

AGRICULTURAL CHANGE AND THE DECLINE OF DOMESTIC FOOD
PRODUCTION IN GUYANA, 1960-1994

by

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A THESIS
Submitted to the Faculty of Graduate Studies
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for the Degree of

DOCTOR OF PHILOSOPHY

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HUGH M. SEMPLE

A Thesis/Practicum submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements for the degree of

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TABLE OF CONTENTS

ABSTRACT	v
ACKNOWLEDGEMENTS	vii
LIST OF FIGURES	viii
LIST OF TABLES	ix
LIST OF ABBREVIATIONS	xii
1.0 INTRODUCTION	1
1.1 Background to Research Problem	1
1.2. Literature Review	7
1.3 Theoretical Considerations..	21
1.4 Organization of Study	27
2.0 THE STUDY AREA	29
2.1 The Coastal Plain (Physical Aspects).	32
2.2 Population.	35
2.3 Settlement and Agricultural Land Use.	37
2.4 Background to Political, Economic and Social Forces which have Shaped Domestic Agriculture in Guyana.	42
2.5 Recent Economic Indicators.	55
3.0. REVIEW OF DOMESTIC FOOD PRODUCTION IN GUYANA, 1960-1994.	59
3.1. Total Food Output, 1960 - 1994.	61
3.2 Phase One, 1960 - 1970.	62
3.3 Phase Two, 1970 - 1980.	70
3.4 Phase Three, 1980 - 1994.	77

4.0.	HYPOTHESIS AND RESEARCH METHODS	81
4.1	Hypotheses	82
4.2	Data Sources	84
4.3	Techniques Utilized for Data Analysis and Hypothesis Testing.	91
5.0.	CHANGING PATTERNS IN GUYANA'S FARMING SYSTEMS AND THE DECLINE OF DOMESTIC FOOD PRODUCTION	97
5.1	Small Farms.	99
5.2	Mini-estates.	110
5.3	Estates and Ranches.	118
5.4	Livestock Farming.	122
5.5	Kitchen Gardens.	125
5.6	Summary	127
6.0.	GOVERNMENT INTERVENTION IN MARKET PRICING AND THE IMPACT ON DOMESTIC FOOD PRODUCTION.	129
6.1	Government Price Support Programme	130
6.2	Government's Input Subsidy Programme	132
6.2	Consumer Protection and Food Production.	136
6.3	Evaluation.	139
6.4	Conclusion.	144
7.0.	ENVIRONMENTAL CONSTRAINTS AND THE DECLINE OF FOOD PRODUCTION IN GUYANA.	146
7.1	Flooding.	146
7.2	Reasons for Breakdown of Local-level Drainage and Irrigation Systems.	151
7.3	Other Environmental Problems.	164
7.4	Conclusion.	168

8.0.	LAND TENURE AND THE DECLINE OF DOMESTIC FOOD PRODUCTION IN GUYANA.	169
8.1	Distribution of Land Titles Among Domestic Food Farmers.	169
8.2	Land Tenure by Village Type	176
8.3	The Impact of Land Tenure on Domestic Food Output Increased Production.	179
8.4	Tenure-Related Constraints to Increased Food Production.	182
8.5	Conclusion.	184
9.0	FARM CREDIT AND DOMESTIC FOOD PRODUCTION.	186
9.1	Credit Supply to the Domestic Sector.	187
9.2	Credit Demand in the Domestic Food Sector	192
9.3	Women Food Producers and Farm Credit.	197
9.4	Policy Options.	199
10.0.	HUMAN RESOURCES AND DOMESTIC FOOD PRODUCTION.	202
10.1	Demographic Characteristics of Farmers.	203
10.2	Educational and Technical Training of Farmers.	206
10.3	Farm Technology and Food Production.	208
10.4	Conclusion.	214
11.0.	LOGIT ANALYSIS OF PROBLEMS AFFECTING DOMESTIC FOOD PRODUCTION IN GUYANA.	215
11.1	Policy Implications of Model Results.	218
11.2	Conclusion.	222

12.0 SUMMARY AND RECOMMENDATIONS 223

 12.1 Recommendations for Increased Food
 Production in Guyana. 234

BIBLIOGRAPHY. 239

APPENDIX ONE. 251

APPENDIX TWO. 259

APPENDIX THREE. 260

ABSTRACT

Although world food production has increased since 1950, many countries in Sub-Saharan Africa and more recently, Latin America, have experienced declines in the amount of food produced for domestic consumption. Frequently associated with Latin America is the group of English-speaking island nations in the Caribbean and the mainland territory of Guyana, all of which have experienced declining food production since 1960. Among these countries, Guyana, which contains more than half of all combined arable land, experienced the greatest degree of decline, with per capita food production dropping by more 3.2% per annum between 1970 and 1993. In terms of overall standards of nutrition, this decline was very problematic between 1976 and 1985 as food imports declined from U.S \$52.9 million to U.S.\$ 18.4 million.

By applying historical and statistical analyses, this study investigates patterns of change in Guyana's domestic agricultural system in order to ascertain those factors contributing to declines in food production. The evidence shows that between 1960 and 1994 there was a massive deterioration in local drainage and irrigation systems which reduced the amount of land utilised for food production. Furthermore, subsidies, marketing and credit supports available to local food producers at various times between 1960 and the mid-1980s were eliminated because of high

financial costs, but not replaced by any alternatives. Extensive regimes of implicit and explicit price controls for food products also acted as disincentives to food production. Other factors negatively affecting local food production include: racial politics, which affected both the level and pattern of agricultural investment; failures in the local government system; and economic mismanagement which resulted in the collapse of the country's productive sectors in the late 1970s and early 1980s.

The thesis of the study was generally substantiated. Domestic food production declined because government policies in the post-independence period largely neglected the needs of agriculture when output was not for export. In order to avoid further breakdown in the food production system, a balanced approach to agriculture is required; one which explicitly considers the needs of both the domestic and export sectors, as well as those of different interest groups and communities involved in farming.

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LIST OF FIGURES

1-1	Food Imports, Guyana, 1970-1994.	5
2-1	Guyana - Location and Administrative Regions.	30
2-2	Guyana - Physiographic Regions.	31
2-3	Average Monthly Rainfall on Guyana's Coastal Belt, 1980 - 1993.	34
2-4	Annual Population Growth Rates, Guyana, 1960-1993.	37
2-5	Distribution of Land Used for Rice and Sugar-Cane Cultivation.	41
3-1	Total per capita Domestic Food Output, 1960-1993 for Selected Crops and Livestock	61
3-2	Per capita Vegetable, Fruit, and Provision Crops Production, 1960 - 1993.	65
3-3	Per capita Coconut Production, 1960-1993.	66
3-4	Per capita Beef, Pork, and Poultry Production 1960-1993.	67
4-1	Map of Guyana Showing Location of Study Areas.	88
5-1	Major Farming Systems in Guyana.	98
7-1	Central Government Capital Expenditure on Drainage and Irrigation, 1971-1991.	157

LIST OF TABLES

1-1	Percentage Annual Growth Rates of Population and Food Production for certain World Regions, 1952 to 1991.	4
1-2	Annual Percentage Growth Rates of per capita Food Production and Population, West Indies, 1961-1991.	4
2-1	Area Occupied by Major Agricultural Crops Guyana, 1993.	40
2-2	Percentage of Blacks and East Indians Living in Urban Areas, 1921-1960.	48
2-3	GDP per capita - West Indies, 1951 - 1994.	57
3-1	Selected Food Groups and Representative Commodities.	60
3-2	Cropland Harvested and Yields for Selected Domestic Food crops, 1960 - 1993.	69
3-3	Guyana, Balance-of-Payment, 1978-1990.	75
3-4	Yields for Vegetables, Roots and Tubers (Selected Countries), 1974-1976.	77
4-1	Village Profiles.	87
4-2	Census and Surveys used for Baseline Data.	91
5-1	Frequency Distribution of Types of Domestic Food Farms Encountered in Survey of Five Villages.	100
5-2	Farm Size by Racial Groups.	103
5-3	Changes in Farm Types, Guyana, 1952 - 1978.	106
5-4	Cross-tabulation of Variations in Farm Output (1989-1994) by Size of Farms.	109
5-5	Total Area in Hectares Reaped for Rice and Sugar cane, 1960 - 1993.	111
5-6	Daily per capita Caloric and Protein Intake, West Indies, 1958 - 1988.	116

5-7	Percentage of Farmers Raising Livestock and Livestock Population, 1952 - 1994.	124
6-1	Retail Prices and Output Levels (Selected Food Produce), 1960 - 1994. . . . .	.134
6-2	Regression of Output on Prices. . . . .	.134
7-1	Cross-tabulation of Variations in Output by Adequacy of Farm Drainage. . . . .	.149
7-2	Statement of Revenue and Expenditure, 1993 Woodlands/Farm Neighbourhood District.	155
7-3	Regional Expenditure on certain Large-scale Drainage and Irrigation Projects as a Percentage of Total Regional capital Expenditure.	158
7-4	Frequency Distribution of Environmental Constraints Perceived by Farmers. . . . .	.166
8-1	Distribution of Land Titles Among Sample Farmers by Type of Villages.	170
8-2	Cross-tabulation of Land Titles by Respondents' Racial Background. . . . .	.172
8-3	Coastal Land Development Schemes since 1960.	175
8-4	Summary Statistics on Land Tenure. . . . .	.178
8-5	Cross-tabulation of Output by Tenure. . . . .	.180
9-1	Gaibank: Value of Agricultural Disbursements by Economic Activity, 1975-1991.	188
9-2	Variations in Output by Credit Receipt. . . . .	.191
9-3	Farm Credit Receipt by Villages.	193
9-4	Frequency Distribution of Reasons for Farmers not Applying for Loans. . . . .	.196
10-1	Selected Demographic Characteristics of Guyanese Farmers. . . . .	.204
10-2	Percentage of Total Labour Force Involved in Agriculture. . . . .	.206

10-3	Type and Number of Tools, Implements and Machinery by Percentage of Farmers Owning Tools, Implements and Machinery.	210
10-4	Cross-Tabulation of Age of Farmers by most Profitable Crop Cultivated.	211
10-5	Cross-Tabulation of Age of Farmers by most Profitable Livestock Raised.	212
11-1	Parameter Estimates for the Logit Model.	216

LIST OF ABBREVIATIONS

CARDI	- Caribbean Agricultural Research and Development Institute
CARICOM	- Caribbean Community
CIDA	- Canadian International Development Agency
DDIA	- Declared Drainage and Irrigation Area
FAO	- Food and Agricultural Organization (United Nations)
GAIBANK	- Guyana Agricultural and Industrial Development Bank
GMC	- Guyana Marketing Corporation
GTS	- Guyana Transport Services
GUYSUCO	- Guyana Sugar Corporation
IBRD	- International Bank for Reconstruction and Development (World Bank)
IDB	- Inter-American Development Bank
IFAD	- International Fund for Agricultural Development
IICA	- Inter-American Institute for Cooperation in Agriculture
IMF	- International Monetary Fund
IPED	- Institute of Private Sector Development
LIDCO	- Livestock Development Company
MDC	- More Developed Countries
OECS	- Organization of Eastern Caribbean States
PAHO	- Pan American Health Organization
PNC	- People's National Congress
PPP	- People's Progressive Party
RDC	- Regional Democratic Council

- UNCTAD - United Nations Conference on Trade and Development
- UNESCO - United Nations Education, Social and Cultural Organization
- USAID - United States Agency for International Development

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to Research Problem

Since the end of the Second World War the nature of the world's agriculture has undergone major transformations. For instance, there have been improvements in technology; increases in food and fibre production; greater concentration of land ownership; increases in average farm size; and increased specialization and capitalization of farms. There have also been loss of farmland because of environmental mismanagement and urban expansion, and continued decline of the family farm (Griffin 1976; Visser 1980; Gregor 1982, Howard 1986; Brockett 1990; Grigg 1992).

The economic and other impacts of specific changes in the agricultural sector of different countries have inspired ongoing studies. One topic of recurring interest is the relationship between changes in the domestic agricultural sector and declining food production in certain regions of the world (Bradley and Carter 1989). Interest in this topic invariably stems from threats of hunger, starvation, and malnutrition that declining food production poses for millions of people in some parts of the world. Additionally, declining food production is a symptom of deteriorating rural economic bases and constitutes a threat to employment and income

possibilities for millions of people throughout the developing world.

According to data in Table 1-1, the rate of food production in the early 1990s was below that for population growth in two major world regions, Latin America and Africa. The data show that for Latin America, the annual rate of food production fell below the annual rate of population growth between 1982 and 1991 despite a decline in the latter. In Africa, the rate of domestic food production fell below that of population growth since the early 1970s. In the 1980s, the rate of food production in Africa improved faster than other world regions, but the food deficit gap on this continent is such that famine and hunger, which intermittently characterized the Sahel region in the late 1970s, have also, at various times in the 1980s, affected parts of southern Africa, namely Mozambique and Angola (African Development Bank 1993). In comparison to Africa, food production problems in Latin America are not as critical. However, declining rates of food production in this part of the world still pose serious challenges to the well-being of people.

This study is an analysis of changes in the domestic agricultural sector and resultant declines in food production in one region commonly identified with Latin America, namely the West Indies.^{1/} In particular, the study focuses on

^{1/} In this study, the term "West Indies" refers to the former British colonies in the Leeward and Windward Islands plus
(continued...)

Guyana, a country accounting for up to 50 percent of agricultural land in the West Indies (FAO 1994), but where domestic food production has declined more than any other country in the region since 1970 (Table 1-2). Unlike other West Indian countries where decline in domestic food production was supplemented by increases in food imports, decline in food production in Guyana was accompanied by marked fluctuations in food imports. Figure 1-1 shows that the value of food imports increased from U.S. \$18.9 million in 1970 to U.S. \$52.9 million in 1976. Thereafter it declined precipitously, reaching a low of U.S. \$18.4 million in 1985. Since then recovery has been slow, and the 1994 total of U.S. \$40.6 million was still well below food import levels of the mid-1970s, despite continued declines in per capita domestic food production. Overall, the situation in Guyana between 1960 and 1993 was one of decreases in food supplies brought about by declines in both food production and food imports.

1/(...continued)

Jamaica, Barbados, Trinidad and Tobago and the mainland territories of Guyana and Belize. The term "Caribbean" is used whenever other territories in the region are included with this set of countries.

Table 1-1 Percentage Annual Growth Rates of Population and Food Production for certain World Regions, 1952 to 1991.

Region	Pop	Food Prod	Pop	Food Prod	Pop	Food Prod	Pop	Food Prod
	<u>1952-60</u>		<u>1961-70</u>		<u>1971-80</u>		<u>1982-91</u>	
World	2.1	3.2	2.0	3.0	1.9	2.7	1.8	2.1
Developed Countries	1.3	3.2	1.1	2.6	0.8	1.8	0.7	0.7
Asia	2.6	3.4	2.2	2.7	2.0	3.2	2.4	2.9
Latin America	2.8	3.2	2.9	3.5	2.7	3.9	2.1	2.0
Africa	2.2	2.1	2.5	2.6	2.9	1.8	3.0	2.9

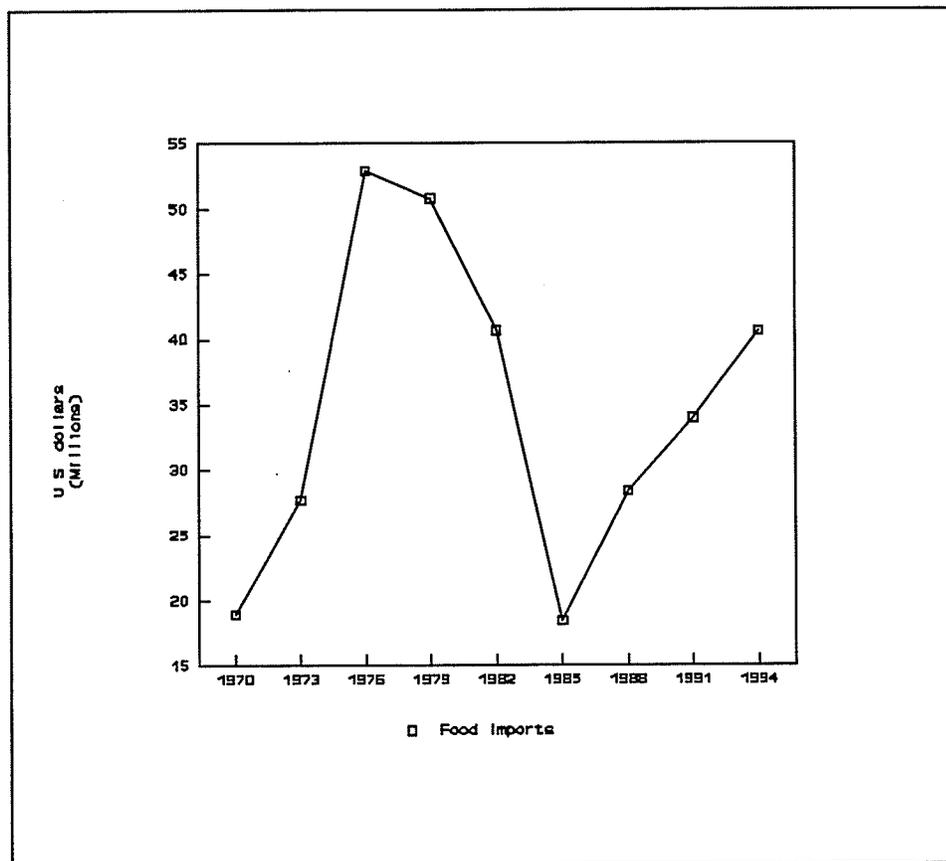
Sources: Grigg 1985; Mellor 1988; Schmitz 1989; UNCTAD (1991); United Nations 1991(b).

