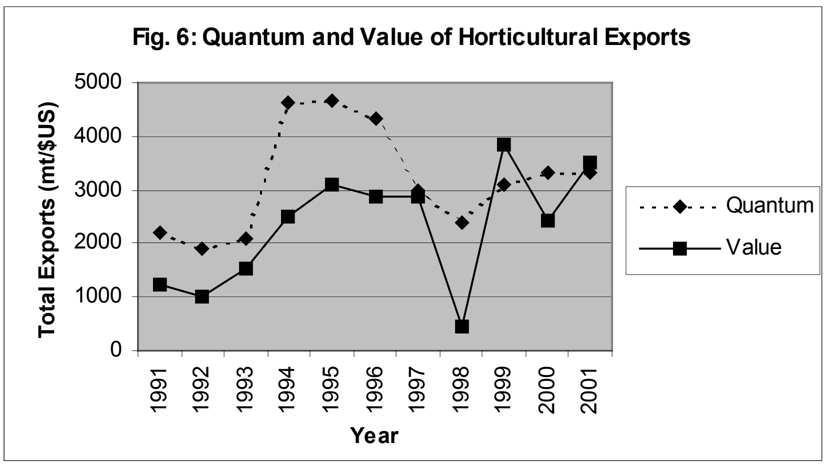
An examination of the FAO food balance sheets data shows that around 79 per cent of the total supply of cereals is utilised as food. Utilization of vegetables and fruits as food is 90 and 89 per cent of the total supply, respectively. Wastage is high in both, being 10 per cent in case of vegetables and 7 per cent in fruits.

Table 9: Domestic supply and utilization of cereals, vegetables and fruits among CARICOM countries (average 1992-94)

Country		Domestic supply (mt)	Domestic utilization for food (mt)	Per caput supply (kg/year)	Calories (nos/day)
1.Antigua / Barbuda	Cereals	6627	5724	88.1	651
	Vegetables	4266	4110	63.2	48
	Fruits	12221	11422	175.7	162
2. Barbados	Cereals	66536	29099	111.9	910
	Vegetables	11458	11051	42.5	35
	Fruits	19876	19203	73.9	71
3. Belize	Cereals	51121	21689	106.3	857
	Vegetables	7821	6630	32.5	25
	Fruits	66238	50106	245.6	185
4. Dominica	Cereals	9026	7737	109	812
	Vegetables	5841	4980	70.1	46
	Fruits	24830	14954	210.6	178
5. Grenada	Cereals	21013	9240	100.4	773
	Vegetables	2864	2465	26.8	22
	Fruits	16572	13287	144.4	188
6. Guyana	**Cereals**	**167244**	**128730**	**157.8**	**1242**
	Vegetables	**12258**	**11041**	**13.5**	**8**
	Fruits	**66393**	**59306**	**72.7**	**110**
7. Jamaica	Cereals	4509401	238460	98.9	824
	Vegetables	157165	142640	59.2	40
	Fruits	301346	369331	111.7	135
8. Montserrat	Cereals	NA			
	Vegetables				
	Fruits				
9. St. Kitts and Nevis	Cereals	7217	4940	120.5	919
	Vegetables	1653	1563	38.1	29
	Fruits	3036	2546	62.1	58
10.St Lucia	Cereals	21334	12791	92.7	702
	Vegetables	3594	3538	25.6	28
	Fruits	70673	31408	227.6	249
11.St. Vincent & Grenadines	Cereals	16328	10647	96.8	780
	Vegetables	3507	3202	29.1	20
	Fruits	8815	8139	2.3	2
12.Suriname	Cereals	158917	68806	166.2	1285
	Vegetables	27698	25428	61.4	44
	Fruits	60963	42613	102.9	136
13.The Bahamas	Cereals	26969	21521	80.3	631
	Vegetables	43720	38550	143.8	119
	Fruits	42203	33250	124.1	129
14.Trinidad and Tobago	Cereals	245919	151497	118.5	934
	Vegetables	30129	28215	22.1	22
	Fruits	88949	87279	68.3	71

