



*Caribbean Regional Centre*

## Agriculture in Guyana



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## Preface

*Mindful of its technical cooperation responsibilities, IICA identified the critical need for improved information on the agricultural sector of member countries to assist them to more rapidly integrate with the global marketplace. The identification of the challenges and opportunities for the agri-food sector of constituent member countries, along with the development of a compendium of the best available comparative statistics for agriculture, was identified as a starting point.*

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As with many Caribbean countries, there are many areas in which the agricultural data collection, analysis and dissemination system in Guyana may be improved. Some information does exist, however, imprecise, and is often spread over a range of national, regional and international publications and databases. Scarcity and limitations of Guyana's data base regarding the agricultural sector continues to be a serious impediment to effective planning.

This working document represents one in a series of 13 working documents prepared for the IICA Caribbean member states, compiled for the specific purpose of preparing the document titled "*Performance and Prospects for Caribbean Agriculture*". The preparation of this working document constitutes a step towards the goal of improving access to information on the agricultural sector.

This working document was the result of the collaborative efforts of Mr. Michael Henry of the IICA Caribbean Regional Centre (CaRC), Mr. Mark Bynoe (Guyana), with support from the IICA Technical Cooperation Agency in Guyana. The information and analysis are based on statistics and descriptive information extracted from the national sources, as well as from reports generated by regional and international counterpart institutions. It is anticipated that the information will be useful, not only to individuals and institutions working in agricultural development in Guyana, but also to persons interested in information on the agricultural sector in general.

The guidance of Dr. Patrick Antoine Head, Socioeconomic Policy, Trade and Investment Programme in the preparation of this working document is acknowledged. This report would not have been possible without the full commitment of the IICA Director General, Carlos E. Aquino G. and the Caribbean Regional Centre (CaRC) Director, H. Arlington D. Chesney.

This exercise will be undertaken every two years. We welcome comments aimed at improving subsequent reports. All errors and omissions are the responsibility of the authors.

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### Country Profile

The Cooperative Republic of Guyana (hereafter Guyana) is located on the north-eastern coast of South America, bounded to the east by Suriname, to the south by Brazil and by Venezuela in the west. The country experiences two wet seasons with rainfall averaging 2,300mm in the Coastal regions, 3,000mm in the Forested zone and 1,600mm in the Savannah zone. Annual average coastal temperatures range from 22°C to 31°C. Temperatures in the interior average between 34°C to 16°C.

Guyana's land area comprises 214,970 km<sup>2</sup> (21.5million hectares), of which approximately 75% is under vegetative cover. Most of the country's economic activity is concentrated on an estimated 1.36 million hectares of fertile coastal plain. However, the Guyana's relatively flat topography has made the coastal plain, in particular, extremely vulnerable to the adverse effects of high rainfall and flooding which wreaks extensive damage to industry, agriculture and infrastructure. Guyana is among the few Caribbean countries to possess abundant forest and mineral (gold, diamond and bauxite) reserves of economic significance. Several large rivers facilitate the fisheries, industry and transportation sectors.

Guyana's population is mixed, the two dominant ethnic groups being of East Indian and African origin. A number of small Amerindians communities continue to reside in the interior. Guyana is among the least densely populated countries of the Caribbean, with a 1991-93 population density of 3.5 persons per sq. km. The small increase in the 1996 population to 843,000 (average annual growth rate of 0.6%), resulted in a similarly slight increase in the population density to 3.9 persons per sq.km.

Following the economic recession which lasted up to 1990, the Guyana economy recorded 6% real growth in 1991. This growth was a direct result of the implementation of the Economic Recovery Programme (ERP) from the late 1980s. The ERP advocated the adoption of broad macroeconomic measures and structural reform to realign prices, dismantle state controls and the establishment of a market-oriented economy.

The initial negative response to the ERP, coupled with adverse weather conditions, industrial unrest and disruptions in electricity supply were largely responsible for the 3.2% decline in real GDP in 1990. The turnaround in 1991, was maintained throughout the 1992-1995 period, with the economy growing at an increasing rate towards 1995. Between 1991-1995, Guyana's economy grew at an annual rate of 7.1% per annum.

The agriculture and fishing sector maintained its role as the largest productive sector in Guyana, with an average share of 28.3% in real GDP for the 1991-1995 period. The agriculture and fishing sector grew by 4.6% per annum, recording positive, albeit highly variable growth over the 1991-1995 period. Manufacturing, including utilities was the second largest contributor to real GDP growth. The mining and quarrying sector, which generated the bulk of Guyana's foreign exchange, slowed towards the latter part of the period, eventually declining by 11% in 1995.

The continuation of the reform was expected to foster macroeconomic stability, thus contributing to the maintenance of the favourable economic growth. The economy was estimated to grow in excess of 6% in 1996. The continued exploitation of minerals, fishery and forestry resources and continued emphasis on primary production should ensure that the growth trends are maintained.

#### Guyana

Key Economic Indicators	1991	1992	1993	1994	1995*
G\$-US\$ Exchange	122.0	126.0	130.8	142.5	140.5
GDP, G\$m@1988	3,516	3,792	4,104	4,452	4,677
Agriculture	879	1,095	1,160	1,302	1,412
Manufacturing	409	488	505	533	583
Mining/Quarrying	380	337	502	535	474
Other Industry	251	256	265	331	349
Services	1,597	1,616	1,671	1,765	1,858
Fiscal Bal <sup>1</sup> G\$m	-9,165	-7,994	-7,001	-11,490	-1,880
<b>US\$m</b>					
Visible Trade Bal.	-5.0	-61.0	-68.3	-40.6	40.8
B.O.P	-66.0	-39.3	-49.7	-63.9	-67.3
Ext. Debt (yr. End)	1.855	1,967	1,959	1,999	2,058

Source: Bank of Guyana, various annual reports & statistical bulletin

## Agriculture in Guyana - Sector Profile

### Socio-Economic Role

In spite of the existence of mineral reserves, agriculture has traditionally been a pillar of the Guyanese economy, both in terms of contribution to gross national income and in terms of its impact on employment and welfare of a significant proportion of the population. Up to the early 1990s, the ability of the agriculture sector to contribute to economic growth and welfare was constrained by the overall economic mismanagement and a generally unfavourable policy framework. With the reformed policy environment which underpinned the ERP, agriculture sector activity was reactivated, experiencing significant growth levels over the 1991-1995 period (Table 1).

**Table 1:**

Guyana: Composition of Agricultural GDP					
\$G M	1991	1992	1993	1994	1995
Total GDP	3,516	3,792	4,104	4,452	4,677
Agriculture GDP	25.0	28.9	28.3	29.2	30.2
<b>Shares in Agriculture</b>					
Sugar cane	43.1	52.6	49.6	45.9	42.1
Rice paddy	7.6	6.8	8.0	7.9	9.9
other Crops	22.2	17.6	17.5	16.5	16.5
Livestock	6.3	4.9	5.2	5.3	5.9
Fishing	12.6	9.9	9.6	9.5	9.3
Forestry	8.2	8.0	10.1	15.1	16.1
<b>Share in Manufacturing</b>					
Sugar	29.3	37.5	36.0	35.6	32.2
Rice	6.6	6.2	7.1	7.6	9.5

Source: computed from Bank of Guyana, Statistical Bulletin,

In 1995, gross activity in the agricultural sector accounted for 30% of real GDP, representing an increase from the 25% share in 1991. Agricultural output generated about 43% of Guyana's total foreign exchange earnings in 1994. As indicated in Table 1, sugar (cane planting, milling and processing) is Guyana's most important agricultural industry. The sugar industry is single largest contributor to agricultural GDP, agricultural export earnings and employment. Rice production is Guyana's second largest agricultural industry, and is particularly important in terms of domestic food supplies.

Between 1980-1992, the agriculture, hunting and fishing sector was estimated to employ approximately 27% of the employed labour force. There was some structural change in employment which occurred between 1980 and

1992 as a consequence of structural adjustment. During this period of adjustment, a large proportion of the work force released from public service employment found employment in the agricultural sector, either as part of the formal agricultural industries, but mostly as self-employed farmers.

**Table 2**

Guyana, Contribution of Agriculture to Employment		
	1980	1992
Total Employed Labour force	192,636	245,492
Agriculture, Hunting & Forestry	48,603	74,038
% Agriculture to total	25.2%	30.2%

Source: National Statistics

In 1995, the sugar industry employed an estimated 27,000 persons, representing 10% of the employed labour force that year. Agriculture is an important source of employment for the estimated 70% of Guyana's population which reside in the rural areas and remain dependent on income generated from agriculture and related activities. A 1994 IICA/IFAD survey of four villages revealed that about 65% of the households in the rural communities live below the poverty line and that poverty was more pronounced among the small farming sector

### Organizational Characteristics

From the early 1970s, economic activity, including the agricultural sector, was characterised by high and increasing levels of state intervention. The sugar and rice industries were nationalised and state-run, monopolies were established for the procurement and distribution of inputs and restrictive trade and pricing practices for most of the sector's key commodities were enforced. These interventions resulted in serious distortions in resource allocations, severely constrained private sector initiative and impaired the sector's ability to respond to market signals.

From the late 1980s, Guyana has undergone significant economic reform and much of the distortions induced by state interventions have been greatly reduced, thus allowing for the emergence of a market-led agricultural sector. Between 1988-1992, six of the eight state-owned

rice mills were privatised, with the management of the largest agricultural concern, the sugar industry (GUYSUCO) contracted to the private sector firm, Booker Tate. In addition to the policy of privatisation of state-owned enterprises, other reforms, such as the deregulation and simplification of the trade and pricing regimes and the establishment of a floating exchange rate for the Guyana dollar, a significant impact on the sector's turnaround.