Table 1-2 Annual Percentage Growth Rates of per capita Food Production and Population, West Indies, 1961-1991

Country	Food Prod	Pop	Food Prod	Pop	Food Prod	Pop
	<u>1961-70</u>		<u>1970-80</u>		<u>1980-93</u>	
Antigua	3.9	1.0	-0.5	0.2	0.7	0.7
Dominica	2.0	1.5	0.0	0.6	4.2	-0.4
Grenada	3.5	0.5	0.5	0.2	-1.9	0.0
St Lucia	0.6	1.5	-1.5	1.3	3.1	1.5
St Vincent	-4.0	1.1	0.7	0.8	3.5	0.9
Barbados	-0.2	0.8	0.5	0.5	-2.1	0.3
Guyana	-0.7	2.2	-3.2	0.7	-3.2	0.1
Jamaica	0.6	1.3	0.0	1.3	0.9	1.0
Trinidad	0.8	1.4	-2.2	1.2	-0.7	1.3

Source: Food Production Data provided by (UNCTAD 1994). Population growth rates computed from data provided by FAO (1994).

Figure 1-1 Food Imports, Guyana, 1970-1994.



Source: FAO Statistics (1970 to 1994)

Two main concerns prompted this study, one economic and the other theoretical. At the economic level, a study of this nature was deemed desirable because of the increased role domestic food production is likely to play in the economic well-being of West Indian countries. Since 1945, the import capacity of those West Indian countries which depend heavily on agriculture has been seriously eroded as a result of the steady decline in the demand and price for traditional

agricultural exports such as sugar, bananas, coffee, and cocoa. This problem has intensified since the early 1980s as a result of global economic restructuring (Preeg 1993; World Bank 1993).

One implication of declining demand for traditional agricultural exports is that if, in the short-run, countries cannot develop alternative export bases, then they are likely to face increasing difficulties in sustaining the high levels of food imports needed to offset current deficits in domestic food production. Dealing with this problem could be one of the most important challenges confronting governments in the region during the latter half of the 1990s. While autarchy in food supply is not a goal, it is likely that governments will try to increase the level of domestic food production in order to reduce the cost of food imports. This action will be necessary because with reduced export earnings, the opportunity cost of foreign exchange spent on foods that could be produced in the region will be considerably high, and policy makers may want to spend such foreign exchange on more critical imports. This dissertation contributes to the discussion as to how food production might be improved in the West Indies, particularly in Guyana, by providing an understanding of the type of changes that are occurring in domestic agriculture and how these changes are linked to declining food output.

The second rationale for this study is to address a need in the agricultural geography literature for considering factors other than those of high population growth rates and replacement of traditional agricultural systems by large, multinationally owned, export-oriented farms, as explanations for declining rates of food production in developing countries. The assumption that declining rates of food production in some developing countries is due to high population growth rates and the resultant pressures on land and other resources has been challenged by those using a world-systems approach to the study of agriculture change (e.g. Bradley and Carter 1989). These writers contend that increased capitalist penetration of traditional agricultural systems, and resultant diversion of resources to export production, are more important factors in explaining declining food production in developing countries than are high rates of population growth.

This study recognizes that both high rates of population growth and increased capitalist penetration of agriculture in developing countries have negative impacts on per capita rates of domestic food production. It will be argued, however, that the failure of national governments to formulate decisive and effective policies to promote domestic food production is also a major factor contributing to declining rates of per capita food production. One piece of evidence in this regard is the existence of severe inadequacies in the provision of agrarian

infrastructure and services to support local food production, especially in contrast to those provided for export-based agriculture. The farming environment for locally produced foods is thus characterized by high production costs and other structural constraints to production; for example, poor drainage, deteriorated farm-to-market roads, and limited credit support. Such an environment makes it difficult for farmers to be competitive, even at the level of local markets, since farm products from the more developed countries are cheaper and possibly of a higher quality. In those countries, government support for research and development, and the provision of agricultural subsidies are of substantially higher magnitude than that generally available in developing countries (Schuh 1988).

1.2 Literature Review

Recent studies on agricultural change in Guyana have virtually ignored the problem of sustained decline in domestic food production since the early 1960s. One exception is the study done by Ford (1992) who compared the country's recent food performance with that of other Caribbean countries. In giving examples of the sharp decline in food production in Guyana, Ford noted that pork production declined from 9.9 million kg in 1978 to 0.97 million kg in 1990; beef production declined from 3.8 million kg in 1973 to 2.2 million kg in

1990; and milk from 2 million kg in 1964 to 0.9 million kg in 1974. Among the reasons stated for this decline were: neglect of small-scale agriculture due to policy changes that preferred large-scale state farms; a switch in emphasis from coastal to interior agriculture; inappropriate macro-economic policy; and the breakdown of drainage and irrigation systems.

Other studies which have dealt with agricultural development in Guyana have focused either on the decline of agriculture as part of the general collapse of the productive sectors in Guyana during the late 1970s and early 1980s (Thomas 1982), or on production trends of specific export crops (Thomas 1984, Lakhan, Heron and de Souza 1988). In these studies, explanations for declining agricultural output have been mostly from the point of view of changes in the political economy of Guyana. For example, Lakhan et al. (1988) contended that the People's National Congress (PNC), the governing party between 1964 and the time of writing in 1988, deliberately reduced capital investment in agriculture from pre-1964 levels because its support came mostly from urban-based Afro-Guyanese and not from rural-based East Indian farmers. Agricultural output, consequently, declined because of massive deterioration in key agrarian infrastructural systems.

Thomas (1982) and Baber and Jeffrey (1986) have stressed the political origin of Guyana's agricultural problems from another perspective. They noted the decline in agriculture, as

with other productive sectors in the economy, to be part of a general political crisis that originated in the early 1970s and involved prolonged economic mismanagement and suppression of broad-based democratic institutions. Such a political economic climate stifled private initiatives in agriculture as well as other sectors. Indeed, Guyana's economic problems were of such magnitude that even basic agricultural inputs, such as seeds, simple farming implements, fertilizer, machinery and spare parts, were in short supply (Baber and Jeffrey 1986). Under these circumstances, Thomas, Baber and Jeffrey considered it inevitable that agricultural output would decline steadily throughout the late 1970s and 1980s.

Notwithstanding the paucity of studies specifically on the problem of declining food production in Guyana, there are numerous studies, both for Guyana and the wider West Indies, describing socio-economic trends and problems affecting agriculture and food output in the region (e.g Chernick 1976; Long 1982; Axline 1986). It is these studies that provide an adequate background from which to analyze the problem of declining food production in Guyana.

One such study, a review undertaken by the FAO, points to increased intensity of soil erosion and depletion of soil fertility as one of the foremost environmental problems affecting agricultural output in the West Indies (FAO 1988b). However, Guyana, which is located on the northeast shoulder of South America, has coastal flooding as its main environmental

problem which adversely affects agriculture (Strachan 1975; Richardson 1987). Both Strachan and Richardson reviewed water-management issues on Guyana's coast, but neither attempted to relate the performance of the drainage and irrigation systems to agricultural output over the last several decades.

Richardson's finding that small-scale farmers have adapted inadequately to their environment owing to low capital investment in drainage and irrigation, suggested a constant level of low output among peasant farmers. But there is no indication in his study that food output has constantly declined because of this adaptation. However, regular flooding of farmland in the rainy season and water shortages in the dry season are recurring problems in Guyana and their increased impacts have been linked to the progressive deterioration in the country's sea defences, and drainage and irrigation systems (Chambers et al. 1994). Due to the high level of dependency of Guyana's agriculture upon effective water management, the progressive deterioration in water-management systems is hypothesised as a major contributing factor to declining food production.

Deterioration in Guyana's drainage and irrigation system has been attributed to the country's economic crisis of the 1970s and 1980s (World Bank 1992). Less attention, however, has been given to the effect the undermining of village-level government in Guyana between 1973 and 1992 has had on flooding

of farmlands used for domestic food crops. These councils have statutory responsibility for maintaining secondary drainage and irrigation canals that support agriculture in individual villages. Historically, such councils have been politically and financially weak, partly on account of the systematic weakening they suffered during their formative years by sugar planters who were determined that villages occupied by ex-slaves did not evolve into economic units independent of the sugar plantations (Baber and Jeffrey 1986).

During the 1970s and 1980s, local government reforms rendered the already weak village councils even weaker politically, so that even their previous limited ability to mobilize people and financial resources for water management was further eroded. New institutions to replace village councils are either ineffectual or have never been implemented (Potter 1987). Consequently, opportunities for farmers' participation in community politics and resolving development problems are either significantly reduced or non-existent. Altogether, these problems suggest that the weakening of Guyana's local government system since the early 1970s has contributed to declines in food production because local-level drainage and irrigation canals are either poorly maintained or completely abandoned.

From the point of view of market pricing, a persistent trend of ineffective agricultural pricing policy has been cited as an important factor contributing to declining food

production in the West Indies (World Bank 1993). Prior to the early 1960s economists discounted the notion of economic rationality among farmers in peasant-based agricultural systems (Shultz 1964). Variations in output were explained, not in terms of changes in prices for end products or factors of production, but in terms of thrift, industriousness, religion and other personal attributes of farmers.

In the West Indies, studies by Pollard and Graham (1985) for Jamaica revealed peasant farm output to fluctuate in accordance with prices and, therefore, effective pricing policy is required to encourage increased production. Similarly, Grossman (1993) concluded that, collectively, low farm-gate prices were an important factor contributing to low levels of food production in St Vincent. Additionally, the World Bank has maintained that producers, including farmers, receive low prices for their products not because the market sets low clearing prices, but because of the prevalence of price controls on a wide variety of products (World Bank 1993). Since the mid-1960s, the Guyanese government has been extensively involved in agricultural product pricing. A thorough review of their involvement is thus warranted at this time since the interventionist policies of the government appear to have had significant negative impacts on food production between 1960 and 1993.

Economists, writing from the perspectives of the "plantation school of thought" (e.g. Beckford 1972) and

dependency theory (Thomas 1988) have given considerable attention to how patterns of resource allocation have stifled domestic agriculture in the region. A general consensus is that economic structures and relations set up during colonialism have persisted in the post-independence period, so that most of the region's agricultural resources are still being used to support export agriculture. Local food production continues to be compromised because small farmers are still obliged to occupy marginal land, find difficulty in obtaining farm credit, or lack proper infrastructure, such as feeder roads, storage facilities, farm subsidies, and extension services (FAO 1986c; Rojas and Meganck 1987).

In Guyana, these patterns have all been a part of the recent history of the country. For example, the amount of land devoted to sugar cane and rice, largely export crops, has continued to increase since the end of the Second World War (Ministry of Agriculture and IICA 1980; Bureau of Statistics 1994). In the process, they have reduced the amount of land potentially available for domestic agriculture, for example, cattle raising. Storage facilities and transportation infrastructure in the domestic sector continue to be rudimentary in comparison with the export sector (World Bank 1992).

With respect to farm credit, the situation is slightly different because efforts were made to deal with the problem of low credit supply to the domestic sector. For example,

between 1973 and 1994, Gaibank, the main development bank supplying credit for agriculture, had, as a main objective, the provision of credit to all categories of farmers. Although Gaibank attracted many farmers in this regard, the impact of the banks's operations on domestic food production has been far from desirable. Assessments of credit patterns up to 1975 by Omawale and Rodrigues (1979) suggest that, despite Gaibank's objective, domestic food farmers, especially those growing ground provisions, received only a negligible amount of the loans disbursed. It is unclear as to whether Gaibank's lending practices changed during the 1980s; hence this study will assess Gaibank's recent lending pattern and thereby determine its impact on domestic food production.

The literature on social change in the West Indies points to some recent trends that may be relevant in explaining declining food production in both the island nations and Guyana. Firstly, population growth in urban areas throughout the region has been increasing at a rapid rate (Potter 1989:1-20; Potter 1993). This development conceivably contributes to declining rates of food production because the traditional farming technology used by the smaller number of farmers in rural areas cannot increase output rapidly enough to compensate for the loss of farm labour. This observation appears relevant to Guyana as there is little evidence to suggest that improvements in small-farm technology have occurred during the last several decades.

Secondly, important changes have been taking place in food consumption patterns in the region (FAO 1988c:4-23). Since the 1950s, increased per capita income, rapid urbanization and powerful advertising have resulted in decreased caloric intake from complex carbohydrates, such as roots and tubers, and an increase in intake of sugars, oils, fats and animal protein (FAO 1988c). Most of the latter category of foods are supplied in processed form by multinational corporations which import most of their supplies from outside the West Indies (Whitehead 1979; Barry, Wood and Preusch 1984). Evidently West Indian farmers have had to reduce their output because demand for their products, whether for direct consumption or for use as intermediate products in agro-processing, has declined and/or even become non-existent.

Thirdly, West Indian farmers are believed to be ageing rapidly to the extent that the vast majority of them are now elderly people with their mean age being approximately 50 years (Gomes 1984). Gomes' assertion that the average age of farmers is on the increase was based on a number of UNESCO-sponsored sample surveys in several Caribbean countries and not on time-series data from these countries. Hence, it is not totally clear as to whether West Indian farmers have always been characterized by a high average age, or whether the existing average age represents the current stage of an ageing process. Determining whether the average of farmers in Guyana has been increasing will be attempted in this study.

As well, the relationship between age and output will be investigated.

Brierley (1974) hypothesised that a relationship exists between the age of farmers, the type of farm they possess, and the output levels of different crops they cultivate. Older farmers in an effort to avoid heavy manual labour tend to concentrate on tree crops, e.g. cacao, nutmeg, and coconut, that require little attention. Younger farmers, on the other hand, tend to concentrate on vegetable and root crops which require more time and attention to successfully grow than do tree crops. To date, no study is available that has attempted to verify this hypothesis in the context of Guyana. Such a task will be attempted in this study, particularly because, if the hypothesis is correct, then it may be an important variable contributing to the decline of certain food crops and even livestock production in Guyana. This supposition is predicated on the assumption that the percentage of older farmers in the country's food production system is increasing.

Apart from the trends mentioned above, the World Bank has noted that the West Indies continue to be characterized by a large numbers of farmers cultivating land for which there is no proper legal title (World Bank 1993:78). However, it has not been established in the literature whether there has been an increase in the percentage of farmers with insecure titles to land they cultivate and how this might be affecting food production. Conventional wisdom is that insecure titles to

land negatively affect output because they preclude farmers from qualifying for credit which could be used for farm improvement and enhanced productivity (Lipton 1976). Also, insecure titles to land prevent farmers from investing in any permanent infrastructure that could enhance their productivity and output. If the percentage of farmers with insecure titles to land is increasing, then this factor can qualify as a contributor to declining output as less farmers are in a position to produce at desired levels. In this study, the hypothesis to be tested is that insecure titles to land increased during 1960 and 1994 in Guyana, and that this increase, in turn, led to declining food output. One reason why the proportion of domestic food farmers with insecure titles could be increasing in Guyana is that since 1945, most of the state-owned lands that were developed for agriculture were leased to rice farmers (Vining 1975). Thus, there is a high probability that the proportion of domestic farmers with insecure titles to land has increased over time.

Feminist perspectives on agriculture are also suggestive of the reasons why food production has declined, not only in Guyana but throughout the West Indies. Odie-Ali and Rutherford (1994) have drawn attention to the fact that women in Guyana are well represented in cultivation, processing and marketing of farm products, and are even more visible than men in some of these activities. Their contribution is, however, inadequately acknowledged owing to statistical underrecording

and underestimations. These shortcomings have resulted in ineffective policies because of discriminatory gender bias, particularly with respect to farm credit and land acquisition. These biases, in turn, have undermined the effectiveness of women food producers and have impacted negatively on output levels in the agricultural sector as a whole.

In terms of agricultural land-use changes, an increase in the amount of farmland left idle is one reason for declining agricultural output in the region (O'Loughlin 1965; Chernick 1978; Axline 1984; Brierley 1988). Increases in idle land has been related to the widespread perception among youth that agriculture represents a low-income activity. It has also been related to the noticeable reduction in the amount of land cultivated by large plantations involved in export agriculture. Most of these crops, for example, sugar cane, banana and cacao, are declining in importance as major export earners. In Jamaica, further degradation of marginal agricultural lands used for domestic food production is a critical land-use-related problem affecting food output (McGregor and Barker 1991).

Since the 1960s, both the nature and extent of agricultural land-use changes in Guyana and their impact on food production have not been widely discussed in the literature. Nonetheless, available data suggest that the impact of current agricultural land-use changes on domestic food production are largely negative. For example, data from

the 1952 agricultural census and the 1978 Rural Household and Farm Survey for Guyana show a definite increase in the proportion of farms between 4 to 20 ha, from 20% to 34% of all farms. By contrast, farms less than 4 ha decreased in their proportion of all farms from 78% to 60% over the same period. The 1978 Rural Household and Farm Survey also revealed that a definite relationship existed between crop emphasis and farm size. Vegetables, roots and tubers destined primarily for the domestic market were produced mostly on farms whose area was less than 4 ha, while rice and sugar, which are largely exported, were grown mostly on farms larger than 4 ha. If trends in Guyana continue towards an increase in farm size, then it is reasonable to postulate that this pattern of change is an important reason accounting for the decline of domestic food-crop production, because these crops are generally not cultivated on the larger farms that are evolving.

From the foregoing literature review, there is evidence that a broad range of factors has contributed to a reduction in food production in Guyana. Such factors include: the nature and structure of agriculture in the region; the widespread emphasis on export-crop production; deterioration of basic agrarian infrastructure; and the ineffective use of price as a means to stimulate to production. As is the case elsewhere in the West Indies, declining per capita food production probably has more to do with the failure of the state, in collaboration with its citizenry, to resolve these structural

issues, than it does with problems stemming from a rapidly increasing population. Factors contributing to declines in food production among West Indian countries are similar in many respects, but there are variations in patterns depending on the specific country. This literature review has identified ways in which Guyana's domestic food production sector is being adversely affected. The remainder of the study seeks to determine precisely how these factors have operated.