Exports of Horticultural Commodities

Exports of horticultural products relative to total exports are very small from Guyana accounting for less than 0.5 per cent of the total exports. Between 1991 and 1995, horticultural exports showed a steadily increasing trend both in quantum and value. A steep decline in the quantum and value of exports was observed from 1996 to 1998 after which exports picked up once again (Fig 6). The very steep decline in exports during 1997 and 1998 was the result of the pink mealy bug pest epidemic which led to a



ban on the imports of these commodities by several countries. Exports, especially to the regional markets, declined significantly. Particularly affected was pineapple, the exports of which declined from 634 tonnes in 1991 and 394 tonnes in 1996 to 138 tonnes in 1997 and further to a meagre 13 tonnes in 1998. On an average, the compound annual rate of growth of the quantum of horticultural exports during 1991-2001 was 3.43 per cent while that of the value of exports was 7.54 per cent.

Although the quantum of horticultural exports from Guyana has shown a moderate rate of annual growth, the rate of growth in value of exports has been fairly high. This has resulted in the country realising higher unit values for its horticultural exports over the years. In order to account for changes in domestic inflation rates and the changing exchange rates, value of exports and unit values are taken in US dollar terms. The increasing unit values of horticultural exports imply that the country stands to gain substantially if it can expand its exports and, besides earning valuable foreign exchange, increased horticultural exports can help to offset the negative trade balance on account of higher imports.

Exports from Guyana may be categorized into exports to regional and extra-regional markets. Regional markets include the CARICOM countries while extra-regional markets include the rest of the world. The regional markets have during the last decade accounted for a fairly high share of the total quantum of horticultural exports of Guyana (Table 10). This share fell in 1997 and 1998 when some countries put restrictions on the imports from Guyana because of the mealy bug infection.

Table 10: Regional and extra-regional exports of horticultural products from Guyana

Year	Regional markets (tonnes)	Extra-regional markets (tonnes)	Total exports (tonnes)	Share of regional markets (%)	Share of extra-regional markets (%)
1991	1210	977	2187	55.33	44.67
1992	956	946	1902	50.26	49.74
1993	937	1170	2107	44.47	55.53
1994	2958	1679	4637	63.79	36.21
1995	2275	2387	4662	48.80	51.20
1996	2259	2054	4313	52.38	47.62
1997	884	2113	2997	29.50	70.50
1998	925	1449	2374	38.96	61.04
1999	1305	1805	3110	41.96	58.04
2000	1656	1650	3306	50.09	49.91
2001	1146	2192	3338	34.33	65.67

Source: Computed from data available in Annual Reports of New Guyana Marketing Corporation, Georgetown, Guyana.

During the early nineties the major regional export markets for Guyana were Barbados, Jamaica, Trinidad and Tobago and Antigua, but exports to Jamaica and Antigua have been low after mid-nineties. The major extra-regional markets are France, Canada and the United States of America. The other markets outside the region to which Guyana has exported horticultural products in the past, and which may be important even now in terms of the potential that they offer for exports, are United Kingdom, the Netherlands and Germany. While it is important that Guyana makes all efforts to further expand its exports to the CARICOM countries and benefit from the proposed establishment of the CARICOM Single Market and Economy (CSME), it must also make efforts to expand its trade to extra-regional markets in view of the potential that they offer in terms of both their size and higher unit prices.

It is equally important that the country should also make attempts to expand its export commodity mix. Currently the major exports are copra, mango, pineapple, plantain, pumpkin, pepper and heart of palm. Given the wide variety of vegetables and tropical fruits that are grown in Guyana, it may not be very difficult to do so. Efforts to expand exports must be supported with policies that promote the development of processing industries. Value addition through processing will not only help to expand exports and fetch higher prices for the exports, but it will also simultaneously help to reduce imports of such products into the country thus helping to save foreign exchange.