In keeping with the overall policy of economic revitalisation, sectoral policies emphasised the need to reverse the stagnation and decline which characterised the agricultural sector up to the late 1980s. Consequently, the Ministry of Agriculture was expected to increase its effectiveness with respect to the following areas:

- i. provision of appropriate policy direction;
- ii. the coordination of functions between a large number of public sector institutions and between public and the private sector involved in agriculture;
- iii. manage the sector's technical and information needs and monitor developments in order to facilitate planning and increased investment flows into the sector.

The economic reforms and the new policy environment also placed emphasis on private sector-led development. Consequently, private sector initiative in agricultural sector development was encouraged and eventually increased, particularly in the areas of non-traditional crop production, fishing, forestry and agro-processing. However, in spite of the economic reforms and the reduction of state control from direct production, agricultural sector activity in Guyana remains public sector-driven.

As alluded to above, the Ministry of Agriculture is the foremost agricultural institution which manages, sets policies and guidelines and monitors the performance of the sector. Within the new economic framework, the MoA's role was redefined as one of facilitator, providing an enabling environment within which the private sector initiative would be facilitated. The MoA's direct involvement in agricultural production was to be mainly in the provision of technical

and extension services for crop and livestock development. Within the policy of state withdrawal, however, the Government maintained its involvement in agricultural sector through activity-specific public-sector institutions, such as National Agricultural Research Institute (NARI) and the Guyana Rice Development Board (GRDB) for technology development and transfer, training through the University of Guyana, production through institutions such as GUYSUCO, and marketing through the New Guyana Marketing Corporation.

These governmental organisations also provide technical assistance, such as extension, marketing, research and development for specific crop development from these state-owned enterprises to the few smaller commodity and farmers' organizations. Some of these organizations are also provided with seedlings, inputs such as tools, seeds, fertilizer, pesticides and other chemicals.

Regional and international agencies/institutions also play a critical role in Guyana's agricultural sector development, particularly with respect to R&D and sustainable agricultural and rural development projects. These institutions are an important complement to the functions of the Ministry of Agriculture. However, a specific area which remains deficient is the supply of agricultural credit.

The proportion of commercial bank lending for agricultural sector activity is generally inadequate to satisfy the needs of the sector. Commercial bank credit tends to be utilised mainly by the large-to-medium size farmers, particularly rice industry farmers. Between December 1993-December 1994, commercial bank lending for paddy production more than doubled, with loans to other agriculture increasing by approximately 40%. Over the 1991-1995 period, commercial bank lending for agriculture (primary activities) represented less than 13% of total outstanding commercial bank loans, with that to the agro-industrial sector averaging 5% (Table 3)

Table 3  
Commercial Bank Credit to Agriculture

G\$M	1991	1992	1993	1994	1995
Total Loans	7,096	9,896	11,276	15,075	22,189
Agriculture	822	1,467	1,075	1,765	3,445
Agro-processing	450	512	643	596	1,229
Timber & sawmill	228	301	589	605	570

Source: Bank of Guyana, Annual Reports

The majority of the small farmers experienced great difficulties in accessing commercial bank credit and have continued to rely almost solely on the Guyana Agricultural Development Bank (GAIBANK). Over the review period (1991-1995) the GAIBANK was the only financial institution servicing most areas outside of the capital town, Georgetown. As indicated in Table 4, agriculture's (primary) share in total loans over the 1991-1994 period averaged over 80% in 1991, 43% between 1992-93, and 74% in 1994. The bulk

of this credit was allocated to rice, tree crop poultry and pig production. The severe financial difficulties experienced by GAIBANK's financial difficulties, access by the small farming community to credit has been progressively reduced. Similarly, financial-related difficulties have also constrained the effectiveness of the state-owned commercial Guyana National Cooperative Bank (GNCB) in its role as provider of credit for agriculture and industry development.

Table 4  
GAIBANK's Credit to Agriculture

G\$'000	1991	1992	1993	1994
Total Loans	176,429	546,457	1,914,616	1,446,000
Agriculture	152,196	235,153	815,201	1,065,302
Deep sea fishing	0	0	0	300,000
Logging	13,437	732	143,195	390,300
Food & Be v.	1,901	27,424	425,072	750,000

Source: Bank of Guyana, Annual Reports

### Agriculture in Guyana - Performance Indicators, 1991-1995

#### Socio-Economic Performance

In 1990, the agricultural sector registered overall decline. This was a result of unfavourable weather conditions and the initial poor response to the structural adjustment programme. While most sub-sectors declined, the category "other crops" reported an increase in output in 1990, suggesting that this sub-sector was least affected by structural adjustment and adverse weather conditions than the traditional sub-sectors. From 1991, however, the agricultural sector experienced significant recovery, led by growth, albeit variable, in rice production and forestry (Table 5).

Table 5  
Guyana, Agriculture Sector - Real Growth

(1998 prices) %	1991	1992	1993	1994	1995
Real GDP Growth	5.9	7.8	8.2	8.5	5.0
Agricultural GDP	12.1	24.6	5.9	12.2	8.4
Sugar	23.0	52.0	-0.2	4.0	-0.5
Rice	59.5	11.9	24.0	10.7	35.9
Other Crops	0.0	-1.0	5.2	5.9	8.4
Livestock	-16.7	-1.8	11.1	15.0	21.7
Forestry	14.1	22.2	32.9	68.4	15.7
Fishing	10.9	-3.5	2.7	7.1	10.0

Source: Bank of Guyana, Annual Reports

In fact, growth in the agricultural sector was the most rapid among the productive sectors, averaging 12.6% per annum between 1991-1995. This rapid growth rate was attributed largely to the agricultural incentives embodied in the ERP and the elimination of import restrictions on agricultural equipment and fertilisers, thus facilitating production expansion. The sugar industry reported significant growth for the 1991-1992 period, followed by decline in output thereafter to 1995. The decline in the sugar industry in 1995 was a main contributor to the slowdown in growth of the overall agricultural sector. While the rate of agricultural sector growth slowed between 1993-1995, compared to many Caribbean countries, the rates during that period was more than favourable.

To maintain the sector's growth momentum, the Government taken action on important agricultural policies. This measure was in an attempt to meet the basic objectives of consolidation of commodity trade liberalisation and extending the benefits of the adjustment process to key agricultural markets. This programme was implemented with assistance



from an Inter-American Development Bank (IDB) Agricultural Sector Loan, which enabled the Government to undertake: (i) adjustments to the legal/institutional framework and trade regime for the rice industry; (ii) centralisation of policy and decentralisation /divestment of operations in agricultural water resources; and (iii) development of agricultural land markets.

Due to trade data limitations, it is difficult to assess the trade performance of the agricultural sector during the 1991-1995 period. However, data for the 1989-1991 period indicate positive and increasing annual surpluses on the agricultural trade account (Table 6). Guyana's agricultural sector remains heavily dependent upon trade, with the structure of agricultural exports being more concentrated than the structure of its imports. The bulk of agricultural export earnings continue to rely on a very narrow range of exports, specifically sugar and rice. Consequently, given the acceleration in trade liberalization in the post 1990 period, the country will be challenged to maintain surpluses on agricultural trade, particularly since the level of food imports are expected to rise.

Table 6:

Guyana: Agricultural Trade Balance (SITC 0)

US \$ M	1989	1990	1991
Agri-Food Exports	121	117.5	127.8
Agri-Food Imports	29.6	25.1	15.3
Agri-Food Trade Balance	91.4	92.4	112.5

Source: national statistics

Between 1991-1995, the volumes of frozen and processed vegetable imports increased rapidly. In fact, the level of frozen and processed vegetable imports in 1994 represented a 1,034% increase over 1991 import volumes. Fresh vegetable imports, which included commodities such as carrots, sweet peppers, cauliflowers, and broccoli, were sold mainly by large supermarkets and mostly consumed in hotels and restaurants. Fruit imports also increased steadily between 1991-1995. This increase also reflected the expansionary effects associated with the removal of import restrictions on specific commodities, such as grapes, apples, pears etc. These commodities enjoy high levels of demand among consumers.

In spite of the anticipated increase in food imports, the increasing trend in the production of a more diverse range of agricultural commodities augers well for Guyana's ability to maintain a surplus on agricultural trade. In addition, the relatively stable trend in the prices of traditional and non-traditional export crops will also contribute to the maintenance of agricultural trade surpluses.

Within recent times, the expansion of the production base, in terms of range of commodities produced, led to an increase in the domestic content of food supplies (including meat products). In fact, the bulk of domestic food production is undertaken by the small farming community. While individually, the contributions of the small farmer in terms of volume and quality of production appears to be insignificant, on the aggregate, small farmer production contributes significantly to agricultural diversification and overall growth of the agricultural sector. In fact, it has been determined that of the more than sixty non-traditional crops exported between 1993-1994, all, but copra, were produced in the small farming community.

#### Agricultural Diversification

Notwithstanding the impressive performance of the agricultural sector under the ERP, gross agricultural output is still heavily dependent on the two traditional crops of rice and sugar. During the period in which the Guyanese economy followed a path of "cooperative socialism", the government of the day attempted to foster some degree of diversification with the intention of reducing the sector's vulnerability to external market forces. To date however, very little diversification, both within the sugar and rice industries and into new or non-traditional crop and other production, has occurred.