1.3. Theoretical Considerations

During the 1980s and early 1990s, several social scientists attempted to account for what was perceived as the increasing influence of the state and international capital as major factors shaping agricultural patterns in developing countries (e.g. Watts 1983; Blaikie 1985; Bradley and Carter 1989). Most drew heavily from perspectives provided by political economy and political ecology. In varying degrees, they emphasised how power and class relations, together with increased presence of multinational corporations in the export agricultural sector of developing countries has distorted the direction and level of agricultural development in these countries.

Despite insights gained from the political economy approach, its usefulness for policy prescription appears to be limited. Most writers, for example, Watts (1983), called for

radical social and economic transformations that the majority of developing countries simply do not have the political will to implement. This lack of will has been reinforced by the discrediting of international socialism in the 1980s and the consequently new respect given to the role of the market in allocating resources.

In order to conceptualize declining food production in the West Indies and simultaneously avoid sterility in policy prescription, a structural approach is utilized in this study (Johnson 1991). Within this approach, explanations of the complex ways by which human beings interact with their physical environment are sought in the nature of the physical environment, as well as in the dominant socio-economic forces shaping society. Such a multi-faceted approach has the advantage of not being restricted only to a consideration of capitalistic forces affecting society, but incorporates other dominant economic, social and environmental forces that influence society.

In the West Indies, since the end of the Second World War, a number of social and economic trends have negatively affected domestic food production - some of these have been previously discussed (supra pp 10-21). Notwithstanding the importance of each trend, analysis of the region's economic history suggests that it is the dominance of export-centred agricultural policies of West Indian governments as well as the urban-industrialization strategy of development that hold

the best clues for understanding the problem of declining food production in the region.

Since 1945, there has been a noticeable decline in the value of agriculture's contribution to total GDP in the West Indies. This decline in agriculture's contribution to GDP is not peculiar to the region, but what is significant from a developmental perspective, is the decline has not fundamentally altered patterns of agricultural investment in the region; evident by governments still maintaining the colonial tradition of supporting mainly those enterprises in the export agricultural sector (Mandle 1989). Thus, farms specializing in cultivating sugar cane, banana, rice, nutmeg, cacao, and coffee have benefited from relatively large public investment in agrarian infrastructure, science and technology, as well as from various production and marketing incentives. In contrast, farms that supply the domestic market have not benefited from comparable levels of public investment. This bias against domestic food farms exists despite acknowledgement by prominent Caribbean economists and planners that these farms contribute significantly to rural and national economies in terms of food supply, income, and employment (Demas 1965). In general, the main reason for neglecting these farms is their limited foreign-exchange earning capacity. Still, by overlooking their importance, the region's ability to feed itself has been significantly undermined.

The urban-industrialization strategy of development was adopted by nearly all governments in the region in the post-1945 period (Thomas 1988). The first stage of the industrialization process was characterized by import substitution, but an export-based model was later adopted as the import-substitution model failed to generate the required income and employment (Thomas 1988). For example, between 1957 and 1977, the number of manufacturing plants in Barbados increased from 70 to 194, but the contribution of manufacturing to total GDP rose from 7.8% in 1950 to only 10.2% in 1980 (Braithwaithe 1988). In Trinidad and Tobago, a total of 139 new factories were established between 1950 and 1967, but the contribution of manufacturing to total GDP averaged between 9 and 10% (Mandle 1989). In terms of employment, Mandle noted that the 139 factories established in Trinidad and Tobago created 6,921 jobs at a cost of \$TT 257.8 million or TT \$41,584 per worker - a cost considered to be very high. In Barbados, Braithwaithe (1988) observed that employment creation via industrialization was far below projected levels and that between 1960 and 1976, employment in the manufacturing sector actually decreased from 15.3% of the labour force to 13.8%

The failure of the industrialization model to generate requisite income and employment levels occurred because many of the industries that were established were actually "finishing-touch" industries, i.e., manufacturing establishments dependent upon imported manufactured or semi-

manufactured inputs. Due to the high dependence of these industries upon foreign inputs, local sectoral linkages were not established to a degree that was sufficient to generate the required income and employment to benefit the local population in a significant way.

Increased urbanization in the Caribbean led to changing consumer food habits, such as the preference for "ready to cook" and "ready to eat" foods, e.g., frozen vegetables and instant soups. As a result, there was extensive importation of such convenient foods throughout the region. While such large-scale importation of inexpensive ready-to-cook and ready-to-eat foods helped governments meet the food demands of their population, it contributed, concurrently, to the problem of declining domestic food production because governments felt relieved of the need to invest in domestic agriculture.

In Guyana, domestic agriculture was more a casualty of extensive government neglect resulting from a fixation upon export agriculture, rather than from an obsession with industrialization. Unlike Trinidad, Barbados, and Jamaica, Guyana did not attract a wide range of "finishing-touch" industries in the 1950s and 1960s owing to problems of political instability. Consequently, agriculture continued to be the mainstay of the economy, along with mineral extraction. In the absence of a more diversified economic base, export-based agriculture in Guyana assumed particular importance and attracted large amounts of public investment, largely at the expense of domestic agriculture. Even international agencies

involved with agriculture in Guyana endorsed this skewed nature of agricultural investment. For example, the influence of the World Bank in shaping agricultural patterns has been evident since the early 1950s (IBRD 1953), and then during the late 1970s and throughout the 1980s, the International Monetary Fund (IMF) became increasingly influential in shaping patterns of agricultural investment. In general, the structural adjustment policies advocated by the IMF and the World Bank have largely supported investment in export agriculture because of the need to generate foreign exchange. Consequently, domestic agriculture was generally neglected to the extent that the local-food capability was undermined.

In addition to an export bias, there are other problems affecting Guyanese domestic agriculture that can only be understood by recognizing the longstanding divergence, both spatially and economically, that exists between the East Indian and Afro-Guyanese segments of the population (Lakhan et al. 1988). Details of this divergence are discussed in the next chapter. Suffice to say at this stage that the inability to accommodate the economic interests and aspirations of the two main racial groups within the constraints of a limited budget has resulted in neglect, at various times, of the particular crops mostly cultivated by each racial group.

Finally, it is argued in this study that the decline of the domestic food production sector in Guyana needs to be viewed against the backdrop of development policy in Guyana - one which has consistently failed to recognize the income and

employment capability of the domestic food sector. The comparatively small amount of public investment in the domestic food sector attests to the fact that government has limited income and employment expectations of this sector. This position could be shortsighted because export agriculture is currently not capable of providing employment and income for a large segment of the rural population. Furthermore, some development experts have long argued that a strong domestic agriculture sector is just as necessary for sustained economic growth as is a strong export sector (e.g. Demas 1965; Mellor 1988). It has also been demonstrated that the combined agriculture and food-processing sectors in many developed countries have some of the largest employment multipliers (Greig 1984). Policies which fail to create suitable macro-economic conditions for the development of the local food production sector perpetuate what may be a major weakness of current approaches to development; namely, that economic growth is tied only to the development of the export sector.

1.4 Organization of Study

The remainder of study is divided into eleven chapters. Chapter Two provides a description of the study area, including a review of political and economic developments in Guyana necessary to understand the unique problems facing the domestic food sector. Chapter Three is a detailed account of the extent to which food production has declined in Guyana

between 1960 and 1993. Chapter Four describes the methodology used to carry out the study.

The substantive findings of the research are presented in Chapters Five through Ten. Chapter Five discusses some of the changes that have occurred in the country's main farming systems and show how these have affected food production. Price distortions caused by government intervention in the marketing of domestic food items and how these have contributed to declining output of food are the focus of Chapter Six. Environmental constraints to food production, principally the problems associated with flooding and the inability of village and district councils to deal with their statutory responsibilities of providing local-level water-management services are examined in Chapter Seven. The problems of land tenure and farm credit are the focus of Chapters Eight and Nine respectively, while Chapter Ten analyses how the changing demography of the country's farming population might have implications for food production. The results of a logit analysis, which attempts to provide a ranking of the variables contributing to declining food production are presented in Chapter Eleven. Finally, Chapter Twelve sums up the research findings, comments on the implications of these findings for government policy, and suggests avenues for further research.

CHAPTER TWO

2.0 THE STUDY AREA

Guyana is a former British colony located on the north-eastern coast of South America (Figure 2-1). Although its total area of 214,970 km² makes it a relatively small country by South American standards, nevertheless, it dwarfs other West Indian countries, with which it shares a similar culture and colonial history. Physiographically, the country is made up of an uplifted area of dense rainforest in most of the central and western regions of the country, an uplifted savanna region in the south-western part of the country, a region of low, forest-covered hills in the east-central portion of the country, and a low, flat coastal plain adjacent to the Atlantic Ocean (Figure 2-2). While the three interior regions occupy 95% of Guyana's land surface, it is the coastal plain, occupying just 5% of the country's land area, that accounts for most of its arable land.

It is on this coastal plain that more than 90% of total population is found — a fact which is one of the striking human geographical features of the country. This settlement pattern, however, is not dissimilar from that found in many parts of South America where difficult physical environments in the interior of countries have resulted in large concentrations of population on the more accommodating coasts.

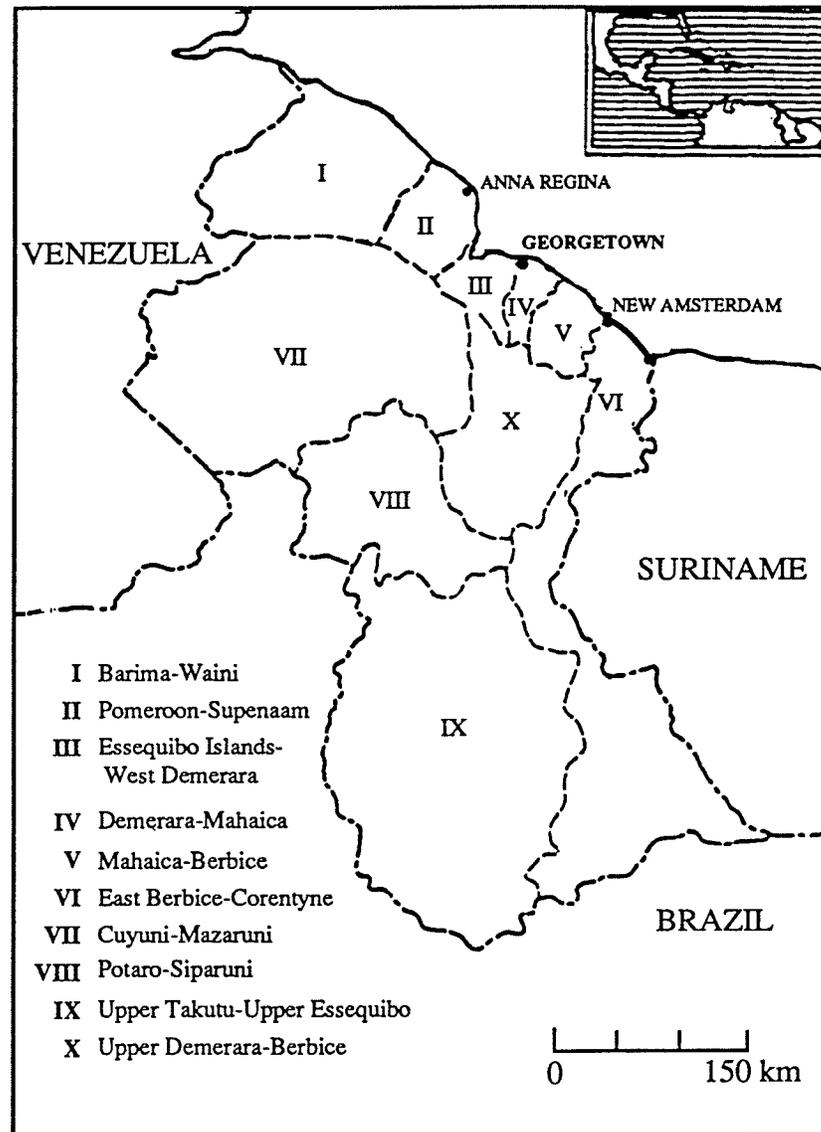


Figure 2-1 Guyana - Location and Administrative Regions
 Source: Adapted from Baber and Jeffrey (1986).

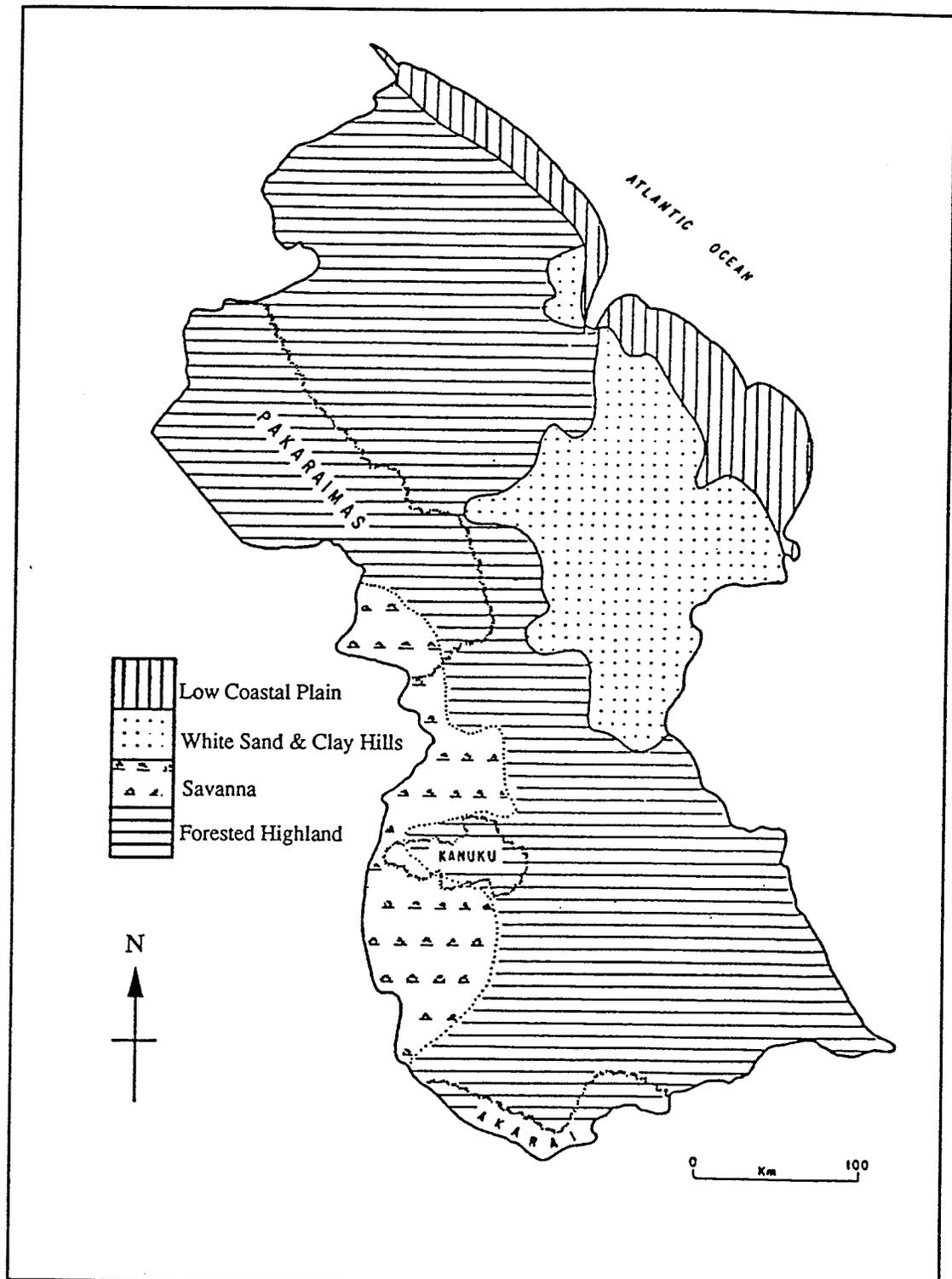


Figure 2-2 Guyana - Physiographic Regions
 Source: Cartography Division, Department of Geography, University of Guyana.

Agriculture in Guyana is practised mainly on the coastal plain. Some other areas where agriculture is carried out are the interior banks of rivers and creeks, in the northwest region of the country, the Rupununi savanna, and at various isolated locations in the interior. Owing to the strong littoral orientation of Guyana's agriculture, most of this study is focused upon this coastal region. In order to comprehend the current problems associated with domestic food production on the coast, background information is presented on environmental, economic, social, and political forces shaping agricultural patterns in this region. The general pattern is one in which agriculture is confronted by complex but resolvable environmental constraints, but the socio-economic and political contexts in which agriculture operates continue to present formidable barriers to increased food production.