In view of Guyana's proximity to the United States of America, Canada and Europe, another commodity group that merits development attention for exports is flowers and ornamental plants. Cut flowers were being exported from Guyana in varying quantities between 1991 and 1998 after which their exports were either stopped or were insignificant as data is not available (Table 11). On account of its tropical climate, Guyana grows a wide range of flowers, orchids and ornamental plants. It is estimated that the world floriculture market is growing at an annual rate of 10 to 15 per cent (Kumar, et al, 1998). It was estimated that in 1995, the demand for flowers in selected countries of Europe and the United States was of the order of US $ 42000 per year. Induced by changing life styles all over the world, demand for flowers in the world is high and growing. India (Kumar, et al, 1998) and China (Jiang, 2001), among other countries, are laying special emphasis on the development of commercial floriculture for exports. Suitable policies need to be put in place in Guyana to develop commercial floriculture production for the export market and take advantage of favourable climate, suitable soils and inexpensive labour in Guyana. However, developing competitiveness in floriculture production will be the key to successful exports as Guyana will face stiff competition in the global market from countries like Israel, India and China, besides the European producers.

Table 11: Exports of cut flowers from Guyana

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Quantity (kgs)	933	1925	3679	747	2251	7900	1499	1900	318

Source: Ministry of Agriculture, Guyana.

An important outcome of the expansion of production and exports of fruits and vegetables and of processing and value addition can be import substitution. Guyana's imports of food, beverages and tobacco (FB&T) for household consumption have shown an increasing trend over the last decade (Table 12). Imports of FB&T in 2001 were over 900 times the imports in 1991. Steadily increasing over time, the share of FB&T in total imports of Guyana reached 13.33 per cent in 2001. This group of products also accounts for a major share of the total consumer goods imports, with around 40 per cent of the consumer goods import bill going towards them. It is important, therefore, for the country to expand fruit and vegetable production and also develop processing industries to reduce food imports.

Table 12: Food imports of Guyana (G$ millions)

Year	Imports					Share of FB&T imports in consumer total imports (%)
	Total	Consumer Goods	Food for households	Beverages & tobacco	Total food, beverages & tobacco (FB&T)	
1991	34274.90	6588.50	979.60	362.50	1342.10	3.92 (20.37)
1996	83894.80	23814.70	7910.10	1240.80	9150.90	10.91 (38.42)
1997	89746.80	25282.40	8494.20	1358.50	9852.70	10.98 (38.97)
1998	90890.30	29344.90	10075.80	2382.00	12457.80	13.71 (42.45)
1999	97554.90	30998.80	11386.00	1623.10	13009.10	13.33 (41.97)
2000	106113.20	29798.60	10002.90	1795.70	11798.60	11.11 (39.59)
2001	109251.00	30907.60	11010.70	2564.40	13575.10	12.42 (43.92)

Note: Figures in parentheses are shares of food, beverages and tobacco imports in total consumer goods imports.
Source: Computed from data available in Statistical Bulletin, Bank of Guyana, 2001.

Marketing Systems for Fruits and Vegetables

To improve efficiency in marketing of agricultural commodities, eliminate malpractices and ensure a fair deal for the producer farmers, varying forms of state intervention have been tried in different countries. State trading enterprises, marketing boards, marketing cooperatives and other types of parastatal organizations, and, at the level of markets, regulation of markets, are some of the forms in which governments have sought to intervene to protect the interests of farmers, improve domestic marketing and promote exports of agricultural commodities. In India, for instance, regulation of markets has helped to eliminate malpractices indulged in by middlemen and provide fair prices to farmers. There are no regulated wholesale markets for fruits and vegetables in Guyana.

However, the New Guyana Marketing Corporation undertakes the purchasing and selling of farmers' produce.

The Bourda market in Georgetown is perhaps the major wholesale market in the country. From this market, produce is distributed to other markets in the country including the small municipal markets in different regions. The Bourda market is also the terminal market for consumers located in and around Georgetown. Some of the other important markets are Stabroek, Parika, Port Mouran, Skeldon and Charity. In addition to these, there are a number of small, weekly markets spread over different regions.