In terms of sugar, prior to the 1990s, GUYSUOCO embarked upon a programme to diversify its operations in order to enhance competitiveness. An old sugar estate at Versailles was converted into a diary project which was expected to provide milk for local consumption, as well as engage in the production of cheese. However, with the reinstatement of Booker Tate in 1990, the management consolidated the sugar assets

and divested non-sugar operations, thus terminating the dairy project. The relatively small scale and low output from the dairy project resulted in the cessation of the cheese operations. The low volume of milk was attributed to:

- low prices for milk products;
- supply difficulties and the high cost of feed supplements;
- the enforcement of municipal and local and government laws on grazing;
- the disappearance of community pastures, and
- the lack of pasteurising, storage and transport facilities.

Another element of GUYSUCO's diversification programme was the construction of tilapia (a freshwater fish) ponds on many of the estates. However, this project, like that of the cheese and dairy farms, was considered uneconomical by Booker Tate and as such, the aquaculture project was discontinued. Successful diversification around the sugar industry required an aggressive marketing strategy and improvements in product quality, factors which were lacking following the introduction of the dairy and aquaculture projects.

Very little diversification occurred within the rice industry due to the existence of lucrative markets for Guyana's cargo rice, especially those going to Europe through the OCT route. As long as this avenue remained available to Guyanese exporters, then there would be very little incentive to develop parboiling or polished rice for export. Other factors which discouraged product diversification within the rice industry included the high capital cost associated with installing equipment to carry out parboiling, the erratic electricity supply and the increasingly stringent export quality conditions. A potential opportunity for policy-makers to encourage diversification exists with the removal of restrictions against rice imports. This could increase competition within the domestic market in particular and force producers to diversify their operations.

The relatively slow progress in non-traditional crop production has been due to a range of factors. Generally, the continued concentration of organised activities around sugar and rice

production has restrained small farmer initiative and hampered the expansion of non-sugar and rice production. This was particularly evident in terms of the availability of land and other facilities for efficient non-traditional crop and livestock production. The producers of non-traditional crops and livestock are generally small farmers, the majority of whom are resource poor. Thus to ensure greater participation in the diversification process and hence a greater degree of diversification in the agricultural sector, measures must be initiated to ensure that these small farmers have greater access to credit as well as the necessary advisory, production and marketing services and facilities.

The diversification programme is also hampered by the fact that these small farmers are also involved in multi-cropping systems as a means of achieving some income stability. This type of farming system perpetuates the constraints which derive from small production area, and high seasonality of output. However, while no data exist, there is reason to believe that as a result of the reformed incentive system for traditional crop production, there has been greater incentive for increased small farmer production of other crops.

In addition to the serious deficiencies at the farm level, in general, agricultural diversification in Guyana has been confronted by a number of constraints at all levels. Poor supply of planting material and the absence of improved cultivars and technological packages for most crops continue to be major constraints. Apart from rice and sugar, other crops in Guyana do not benefit from adequate and efficient post-production and marketing facilities. The public markets in particular, are undersized, and poor transportation links to export markets are inappropriate for the expansion of the sector.

#### **Commodity and Sub-Sector Performance** **Sugar**

Sugar cane cultivation and sugar processing in Guyana, which dates back to the 17<sup>th</sup> Century, remains the single most important economic activity in the agricultural sector. The industry is state-owned and managed by a parastatal company, Guyana Sugar Company (GUYSUCO). Sugar cane is cultivated on estates of

approximately 48,000ha in size, complemented by some 2,200 small independent farmers occupying approximately 4,800ha. The state-owned company accounts for 90% of sugar production in Guyana.

Guyana's sugar is exported to the EU and US markets under quota. Prior to 1990, the sugar industry was in a critical position, in terms of production and export levels. For most of the 1980s, the volume of sugar exports declined steadily. In fact, sugar production and export levels reached their lowest of 132 thousand tons and 129.3 thousand tons respectively in 1990. During that year (1990), Guyana, for the first time, was forced to import sugar in order to meet its EU sugar quota and secure its preferential market in Europe.

The impact on the economy of Guyana of further decline in the sugar industry (both sugarcane and milling), was estimated to be responsible for most of the 3% decline in agricultural value added and for roughly 60% of the decline in total GDP over the 1981-90 period<sup>1</sup>. This decline was attributed primarily to the following.

- (i) inappropriate Government policies which exhausted GUYSUCO's resources and limited its access to foreign exchange, thereby reducing its ability to replace and maintain capital equipment and obtain other agricultural inputs. Consequently, agricultural practices, infrastructure and factory and capacity were negatively affected;
- (ii) loss of management personnel, decrease in labour participation, an increase in labour unrest partly due to low salaries and wages. Further, the inability to freely access foreign exchange, negatively affected the industry in terms of its capacity to invest in equipment and maintenance and also its ability to acquire fertilizers and agro-chemicals. Consequently, the industry's production and productivity declined dramatically.

In an attempt to reverse the declining trend in the sugar industry, the organisational structure of GUYSUCO was reformed in October 1990 and the industry administration brought under

private sector management. To this end, the multinational firm of Booker-Tate was contracted to undertake the management of GUYSUCO's operations. Among the changes instituted was the increase in the wage rate by 200% between 1990-1992; a measure which substantially reduced industrial action in industry. GUYSUCO also refocused its priorities on sugar production and re-allocated resources out of the less profitable activities of livestock and fish farming. Substantial investments in drainage and irrigation schemes also facilitated the expansion of sugar cane cultivation on the coastal area, with total area increasing from 36,000ha in 1988 to 44,000ha in 1995. The increase in cultivated area was also matched by similar increases in yields from 4.3 tons sugar per hectare to 5.9 tons/ha over the same period. As a result of these initiatives, both production and export volumes reported substantial increases in the post 1990 period.

These industry developments largely account for the steady improvement in industry statistics over the 1991-1995 period. Sugarcane production peaked at 3.2 million tons in 1994, before leveling off at approximately 3 million tons in 1995. Sugar production also increased throughout the 1991-1995 period, rising from 162.5 thousand tons in 1991 to 254.3 thousand tons in 1995, an increase of 56%. In addition to improvements in field productivity, factory retooling, equipment rehabilitation and an overall increase in operating efficiency, also contributed to the strengthened position of the sugar industry during the 1991-1995 period (Table 7).

Table 7  
Guyana: Sugar Industry Statistics 1991-1995

	1991	1992	1993	1994	1995
Area Harvest, '000 ha	37.8	40.1	41.5	42.5	42.4
Cane, '000 tons	2,330	3,120	3,183	3,199	2,909
Yields:					
tons cane/ha	61.6	74.5	76.7	75.6	68.6
tons cane/ton sugar	14.3	12.6	13.1	12.5	11.5
sugar tons/ha	4.3	6.2	5.8	6.1	5.9
Production, '000 tons	162.5	247.0	246.5	256.7	254.3
Exports: '000 tons	150.1	229.5	236.8	238.3	225.4
US\$M	89.8	134.1	116.3	116.4	125.5

Source: Bank of Guyana Statistical Bulletin Dec. 1996

Between 1991-1994, sugar export volumes increased by 58.8%, declining slightly in 1995. This rapid recovery of the sugar industry

<sup>1</sup> World Bank 1993

enabled Guyana to fulfill both its EU and US preferential market quotas, while simultaneously supplying its domestic and CARICOM markets. Following a loss of confidence in the Guyana sugar industry during the 1988-1991 period, the industry has regained its reputation as a reliable supplier and one capable of quick response to market instability created by declines in shortfalls from regular suppliers.

Despite the increased export tonnage over the review period, sugar export earnings generally declined between 1992-1994. This was due largely to a fall in export prices. In 1995 however, the revenues of GUYSUCO increased as a result of currency movements of the Pound Sterling within the EU monetary system and appreciation against the US dollar. The net result was an inflation of earnings in Guyana dollars. Additionally, the new Special Preferential Sugar (SPS) facility introduced in July 1995, provided an alternative lucrative outlet for sugar which would have otherwise been sold at a much lower price on the world market. The combination of favourable currency movements and the SPS facility made 1995 a year of windfall revenue for the Guyana Sugar Industry. The revenue windfall in 1995, however, did not translate in a fundamental improvement of the sugar industry's marketing position. Basic prices in the EU remained static and in fact, declined in real terms.

The more critical challenges then confronting the industry were that of increasing competitiveness and adequately supplying roughly 225 thousand tons per annum to its three main markets: (i) the European Union where in 1990 Guyana had preferential access to export 163.5 thousand tons per annum at a price of roughly US\$0.25/lb; (ii) the U.S. where in 1990 Guyana had an export quota of 23 thousand tons per annum at a preferential price of US\$0.21/lb and; (iii) the domestic market with an estimated annual consumption of about 38.5 thousand tons. These challenges still remain relevant to the Guyana industry in the post-1997 period.

#### Rice

In terms of value of production and foreign exchange earnings, rice is Guyana's second most important agricultural industry. In addition to

fully satisfying domestic demand, the rice industry is a major source of income and employment in rural areas. While current figures on employment in the rice industry are not available, the 1978 Agricultural Census indicated that about 12,600 households (representing about half of Guyana's farming population) were involved in paddy cultivation. Rice growing and milling are undertaken by private farmers and millers, respectively. The provision of seed paddy, research and extension services, infrastructure maintenance and export marketing support falls within the purview of the Government through the Guyana Rice Development Board (GRDB), the National Agricultural Research Institute (NARI) and the MoA.

Over the 1991-1995 period, the rice sub-sector registered impressive improvements, with paddy production increasing from 251.3 thousand tons in 1991 to 525.5 thousand tons in 1995, an increase of 109.1%. The volume of processed rice also registered similar increases, from 150.8 thousand tons in 1991 to 317.0 thousand tons in 1995 (a rise of 110.2%) (Table 8). However, while previous increases in output were achieved largely through acreage expansion, the increases in output between 1994-1995 were due primarily to improvements in both field and factory productivity, with yields increasing by 10.6% in 1994.