2.1 The Coastal Plain

To Dutch colonists, who established the first permanent settlements on Guyana's coast in the 17th century, the main attraction of this region was its potential for lower-cost agriculture compared with interior locations (Kramer 1991). This observation still applies to present-day inhabitants of the coast. Lying partially below the level of spring high tides and dissected by many large and small rivers, this strip of extremely flat land (470km long and between 15 and 65km in width) possesses soils which are classified as having

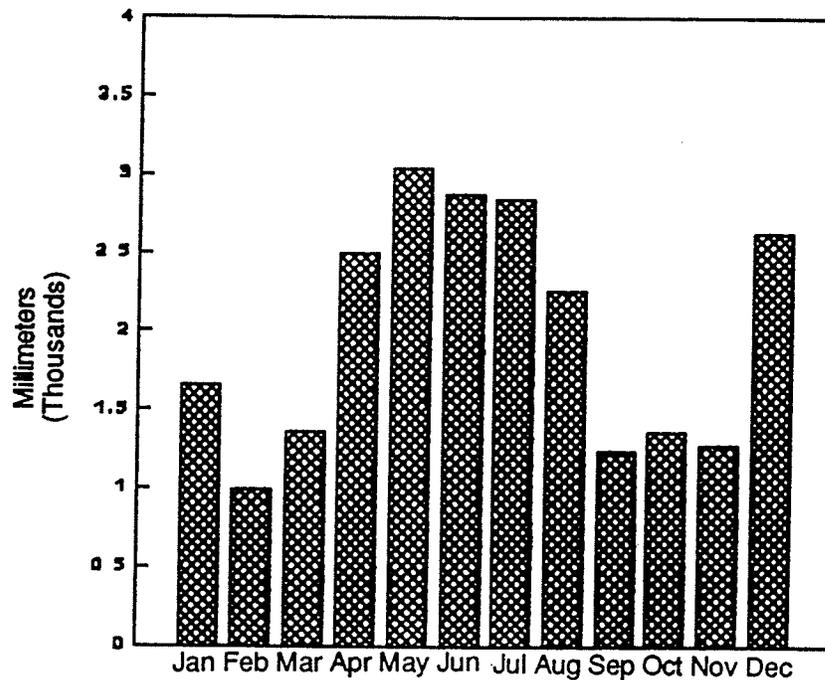
relatively high natural fertility in its central and eastern portions (FAO 1966). As they suffer from poor natural drainage, agriculture can only be sustained on these soils through expensive drainage and irrigation systems.

The coastal climate is tropical humid, Köppen classification Af. The mean relative humidity is 79%. Temperatures although high are moderated by the cooling effect of the north-east trade winds so that the mean annual temperature is 26° C. There is little seasonal variation in temperature and the standard deviation associated with this mean is just $\pm 0.54^{\circ}$ C. Average annual rainfall between 1980 and 1993 was 2003mm and was characterized by a coefficient of variation of 37.8% — a level which makes for a high degree of variability in soil moisture during the year. Figure 2-3 shows that rainfall is seasonally distributed between two wet seasons and two dry seasons. This pattern of rainfall enables agriculture to be practised year-round, however, there is a distinct cycle of farming activity and cultivation of certain crops varies in accordance with the seasonality of rainfall.

Altogether, the marked seasonal variation in rainfall, the small discharge capacity of most of the rivers (FAO 1966), and the low elevation of the coastal plain itself have made riverine, tidal, and run-off flooding, along with periodic droughts, the principal environmental problems facing farmers. In the 18th century, Dutch colonists laid the groundwork for coping with these environmental constraints by using African slaves to build a complicated system of canals, dams and sea

walls to facilitate sea defence, drainage and irrigation of the land (Rodney 1981; Richardson 1987). This initial system, which is now complemented with a number of newer, large-scale drainage and irrigation schemes constructed since the 1960s (Strachan 1975), is still in use today. If properly maintained, it can be effective in facilitating agriculture and settlement along the coast.

Figure 2-3 Average Monthly Rainfall on Guyana's Coastal Belt, 1980-1993



Source: Bureau of Statistics (1994)

2.2 Population

In 1993, Guyana's population was estimated at 717,460 (Bureau of Statistics 1993), of which approximately 87% resided in the five coastal administrative regions, i.e., Regions Two to Six (Figure 2-1). This population concentration gives the coast a physiological/nutritional density (total population divided by arable land and land under permanent crops) of only 1.5 persons/km². The corresponding figures for Grenada is 6.5, Jamaica 9.6, Trinidad and Tobago 11, and Barbados 16 (FAO 1994). These statistics indicate that, theoretically, Guyana has more arable land per person available to feed its population.

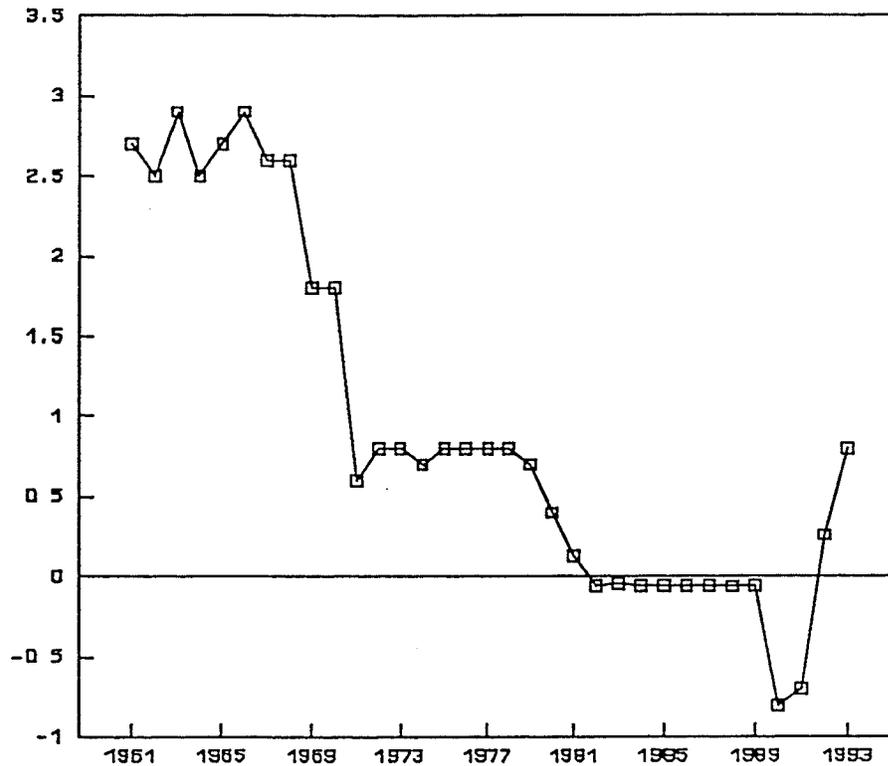
Approximately 85% of Guyana's coastal population is concentrated in just three of the five coastal administrative regions - Regions Three, Four and Six. East Indians are the largest racial group in Guyana, accounting for 49.5% of the total population, and approximately 56% of the coastal population. In Region Two, East Indians accounted for 54% of the population; they composed 71% in Region Three, 60% in Region Five, and 74% in Region Six. Afro-Guyanese, the next largest racial group, comprised 35% of the national population in 1993 and 34% of the coastal population. In Region Four, they are the largest racial group (48%) and are significantly represented in the other regions. Persons of mixed racial background accounted for only 7% of the national population; their principal concentration being in Regions Five and Six.

Between 1960 and 1968, the average annual population growth rate for Guyana was 2.5% (Figure 2-5). This rate of

population growth declined suddenly to 0.8% between 1968 and 1970 as a result of emigration by those who feared the consequences of government implementing its desire to shift the country from a market-based economy to one based on cooperative socialism. An annual population growth rate of 0.8% was maintained until 1978. Thereafter, population growth rates declined further to the extent that, between 1982 and 1990, the nation experienced a slightly shrinking population as the annual rate of population change was -0.2% per annum, i.e., from 759,000 to 739,553. While some of the decrease in population growth rates during the 1980s was caused by the country entering that stage of the demographic transition where both fertility and mortality are declining, most of the decline is attributed to the high levels of emigration that transpired because of rapidly deteriorating economic conditions (Appendix Two). Since 1991, the annual rate of population growth has risen, reaching 1.2% in 1993 largely as a result of return migration from Surinam following improvements in Guyana's economy and political climate.

Guyana's large land base and relatively small population should, theoretically, give the country an advantage in meeting the food needs of its people. That this has not occurred is indicative of the complex agrarian problems facing the nation. If it had not been for the high rates of emigration in the late 1970s and 1980s, then the country's inability to meet its food needs could have significantly exacerbated the social and political disruptions that were actually experienced during this period.

Figure 2-4 Annual Population Growth Rates, Guyana, 1960-1993



Source: Computed from statistics obtained from the Ministry of Economic Development (1974) and Bureau of Statistics (1994).

2.3 Settlement and Agricultural Land Use

Modern settlement of Guyana's coast has still not outgrown the areal extent of early Dutch and English sugar, coffee and cacao plantations. Most of these plantations were located east of the Pomeroon River, so that northwest of this river and extending to the border with Venezuela, the land remains generally undrained, unused and virtually uninhabited.

To a large extent, this land-use pattern is a reflection of the fact that most of the good-to-moderate agricultural lands on the coastal plains are located east of the Pomeroun river (FAO 1966). Much of the unutilized land in the northwestern part of the coast has organic soils, which are low in fertility, expensive to drain, and contain toxic salts that make their utilization difficult (FAO 1966).

Owing to the large area of land that is currently uneconomic to develop in the northwestern portion of the coast, competition for land in the eastern portion between the Pomeroun and Corentyne rivers is high. This competition for land is exacerbated by the fact that the linear settlements, which characterize the coast, extend inland from the seashore and river banks, for between 2 to 10 km, thereby leaving extensive areas in the backlands undeveloped and undrained. Even within the settled areas, large tracts of land remain inadequately drained, thus reducing the amount of land available for either agriculture or settlement.

National economic priorities are acutely reflected in agricultural land-use patterns. During early colonial times, the demand in Europe for sugar resulted in the bulk of empoldered land being devoted to the cultivation of this crop. Since the 1950s, however, overseas demand for rice, as well as the need to compensate for declining rice yields by increasing the area devoted to this crop, has resulted in rice overtaking sugar cane as the predominant crop in terms of land use.

Currently, rice occupies about one-half of all arable land, sugar occupies one-quarter and coconut about one-eighth of the total arable land (Figure 2-5, Table 2-1). In general, the intense preoccupation with rice and sugar cane for export has meant that prime land is not normally used for domestic food production. This activity has been relegated to the periphery of sugar and rice estates; to a secondary activity on coconut estates; and to tracts of silty soil along the river banks.

Present agricultural land-use patterns are also influenced by soil type. On Guyana's coast, *cheniers*, i.e., old beach ridges formed during the Pleistocene and Holocene periods (Daniel 1981), are favoured locations for settlement and agricultural activities other than rice and sugar cultivation. Cheniers are composed mostly of sand, shell and smaller amounts of clay, and are raised above the level of surrounding clays which are naturally waterlogged (Daniel 1981). Their well-drained soils provide excellent conditions for the growth of coconuts, vegetables, and fruits. For this reason, these crops are generally cultivated in areas where cheniers exist — a narrow belt 5-12 km wide along most of the coast (Daniel 1981). It should be noted that cheniers do not provide the only location for domestic agriculture on the coastal plain. Large amounts of roots, tubers, and other domestic food crops are also grown on the silty soils along the lower river banks on the coast.

Other crops such as rice, sugar cane and provision crops to a lesser extent, thrive on the semi-impermeable clays of Guyana's coast, provided the soils are properly drained. Since substantially more land is covered by clay soils than by cheniers, rice and sugar cane have a larger area available to them for cultivation. Furthermore, sugar cane is also grown on cheniers.

Table 2-1 Area Occupied by Major Agricultural Crops, Guyana, 1993

Crops	Total Hectares Cultivated	Percentage of Cultivated Land
1. Rice	100,300 ^a	52.9
2. Sugar cane	41,500 ^a	21.9
3. Coconuts	25,000 ^b	13.2
4. Roots and Tubers	4,000 ^c	2.1
5. Plantains	8,932 ^b	4.7
5. Fruits	3,810 ^b	2.0
6. Green Vegetables	1,000 ^b	0.5
7. Dried Peas	2,000 ^c	1.1
8. Other Grains (Corn)	2,000 ^b	1.1
9. Groundnuts	1,000 ^c	0.5
Total Area Cultivated	189,542 ^c	100.0
Total Agricultural Land	495,000 ^c	-

Source: (a) Unpublished data, Ministry of Agriculture, Guyana; (b) Author's estimates based on past area cultivated; (c) FAO, 1994.

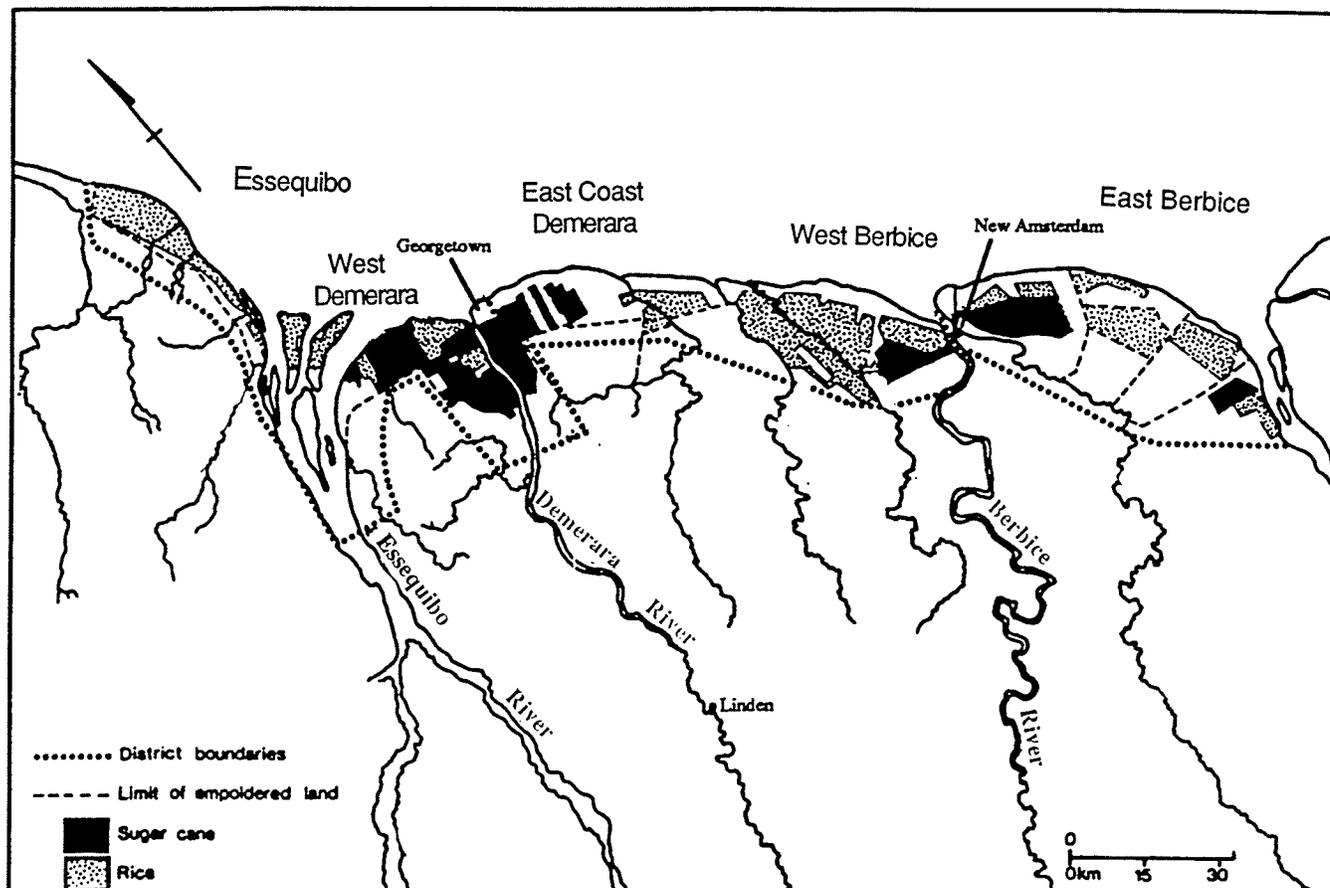


Figure 2-5 Distribution of Sugar Cane and Rice Cultivation Areas
 Source: Adapted from Potter (1987), p. 233

2.4 Background to political, economic and social forces that have shaped domestic agriculture in Guyana.

Similar to other West Indian countries, Guyana has had a long history of colonial domination, including a period of legally-sanctioned servitude, i.e., slavery, during which certain political, social, and economic relations were established. Many of these relations, together with new ones that have emerged with changing circumstances, exert a strong influence on the present nature and direction of agriculture. In this section, an overview is presented of the political, economic and social developments that have shaped the nature of domestic agriculture on Guyana's coast. Issues considered include: the role of colonial sugar planters in establishing the basis for a weak domestic agricultural sector; the differential experience of Afro-Guyanese and East Indians with village settlements and how this consideration has contributed to a weakened agricultural sector; political conflicts between Afro-Guyanese and East Indians and the problem of biased allocation of resources to these groups; and the need to engage in activities that earn foreign exchange as a determining factor in shaping the direction of agricultural development.

During the period of slavery, which lasted from the early 18th century to August 1, 1834, agriculture was organized primarily for the export of sugar to European markets. Although food crops were cultivated by the Negro slaves for personal consumption and exchange at their weekend markets, this quantity was small. After the full emancipation of

slaves in 1838, most of them left the sugar plantations and sought to establish themselves as an independent peasantry on collectively purchased, abandoned sugar estates, as individual proprietors on frontlands of existing plantations, and, to a lesser extent, on unutilized Crown Lands (McLewin 1987). Lacking the capital resources to provide the large-scale drainage and irrigation necessary to cultivate sugar cane, these ex-slaves resorted to growing roots, tubers, fruits and vegetables for their livelihood.

The emergence of an expanding domestic food sector presented a threat, however, to the sugar plantations in the form of a shortage of labour. Instead of working full-time, many ex-slaves preferred to work either part-time or not at all on the plantations. Labour shortages on the plantations led to rising wages, hence the cost of sugar production increased. At the same time, the British government passed the Sugar Duties Act of 1846 to terminate the system of preferential entry of colonial sugar into the British market (Thomas 1984). This Act, by increasing the supply of sugar to Britain, lowered the price for British consumers, hence planters were paid less for their sugar. The response of the planters to this situation was to have far-reaching effects on domestic agriculture, the aftermath of which are still felt today.