Household gardeners grow vegetables in and around their homes mainly for own consumption. The surplus production after the household's requirement is sold in the local markets (Kumar, 1999). These producers transport the produce themselves to the nearby local markets for sale. Similarly, the specialized vegetable producers located in and around cities also generally transport their produce to the nearby markets themselves. The large farmers use middlemen to sell their produce. The middlemen collect the produce from the farmer's gate and transport it to the market for sale.

For exports, support services are provided to farmers by the New Guyana Marketing Corporation (NGMC). The NGMC provides guidance to farmers on production of non-traditional crops for export markets, helps in documentation for exports and disseminates market information to farmers, traders and exporters.

Many countries in south and south – east Asia have found that formal or informal associations of the local market participants have helped to boost exports and processing of agricultural commodities (Kumar, 1996; Mathur, 2001; Titapiwatanakun 2001). Such formal and informal associations are conspicuous by their absence in Guyana. It may be useful to provide appropriate extension and institutional support to farmer producers to form such associations. Producers' or processors' associations can provide better bargaining power to them as a group, reduce processing and marketing overheads from the management and handling of large collective volumes and promote capital investment in essential processing equipment and cold chains.

Agro-industries and Processing

Food processing industry is of enormous significance for developing countries because of the vital linkages and synergies that it provides between two major sectors of such economies – industry and agriculture. Studies have shown that in agro-processing value addition can be as high as 80 per cent contrasted to around 35 per cent in industrial processing. In low-income countries, agro-industries (which include industries manufacturing farm inputs and those using farm output as raw material) often account for as much as 40 per cent of the manufacturing output which continuously increases as the economies develop (Mathur, 2001). Agro-industries provide the crucial backward and forward linkages between farm production and industry, thus accelerating overall agricultural development.

The author has not been able to have access to data on numbers and capacities of food processing industries in Guyana. However, an examination of the data on exports of processed products shows that crude coconut oil, copra and heart of palm are the three major processed products of the non-traditional crops sub-sector which have some significant exports. Among these also, the major share is that of heart of palm. It accounted for 72 per cent of the processed non-traditional products' exports from Guyana in 2001. It is obvious, therefore, that there is considerable scope for development of food processing industries in the country. Factors such as globalisation and trade liberalization, increasing urbanization, changing dietary patterns and consumer preferences, increased awareness of food safety and changing global trade policies have given a boost to agribusiness activities and agro processing in all developing countries. Emerging trade and demand trends, especially in developing countries, indicate a shift towards high value products like fruits, flowers, dairy products and marine products. Scope for increasing production of these products exists in Guyana. It is important that policy support be provided to producers to overcome institutional constraints, that is, to provide effective organizational arrangements for purchase/procurement of farm output produced for agro-processing industries to assure farmers of a relatively stable demand and some price guarantee. This would also be beneficial to the processing units as it will result in assured supply of raw material (Chand and Mathur, 1998). This must, necessarily be supported by the generation of an enabling environment for entrepreneurs to invest in food processing by means of fiscal incentives, harmonization and simplification of food laws, strengthening of research and extension services for developing products suitable for processing and for improving production, provision of market information, simplification of documentation and taxation procedures and development of transportation and communication infrastructure.

Institutional Support

Development of the non-traditional commodities sub-sector (or "other agriculture") will necessarily require the extension of institutional support to the producers. Broadly, this institutional support will be required for (a) technology development (including variety development and development of better farming practices); (b) extension services for dissemination of information and for motivating producers to adopt modern production technology; (c) training and education; (d) marketing; and (e) credit availability and financing of production, marketing and exports.

Currently the Ministry of Agriculture (MOA) is responsible for providing overall policy direction for the development of the agricultural sector in Guyana. The Ministry of Fisheries, Crops and Livestock (MFCL) is responsible for providing technical and extension services to farmers focusing on specific sub-sectors and crops within the agricultural sector.