Table 8

Guyana: Rice Industry Statistics 1991-1995

	1991	1992	1993	1994	1995
Harvest area, '000 ha	75.2	79.2	101.3	101.3	130.8
Paddy '000 tons	251.3	280.5	350.4	383.1	525.5
Yield-ton/ha	2.0	2.1	2.08	2.3	n.a.
Production, '000 tons	150.8	168.3	210.2	233.4	317.0
Exports, '000 tons	54.0	115.1	124.1	182.6	200.5
US\$M	18.0	35.0	33.0	55.6	76.5

Source: Bank of Guyana Statistical Bulletin Dec. 1996

This revitalised performance was also attributed to an expansion of private farm cultivation, stimulated by expectations of continued good prices, and investment in irrigation facilities which allowed for an extended production period. Far reaching policy reform aimed at addressing the negative interventions on the sector, including divestment of state-owned mills, price deregulation and the elimination of the Government monopoly on rice exports, also

stimulated re-investment in paddy production and rice processing. Among other things, the government's divestment programme resulted in a reduction of state-control of rice complexes from 8 in 1988 to 2 in 1992.

Both expansion in cultivated area and improvements in yields have enabled the rice industry to regain high export levels between 1991-1995. In terms of export volume, the increase has been phenomenal, rising from 54 thousand tons in 1991 to 200.5 thousand tons in 1995 (an increase of 71.3%) It is important to note that the increase in rice exports between 1991-1995 was achieved against the backdrop of a loss in a substantial portion of the Jamaican rice market due to the influx of cheaper PL 480 rice imported from the US.

Rice, as the case with sugar, benefits from preferential access to the EU market. Guyana is presently supplying two markets, the EU and CARICOM. Despite high costs relative to world prices, the rice industry is still a viable option because of the protected nature of these markets. The EU market established under Lomé IV, was ratified in August 1991 to remain in effect until 2001. It provides for 125 thousand tons of rice and 20 thousand of brokens to be imported into the EU by ACP countries. Guyana supplies about 40-45 thousand tons of the EU quota each year.

Between 1989-1991 the EU accounted for the largest share of Guyana's rice exports (an average of 76.3% per annum). In 1992 the pattern changed. Following the significant increases in production levels, Guyana's direct exports to the EU dropped to only 17% of total exports, due in part to the resumption of significant volumes of rice exports to Jamaica. In 1992, the Jamaican market accounted for a 46% market share of rice exports from Guyana.

In addition to direct exports to the EU, an indirect route to the EU market, through Curacao and Bonaire, was introduced following new regulations under the EEC 1992 Single Market agreement. As Dutch overseas countries and territories (OCT), Curacao and Bonaire were allowed to export industrial and processed agricultural products, if sourced from an ACP country, to the EU without paying levies. Thus

rice imports from Guyana were semi-processed and re-exported to the EU under this OCT facility. This facility did not constitute part of the ACP quota and prices for processed rice products tended to be higher than raw rice exports, even after the additional shipping and processing costs are taken into account.

#### **Non-Traditional and "Other" Crops**

This category includes non-sugar and non-rice crops. The major non-traditional or other crops "NTCs" tend to be classified under the broad headings of root crops, vegetables, fruits, seasonings, oil crops, grains, legumes and cereals. NTCs are generally produced by small farmers as part of an integrated farming system on areas adjacent to sugar and rice estates and in rural areas. The utilisation of improved technologies is invariably low, with most operations performed manually. During the mid-to-late 1980s, rapid growth of the parallel economy stimulated an increase in exports of food crops and this expanded market has contributed positively to the increase in the role of the NTC sub-sector to agricultural GDP. As a result of institutional deficiencies, the data base on "other crops" is deficient and unreliable.

Cereals and grain legumes form an integral part of the population's diet and also constitute important components of livestock feed. Corn is an important cereal crop grown by a multitude of small producers in the coastal areas as well as within the Amerindian communities. As is the situation in the Caribbean in general, root crops constitute an important source of food and income in rural communities. During the 1985-1987 period, following the imposition of import restrictions on wheat flour, root crops were consumed in significant quantities as substitutes for wheat flour products.

In terms of production and cultivated acreage, pineapple and citrus are the most important fruits grown in Guyana. Mango, avocado, carambola, bananas, West Indian Cherry, passion fruit and sapodilla are also produced by small farmers. Coconut production has also increased in importance in recent times.

This "other crops" sub-sector has traditionally played a secondary role to the more established

export crops of sugarcane and rice. Generally, the sub-sector registered declines in the contribution both to real agricultural and national GDP between 1991-1995. In the case of real agricultural GDP, the "other crops" category share fell from 22.2% in 1991 to 16.5% in 1995, while the sub-sector's share in real GDP declined marginally from 5.5% to 5.0% over the same period. Production is geared specifically towards satisfying domestic needs and is undertaken mainly by small farmers on lands adjacent to large sugar and rice farms, and in rural areas

Within the 'other crops' sub-sector the output of coconuts, cassava and plantains recorded significant increases (in excess of 60%) for the review period (Table 9). Tomato, cabbage and legume production almost doubled over the six year period. Pineapple production also registered increases from 1992 through to 1995.

Traditionally, the commodities in this "other crops" category have been produced primarily for domestic consumption. This largely explains the relatively low level of volumes and earnings of the exports of this category (Table 9). In spite of their low levels, foreign exchange earnings from exports of these crops remained relatively constant throughout the 1991-1993 period. On the contrary, export volumes exhibited great annual variability over the 1991-1994 period.

Table 9  
Guyana: Non-Traditional Crop Production & Exports

Production	1991	1992	1993	1994	1995
Coconuts mn nuts	54.6	56.3	63	72	91.5
Cassava '000 mt	31.6	30.8	30.1	29.2	35.1
Plantains '000 mt	13	13	13.2	19.4	21.2
Pineapple '000 mt	6.5	8.8	9.5	10.1	10.4
Tomatoes '000 mt	1.6	1.6	1.9	2.0	3.3
Cabbage '000 mt	1.2	1.3	1.7	1.8	2.6
<b>Exports</b>					
Food crops tons	172.6	289.1	115.7	206.8	na
US\$M	0.03	0.04	0.03	-	na
Season/Spice tons	2.5	15.8	13.5	30.9	na
US\$M	0.01	0.01	0.01	-	na
Fruits tons	731.3	419.8	516.5	587.4	na
US\$M	0.20	0.17	0.12	0.17	na
Vegetables tons	87.5	44.1	32.7	93.5	na
USM	0.01	0.02	0.02	-	na

Source: National Sources; IDB

The unreliability of supplies due to poor internal farm-to-market road transportation, unpredictable weather conditions, and the

difficulty faced by producers in obtaining credit have been cited as some of the factors responsible for the variable export volumes. Since 1992 however, fresh and processed seasoning and spice exports have been increasing as a result of new markets and improvements in transportation facilities and cargo services (cold storage).

Fruit exports declined between 1989 and 1992, from 857.8 tons to 419.8 tons - a fall of approximately 51%. This decline in exports was attributed to a number of factors which included poor produce handling at transit points in Trinidad and Barbados; the non-competitive prices generally paid for exported fruits; the difficulty of maintaining a reliable supply of produce; and the difficulty of ensuring the quality of the commodities due to the absence of a quality and standard enforcement agency. The years 1993 and 1994 showed increases in fruit exports to Europe, North America and the Caribbean as new markets were identified in these areas.

Excluding the year 1991, vegetable exports generally declined over the period. The significant increase in vegetable exports in 1991 was attributed to the similarly significant increases in the shipment of pumpkins to the Netherlands and the United Kingdom; the introduction of Royal Air Cargo Service to CARICOM countries and North America; the introduction of containerised services by Blue Caribe and Tec Marine Lines to Miami and European West Indian Lines to Europe; and the Development of "EXPONEWS" Newsletter.

In spite of these positive developments, vegetable exports declined in the post-1991 period. This decline was as a result of the difficulties in ensuring standardised quality for exported vegetables, the non-existence of an efficient and regular cargo service to the main markets (US and Canada) and problems experienced in organising shipments of quality vegetables from remote production areas. Other difficulties experienced by exporters which resulted in a decline in the level of vegetable exports included:

- a) The difficulty of securing a reliable supply of the products from the large number of small producers;
- b) Little or no access to short-term transactional financing;
- c) Poor handling of perishable produce transported by air, and;
- d) The reluctance of shipping lines to transport perishable products (particularly to the Trinidad market).

The remarkable recovery in vegetable exports in 1994 was attributed to marked increases in shipments to the "exotic vegetables" markets in New York, Toronto and Antigua. Additional benefits were derived from the use of transport shipments to Trinidad on vessels seeking much needed cargo out of Guyana on the return trip.

### Livestock

The livestock sector contributed an average of 5.5% of real agricultural GDP between 1991-1995. From 1993, output in the livestock sub-sector recorded continued growth. However individual industry output levels exhibited great variability between 1991-1995 (Table 10).

Table 10:

Guyana: Livestock Production					
	1991	1992	1993	1994	1995
Beef '000 mt	3.0	4.2	3.8	4.6	3.8
Poultry '000 mt	1.5	3.1	4.1	6.2	7.3
Milk mn. gal.	8.5	8.6	8.8	6.0	6.0
Eggs mn.	5.3	7.3	8.5	16.5	30.4

Source: national statistics; IDB

Beef and dairy cattle production is the most important livestock industry in Guyana. The National Dairy Development Programme (NDDP) was initiated in 1984 specifically to achieve Government's objective of national self-sufficiency in the production of milk and the reduction of foreign exchange expenditure on milk imports. The programme was expanded in 1998 to increase output in milk and dairy products as well as beef and beef products and the export of these commodities.