In the first instance, sugar planters, through the colonial legislatures they controlled, began a systematic process of weakening the village economies in order to make

the ex-slaves dependent on plantations as their main source of income, thereby giving the planters greater control over labour costs (Thomas 1984). Tactics used by the planters to undermine the peasantry included: non-allocation of public expenditures for drainage and irrigation in Afro-Guyanese villages; denying credit for small-farm expansion or for improvement to drainage and irrigation; levying high rates and taxes on property that would be confiscated if taxes were not paid; charging excessive prices for land to prevent further expansion of the peasantry and thereby increasing the degree of landlessness among them; and harassing small farmers occupying undeveloped Crown Lands (Rodney 1981).

Although the actions of the planters were largely successful in weakening the "village movement", they did not achieve their overall objective of forcing the ex-slaves to become dependent on plantations for their main source of income. Most ex-slaves continued to work on plantations in order to satisfy part of their cash requirements, but they also remained committed to their provision and vegetable farms. In addition, many ex-slaves opted for life in the growing urban areas of Georgetown and New Amsterdam, rather than remain in villages where the practice of domestic agriculture was difficult and where employment, other than what was found on sugar estates, was largely unavailable.

The connection between the situation described above and current domestic food production problems in Guyana is that Afro-Guyanese villages have never fully recovered from the

attacks levelled against them during the second half of the 19th century (Adamson 1970; Semple 1981; Thomas 1984). Thus, many villages continue to be bedevilled by unresolved problems relating to poor drainage and irrigation, low levels of farm credit, excessive land fragmentation, and lack of secured titles to land. Apathy and frustration fostered by these problems continue to be reasons for outmigration of many people from the villages (Semple 1981). Since Afro-Guyanese have traditionally cultivated roots, tubers, fruits (Smith 1964, Burrough 1972), the production of these crops has declined with each wave of outmigration from the villages.

The failure of sugar planters to force ex-slaves back to the plantations resulted in their resorting to importing indentured labourers, mainly from India, to work on their sugar plantations. Between 1845 and 1917 close to 240,000 East Indians were brought to Guyana (Rodney 1981). In many ways indentureship was similar to slavery. East Indian labourers were subjected to the following conditions: they were obligated by sugar planters to work nine to ten hours per day instead of the typical seven and one-half hours; their rate of pay was sixteen cents per day instead of the prevailing thirty-two cents; they were subject to fines and imprisonment for refusing to work, being drunk on plantations, or using abusive language or gestures to their employers; and they could not leave the plantations without permission (Budhoo 1981; Rodney 1981). Moreover, working and living conditions were deplorable, and in many instances, paralleled

those encountered during slavery. After their period of indentureship, which lasted for either five or ten years, depending on whether there was voluntary renewal of indenture, many East Indians returned to India. Some, however, chose to remain in Guyana, thereby adding to the size and heterogeneity of the emerging peasantry.

East Indian experience with village settlement and agriculture was different from that of the Afro-Guyanese. This difference in settlement history is a major factor explaining why East Indians became more entrenched in agriculture in the ensuing years than their Afro-Guyanese predecessors. The three most-cited factors distinguishing the East Indian settlement experience from that of the Afro-Guyanese are: the assistance they received from the colonial government so as to become established in villages (Smith 1964; Vining 1975); their good fortune of specialising in rice, a crop with both local and international demand (Smith 1964; Rodney 1981); and their tendency to live in extended families, a cultural factor that proved important in dealing with the ecological difficulties of the coast (Despres 1967).

In terms of assistance to establish villages, sugar planters, in an effort to avoid financing the cost of the return passage to India, regularly granted East Indian labourers small plots of land on the frontland of sugar estates for residence and subsistence agriculture. Plots were of sufficient size to provide basic food needs of labourers

and their families, but not large enough to prevent them from becoming independent of the plantations for wage labour.

Following the depression in the sugar industry in the late 1880s, more formal land-settlement schemes were initiated. In all, thirteen land-settlement schemes for East Indian immigrants were established and supervised by the colonial government between 1880 and 1943 (Vining 1975). Also, Crown Lands were made available to those East Indians wishing to purchase them. Although conditions in the settlements and on sugar estates were deplorable, the important point is that East Indian villages were not subjected to the same degree of economic and political attacks that undermined the earlier Afro-Guyanese villages. East Indian experience with village settlement and farming was thus different from that of Afro-Guyanese.

Traditionally, East Indians cultivated a wide range of vegetables, roots and tubers, although lesser emphasis was given to roots and tubers. They also tended to raise proportionally more cattle than Afro-Guyanese and, hence, were in the forefront of beef and milk production. By far, however, the most distinguishing feature of East Indian small farmers in Guyana is their cultivation of rice. The emergence of rice as a cash crop provided rural East Indians with a stronger economic base than that available to rural Afro-Guyanese who mainly grew roots, tubers, and fruits (Smith 1964). Rice became an important cash crop during the sugar depression of the 1880s, but its significance rose

dramatically after 1917 when rice supplies from the Far East suddenly ceased as a result of the First World War (Mandle 1973). During this period, Guyana began exporting rice throughout the West Indies, and has continued doing so up to the present time. As an export crop, rice has maintained its importance in the country's agrarian structure, strengthening the economic base of many East Indian villages to the degree that outmigration to urban areas did not occur at anywhere near the levels experienced in Afro-Guyanese villages (Table 2-2).

Table 2-2 Percentage of Afro-Guyanese and East Indians Living in Urban Areas, 1921-1960

Racial Group	1921	1931	1960
Afro-Guyanese	29.1	33.5	43.3
East Indians	6.2	7.1	13.4

Source: St Pierre (1981).

Concerning the influence of the family structure and the role of inheritance customs, Despres (1967) argued that the extended family provided East Indians with a strong resource base capable of dealing with the environmental uncertainties of Guyana's coast. By pooling family income, labour and land, East Indians could better cope with the problems of flooding,

land clearing and cultivation than Afro-Guyanese, who tended to be more individualistic once they reached adulthood. Despres also noted that whereas East Indians were more likely to subdivide large plots of land or acquire new plots for their grown children so that individuals had distinct, economic portions of land, this was not generally the case among Afro-Guyanese.

In general, Afro-Guyanese tended to pass on intact whatever land they owned to all their children. Thus, each member of the family would have a share in the property but the property itself was not subdivided. This so-called "family land" arrangement reduced individual entrepreneurship, because permission was usually required from all members of the family for certain types of land uses. For example, grazing of cattle on family property or cultivating vegetables might be undertaken without the consent of all family members, but the large-scale cultivation of perennials which require more permanent land-use change would require the consent of all family members. Frequently, family friction or absence of family members prevented development of properties and led, in many cases, to prime agricultural land being left idle. The factor of family-land arrangements among Afro-Guyanese have been frequently cited in the literature as one of the problems affecting domestic agriculture not only in Guyana, but elsewhere in the West Indies (Besson and Momsen 1987).

The experience of East Indians with village settlement and agriculture combined to result in their having lower rates of rural-to-urban migration than Afro-Guyanese throughout the first half of the 20th century and up until the mid-1970s. It was only as a result of the economic crisis of the late 1970s and 1980s that high rates of migration from East Indian villages became noticeable, and agriculture, consequently, began declining to a marked degree, similar to what had happened earlier in the Afro-Guyanese villages.

2.4.1 Racial Politics, International Economics and Domestic Agriculture in Guyana.

During the immediate post-World War Two period, deplorable socio-economic conditions confronted both Afro-Guyanese and East Indian working-class people in Guyana, and led to calls for independence from Britain. In 1950, the popular, multiracial and nationalist party, the People's Progressive Party (PPP), was formed. It advocated universal suffrage, independence from Great Britain, and social justice for all (Spinner 1984). Cheddi Jagan was elected leader of the party and Forbes Burnham emerged as chairman. In 1953, the right to internal self-government was granted to Guyana by the British government and a general election was held. This election was won by the PPP because of its popularity with the Guyanese working class.

During the early stages of internal self-government, Jagan became unpopular with both the British government and conservative elements within Guyana because many of his policies were thought to be decidedly Marxist. Such policies included: the government's removal of a ban on entry into Guyana of West Indians judged politically subversive by the old colonial government; government supervision for the numerous schools in the country which had up to that time been run by Christian churches; ownership of property as a qualification for voting in local government elections was abolished; and higher taxes for both the mining and sugar industries. Other moves by the PPP government, which led to it being labelled as Marxist, was the refusal to grant leases of Crown Lands to landlords who already had large landholdings, and the imposition of penalties on landlords and tenants who did not practise good estate management (Spinner 1984).

Local agitations over the PPP's policies and fear by the British government that communism would spread from Guyana to other parts of the British Caribbean, which was then planning for the formation the West Indian Federation, led to the suspension of Guyana's constitution on October 4, 1953. In all, the PPP's tenure in office lasted only six months. The constitution, on the other hand, was suspended for a period of four years during which time the country was governed by an interim government nominated by the British Crown.

Shortly after the PPP was ousted from government, a split occurred within the ranks of the PPP, with Jagan claiming leadership of the East Indian faction and Forbes Burnham that of the Afro-Guyanese. The East Indian faction continued with the name PPP, while the Afro-Guyanese faction organized under the name of the People's National Congress (PNC). Although both factions had leanings towards the political left, the PNC was seen by the British as being more moderately socialist, while the PPP was labelled communist. Since its occurrence in 1953, this split of nationalist political leaders along racial lines has profoundly affected the economic and political life of Guyanese people.

Economically, the split along racial lines led to bitter struggles over allocation of resources, while politically it has resulted in a nation unable to free itself from the burden of divisive racial issues. Thus, despite Jagan's unpopularity with the British, the Americans and other pro-western forces, including local business elites in Guyana, he still managed to win elections in 1957 and 1961 as a result of support from the East Indians who were the largest racial group in the country.

According to Greene (1974) and St Pierre (1981), a main criticism of the PPP during its tenure in office in the late 1950s and early 1960s was that it invested heavily in rural communities where East Indians predominated, but neglected the urban areas where Afro-Guyanese predominated. Even within the agriculture sector, the government was criticised for its biased approach to agricultural spending. Relatively large

sums of money were invested in the infrastructure necessary to further the growth and development of the rice industry with which East Indians were particularly associated. At the same time, little was done to improve the infrastructure associated with crops such as roots, tubers and fruits, which represented the economic base of Afro-Guyanese villages. This neglect of the agrarian infrastructure in the Afro-Guyanese villages during the 1950s is one specific factor explaining decline in per capita local food production in the early 1960s (Table 3-1). In particular, it accounts for the decline of root and tuber production which mainly accounted for the overall decline in food output during the early 1960s.

During 1964-1992 when the PNC government was in power, the politics of agricultural investment reversed direction. Data supplied by Lakhan et al. (1988) show that during this period public investment in agriculture, and rice production in particular, declined considerably from their pre-1964 levels. Lakhan et al. have argued that cuts in public investment in agriculture should be interpreted in the light of the PNC redressing the investment pattern set by the preceding PPP government. This redressing, they observed, was largely influenced by racial considerations because the PNC support base came mainly from urban Afro-Guyanese, but not rural East Indians. In any event, reduction in agricultural investment not only affected the East Indian-dominated rice industry, but also the domestic food sector as there was

little investment in infrastructure and supporting services for agricultural development.

Finally, as part of the background for understanding food production problems in Guyana, cognizance must be taken of the "peripheral" position of countries such as Guyana in the world capitalist system (Knox and Agnew 1989), and the consequent attention that must be given to activities earning foreign exchange. In Guyana, bauxite, sugar, rice and, more recently, gold are the main foreign exchange earners. Except for gold, each component of the export sector has a long history of relatively generous support by successive governments in the post-war period, regardless of political ideology. Thus, although the level of investment in agriculture relative to other sectors was reduced after 1964, when the PPP government was replaced by the PNC, relatively large sums of money were still spent on drainage and irrigation programmes, machinery, farm credit and other support for the sugar and rice industries. Despite the rhetoric of the PNC government that it was supportive of domestic food production, deterioration in village agrarian infrastructure continued throughout its tenure in office, because most of the available resources for agriculture were used to support the export subsector. In those instances where support to the domestic food sector was conspicuous, IMF restructuring policies in the late 1970s were instrumental in eliminating them as they were perceived to be excessive subsidies which the state should not finance.

2.5 Recent Economic Indicators

Currently, agriculture is still the single most important economic activity in Guyana, accounting for 27% of total GDP and just under half of total export earnings in 1993 (Bureau of Statistics 1994). Sugar is the largest contributor to both agriculture and total GDP. Between 1989 and 1993, it accounted for approximately 62.3% of agricultural GDP and 16.1% of total GDP. The sugar industry is also the second largest employer of agricultural labour, accounting for one-third of all agricultural employment. Domestic food crops and livestock account for some 57% of agriculture employment, but much of this is low-income, part-time employment. The subsector contributed 27.6% of the agricultural GDP between 1989 and 1993, and 7.2% to total GDP (Bureau of Statistics 1994). Rice occupies more than half the arable land in Guyana, but contributed only 10% of the agricultural GDP between 1989 and 1993, 2.6% to the total GDP, and 8.2% to total export earnings (Bureau of Statistics 1994). These statistics indicate that the importance of rice to Guyana's economy is not as great as some government officials believe (Ministry of Agriculture (1994)).

After agriculture, government services and mining and quarrying are the next largest sectors. Government services, along with distribution, manufacturing and other services are heavily concentrated in Georgetown, the capital city and main urban centre. A significant portion of these activities are,

however, becoming important outside Georgetown in the form of rural non-farm activities (Hope 1986). Official unemployment is between 12-15%, but actual unemployment is probably much higher given that large reduction has occurred in the size of the public sector in recent years. During the 1970s and 1980s, the socialist policies of the PNC government led to 80% of the economy coming under the direct control of the public sector (Baber and Jeffrey 1986). Economic restructuring, which began in the late 1980s, led to large reduction in the size of the public sector and since the private sector was very small, it meant that a significant proportion of the labour force remained unemployed or underemployed. Some laid-off public-sector workers have found jobs in the informal economy, but high rates of unemployment pervade the country's economy.

Efforts to transform and modernize Guyana's economy in the post-war period have been particularly disappointing in comparison with other West Indian countries. Almost four decades of a mixture of racial politics, Marxism, and economic mismanagement (Spinner 1982; 1984) resulted in the country moving from a position of relative economic strength in the 1950s to become the poorest nation in the West Indies in the 1980s, with its GDP being just one-tenth that of the regional average (Table 2-3).

Table 2-3 GDP per capita - West Indies (\$ U.S. at current prices)

Countries	1951 ^a	1965 ^b	1973 ^b	1983 ^b	1994
<u>Leeward Is.</u>					
Antigua & Barbuda	N/A	} 235	930	1,735	6,500
St Kitts/Nevis	"		506	1,268	3,650
<u>Windward Is</u>					
Dominica	N/A	} 235	404	1,025	2,000
Grenada	"		319	1,052	2,800
St Lucia	"	} 235	480	1,066	1,930
St Vincent	"		311	877	1,300
<u>MDCs</u>					
Trinidad & Tobago	322	751	1,314	6,854	3,600
Jamaica	163	456	868	1,572	1,400
Guyana	201	291	420	622	300
Barbados	N/A	235	1,178	4,169	6,500

Sources: a - U.S.D.A. (1963);
b - United Nations, 1993;
c - The World Factbook 1993-1994.

After a series of IMF interventions in 1988, an Economic Recovery Programme was implemented under IMF supervision with the objective of bringing about a "fundamental shift in economic management from a state-dominated economy to a market-oriented one" (World Bank 1993). A variety of macro-economic reforms were instituted between 1988 and 1992. These reforms included relaxation of foreign exchange controls, successive devaluations, credit restrictions, privatization of state-owned firms, removal of price controls and subsidies on food, transportation, education and petroleum products, and reduction in public-sector employment, services

and spending. The abrupt redirection of the economy towards a free-market system resulted in severe social dislocations. These include deterioration in physical infrastructure, widespread unemployment, increases in the incidence of crime and poverty, and migration of both skilled and unskilled labour (Ali 1994). As a result, Guyana was perhaps one of the few countries in the developing world to experience a decline in population during the 1980s.

Despite the high social costs of IMF prescribed shock-treatments, the economy grew by 6.1% in real terms in 1991, 7.3% in 1992, 8% in 1993 and 8.4% in 1994 (World Bank 1993; World Fact Book 1994). Domestic inflation slowed to 13% in 1992 as compared with 102% in 1991, while exports increased by about 12.5% in real terms after having declined by 5% per year between 1989-1991 (World Bank 1993). Based upon the above indicators, it would appear that a long period of economic stagnation and decline is gradually coming to end in Guyana. Also, since 1992 a new government replaced the PNC government which had been in power for 28 years, strengthening the notion that a new era of politics has begun in Guyana. If this is indeed the case, then the time is all the more opportune for an investigation of the structural problems that have contributed to the decline of domestic agriculture in Guyana.

CHAPTER THREE

3.0 REVIEW OF DOMESTIC FOOD PRODUCTION IN GUYANA, 1960-1994

While Chapter One provided a general picture of Guyana's dismal experience with food production between 1960 and 1994, this chapter provides a detailed review of certain indicators in order to gain further insights into the nation's food production history since 1960. The indicators selected to measure changes in food production are per capita food output, amount of cropland harvested, and yields. Food products were divided into five groups; namely, vegetables, provision crops, livestock products, vegetable oil, and fruits. Within each food group, one or more commodities were selected to highlight changing production patterns between 1960 and 1993. Selection was based upon the availability of complete data for the period 1960 to 1994, together with their ability to represent a given food group. Table 3-1 shows the five food groups and the associated commodities chosen to represent them.

Rice and sugar were not considered in this study because they are regarded as export crops. Up to 85% of sugar output and close to 70% of rice output is regularly exported. Notwithstanding their exclusion from this study, it is noteworthy that the output performance of both sugar and rice during the study period was not unlike crops for domestic food production. Between 1960 and 1990 output of sugar declined by

approximately 25%, i.e., from 327,000 tonnes to 132,000 tonnes. Since 1991, production has steadily increased reaching 241,300 tonnes in 1993. Rice production which averaged 122,000 tonnes in the 1960s declined to a low of 95,000 tonnes in 1972. Subsequently, the average annual output was just 154,000 tonnes. Production has risen steadily since 1991 and, by 1993, it had reached 210,000 tonnes (Bureau of Statistics 1994).