Research for technology development, especially for fruits and vegetables, is primarily the responsibility of the National Agricultural Research Institute (NARI). NARI also undertakes some extension activities aimed at improving production and promoting balanced, sustainable and diversified development of the sector. In its efforts, NARI collaborates with other institutions, including international institutions, engaged in agricultural research. NARI has research and development programmes related to fruits and perennial crops, roots, tubers and other food crops, vegetable crops, livestock, soils and environment. In addition it has an Intermediate Savannahs Unit that undertakes R&D in cowpea and black eye and sheep production and some resource conservation technologies for the area. An agricultural Services Unit provides support services to farmers and researchers.

Although, extension is primarily the responsibility of the Ministry of Agriculture, there appear to be several agencies that are at present associated with the provision of extension services in Guyana. Besides the Ministry of Agriculture, some extension activities are also undertaken by NARI, the New Guyana Marketing Corporation (NGMC), and the Guyana Rice Development Board (GRDB). Multiplicity of extension agencies necessarily requires close interaction and strong linkages between the different agencies and R&D organizations to avoid duplication of effort and to minimize loss and distortion of information during dissemination. Technologies (varieties) and cultural practices are generally crop and area specific. Further, extension is a two way process in which information also flows from farmers to researchers on the basis of which technology refinement is undertaken. Therefore, it may be best if multiplicity is avoided and extension is made the prime responsibility of the R&D organization dealing with the crops/commodities.

Training and education support is provided in Guyana through the Guyana School of Agriculture, which has a strong emphasis on practical training in agriculture, the Regional Educational Programme for Animal Health Assistants, which provides training in animal health and animal production, and the University of Guyana which conducts an 4 year undergraduate level programme in agriculture.

The New Guyana Marketing Corporation has been set up to improve market access and provide market intelligence, analyse market performance and promote better post harvest handling of agricultural produce, especially in respect of the non-traditional crops. This institution is engaged in a number of activities. In addition to commercial activities like buying agricultural produce and processed products from farmers and processors and selling products through retail units as well as directly to bulk purchasers like hotels, the NGMC also undertakes dissemination of market information and extension and provides assistance to exporters in documentation for exports.

Agricultural Information

Production related information

Decision making and policy formulation assume availability of basic information. Information and data on many important agricultural aspects such as land utilization, irrigation, cropping patterns, input use, cost of production, etc. are not available in Guyana. For instance, while data is available on production of non-traditional crops, data on area and yield is not available. Further, wide year to year fluctuations in the available production data point towards possible shortcomings in the mechanism or methodology of data collection. Thus steps need to be undertaken urgently to collect data on a regular basis on scientific lines on a number of aspects related to agriculture in Guyana to facilitate research and policy formulation.

Profitability of different commodities needs to be estimated in order to assess the comparative pecuniary advantage of producing them. At a more disaggregated level, this needs to be done for different producing areas and regions. Such an assessment of the relative profitability of fruits and vegetables is essential to motivate farmers to diversify into commercial production for domestic and export markets. However, such assessments are constrained by a lack of time series data on such aspects as input use, input and output costs, output prices, area under cultivation, production and yield. Similarly, research on the changing domestic market conditions requires information on market arrivals, wholesale and retail prices at different times, consumption pattern, incomes, and so on. Hence it is essential that data should be regularly collected on a wide range of aspects related to production in order to strengthen agricultural economics research, especially policy-oriented research, in Guyana.