The NDDP has continued to foster development within the cattle industry primarily through the transfer of appropriate dairy production technology, including the use of artificial insemination and the cultivation of improved

pastures. As a result of this initiative, Guyana has achieved relatively high self-sufficiency levels in beef production. At the end of 1983, the level of fluid milk production in Guyana was about 3.3 million gallons, representing approximately 25% of the national requirement. By 1989, production had more than doubled.

While a significant proportion of Guyana's livestock requirements are adequately met from local production, Guyana imports quite a substantial amount of processed beef and pork products. During the 1991-1992 period, the volume of beef and beef product imports increased sharply from 103mt to 674mt, an increase of 554%, before declining by approximately 87.6% in 1993. However, in 1994, the volume of beef and beef product imports increased sharply, by more than 1,000%. This significant increase was partly the result of an increase in herd size. This growth in beef size was also evident in the general increase in beef production from 3,000 tons in 1991 to 3,800 tons in 1995. The 1994 Cattle and Milk Production Survey estimated the number of cattle in the coastal regions at 238,333 heads.

Poultry, swine, sheep and goat rearing is also undertaken on a relatively smaller scale. The 1994 pig population was estimated at 175,000, sheep at 120,000 and goats at 77,000 heads. For most of the 1990s, growth in the pork industry in particular, continued to be sluggish. The unavailability of inputs, particularly animal feed (both from imports and local production), which plagued these enterprises since the 1980s severely affected the scale of pork production in Guyana. The emerging "feed crisis" in the pig industry led to prolonged adverse impacts, with which the industry continued to struggle in the 1990s. Competition with the local poultry farmers for the available, but limited locally produced feeds and by-products contributed to a further decline in the industry. Consequently, pork production declined by some 50% between 1985 and 1995.

During the early 1990s, the local poultry industry was also faced with serious competition from the cheaply imported poultry meat and table eggs. This largely explains the relatively low output levels attained compared to the 1993-1995

period. Import concessions provided to local poultry producers however, stimulated the industry's revival of the local poultry industry as local producers were able to produce at a more competitive price. As a result, the production of poultry meat increased by 135% between 1992-1995. Egg production declined progressively during the 1980s, reaching its lowest in 1990 of 5.3 million eggs. Production increased gradually between 1994-1995 as locally produced eggs became competitive with imported eggs. In fact, between 1993-95 egg production grew at an average rate of 89% per annum.

Availability of high quality feed in sufficient quantities was in fact, a problems affecting all the livestock enterprises, albeit in varying degrees of severity. Notwithstanding the local availability of rice bran, copra meal and molasses, such availability is subject to high levels of seasonality, which affects prices during periods of scarcity. In addition to the reliance on imports for protein, in many instances, the imported concentrate is costly and the industry has so far been unsuccessful in finding an appropriate imported protein - local material feed blend. The resulting low quality of blended animal feeds acts as a limiting factor to stock productivity.

In spite of the importance of domestic meat production, well quipped abattoir facilities are generally lacking. Of the available facilities, those operated by the state, are neither sanitary nor functional. In contrast, the existing two private-sector abattoirs are highly efficient, and also process ham, bacon and sausages. There continues to be need, however, to improve the quality and variety of processed meat products and other meat preparations if the livestock industry in Guyana is to expand beyond national boundaries. The fact that livestock products have yet to contribute to export earnings is linked mainly to the inability to satisfy stringent sanitary requirements.

#### **Fisheries**

Fish is a major source of animal protein for a large majority of the Guyanese population. Consequently, fishing has become an important industry in the agricultural sector. 1980-1988 estimates indicated an increase in per capita

annual consumption of fish from 9kgs to 27kgs over that period, with an estimated increase in per capita consumption to 45kgs in 1995.

Fishing activities in Guyana range from marine, and inland fisheries to aquaculture. The marine fisheries industry comprises both offshore industrial/trawl fishery and inshore small-scale/artisanal fishery. The size of the offshore industrial fleet averaged over 100 trawlers providing material for four licensed fish/shrimp processing plants. As was the case with the Suriname shrimp industry, there is a large presence of foreign ownership (53%) in the industrial fleets which focus activities on prawn and to a lesser extent, fin-fish. Locally-owned trawlers tend to concentrate on seabob, a smaller shrimp.

The artisanal fishery sub-sector comprised of approximately 1,300 vessels ranging in size from 6 - 18 meters. The numbers of small-scale fishermen were estimated at 4,500, of which about 1,000 owned boats. The catch normally comprised of whitebelly shrimp, seabob, bangamary, butterfish and catfish. Sixty-four farms, including two registered fish culture cooperatives utilize approximately 670ha of coastal lowland in a controlled exploitation of the coastal swamp for a variety of fin-fish and shrimp species. The average farm is 11ha. Freshwater culture of *Tilapia mossambica*, *Tilapia nilotica* and to a limited extent, *Hoplosternum littorale* are the main species cultured in Guyana.

Inland fishing occurs in rivers, creeks, canals as well as in the savannah area during the rainy season. Until very recently, this component of the fisheries sub-sector was largely under-exploited with any such activity dominated by small-scale and part-time fisherfolk, Amerindians, mining camps etc.

Between 1991-1992 the fishing industry contributed an average of 10.6% of agricultural GDP and 2.9% of overall GDP in real terms. Total fish output stabilized at roughly 37 thousand metric tons between 1992-1995 (Table 11). In contrast, the output of prawns declined steadily throughout the period. However, this trend was compensated for by an increase in shrimp landings. In 1995, shrimp/prawn landings stood



at 17 thousand metric tons, an increase of 178.7% over the 1993 volumes.

Guyana's 1994 export earning from fisheries was approximately US\$20.5 million. Exports of finfish grew from 943mt in 1989 to 3,485mt in 1994 while shrimp exports (seabob, and white belly) rose from 719mt to 1,408mt during the same period. There was a slight decline in the export of prawns, from 1,892mt to 1,482mt during the same period.

Table 11:  
Guyana: Fish & Shrimp Landings & Exports

	1991	1992	1993	1994	1995
<b>Landings' 000 mt</b>					
Fish	36.1	37.1	37.2	37	37
Shrimp & prawns	6.4	6.0	6.1	na	17.0
<b>Fish Exports mt</b>					
Prawns	1,922	1,526	1,630	1,483	n.a.
Seabob & Whitebelly	1,073	1,238	,239	,408	n.a.
Finfish & By-Products	2,367	3,151	3,080	3,485	n.a.
Crabmeat	10	16	11	9	n.a.
<b>Shrimp Exports US\$m</b>	18.6	13.0	11.4	25.5	n.a.

Source: national statistics; IDB

The US is the major destination for Guyana's shrimp exports, which enter the market under the Caribbean Basin Initiative (CBI) free of duty. Traditionally Guyana's exports of fish and fish products in the US have been limited to relatively minor quantities. For Guyana, this lack of market penetration could be attributed to infrastructural constraints and poor market information.

In addition to marine and inland fisheries, there have been some experiments with aquaculture fisheries. However, progress has been relatively slow due largely to the lack of funds, skills, equipment and infrastructure and technical support for research, technology development and extension. This situation was exacerbated by the high initial capital cost involved in establishing an aquaculture farm. Brackish water culture occurs mainly in the brackish water swamp along the Atlantic Coast in the Corentyne and Berbice.

Ornamental fish are also caught in the upper reaches of the rivers for export to specialised markets in the US. Most of this activity is

undertaken by collectors who sell their catches to exporters on the coast.

### Forestry

The contribution of the forestry sub-sector to real agricultural and national GDP increased steadily within recent times. In fact, the sector's contribution to Guyana's GDP was estimated at between 4-5% with export revenues almost tripling from 1987 to US\$25 million in 1994. The total full-time and direct and indirect employment opportunities created from forestry was estimated at approximately 20,000. This estimate did not include informal jobs due to timber and non-timber harvesting opportunities.

In fact, as more and more areas become accessible for forest-related activities, the forestry sub-sector is seen as a new growth area in Guyana's agricultural sector. Timber production recorded a phenomenal increase between 1991-1995 from 150,597 cubic metres to 538,437 cubic metres, an increase of 270% (Table 12). In 1992, only about 40% of the forest areas was accessible and only 10% was exploited. A total of 3.7 million hectares was allocated for commercial use by 10 large companies and 250 medium and small operators to supply the domestic market and some CARICOM countries with wood products.

Table 12:  
Guyana: Timber Production & Exports

	1991	1992	1993	1994	1995
<b>Production</b>					
Cubic metres	150,597	188,994	237,125	469,557	538,437
<b>Exports</b>					
Cubic metres	15,824	15,261	18,614	39,166	43,121
US \$M	4.0	3.7	4.5	7.9	8.3

Source: Bank of Guyana Statistical Bulletin, Dec. 1996

Guyana's economic liberalization and state divestment policies stimulated rapid growth of investment in forest and timber activities. The firm of Barama, a Korean-Malaysian partnership, was awarded a 1.6 million hectare concession for the manufacture of plywood for export. However, while the Government continued to welcome such economic initiatives in the industry, emphasis was placed on the requirement that the forests should be harvested in a sustainable manner. Sustainability is defined as that which will not alter the tropical forests

ecosystems and will provide a sustained yield of wood products. As a result of these measures, timber exports experienced a dramatic increase over the 1991-1995 period. Timber export volumes rose by 172.5% from 15,824 cubic meters in 1991 to 43,121 cubic metres in 1995 (Table 12). Foreign exchange earnings virtually doubled, from US\$4m in 1991 to US\$8.3m in 1995.