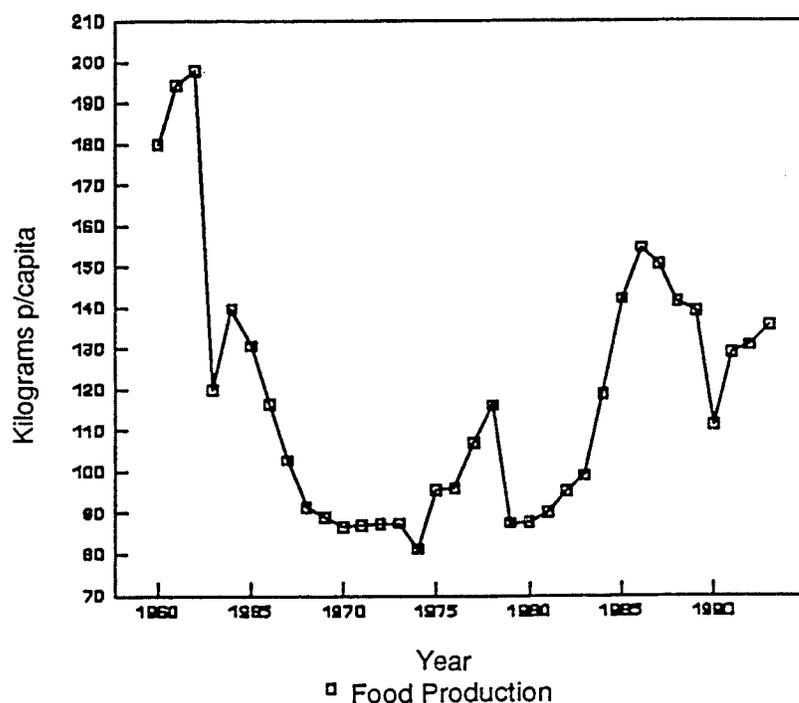
Table 3-1 Selected Food Groups and Representative Commodities

Food Groups	Representative Commodities
Provision Crops	plantains, roots and tubers
Vegetable Oil	coconut
Vegetables	tomato, cabbage
Fruits	citrus, banana, pineapple
Livestock Products	beef, pork, poultry

3.1 Total Food Output, 1960-1993

Since the early 1960s, the overall trend of decline in *per capita* food production has been punctuated by significant fluctuations (Figure 3-1). Nevertheless, certain patterns are obvious and these essentially span each decade. These patterns are discussed in detail as they provide insights into Guyana's recent experience with food production.

Figures 3-1 Total *per capita* Domestic Food Output, 1960-1993 for Selected Crops and Livestock).



Sources: Estimated from data provided by the Ministry of Agriculture and IICA (1980) and Ministry of Agriculture (1994), unpublished.

Note: Per capita food output = weight of food output divided by total population.

3.2 Phase One, 1960-1970

Overall the decade of the 1960s was marked by a severe decline in per capita food production (Figure 3-1). Approximately 72% of this decline was due to reductions in output of provision crops. Altogether, provision crops accounted for an average of 41% of total tonnage of domestic food produced between 1960 and 1974, other than rice and sugar. Consequently, declines in this food group had major effect on total per capita domestic food production. Vegetables, poultry meat, and pork showed increases in output during the period, (Figures 3-2 & 3-4), but these were not enough to prevent total per capita output from falling.

Historically, this phase in Guyana's domestic food production history coincided with the last four years of the PPP pre-independence administration in Guyana and the first six years of the PNC's administration. Food production declined suddenly between 1962-1963 because of civil unrest that characterised the country during this period. During fieldwork many farmers explained that because farmlands are relatively isolated from the residential areas of the villages, many people were reluctant to visit their farms during the period of civil disobedience because of fears of violence. Many farms were thus left unattended and the effect was reflected in lower levels of food output. Decline in food output between 1962 and 1964 was, nevertheless, short-lived and stands in contrast to the protracted decline in per capita domestic food production that occurred between 1964 and 1970, the first six years of PNC rule.

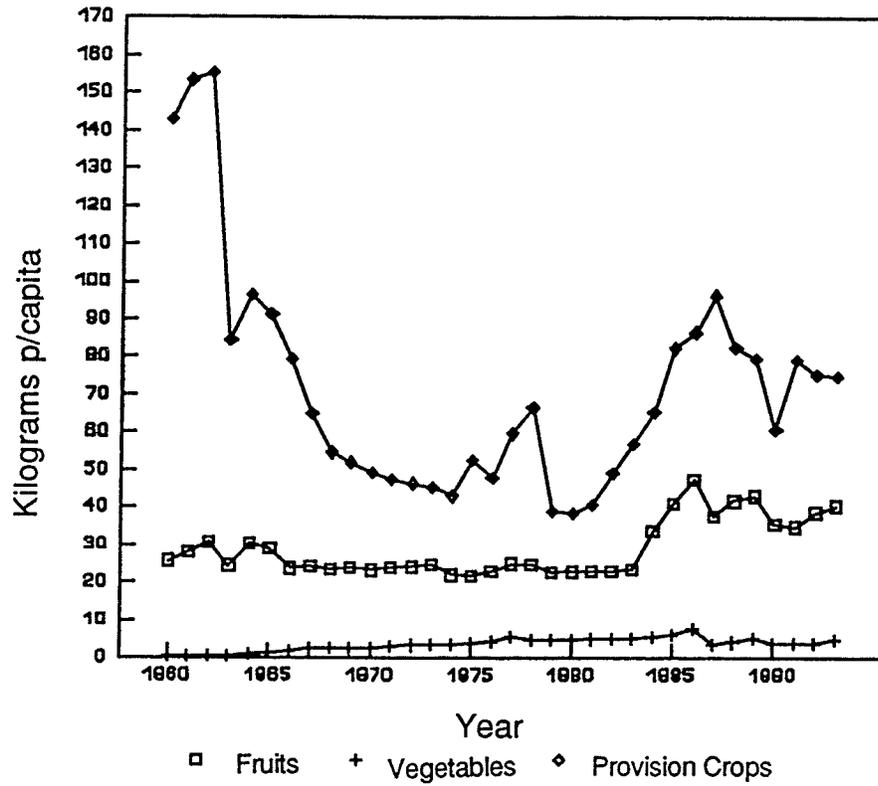
One explanation for the more protracted period of decline in food output during the 1960s is that expansion in bauxite mining in Linden and Kwakwani, gold and diamond mining in the interior, and growth in service activities in Georgetown, speeded up the movement of rural people, especially Afro-Guyanese, away from farming. This explanation was given by older farmers during the field survey conducted in 1994.

Smith (1964) has offered an alternative perspective, noting that the movement of Afro-Guyanese away from farming in the 1960s can be explained in terms of the low prices that were obtained for their main cash crops. He noted that East Indians were fortunate because rice experienced rapid increases in price during the Second World War, as a result of the disruption of supplies to the West Indian market from Asia. Following the war, Guyana continued supplying the Windward and Leeward Islands, Jamaica, and Trinidad and Tobago with rice under a special agreement. This agreement provided for Guyana to supply all the rice required by these countries at an agreed price, and these countries, in turn, agreed to purchase rice only from Guyana, unless the latter was unable to satisfy their needs. Within this captive market rice was sold at prices above world levels, thereby ensuring a measure of profitability to rice farming. Many East Indian farmers were thus less inclined to leave agriculture because, in addition to rice, they could also grow vegetables and raise livestock on a small scale.

Another important factor which contributed to declining food production during the 1960s was the lack of commitment by government to agricultural development. One reason for this was that the newly elected PNC government, having criticised the outgoing PPP government for its large spending on agriculture during the 1950s and early 1960s, had no intention of continuing the policy of strong support for agriculture.

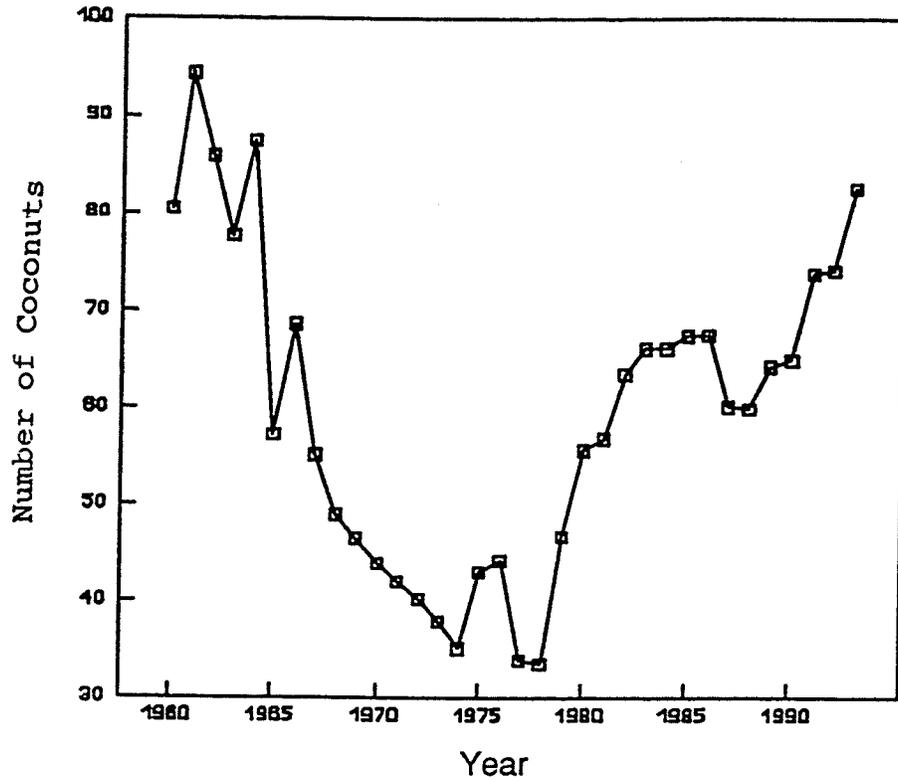
Government's reliance on Arthur Lewis' "industrialization by invitation" strategy as the model for economic development also helped to deflect attention away from agriculture during the latter half of the 1960s. The industrialization by invitation strategy formed the basis of the 1966-72 development plan, but by 1969 it became evident that the strategy was not working since much of the envisaged foreign investment never occurred. This failure was largely a result of bad publicity concerning Guyana's involvement with communism, as well as civil disobedience which occurred in the early 1960s. In any event, the combined effect of racial politics and government's preoccupation with industrialization resulted in the lack of an effective agricultural policy in the 1960s which, in turn, contributed to declines in food production

Figure 3-2 Per Capita Vegetable, Fruit, and Provision Crops Production, 1960 -1993.



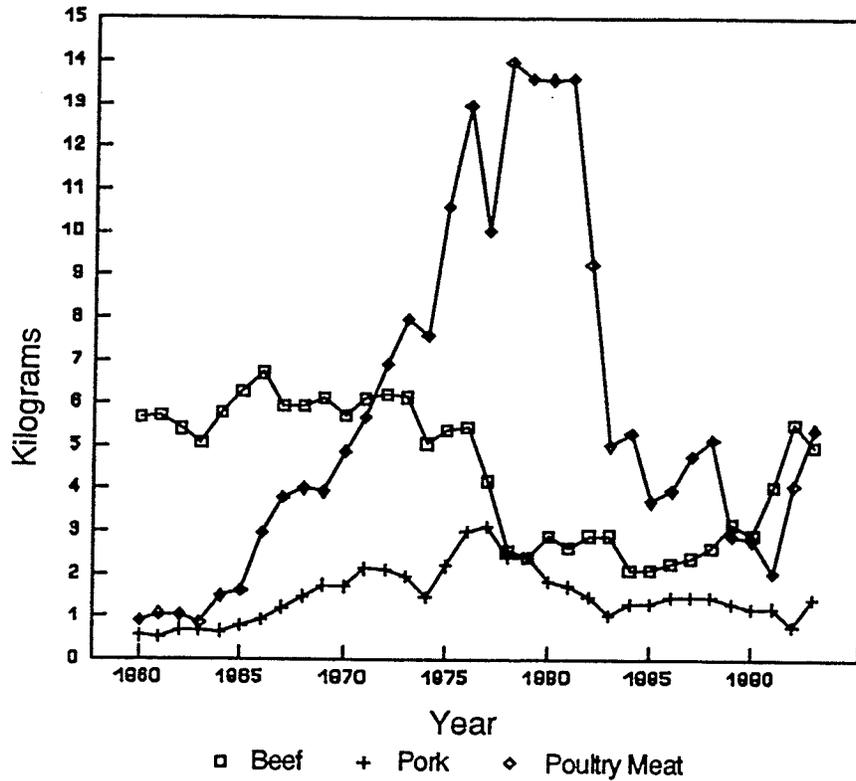
Sources: Estimated from data provided by the Ministry of Agriculture and IICA (1980) and Ministry of Agriculture, 1994, (Unpublished).

Figure 3-3 Per Capita Coconut Production, 1960 -1993



Sources: Estimated from data provided by the Ministry of Agriculture and IICA (1980) and Ministry of Agriculture, 1994, (Unpublished).

Figure 3.4 Per Capita Beef, Pork and Poultry Production, 1960 - 1993.



Sources: Estimated from statistics provided by Ministry of Agriculture and IICA (1980); Unpublished Crop and Livestock Statistics, and Ministry of Agriculture, Guyana, 1994.

3.2.1. Cropland Harvested and Yields, 1960-1970

Although per capita domestic food production declined between 1963 and 1970, the area harvested to domestic food crops increased for the crops selected for study (Table 3-2). Total cropland (excluding vegetables) increased from approximately 28,841 ha in 1963 to 34,350 ha in 1970 mainly as a result of additional lands cultivated in coconuts, provision crops, and to a lesser extent, citrus fruits. Average yields for the selected food crops, however, declined by approximately 40% between 1966 and 1970. Provision crops experienced the greatest decline in yield followed by coconuts and fruits. Yields for provision crops declined by 32%, moving from 5,280 kg/ha to 3,614 kg/ha. Coconuts decreased by 40%, moving from 2,673 nuts/ha in 1966 to 1,615 nuts/ha in 1970. Yields for fruits decreased by 20%, moving from an average of 6,500 kg/ha in 1963 to 4,096 kg/ha in 1970. Even vegetables, which showed notable improvements in production, experienced a slight reduction in yields from 4,646 kg/ha in 1966 to 4,558 kg/ha in 1970.

These data on yields and cropland harvested revealed that the response of farmers to declining yields was to increase the area of cropland cultivated as opposed to intensifying their production. This strategy evidently failed because yields declined at a faster rate than did the increase in cropland cultivated. For the selected food crops, cropland increased at an average annual rate of 7% between 1960 and 1970, while yields declined by an average annual rate of 6%. The main reason for the marked decline in yield during this

period is not entirely clear. One explanation is that with technology remaining unchanged, and labour supply declining due to rural-urban migration, the intensity of production fell rapidly.

Table 3-2 Cropland Harvested and Yields for Selected Domestic Food crops, 1960-1993.

Year	Fruits		Provision Crops		Coconuts		Vegetables	
	Crop land (ha)	Yield kg/ha	Crop land (ha)	Yield kg/ha	Crop land (ha)	Yield nuts/ha	Crop land (ha)	Yield kg/ha
1960	na	na	9923	8143	14297	3078	na	na
1963	2241	6500	10866	4675	15390	2915	na	na
1966	2955	5144	9986	5280	16464	2673	223	4646
1970	3744	4096	10625	3614	19018	1615	383	4558
1973	4258	4862	11823	3178	na	na	370	6316
1976	na	na	3,000	6871	na	na	na	6375
1980	na	na	3,000	6522	"	"	"	6039
1983	"	"	2,000	6735	"	"	"	6170
1986	"	"	2,000	6977	"	"	"	6002
1990	"	"	4,000	7045	"	"	"	6576
1993	"	"	4,000	7373	"	"	"	6719

Source: Computed from data supplied by Ministry of Agriculture and IICA (1980) and FAO Production Yearbook, various years, 1973 -1993.

Note: Data on "Provision Crops" from 1976 onwards are only for roots and tubers and do not include plantains.

3.3 Phase Two, 1970-1980

The decade of the 1970s was distinguished by generally low levels of food output punctuated by a period of sudden upturn in production which lasted for about four years (Figure 3-1). The upturn in production is attributed to initiatives taken by the PNC government to stimulate agriculture during the mid-1970s as part of its second Five-Year Development Programme. This Programme was to be reflective of the government's ideological shift from dependence on free-market capitalism to co-operative socialism (Potter 1987). Government initiatives to intensify domestic food production actually began around 1972 and were extensive in nature. According to Kennard (1980) and Odie-Ali and Rutherford (1994), these initiatives included:

- 1) establishment of the Guyana Agricultural and Industrial Development Bank (Gaibank) in 1973 to provide credit to all levels and categories of farmers;
- 2) strengthening of agricultural training institutions and the establishment of a Faculty of Agriculture at the University of Guyana in 1975;
- 3) appointment of land-development and agricultural-field officers at strategic locations;
- 4) re-organization of the local government system into six ministerial development regions;
- 5) strengthening of the Guyana Marketing Corporation to assist with internal marketing of farm products;
- 6) establishment of various land-development schemes;
- 7) encouraging the formation of agricultural cooperatives, especially for small farmers;
- 8) establishment of specific crop and livestock assistance programmes;
- 9) distribution of seedlings either free or at nominal prices; and

- 10) encouraging the development of small-scale industries for processing fruits and vegetables and manufacturing preserves, condiments, jams, jellies and syrups.