Market information

The availability of timely, pertinent and usable information is a *sine quo non* for inducing efficiency in agricultural marketing systems which are generally complex, involving a host of individuals, agencies and organizations performing a variety of activities related to the creation and exchange of value with one another. Correct decision making and planning depend upon reliable information about the dynamic and variable market conditions. Generally the variable market conditions are reflected through changing prices. However, information on prices is not the only information that needs to be provided to producer farmers. In addition to information on prices, producer farmers will also benefit from information on export markets, export procedures and domestic production and external trade related government policies. The responsibility for the provision of market information in Guyana rests with the New Guyana Marketing Corporation. Information on weekly wholesale and retail prices is collected by the NGMC from major markets in Guyana. Information and assistance is also provided to exporters of agricultural products. The Corporation also documents information on quantity and value of agricultural exports from Guyana. The information is being computerized for better access and processing and farmers, exporters and policy makers will stand to benefit from this exercise.

Issues for Research

Guyana produces around 140 different varieties of tropical fruits and vegetables. Total production of fruits and vegetables annually is estimated to be around 420 thousand metric tonnes. Some of the fruits and vegetables grown in Guyana have characteristics of taste and quality that are in demand among consumers in various Caribbean and Latin American countries. However, at present, Guyana exports only around 15 per cent of its total production of NTCs, with the bulk of the produce going to the CARICOM member countries. For the overall development of the agricultural sector in Guyana, it is important that a strategy of diversification with a focus on non-traditional commodities in general, and fruits and vegetables in particular, be implemented as is envisaged in the National Development Strategy document. However, a strategy for the successful development of the fruit and vegetable sub-sector of Guyana must be devised on carefully researched features and characteristics of this sub-sector. Some of the issues for research in respect of fruits and vegetables are:

Production

Nature of production systems and patterns of fruit and vegetable production, with specific reference to production seasonality, area planted, output realised, yields and regional variations in production; estimation of cost of production/ cultivation of different fruits and vegetables by regions and areas.

Consumption and demand

Product utilization; nature and growth in demand for fruits and vegetables; factors affecting demand; demand projections; price and income elasticities of demand for fruits and vegetables.

Marketing

Identification of different channels of marketing, by size groups of farmers and regions; estimation of costs of marketing, price spreads and producer's share in consumer's price for different fruits and vegetables for different marketing channels; market structure analysis and extent of integration of markets; market information needs and systems for improving marketing including streamlining of the process of data collection; institutional and infrastructure constraints in marketing;

External trade

Trends in Guyana's exports of fruits and vegetables, both raw and processed; identification of major exportable commodities and major export markets; factors influencing exports.

Processing and value addition

Existing facilities for processing and value addition for fruits and vegetables in terms of number and sizes of processing plants, available capacities for processing and capacity utilization; estimation of processing costs and costs of marketing of processed products.

Conclusions

Based on the available data on production of non-traditional commodities/ commodity groups, it is estimated that production of some of the commodities/commodity groups grew at very high rates during the nineties, with compound annual rates of growth being as high as 36 per cent for cocoa, 17 per cent for ground provisions, 9 per cent for vegetables, and so on. For some commodities, negative growth rates were also observed. An examination of the production data for many commodities shows marked fluctuations from year to year. Some of the marked fluctuations in the data series are a result of non-uniformity in the areas from which data is collected. It is important, therefore, to streamline, improve and expand the process of data collection in the country.

There is a lack of time series data on several important aspects of agriculture in the country. Data and information are the most important resource for economics and marketing research. There are also considerable discrepancies in population, production and trade data available in FAO publications and that available from Ministry of Agriculture and the New Guyana Marketing Corporation. It is, therefore, important that the methodology and procedures for collection of agricultural data be streamlined so as to facilitate policy-oriented research. Investments made in organized data collection procedures will be of immense use to the Government in its planning and policy formulation process.

There appear to be several factors that have inhibited the development and growth of the non-traditional crops sub-sector of Guyana's agricultural sector. The foremost among them is the small, subsistence type production system prevalent in this sub-sector.

Production for subsistence and self-consumption, rather than for the market, has prevented this sub-sector from adopting improved technology that is important for growth and development. Significant production increases cannot be expected to be realized unless improved production techniques are adopted by the farmers. The problem is further compounded by the lack of good marketing facilities. These aspects need to be further researched into to suggest policy directions for the development of the sub-sector.