Apart from the issuing of a large concession area to the BARAMA Company Limited (BCL) – a Korean firm – for logging, the rapid growth in forestry activities was also attributed to technical assistance received from Canada and Germany; relaxation of the foreign exchange regulations, the divestment of the Demerara Woods Limited to a private investor from the Netherlands in 1991 and financial and technical support provided by Canadian International Development Agency (CIDA). In fact, CIDA provided a line of credit for the purchase of sawmilling facilities and also funded an Interim Forestry Programme that sought to assist with the strengthening of the Guyana Forestry Corporation (GFC). In addition, the British Overseas Development Administration (ODA) provided assistance to the Guyana Government towards efforts aimed at alleviating problems associated with the shortage of trained personnel as well as financial resources to strengthen the GFC's policy framework and revenue collection system.

The performance of the wood processing industry has not matched the developments in the timber and logging industries. The wood processing industry's growth has been hindered by financial constraints, the lack of basic infrastructure (primarily an inadequate electricity supply and the absence of kiln drying facilities), staff shortages at all levels, lack of equipment and spares, as well as exorbitant freight costs for extra regional exports.

#### **Agro-Processing**

Agro-processing activities in Guyana fall into three categories: micro-processing, small-medium processing and large-scale food processing and/or manufacturing. Each category plays an important role in the development of the agro-processing industry despite obvious differences in scale and resource endowments.

Guyana produces a variety of agricultural commodities, many of which offer viable linkages to agro-industry. The more commonly processed fruit products have been guava, cherry and pineapple jams and jellies, other preservatives and pulp for the production of concentrates. Carambola is also used to produce candied fruit for local and export markets. Some varieties of local fruits are also used in the production of flavours for the manufacture of carbonated soft drinks.

Data limitations preclude an analysis of the overall agro-processing sub-sector. However, given the dominance of the non-alcoholic beverage industry, its performance over the 1991-1995 may be used as an indicator of the general trend of agro-industrial activity in Guyana. The non-alcoholic beverage industry comprises a number of operators [the two largest being Banks DIH Ltd and Demerara Distillers Ltd (DDL)] that rely heavily on imports of concentrates. The non-alcoholic beverage industry has developed largely through trade marks and the licensing of international brand names.

Within recent times, due to the threat of declining profits, Banks DIH and DDL have successfully diversified into food processing activities. Banks DIH is involved in a number of food houses and manufactures biscuits, snacks, cereals and tomato ketchup. The food processing segment is generally characterised by a higher local raw material content. For example, snacks are made from inputs that include plantain, flour and sugar.

The alcoholic beverage industry (rum, beer, stout, ale wines and ports) has evolved, and continues to grow along oligopolistic lines, satisfying national, intra- and extra-regional markets. Banks DIH Limited is the sole producer of beer, stout and malta primarily for the local market. Banks beer is also manufactured under franchise in Barbados, Canada and the USA. DDL has a global business orientation and has penetrated niche markets world-wide. It purchases the bulk of the locally produced molasses from GUYSUCO, which is refined and used in the production of rum, vinegar, liqueurs and methylated spirits. The company has

recently ventured into the seafood and shipping business.

As Table 13 indicates, with the exception of soft drinks production, the production of other listed commodities registered significant declines. Branded rum from Guyana have traditionally benefited from strong consumer appeal, thus commanding a premium price over bulk varieties. Indications are that the beverage industry is increasingly shifting towards import replacement whereby the relatively high volume of exotic beverage imports will be partly replaced by the local manufacture of these (exotic beverages) through access to patents.

Table 13

Beverage Production Indicators			
Category	1992	1994	1995
Rum; liters	21,821	25,791	17,926
Beer and Stout; liters	14,291	9,663	8,470
Shandy; liters	192	-	-
Soft drinks; million cases	2.15Mn	3.44Mn	3.03Mn
Malta (liters)	2,665	1,390	1,034

Source: Research Department, Statistical Bulletin (1996) Bank of Guyana

The information in table 14 provides an indication of the trends in fruit and food processing industries. As indicated, agro-processed exports from Guyana comprise among other things processed pineapple products and preserved fruit and jams, processed spices and seasonings (achar and crushed pepper). Exports of processed pineapple products and preserved fruits and jams fluctuated during the first half of the 1990's. The sharp decline in 1993 was a direct result of Guyana losing a portion of the Trinidad market for pineapple chunks and jams as a result of cheaper imports of the same commodity from Thailand.

Table 14

Selected Processed Agricultural Exports 1991-1995					
	1991	1992	1993	1994	1995
Pineapple Products					
tons	111.7	209.0	124.0	49.0	-
US\$M	0.11	0.06	0.04	-	-
Fruits/Jams Presvd					
tons	44.8	40.0	3.8	24.0	-
US\$M	0.04	0.01	0.01	-	-
Heart of Palm: tons	734.0	797.0	940.9	1,218.7	1,648.3
US\$M	0.80	0.80	1.14	-	-

Source: national statistics

Of note is that Heart of Palm (used mainly as a salad) has become an most important non-traditional processed commodity export. The volume of exports has increased over the past four years from 734 tons in 1991 to 1,648 tons in 1995.

Another commodity which registered noticeable growth over the 1991-1995 period was copra. Coconut production is generally carried out on farms/estates ranging from 0.8 to 160hs. Most of these coconut farms/estates are located in the Pomeroon areas, Mahaica-Mahaicony and Corentyne Coast. While coconut palms are usually cultivated in pure stands, farmers intercrop coconut palms with legumes and vine crops during the first three or four years after establishment in order to generate income and as a form of weed control.

Since the late 1980s, Guyana increased its potential to export copra and copra meal, mainly to regional markets. Coconut production, which fell from 51.0 million nuts in 1986 to 45.4 million nuts in 1987, increased slightly between 1988-1990, to reach an output of 54.6 million nuts in 1991. Production continued to increase, surpassing the 51 million ton level in 1986 to 91.5 million nuts in 1995. This growth in the industry was very heavily influenced by improvements in the purchase price offered by the local vegetable oil industry as well as the increasing demand for copra on the regional market.

In spite of the increase in output levels, productivity on estates was, however, relatively low at 80-100 nuts a tree annually. At this production capacity, Guyana was bale to satisfy only about one fifth of the 500 tons per month requirements of the regional market.. However, in response to the favourable market conditions, there is a likelihood that many more producers will become involved in coconut/copra production.

#### Constraints to Agriculture

Prior to the 1990s, the agricultural sector was severely affected by the increased inability of the Government to provide much needed public goods and services. This was clearly reflected in the deterioration of the country's infrastructure,

particularly drainage and irrigation works, sea defenses, roads and other transportation infrastructure. However, even faced with these constraints, Guyana's agricultural sector has made remarkable recovery during the first half of the 1990s. In many instances, Guyana's agricultural sector continues to be confronted by numerous challenges and constraints which adversely impact upon agricultural production and trade. While most of these have been presented for the specific sub-sector and/or industry, the major constraints facing the sector in general are summarised as follows:

#### Low Productivity Levels

- physical (geological) limitations, including lowlands (which present significant challenges for the adoption of cost-effective drainage and water management systems), unsuitable soils and soil degradation (which adversely impact on yields and productivity);
- pests and diseases of economic significance, problems of which are exacerbated by the inadequacy of quarantine capabilities;
- small domestic and regional markets;
- low levels of human capital and inadequate application of improved technologies;
- lack of a commercial orientation in farming and propensity to produce for "protected" markets, resulting in slow progress in agricultural diversification programmes;

#### Institutional & Structural Deficiencies

- weak macro-economic framework, which constrains the development of an economic environment conducive to investment in agriculture and the creation of inter-sectoral linkages with tourism and agro-industry;
- weak institutional capacity of the Ministry of Agriculture, resulting in inadequate policy analysis, formulation and poor planning, evaluation and implementation of agriculture and rural development initiatives;
- the dependence on public-sector resources, which are inadequate to meet the demands for improved facilities, post-harvest and marketing infrastructure, training, research and other essential services;
- undeveloped domestic capital market and low propensity to invest in agriculture due to

the sector's comparatively high risks and the absence of risk-mitigating facilities, such as insurance, market guarantees and compensation;

- shortage of labour for agriculture and poor skills of the available agricultural labour force;
- inadequate storage, marketing and transportation facilities and services to facilitate and stimulate trade in agricultural commodities;
- undeveloped information systems which constrain the effectiveness of sector planning, produce marketing and trade.

While the above constraints are certainly not exhaustive, they capture the general constraints which are fairly common across all Caribbean countries. However, a few of these, including infrastructure and credit, require further discussion.

As indicated previously, one of the major constraints to agricultural development in Guyana is the lack of adequate physical infrastructure. Since most of Guyana's land area is below sea level, adequate drainage and water management systems are critical for efficient agricultural production. Over the past decade, Guyana has invested heavily on drainage and irrigation schemes mainly to provide more efficient water management systems for the agricultural sector. While there have been some improvements, due to the severe deterioration of the system, proper drainage and water management continues to be a challenge to agricultural production in Guyana.