As a result of the government's agricultural drive, some improvements were noted in domestic food production after 1975. For instance, provision crops and coconuts recovered from their abysmally low output levels in the second half of the 1960s (Figures 3-2, 3-3). Output of vegetables, which had been on the upswing in the 1960s, continued to increase. Poultry and egg production, which were also increasing in the 1960s and early 1970s, expanded even further after 1975. Similarly, pork showed substantial improvements in output.

Undoubtedly, the period 1974-1978 was significant in the recent food production history of Guyana. It represented the first major effort to reverse the consistent trend of declining food production which had plagued the country since the early 1960s. Government's support for local food production was high and farmers' responsiveness to governmental initiatives was also at a high level.

Despite the emphasis on revitalizing the domestic food sector in the mid-1970s, analysis of food production levels during that period reveals that per capita output did not increase significantly and, in fact, was well below per capita levels achieved in the early 1960s (Figure 3-1). One of the reasons for the poor performance of the agricultural drive in the mid-1970s was the new direction established by the PNC government for agriculture. In the first instance, government

sought to move the national agricultural system away from its traditional private, small-farm orientation, which was perceived as inefficient, to either state or cooperatively-owned, large-scale farms (Ford 1992). As a result, smaller amount of funds were allocated to the Ministry of Agriculture to continue with its already limited programmes to support the traditional food base, namely semi-subsistence and commercially oriented small farms found throughout the coast. This strategy led to less than expected levels of food production as the large-scale, mechanized livestock and crop farms failed to become profitable. This failure was due to a number of problems, such as inadequate foreign financing of projects, and the fact that, being located in remote interior locations, they could not retain the technical staff to manage them owing to the lack of infrastructure, such as schools, hospitals and roads (Power 1989).

The emphasis on developing the sparsely populated interior of the country as the geographical base for domestic food production rather than the traditional coastal plain was the second distinguishing feature of the PNC's agricultural drive (Ford 1992). This strategy was justified on the grounds that it was necessary to overcome spatial inequity created by colonialism. The interior-oriented agricultural strategy of government also failed to yield the desired results primarily because of technical inexperience in practising large-scale agriculture in remote tropical rainforests. In addition, the previously mentioned problem of being unable to retain labour

supply in these locations hindered the success of many projects.

Following the period of increased food production in the mid-1970s, Guyana witnessed a short period of severe decline in food production (Figure 3-1). This decline has been linked to: the collapse of the main productive sectors of the country, i.e., bauxite, sugar and rice, as a result of economic mismanagement; the failure of the cooperative strategy of economic development; and political discontent over the stifling of democratic institutions (Thomas 1982). The resultant balance-of-payment problems experienced by the country (Table 3-3) caused cutbacks in the government's agricultural programme because the high level of imports required to support agriculture could not be sustained. By 1980, substantial declines had occurred in per capita food production, especially for livestock products, i.e., pork and poultry meat. In these particular cases, downturns in output stemmed from farmers losing guaranteed market prices for these products, as well as the general shortage of foreign exchange to purchase inputs from abroad (Downer 1983).

One observation that emerges from comparing patterns of food output in the 1960s with those of the 1970s is that food output improved during the years when the government had a clear and definitive role for the domestic food sector in its development plan. Also the government was willing to support the small-farming sector that produced the domestic food supplies with technical, financial, and marketing assistance. It is noteworthy that stimulus to food production occurred in

the context of an agricultural policy that gave high priority to export crops. This demonstrates that it is possible for West Indian countries to provide support for domestic food production while not neglecting their export crops - a strategy advocated by the West India Royal Commission as long ago as 1938 (H.M.S.O. 1945).

Domestic food farms should, however, seek to become profitable without excessive reliance on government subsidies. Whenever there is excess dependence on production support mechanisms, shortfalls in government revenue could have immediate and devastating impact on food production. This is exactly what occurred in Guyana in the late 1970s when economic downturns spurred by low output from the three main export-earning sectors, sugar, bauxite and rice, caused cutbacks in government expenditure. Public expenditure was cut by 30% in 1977 alone and subsidies on transport, poultry feed, flour, electricity, and water were removed (Thomas 1982). Food production collapsed suddenly and severely, so that in the face of an existing broad regime of price controls, output in the early 1980s dropped to levels lower than those achieved during most of the latter half of the 1970s.

Table 3-3 Guyana, Balance-of-Payments, 1978-1990.
(\$U.S. millions)

Year	Balance-of-Payment Current Account	Balance-of-Payment Current Account Deficit as % of GDP
1978	- 31.9	6.4
1979	- 78.8	15.2
1980	- 103.9	18.2
1981	- 182.6	32.2
1982	- 151.2	31.4
1983	- 163.2	33.4
1984	- 115.8	26.1
1985	- 130.3	28.2
1986	- 129.9	25.0
1987	- 119.5	34.5
1988	- 100.0	24.2
1989	- 120.6	47.1
1990	- 163.1	63.6

Source: World Bank (1993).

3.3.1 Cropland Harvested and Yields, 1970-1980

Data from Guyana's Ministry of Agriculture on land area cultivated to food crops and yields obtained between 1973 and 1993 were unavailable. FAO data on yields, however, are available, though only for vegetables and roots and tubers. These data show that yields in the 1970s were much higher than those obtained in the 1960s (Table 3-2). These data also show that instead of a decline, the general trend was towards a moderate increase in yields.

One explanation for the sharp reversal in yields noted in the 1970s could be the renewed emphasis placed on agriculture during this period. Another explanation could be statistical

error stemming from the use of two different estimates. Nevertheless, in comparison with other countries, yields in Guyana for vegetables and roots and tubers during the 1970s were low (Table 3-3).

Carter and Telfer (1976) confirmed that policy-makers in the early 1970s were aware that agricultural yields were low. They also observed that government's approach to dealing with this problem was to expand deliberately the area under food crop cultivation as a means of compensating for low yields. This policy was rationalized on the grounds that with ample resources of agricultural land, and low-cost labour, it was cheaper, initially, to expand area cultivated rather than to increase productivity, which would require the use of costly fertilisers, fuel and machinery. Given the situation of limited capital availability which characterised the period, the policy of expanding cultivable area rather than seeking to increase productivity was an understandable one. However, the fact that total per capita food output did not show significant increases during this period suggest that the policy was not successful. Current thinking on this matter is that sustained agricultural research, the use of better technology supported by effective extension services, and improved agricultural infrastructure have far greater potential for raising agricultural output and productivity (Mellor 1988).

Table 3-4 Yields for Vegetable, Roots and Tubers (Selected Countries), 1974-1976.

Countries	Yields- Vegetables (kg/ha)	Yields - Roots & Tubers (kg/ha)
Venezuela	18,979	12,030
Brazil	22,839	12,006
Barbados	10,659	6,440
Trinidad	20,565	11,565
Jamaica	8,155	10,207
Guyana	6,719	3,000
Grenada	10,583	5,076
St Lucia	na	4,500
Dominica	na	9,741
Antigua	3,455	3,455

Source: FAO Production Yearbook, 1976.

3.4 Phase Three, 1980-1990

The decade of the 1980s was characterized by a six-year period of sustained increases in food production that reached levels higher than those achieved in the mid-1970s. This was followed by an abrupt four-year decline in food output. Food production increased significantly during the early 1980s, but not because of government's promotion of the need for greater domestic production. Rather, it was a response to the extreme shortage of food caused by government's banning of wheat flour and the non-importation of a wide range of other foodstuff. Most of the increase was accounted for by provision crops which were used as substitutes for wheat flour. Restricted importation of vegetable oil provided a boost for the local

coconut-oil industry while the supply of fruits and vegetables expanded to meet demand. Poultry and pork failed to show significant increases in output owing to shortages of foreign exchange to purchase feed and other inputs from abroad. Beef, however, showed upward trends in output after the mid-1980s as a result of the new strategy of focusing on small farmers, rather than on a few large-scale government-controlled beef and dairy farms which had previously monopolized resources devoted to this sub-sector (Ford 1992).

Following the lifting of the ban on wheat flour and the return of people to traditional eating habits, a sharp decrease occurred in per capita food output in Guyana. The food situation during this phase is reminiscent of what Ford (1992) has pointed out; namely, that the banning of staples and food items which have cultural significance does not form a sound basis for sustained increases in domestic food production. On the contrary, such moves have negative impacts on human productivity and participation in the labour force.

Although the period between 1990 and 1994 is too short to be considered a phase, there is evidence to suggest that per capita food production was recovering from the downturn experienced in the late 1980s (Figure 3-1). In particular, beef, poultry meat, coconuts and certain fruits, e.g. bananas and pineapples, have shown increases in output since 1990. Much of these increases appear to be subsistence responses to the stringent measures prescribed by the IMF to restructure Guyana's economy. As such, these increases may be viewed as

short-term measures adopted by Guyanese people to deal with widespread price increases following the rapid market liberalization that formed part of the IMF policy prescription.

Except for the removal of price controls, it appears that structural adjustment policies with respect to agriculture were designed to aid the sugar and rice subsectors. Domestic food production did not rank highly in the adjustment policies of the 1990s and, consequently, the subsector remains largely untouched by reform. The plethora of structural problems which restricted domestic food production in the past is still intact and will continue to pose serious difficulties for the full realization of the country's food potential.

3.4.1 Cropland Harvested and Yields, 1980-1993

FAO estimates for the period 1980-1993 show that yields for roots and tubers and vegetables continued to be at relatively low levels in Guyana. Yields for roots and tubers increased from 6,522 kg/ha in 1980 to 7,341 in 1993 while vegetables increased from 6,039 kg/ha in 1980 to 6,650 kg/ha in 1993. Data for cropland harvested were only available for roots and tubers and these showed that there was no increase in the area of land harvested for roots and tubers (Table 3-2).

3.5 Conclusion

This chapter has reviewed the situation with respect to food output levels in Guyana between 1960 and 1993. Data acquired from various sources confirm that Guyana indeed experienced significant declines in food output during this period. Currently, per capita food output is rising, but it is still well below levels achieved in the early 1960s. The particular factors that led to this decline are the subject of the ensuing chapters. Preceding these chapters is a discussion on the hypotheses and research methods used in this study.

CHAPTER FOUR

4.0 HYPOTHESES AND RESEARCH METHODS

The thesis of this study is that domestic food production in Guyana declined between 1960 and 1994 owing to the failure of government policies in the post-war period to effectively support the economic, environmental, technological and infrastructural aspects of domestic agriculture. Throughout this period, the operating environment for farmers became progressively unattractive and resulted in a contraction of output as factors of production shifted from the domestic food production sector to other sectors where greater economic returns were perceived to exist. Such sectors included mining, services, and underground sector activities.

In Chapters Two and Three, a number of specific concerns were identified for further analysis. In varying degrees, these concerns appear to be significant in accounting for the decline in domestic food-crop and livestock production experienced by Guyana during 1960-1993. These concerns include:

- long-term changes in the nature of the farming systems utilized for domestic food production;
- price regimes facing domestic food producers;
- environmental management of farmland for domestic food production;
- farm credit and infrastructural support to the local food production sector;
- existing land-tenure and land-titling arrangements;
- age and education of farmers; and
- level of technology used in domestic food-crop production.

On the basis of these concerns, seven categories of hypotheses were formulated for testing. The hypotheses are set out below.

4.1. Hypotheses

1. Transformations in Guyana's farming systems between 1960 and 1994, i.e., changes in the relative distribution of different types of farms, are an important factor accounting for the national decline in domestic food production.

2. Government intervention in market pricing has been detrimental to domestic food production because prolonged price distortions acted as disincentives to increased output.

3(a). Food production among farmers has decreased as a result of escalating problems associated with the lack of drainage and irrigation.

3 (b). Problems of drainage and irrigation at the village-level stem from local governments that are unable to mobilize enough financial resources to carry out successful water-management activities.

4. The proportion of domestic food farmers with insecure titles to land has been on the increase. Consequently, the growth of food production has been hampered because proportionally fewer farmers now possess secure titles to the land they occupy. Such titles are necessary for obtaining farm credit which can be used to expand and modernize farm operations, thereby increasing output.

5 (a). Despite government's policy of providing agricultural credit to assist all categories of small farmers, a strong rice bias existed in the lending patterns of Gaibank, the country's main agricultural development bank. At various times, this strong rice bias in agricultural credit has led to reductions in the levels of farm credit to domestic farmers, preventing them from improving their farms and contributing to declining levels of food output.

5(b). Female domestic food farmers are less likely to receive credit from agricultural development banks than their male counterparts because of historical biases in the farm-credit system.

6. Widespread dependence on simple, non-mechanized farm implements and traditional techniques of cultivating crops, particularly in the non-export sector, is an important cause for declining per capita food production in Guyana. There has been a notable decrease in labour supply in the domestic food sector and the low level of technology presently used in this sector has resulted in insufficient food being produced to compensate for loss of farm labour, hence declining levels of farm output.

7. Increase in the age of people engaged in farming is a contributor to declining food production because older farmers avoid cultivating a broad range of food crops and raising livestock that involve heavy manual labour.

4.2 Data Sources

Data for the study were obtained through fieldwork done in Guyana between September and December 1994. Fieldwork entailed the collection of primary and secondary data which are described below.

4.2.1 Primary Data

Primary data were obtained from a questionnaire survey administered to 140 farmers in five coastal villages and from interviewing senior government officials in Guyana. Due to various inconsistencies 15 of the questionnaires were discarded, thus responses from a total of 125 farmers provided the data for the study. A farmer was defined as anyone who occupied 0.4 ha of land for the purpose of cultivating food crops, or who relied on the sale of livestock which they raised for all or part of their cash income. Appendix One is a copy of the questionnaire used in the survey. The questionnaire was designed so as to elicit information on a broad range of socio-economic, demographic and environmental factors that are currently affecting domestic food production in Guyana. In addition, a number of questions were specifically included to obtain data for testing the hypotheses that emerged from the literature review.

The villages in which the survey was conducted were selected to provide a representative overview of farming communities on Guyana's coast. In selecting them, efforts were made to include both communal-type and proprietary-type

villages ^{2/}; villages with predominantly East Indian or Afro-Guyanese populations; villages which reflected the different crop emphasis in Guyana's agriculture; and villages of varying population sizes. Although various other factors differentiate villages on the coast, for example, presence or absence of sea defences and drainage and irrigation systems, and size of cultivated area, the factors cited above are taken as major variables differentiating the villages.

The five villages selected for study were Clonbrook, Bush Lot, Craig/Friendship, Ann's Grove and Central Mahaicony (Figure 4-1). Basic geographic information about the villages are provided in Table 4-1. Initially, areal sampling (Gregory 1973; Brierley 1974) was contemplated, but this method proved inappropriate because domestic food farmers in some of the villages were too few to satisfy the criteria for inclusion into the sample. In the interest of expediency and to make effective use of time, given budgetary constraints, farmers were selected by means of systematic random sampling (Clark and Hosking 1986).

Systematic random sampling involved, first of all, the generation of a sample framework. This was done by acquiring the names of persons in each village involved in both full-time and part-time farming for supply to the domestic market. Acquisition of names of farmers was done through brief house-

^{2/} Communal villages were purchased collectively by ex-slaves after emancipation and sub-divided into lots according to the number of buyers. Proprietary villages are those where, after emancipation, the plantation owners retained the backlands of the estates for sugar cane cultivation while allowing the frontlands to be used for residential purposes.

to-house visits, accomplished with the aid of four research assistants who were residents of the villages. Three of the research assistants possessed university education while the fourth was a former schoolteacher. Once sample frameworks were generated for each village, a sample of farmers was drawn using the interval sampling technique. This entailed determining the number of farmers to be enumerated in each village, calculating a skip interval n , and then selecting every n^{th} farmer on the list. The first farmer was selected by using a table of random numbers. For most villages, the number of farmers in the sample represented between 40 and 50% of food-crop farmers in the villages.

In general, farmers were receptive and willing to talk about their farming operations and associated problems. One surprising observation during field work was that in many predominantly Afro-Guyanese villages, including Central Mahaicony and Ann's Grove, the proportion of residents engaged in farming was far less than anticipated. In these villages agricultural decline had reached an advanced stage and villagers were mostly involved in non-farm occupations, usually outside of their villages.