Social sciences research in general, and agricultural economics and marketing research in particular, are weak in the country. There is an urgent need to have a division or unit of agricultural economics, with trained staff to undertake research in areas of farm management, marketing and trade, at NARI. Besides looking into the economics of various research and development programmes being undertaken by NARI, this unit is also required for undertaking farm management, marketing and agribusiness research in the light of the changing national and global economic and trade environment which offer opportunities as well as pose challenges. Simultaneously there is a need to strengthen education in agricultural economics, marketing and agribusiness management, especially at the post graduate level, to produce trained researchers.

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Appendix A

Production of Non-traditional commodities in Guyana: 1991-2000

Year	Cereals & legumes (mt)	Oilseeds		Total vegetables (mt)	Total fruits (mt)	Citrus (mt)	Spices & seasonings (mt)	Coffee (mt)	Cocoa (mt)	Ground provisions (mt)	Plantain (mt)
		Peanuts (mt)	Coconuts (mill units)								
1991	4064.80	1589.04	54623.10	17394.95	25220.08	11946.50	3314.56	810.12	23.13	13675.08	12963.16
1992	4103.51	1763.99	56312.40	18991.65	29254.46	13273.56	3409.09	895.85	23.13	13366.32	13020.77
1993	4410.55	1991.56	62994.10	21114.55	31639.43	7623.28	4313.48	1056.95	52.16	13507.66	13205.47
1994	4297.96	1863.87	71983.10	22933.54	36211.46	7601.83	4930.64	1168.01	52.16	13408.73	19353.53
1995	4265.53	1665.92	91546.60	38354.95	35009.23	6579.28	5609.58	805.13	51.25	15156.53	20722.21
1996	4203.03	2280.41	131225.00	29024.85	41988.93	5996.64	4357.11	285.08	14.78	48144.60	17561.19
1997	3730.10	2279.37	143000.00	23313.88	31668.10	3791.84	5746.66	14.78	260.81	38405.33	14901.20
1998	3840.83	2270.11	71005.50	23214.95	21572.30	4305.22	4031.66	136.35	260.81	32908.32	8216.32
1999	3770.80	2264.00	90093.30	24596.30	34026.70	6494.90	4755.60	293.70	260.80	13507.66	6456.60
2000	4595.50	2264.20	98850.80	71958.40	37715.80	14485.20	10577.30	14.80	260.80	13408.73	23291.70

YEAR										
CROPS	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Cereals/Legume	4064.8	4103.51	4410.55	4297.96	4265.53	4203.03	3730.1	3840.83	3770.8	4595.5
Ground Provn.	13675.08	13366.32	13507.66	13408.73	15156.53	48144.6	38405.33	32908.32	36672.9	40108.1
Vegetables	17394.9	18991.65	21114.53	22933.54	38354.93	29024.85	23313.88	23214.95	24596.3	71958.4
Seasonings	3314.56	3409.09	4313.48	4930.64	5609.58	4357.11	5746.66	4031.66	4755.6	10577.3
Citrus	11946.5	13273.56	7623.28	7601.83	6579.28	5996.64	3791.84	4305.22	6494.9	14485.2
Fruits	25220.08	29254.46	31639.43	36211.46	35009.23	41988.93	31668.1	21572.3	34026.7	37715.8
Coffee	810.12	895.85	1056.95	1168.01	805.13	285.08	14.78	136.35	293.7	14.8
Cocoa	23.13	23.13	52.16	52.16	51.25	14.78	260.81	260.81	260.8	260.8
Peanuts	1589.04	1763.99	1991.56	1863.87	1665.92	2280.41	2279.37	2270.11	2264	2264.2
Coconuts	54623.1	56312.4	62994.1	71983.1	91546.6	131255	435612.9	71005.5	90039.3	98850.8
Plantain	12963.16	13020.77	13205.47	19353.53	20722.21	17561.19	14901.2	8216.32	6456.6	23291.7