Another debilitating constraint is inadequate access to credit for a large majority of Guyana's farming population. In spite of the improvement in the system for agricultural lending, agricultural credit is still less than 13% of outstanding commercial bank loans. This percentage is also far below the 30% of the sector's average contribution to gross national income. The difficulties associated with agricultural credit, particularly to the rural sector, was aptly summarised as follows:

*"the supply of credit ... is limited by factors such as the risk linked to agricultural production and markets, the sector's small size, its informal nature*

*and because of lack of experience of staff. Lending has been low and restricted to the larger rice producers: rice is a sturdy crop in Guyana and the rice industry is relatively well-structured, but is nevertheless, considered by lending institutions as risky. Non traditional crops are much more volatile (perishability, prone to transport and storage damage, without an established market network - particularly export - unstable prices) than rice and therefore particularly excluded from access to commercial bank credit". (AGRODEV, 1995).*

The persistence of this deficiency is also associated with the legal and regulatory limitations of Guyana's financial sector, inefficiencies in the legal system and marketing channels, poor performance of the financial institutions which serve the farming community and government intervention in commercial banks.

In spite of the progressive economic reforms undertaken in the agricultural sector, particularly in the rice and sugar industries, the institutional framework has not been sufficiently reformed to allow these industries to compete effectively under open market conditions. In addition to the problems affecting primary and traditional production, the agro-industrial sector has to contend with a number of specific challenges, including:

- the absence of a tradition in the production non-traditional commodities for a large market, which exacerbates the risks and uncertainties surrounding processing for exports;
- inadequate financing for fixed and operating capital; commercial banks are generally

unfamiliar with the production process and constraints affecting agri-food production systems, collateral requirements are therefore stringent. This together with high interest rates curtails credit to producers and discourage investment;

- limited access to new processing, packaging, and labeling technologies;
- non-availability of a variety of raw materials in the desired quantity and quality on a timely basis;
- stringent requirements by the Food and Drug analysts department regarding regulations for licensing agro-processing facilities, make it difficult for a small 'bottom house' agro-processors to become officially licensed.

These deficiencies at the domestic level have been brought into clear focus in the emerging trading environment of the 1990s. Global recession, which adversely affects the demand for imports and other external shocks which reduces foreign investment also impact the national economy in general and the major economic sector, in this case agriculture. Agricultural exports in general, and particularly those within protected market arrangements, have had to contend with the changing rules of international agricultural trade. In spite of the large number of constraints to agriculture at the domestic level, in most instances, the sector is most influenced by and vulnerable to international developments.

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### Agriculture in Guyana ~ Prospects

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#### International Environment

Towards the year 2000, world agriculture will be increasingly influenced by an acceleration in the pace of globalisation and trade liberalisation. Trade is identified as the driver of this emerging environment and within recent times, the dynamics of the globalisation and liberalisation have also been extended to agricultural trade. Prior to the 1986-1994 Uruguay Round of

international trade negotiations, agriculture was a very heavily regulated sector.

For the first time, these international trade negotiations included the agricultural sector, with the general objective of reducing the distortions in trade in agricultural products. These distortions resulted from government intervention and support for agriculture in the

form of subsidies and other domestic support. The conclusion of the Uruguay Round and the establishment of the World Trade Organisation (WTO) in January 1995 marked the end of an era of protection the agricultural sector. While developed countries were given a maximum period of six years for implementing commitments (i.e., 1995-2000), developing countries were allowed a period of ten years (i.e., from 1995 - 2004) to comply with the various WTO Agreements.<sup>2</sup> The main WTO Agreements which impact the agricultural sector are summarized below.

- Agreement on Agriculture: 3 Commitments

*Market Access* commitments require the conversion of all non-tariff border measures (import quotas), to tariffs which provide the same protection (process called tariffication). Tariffication is to be followed by a reduction in all tariffs by 24%. Provision is also made for the institution of a minimum-access tariff quota, initially set at 3% in 1995, to increase to 5% by 2004.

Countries are, however allowed to include special arrangements in their minimum access commitment and to allocate their minimum access to exporters with special arrangements, such as with the EU and sugar. Special safeguard provisions were also included for tariffied products that will allow additional duties to be applied in cases where shipments priced in domestic currencies fall below a certain trigger or in the case of import surges. This introduces, at least, the possibility of new protective measures being used in agriculture which may represent a weakness of the agreement.

*Domestic Support* commitments require reductions in the level of expenditures on domestic agricultural support measures which distort genuine trade, by 13.3% between 1995-2004. Trade-distorting aggregate measures of support (AMS) are referred to as amber box measures and include acreage payments,

certain subsidised loan programmes, input subsidies and price supports.

*Export Subsidies* commitments require reductions in the value of direct export subsidies by 21% and in the volume of subsidised exports by 14% between 1995-2004. Developing countries are exempted from commitments on marketing of agricultural exports or internal transport subsidies.

- Sanitary & Phytosanitary (SPS) Agreement

This agreement covers food safety and animal, plant and health regulations. The agreement stipulates that the use of these measures should only be in instances where human, animal or plant life or health is threatened. Although negotiations towards the development of a globally accepted code of standards are still ongoing, Caribbean countries are encouraged to base their national SPS measures on international standards, guidelines and recommendations; higher standards may only be imposed if there is scientific justification.

- Ministerial Decisions

The Decisions on Measures Concerning the possible Negative Effects of the Reform Programme on LDCs and NFIDC seek to ensure that these countries are not disadvantaged in terms of higher food prices. The provision of food aid and basic food stuffs provided in full grant form constitutes the key elements of these Decisions.

The basic objective of agricultural trade liberalisation is to reduce the level of protection which imposed constraints to other potential suppliers of the specific agricultural commodities. The agreements may negatively affect some participants in agricultural trade, particularly the least efficient producers. However, for most, tariff reductions and the elimination of quantitative restrictions may impact positively on their production costs, particularly as the cost of imported inputs are reduced. While lower costs of imported inputs is one element in enhancing commodity competitiveness, other factors, such as increased productivity, improved fruit quality and improved commodity marketing are equally

<sup>2</sup> "The Trading System After the Uruguay Round" John Whalley and Colleen Hamilton, Institute for International Economics, Washington DC, July 1996.

important in producing a cost and quality competitive commodity.

#### **International - Domestic Economy Link**

The Guyanese economy is highly open and will continue to be increasingly influenced by the rapid pace of globalisation and trade liberalisation which has been a feature of the 1990s. The Government Guyana is a signatory to the WTO and by virtue of its membership, has committed to implementing these reforms within the 10-year period. The WTO also specifies that all commitments are to be included in the country's schedules of agricultural concessions and commitments.

Guyana is among the few Caribbean countries which have undertaken reforms in agriculture and trade. However, concerns regarding import competition, particularly from products which continue to benefit from domestic supports and export subsidies have, however, contributed to the slow pace of implementation of WTO commitments in specific industries.

In addition to fulfilling WTO commitments, Guyana must now prepare for the WTO Agriculture negotiations scheduled to begin in late 1999. It is very likely that this Round will place additional pressures in the EU to further liberalise its internal agricultural policy. The EU and the ACP are currently engaged in discussions towards the development of a post-Lomé IV arrangement and preparations are also underway for the review of the EU's Common Agriculture Policy (CAP). The outcome of these negotiations will undoubtedly affect the EU-ACP trade preference regime, particularly the special commodity protocols.

#### **Commodity Market Trends<sup>3</sup>**

The dominant trends in world commodity markets reflect the changes in the global context particularly over the last 15 years. Specifically, these trends relate to the changing patterns of production, food sourcing, distribution and consumption. The following section summarises

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<sup>3</sup> Information for the main export crops extracted from the USDA's "Situation and Outlook Forum'96 Proceedings", February, 1996 and 1997; CARICOM's "Marketing Developments Relating to the Major Commodities" March 1997; Caribbean Basin Regional Profile 1998 Report.

the dominant trends for Guyana's main export commodities.

#### **Sugar**

Sugar continues to be one of the most highly protected agricultural products. In keeping with the commitments of the WTO Agreements, quotas on sugar exports are to be converted to tariffs, which are to be gradually reduced.

The long-term projections suggest eventual convergence of international prices for sugar towards the actual costs of production. This will occur partly in response to increased interactions between the local and international markets and partly in response to the reduction in government intervention in commodity markets. Much of this market dynamism is occurring in the US with similar tendencies emerging in Europe. Sugar prices on the UK market are also expected to adjust downwards as a result of the EU's commitments to tariff reductions, of 3.3% per annum to 2001.

The dynamics of the US and particularly in the EU sugar markets, the expected increase in world sugar production and the commitment to minimize distortions in agricultural trade a lá the WTO are likely to negatively impact sugar prices. The consequent decline in sugar prices thus presents significant challenges to Guyana's sugar industry.

In the short-term, Guyana's market prospects for sugar exports to the EU appear stable. The market provided by the Lomé Sugar Protocol is secured for an unlimited duration. The EU Special Preferential Sugars (SPS) facility which will remain in effect from 1<sup>st</sup> July, 1995 - June 30<sup>th</sup>, 2000 provided a substantial new market at a good price until the year 2001. In addition, Access to the US market was also granted under quota allocations via the new plan for managing sugar imports, i.e. import tariff quota (TRQ) as at 13<sup>th</sup>, 1996. This is based on the 1996 USA Farm Bill provisions which ensured secure access to sugar quota in the US market for a seven year period (1996-2002).

The primary concerns for the Caribbean sugar industry, including Guyana, include the almost complete elimination of the Uruguay Round

regional premium and preference protection of EU sugar by the year 2001; increased duty free access to the EU market for sugar exports from the non-CARICOM countries; and the Caribbean's position vis-à-vis Mexico regarding US sugar quota re-allocations during periods of shortfalls.

Marketing outlets for sugar could widen in the 1996 to 2000 period, but increases are not likely to be significant. Currency movements will have as much influence as any other factor in reducing the level of exports receipts in any given year. However, against the backdrop of trade liberalisation, the continued remarkable improvements achieved in the Guyana sugar industry up to the mid-1990s (specifically productivity improvements and cost reductions) place that industry in a favourable position to compete in the emerging post-2001 sugar market.

#### Rice

World rice production and consumption are projected to increase gradually, each by about 1% per annum between 1995-2005. Rice trade in particular, is projected to grow at 1.4% per annum between the 1995/96-2005/06 marketing period. Global import growth will be fueled by population growth and strong per capita income growth in China, Indonesia, the Middle East, Central America and the Caribbean.<sup>4</sup> Although nominal rice prices are projected to rise, real prices will tend to fall.

Guyana supplies approximately 45,000 tons of the EU quota annually, which is a very small proportion in the context of overall European rice trade. This market is relatively safe until 2001. In light of the projected increase in import growth, Guyana's increased rice production capacity enables the country to increase its participation in world trade. To this end, in light of the movement towards trade liberalisation and the removal of preferential arrangements, there is need to target export markets outside of the EU. Greater attention is being directed to increasing the share in the CARICOM market. These efforts were somewhat affected by the loss of a large proportion of the Jamaican market to

the US. In recent years the US has emerged as the main exporter of rice to the Caribbean region, accounting for a market share of over 75%.

With regard to Guyana's rice exports to the Caribbean, it is important to note that although the reduction in the CET was programmed before the conclusion of the UR and not directly in response to the GATT, exports to the Caribbean will face stiffer competition from rice originating outside CARICOM as the CET is reduced. However, the projected strengthening of the world market as well as increasing demand for long grain rice and slightly increasing prices should be beneficial to Guyana's rice industry. On the other hand, changes in rice policy in the EU, Guyana's most important market could reduce EU prices and adversely affect Guyana's rice industry.

The potential exists for continued growth of the rice sub-sector provided that some critical production-based issues (e.g. low yields in production due to stagnating technology and the deterioration of the drainage and irrigation systems) are successfully addressed. Guyana's paddy yields are low (3.5 mt/ha) in comparison to its both its existing and potential competitors, such as, Venezuela and Columbia (4mt/ha) and the US (6.3mt/ha). Additionally, relatively low labour costs in much of South and South-East Asia and the persistence of heavy subsidisation in that region, highlights Guyana's competitive disadvantage. Currently, Vietnam is able to export rice to Jamaica at a lower price than Guyanese rice, despite CARICOM's CET and transport costs.

The Guyana Rice Development Board has initiated efforts at market exploration in Columbia and Venezuela for parboiled rice. It is estimated that these markets will require approximately 20,000 tons of parboiled rice per annum. To seize this opportunity however, it is necessary that the parboiling capacity is developed. Other constraints, including inappropriate land tenure, small size of rice farms, inadequate drainage and irrigation infrastructure, and low field productivity and milling efficiency will need to be effectively addressed if the Guyana rice industry is to survive in a dynamic trade environment.

<sup>4</sup> USDA's "Situation and Outlook Forum Proceedings", 1996 and 1997.



### **Non-Traditional Crops**

Notwithstanding the improved performance of the non-traditional crop sub-sector, its growth prospects will be conditioned by a number of constraining factors. First, production of non-traded crops is severely limited by the small size of the domestic market. Second, problems relating to both production and marketing militate against the development of significant non-traditional export markets, at least in the short-to-medium term. From a production standpoint, the constraining factors are lack of appropriate technology and high production costs. In the case of marketing, the constraints are imposed by difficulties in domestic transportation, deteriorating physical infrastructure, deficient post-harvest practices, and the small size of its most readily accessible market, CARICOM.

Despite these problems, the non-traditional crop sub-sector holds great potential for contributing to the overall development of the agricultural sector and Guyanese economy. While the Government continually advocates the importance of the "other crops" sub-sector, there has been very limited specific measures implemented to facilitate its development. It should be noted, however, that the nascent tourism sector is being actively promoted. This could result in a significant demand pull which could provide the stimulus for expanded production and export of non-traditional crops. Agro industry also offers another outlet, but this remains dependent upon a general lowering of production costs of the primary product and an overall increase in volumes.

Generally, while the prospects for the non-traditional crop sector, in terms of domestic food supply, appear favourable, the low and irregular output renders prospects for exports uncertain.

An area which has potential for increased export earnings is the cut flower and exotic foliage industry, particularly to the European and North American markets. However, Guyana exports only a limited range of cut flowers and exotic plants.

### **Shrimp**

The international shrimp market is characterised by high value and is equally highly competitive. Within recent times, the conditions for entry into this market have become much more difficult as a consequence of the significance of stringent sanitary and phytosanitary regulations and the prominence of food safety issues among consumers. While traditional trade patterns may not alter significantly, traditional exporters will be required to meet these international standards if they are to maintain market share.

Guyana therefore, will be required to implement the necessary adjustments to its shrimp industry to ensure compliance with international standards, thus maintaining access, particularly in its main US market. This sub-sector has been an important contributor to foreign exchange earnings. The US is the major export destination and any reductions in the US tariffs on shrimp from non-CBI countries would indirectly render Guyana's shrimp exports less competitive. However, the income effect of increased world trade would also lead to an increase in shrimp consumption and demand, which could slightly compensate for some of the erosion in the competitiveness of Guyana's shrimp exports.

### **Timber**

Within recent times, forestry activities have assumed the role of a key economic activity in Guyana, with its share in real GDP increasing from 2.1% in 1990 to 4.8% in 1995. Guyana is one of the few countries in the world which still has the majority of its forests intact and steps are being taken to ensure that forestry activities are undertaken in a sustainable manner. This augurs well for both the timber industry and the economy. The prospects for timber in particular, and forestry in general seem quite favourable. In the case of timber, provided that the problems relating to shortage of personnel and financial resources are resolved, then timber exports are likely to increase.

### **Guidelines for Policy Formulation**

Against the backdrop of the WTO Agreements, all actors in the sector are challenged to develop WTO-consistent mechanisms to increase productivity and competitiveness in agriculture.

*"Competitiveness in agriculture can be viewed as a dynamic economic concept inherent to globalisation, that takes into account the need to adjust to the macroeconomic environment, adapt to the astonishing pace of technological innovation and be flexible in terms of the requirements of sustainable and equitable development."*<sup>5</sup>

For Caribbean countries, the challenge continues to be one of sustaining efficient traditional crop production while expanding into a more flexible, diverse agriculture. These countries are thus faced with the twin tasks of increasing productivity and competitiveness within a free trade environment while simultaneously keeping the adjustment costs relatively small so as to minimise the negative impact on resource constrained groups.

The compatibility among trade liberalisation, competitiveness and equity has been the subject of great debate both within and outside of the region. Without economic growth, capital inflows and greater technological development that generates more productive employment opportunities and greater value-added, it will be impossible to achieve more equitable social development.

Balanced and sustainable agricultural development must emphasise the production of a total commodity, which is appropriate and ready for any market outlet, rather than commodities differentiated between the domestic and export market. Within the world environment characterised by increased economic integration, consideration needs to be given to a coordinated approach to the production and marketing of Caribbean products. This can only be achieved through an appropriate mix of enabling policies, technological research and development, investment and continuous human resource development.

Policy decision making for Caribbean Agriculture should place priority on the following considerations in the design of an agricultural development strategy.

<sup>5</sup> AGRIFORUM - Towards an Agenda for Agriculture in the Americas, DIREXCOM, IICA Costa Rica, August, 1997.

- **An Enabling Policy Environment**

Macro-economic variables and economic adjustment processes have had a growing impact on agricultural performance in the Caribbean over the last decade and a half. Despite social repercussions, adjustment processes are necessary in the agricultural sector and halting them could entail higher costs in the long run.

Combining new public policy for rural areas with current macro-economic policy is essential if agriculture is to be more competitive. The adverse effects of adjustment may be mitigated through policies which ensure rational spending of public resources on direct works that support the market rather than replace it. This strongly suggests an increased role of the private sector in all dimensions of the agricultural sector.

- **Dynamic and Flexible Support Institutions**

Economic globalisation has been accompanied by a rapid transformation of the international institutional framework. Trade is now a major driver of production characterised by a growing dominance of the private sector. As a matter of urgency, the Caribbean should seek to ensure the evolution of an institutional framework characterised by an integrated and dynamic public and private sector partnership with the capacity to capitalise on strategic and tactical alliances for developing the sector.

Attention needs to be placed on the reform and development of specialist institutions, such as relates to the provision of credit, insurance, market promotion, among other services.

- **Technology Generation**

No country can maintain leadership in industry unless its research can continue to innovate technology for improved efficiency. Technologies are developed to enhance the exploitation of specific production areas, usually in the industrialised countries. Since different producing areas face different physical and ecological environments,

technologies developed to the specifics of a particular region may not be appropriate to the Caribbean. In order to ensure continuous improvements in production efficiencies, the establishment and effective operation of a Caribbean research centre for technology generation and transfer may be a prerequisite for the attainment and maintenance of competitiveness and sustainability in the agricultural sector.

Given the resource limitations of most countries of the Region, the only way to effect this may be to pool regional resources and to establish linkages with other Regions which are confronted with similar development problems. An important element in this goal is the provision of adequate resources for the continuous development of scientific manpower.

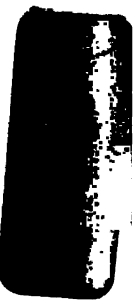
- **Human Resource Development**

Knowledge will become a fundamental factor of production, and investment in human resources will continue to be the basic driving force for technological and economic development. Education will accelerate the adoption of new techniques and will make national economies more productive.

The role of high quality and timely education, which takes into account production and social requirements, cannot be understated. Training and investment in human resources, particularly in the rural areas are inextricably linked to the sector modernisation process, competitiveness and equity.







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