4.2.2 Reliability Check on Primary Data

A reliability check of the results of the sample survey was accomplished by comparing the results of the survey with results from an IICA survey of 700 farmers which was completed in 1993. Comparisons were also made with results from earlier

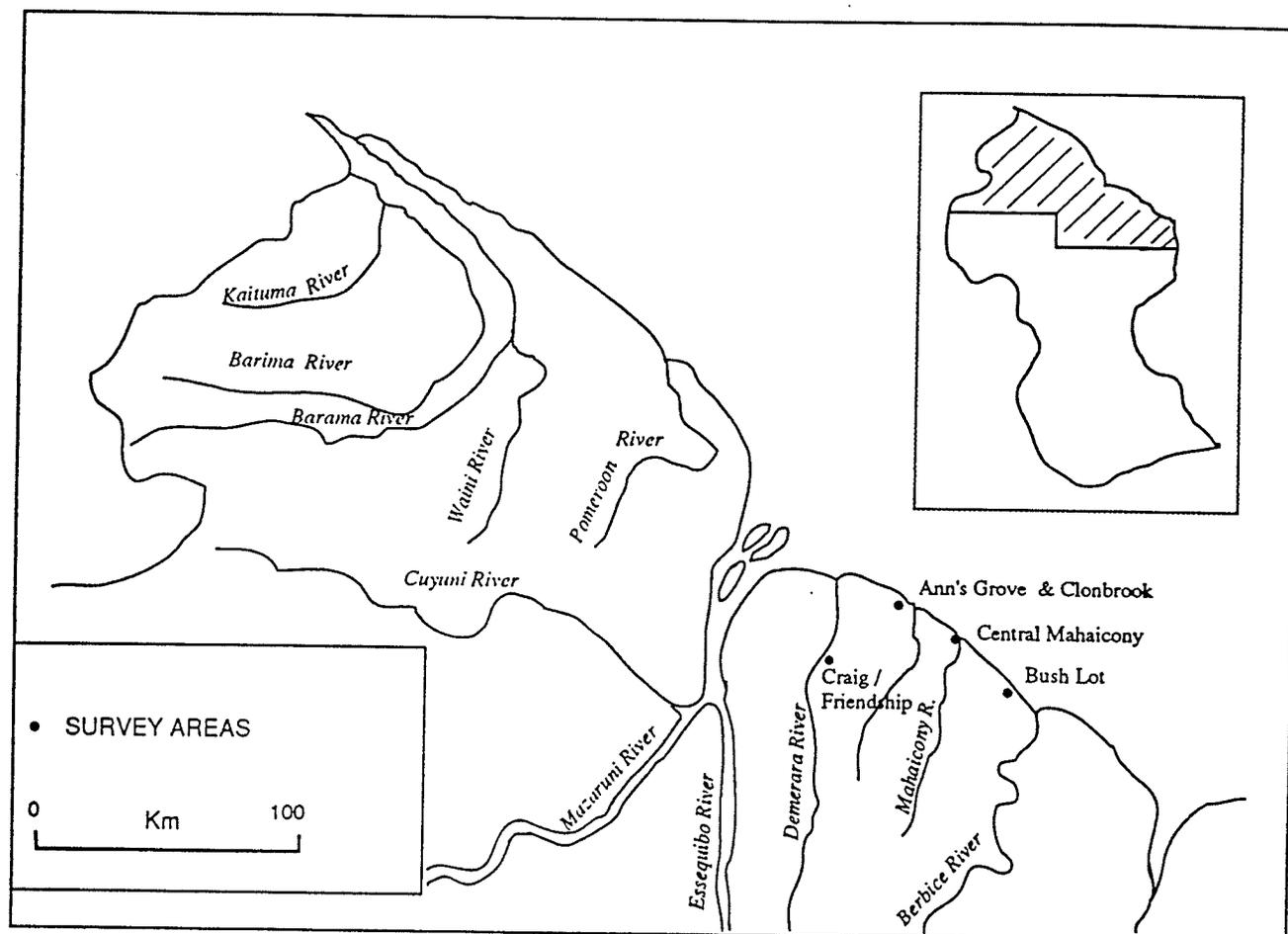
surveys, for example, the 1978 Guyana Rural and Farm Household Survey. In general, there was a high degree of similarity with respect to key variables, such as age of farmers, hours worked on farm, size of plots, and male/female composition of the farm population.

Table 4-1 Village Profiles

Village	Origin of Village / Main Ethnic Group	Estimated Pop, 1994	Economic Base	No. of Farmers Inter-viewed
Central Mahaicony	Proprietary (Afro-Guyanese)	1,711	Rice, Coconut, Rural Services	18
Ann's Grove	Communal (Afro-Guyanese)	2,400	Fruits Coconut	32
Clonbrook	Communal (East Indian)	1,980	Vegetable Fruits	36
Craig/Friendship	Proprietary (East Indian, Afro-Guyanese)	1,297	Sugar cane Livestock	25
Bush Lot	Proprietary (East Indian)	3,300	Rice, Livestock	13

Sources: Population Census, 1981; Unpublished Data, Statistical Bureau, Georgetown, 1994.

Figure 4-1 Map of Guyana Showing Location of Study Areas



Source: Adapted from Odie-Ali and Rutherford (1994).

4.2.3. Interviews with Officials from Government and Non-Government Organizations

In addition to the questionnaire survey, a number of open-ended interviews were conducted with senior officials from government and non-government organizations involved with agriculture in Guyana. Officials were from the Ministry of Agriculture, State Planning Secretariat, Statistical Bureau, Regional Democratic Councils, District and Village Councils, IICA, and CIDA. Perspectives and insights gained from these interviews proved useful in interpreting the data collected.

4.2.4 Secondary Data

A variety of secondary data pertaining to the domestic food production sector in Guyana between 1960 and 1993 was collected. These data provided baseline information on changes in the domestic food sector from 1960 up to 1993. Data were obtained from agricultural censuses and farm surveys, published and unpublished statistics, and documents from all levels of government in Guyana. Publications from non-government organizations, such as IICA, FAO, World Bank, and CARICOM were also used as sources of secondary data. A list of the surveys used in the study is shown in Table 4-2. Noteworthy is the fact that no census or comprehensive survey was available for the early 1960s and the 1980s. In the case of the 1960s, the 1952 agricultural census was used as an indicator of farm data for this early period.

Secondary data obtained from central and local government sources and agencies such as Gaibank were considered reliable

in that they represented official statistics generated from the provision of government services. Estimates from international agencies, such as FAO and IICA, were also considered reliable. There was at least one case where sufficient discrepancies existed between FAO estimates and those from local sources to render any assessment of trends invalid. In this instance, scholarly papers written during the period were used as sources of information to ascertain specific trends.

The main reliability problem with the secondary data used in the study was that results of various sample surveys conducted at different periods in time with varying sample sizes and research technologies had to be used for comparisons. By comparing the results of different surveys and censuses, sampling errors could multiply with the result that conclusions might be misleading. In order to reduce the effect of this problem, only those surveys where sample sizes exceeded 100 respondents were considered. Efforts were also made to use only those surveys whose results had been generally accepted by agricultural officers in Guyana. Given the lack of regular agricultural censuses, these various sample surveys, though limited, provided valuable insights into the nature of change in agriculture in Guyana.

Table 4-2 Census and Surveys used for Baseline Data

Survey	Date	Sample Size	Focus of Survey
1. Agricultural Census of British Guiana	1952	na	Farming systems, livestock pop,
2. Nathan and Associates	1974	321 Farmers	Farming systems, and problems faced by domestic food producers
3. PAHO/WHO	1976	922 Households	Food consumption, socio-economic & agricultural patterns
4. Guyana Rural Household and Farm Survey	1978	na	Creation of comprehensive data base on all aspects of farming in Guyana.
5. IICA	1994	700 Farmers	Land use, farming practices, and socio-economic well being of farmers.

4.3 Techniques Utilized for Data Analysis and Hypotheses Testing

The secondary data collected were ratio-type data, hence, linear regression and correlation analysis were used to identify relationships, and to test the validity of certain hypotheses. For the range of categorical-type data collected during the sample survey, chi-square tests were used to

identify relationships and test levels of significance. A logit regression model was used to analyze survey data in order to assess the relative importance of factors which were hypothesised as significant contributors to decreased domestic food production in Guyana. Since the relative importance of these factors changes over time, only their magnitudes at the time of the survey were computed.

A logit regression model was selected to assess the relative contribution of certain factors to decreased farm output because such a model can handle situations where the dependent variable as well as some, or all, of the explanatory variables are dichotomous or involve more than two responses (Gujarati 1992). This consideration was particularly important to this study because the main type of data collected during the sample survey were categorical in which one response had to be selected from two or more responses. The use of more common statistical techniques such as multiple regression analysis, factor analysis, principal component analysis and discriminant analysis to analyze categorical data has been described in the literature as being less efficient than logit models for analysing categorical data (Gilbert 1981; Stynes and Peterson 1984; Demaris 1992). One of the main criticisms of these techniques *vis-à-vis* their application using categorical data is that since they were designed to use metric type data, when applied to categorical or ordinal data, the results could be misleading.

Although logit models have been in use since the 1960s (Wrigley 1985), geographically based studies have only begun utilizing this technique in the late 1970s (O'Brien 1992). Studies which have used logit models in geography have focused on issues such as housing choice determinants (Quigley 1976); travel-mode choices for shopping destinations (McCarthy 1980); and the impact of the availability of local out-of-home services on the psychological well-being and travel patterns of the urban elderly (Smith and Gauthier 1995). Discussion on the theoretical aspects of logit models can be found in Agresti (1990), Demaris (1992) and Gujarati (1992).

In principle, a logit model bears similarly to a multiple regression model in that a dependent variable is estimated on the basis of two or more explanatory variables. The main difference between the two models is in the way they are estimated. In a multiple regression, the dependent variable is quantitative and hence model parameters can be estimated relatively easy using Ordinary Least Squares (OLS). In logit models, the presence of a dichotomous dependent variable would result in a violation of the assumption of equal variance required for OLS estimation and consequently, the estimated parameters would not be the best estimators of model coefficients (Clark and Hosking 1986). Another problem that arises is that if the values of the dependent variable are binary, ranging from 0 to 1, then values predicted from a regression equation using OLS will be unbounded and as such can take on values ranging from ∞ to ∞ . This result is

unacceptable in this case because the predicted values should not exceed the range of values for the dependent variables.

Logit models overcome the limitations of OLS by using the method of maximum likelihood to estimate the logarithm of the odds of getting a particular outcome from among two or more outcomes given the values of certain explanatory variables (Gujarati 1992). The logit model used in this study was specified as shown in the equation below.

$$\ln \left(\frac{P_i}{1 - P_i} \right) = B_1 + B_2DRA_i + B_3CRED_i + B_4TEN_i + B_5AGE_i + B_6DIST_i + B_7TECH_i + u_i$$

where

$P_i/(1 - P_i)$ = the odds of farmers increasing rather than decreasing or holding constant total volume of output between 1989 and 1994 (the five year period preceding the date of the survey research); 1 = if output increased during the period and 2 if otherwise;

B_1 = a constant;

B_2DRA_i = 1 if farm has adequate drainage and 0 if otherwise;

B_3CRED_i = 1 if farmer ever received credit and 0 if otherwise;

B_4TEN_i = 1 if farmers possess secure tenure and 0 if otherwise;

B_5AGE_i = 1 if farmer is younger than 45 years and 0 if otherwise;

B_6DIST_i = 1 if farm is located less than 2.5 km from farmer's place or residence, 0 if otherwise;

B_7TECH_i = 1 if farmer uses tools beyond cutlass, forks, hoe and shovel, and 0 if otherwise; and

u_i = error term

In the equation specified above, the constant or intercept term represents the average log-odds over all the explanatory variables. Because of the way the variables were coded, a positive intercept means that, overall, there is a greater likelihood of farmers increasing rather than decreasing or holding output constant. A negative intercept suggests that, overall, there is greater likelihood of farmers decreasing or holding output constant rather than increasing output. The significance test for the intercept term as well as for predictor variables is a t-test, obtained by taking the ratio of the parameter estimates to their standard error.

The six independent variables emerged from the literature review as factors influencing farmers' decisions to either reduce or increase production. Other things being equal, a unit increase in a given explanatory variable will result in the log of the odds ratio in favour of farmers increasing output increasing by the value of the coefficient of the particular explanatory variable.

The logit model was estimated using the software Shazam. Among other statistics, Shazam calculates a coefficient for each explanatory variable, the standard error for each prediction and the corresponding t-value. The program also calculates R-square values that can be interpreted similarly to those produced from OLS estimation of linear regressions.

The results of the logit model have implications for policy design and will be discussed in Chapter Eleven. The remaining chapters discuss the specific manner in which various factors have affected domestic food production between

1960 and 1993. These factors include the predictor variables plus two others, prices, and changes in the nature of farming systems. Although these variables were not included in the formal logit analysis, they are deemed important to this study as they provide meaningful insights into the nation's food problems. Chapter Five focuses specifically on recent transformations in Guyana's farming systems and how these are affecting domestic food output.

CHAPTER FIVE

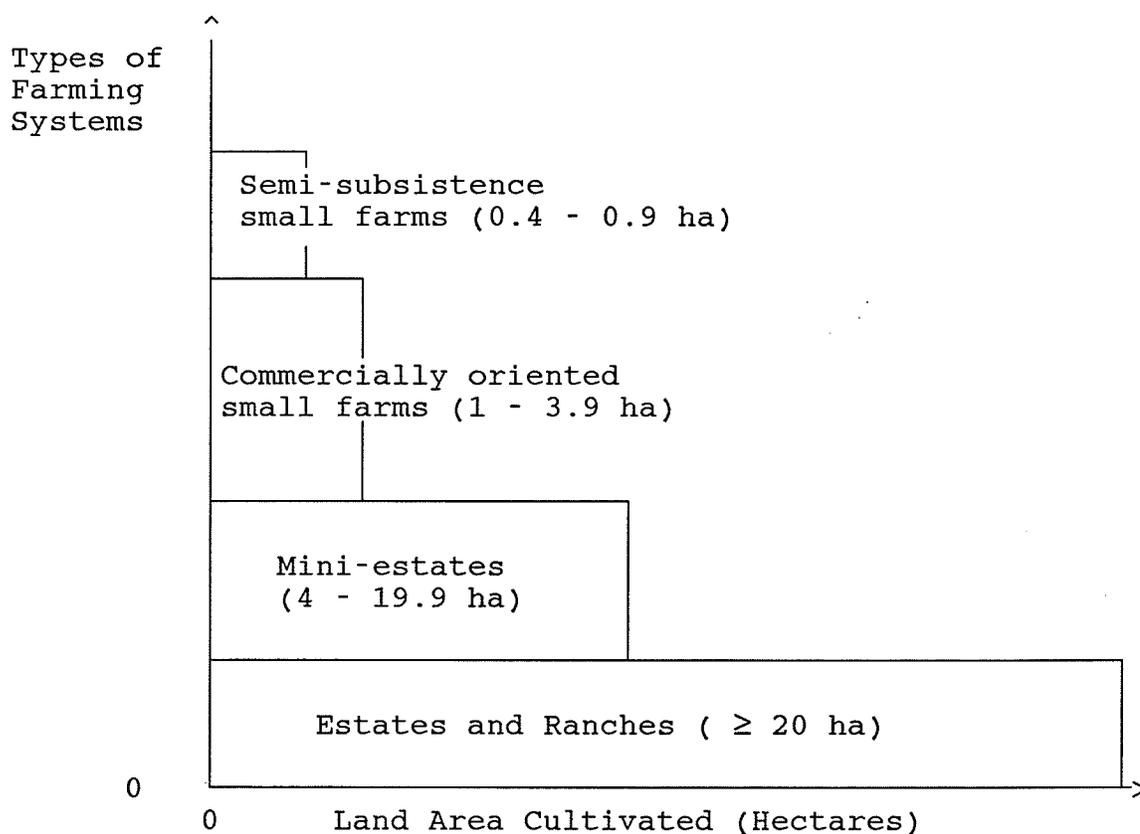
5.0 CHANGING PATTERNS IN GUYANA'S FARMING SYSTEMS AND THE DECLINE OF DOMESTIC FOOD PRODUCTION

This chapter tests the hypothesis that transformations in farming systems of Guyana are an important factor contributing to the decline of domestic food production. Such transformations include: a decline in the number of small farms; rapid growth in the area cultivated in rice and the resulting diversion of resources from domestic agriculture; and decline in livestock farming and kitchen gardens. This chapter presents a broad overview of the different types of farming systems encountered in the country, along with an analysis of recent changes in these farming systems and their implications for food production.

A farming systems' model was devised to classify the major types of farms found in Guyana. This model is shown in Figure 5-1. The main criterion used to classify farms was the scale of operation of individual holdings defined in terms of number of hectares occupied by farmers. Three farming systems are recognized, namely: small farms, classified as semi-subsistence small farms (farms between 0.4 and 0.9 ha) and commercially oriented small farms (farms between 1 and 3.9 ha); mini-estates (farms between 4 and 19.9 ha); and estates and ranches (farms that are equal to or greater than 20 ha).

Small-scale livestock farming and kitchen gardens are not regarded as separate farming systems because, if present, they are considered an integral part of the aforementioned systems. A brief appraisal of livestock farming and kitchen gardens will, nevertheless, be presented. Descriptions of the various farming systems and their associated changes are based on both primary and secondary data.

Figure 5-1 Major Farming Systems in Guyana



5.1 Small Farms

Small farms range in size between 0.4 and 3.9 ha. Historically, they have accounted for over two-thirds of all farms in Guyana and produce the bulk of food for the country other than sugar and coconuts. Although they are not the dominant category in the sugar and coconut subsectors, many small farms are involved in the production of these crops. Figure 5-1 shows that small farms producing domestic food crops can be divided into semi-subsistence and commercially oriented farms. Both categories of farms provide for direct household consumption as well as for sale at local and national markets. However, sufficient differences exist between them in regard to farm size, spatial arrangement and output levels to warrant their treatment as distinct types of small farms.

5.1.1 Semi-subsistence Small Farms

Semi-subsistence small farms are the most common farms found in villages along Guyana's coast, a fact also brought out in the sample survey. Table 5-1 shows that 66% of all the farms surveyed were semi-subsistence as compared with only 27% that were commercially oriented holdings. These farms produce a wide range of vegetables, ground provision and fruits (See Appendix 1, Table 1). Semi-subsistence farms are laid out similarly to kitchen gardens in that a variety of crops are grown in mixed plantings with each crop occupying a separate but small proportion of the farm.

Table 5.1 Frequency Distribution of Types of Domestic Food Farms Encountered in Survey of Five Villages

Farm Type	Frequency	Percentage
Semi-subsistence small farms	83	66.4
Commercially oriented small farms	34	27.2
Mini-estates	6	4.8
Estates and Ranches	1	0.8

Source: Questionnaire Survey Data, 1994.

Similar to their commercially oriented counterparts, semi-subsistence small farms are generally composed of more than one plot or fragment. Data from the questionnaire survey revealed that the average number of fragments associated with semi-subsistence farms was 1.27, while that for commercially oriented small farms was 1.10. These averages represent the latest stage in a trend towards small farms being composed of fewer fragments. For example, in 1952 the average small farm consisted of 2.3 fragments of land (Blaich 1952). This number declined to 2.0 in 1978 (USAID and Ministry of Agriculture 1979), and by 1994, it reached 1.2 fragments. As will be shown in Chapter Seven, reduction in farm fragmentation is largely due to repeated flooding and consequent abandonment of land, i.e., relinquishing of land formerly leased from estates. Amalgamation of fragments into larger, more efficient units for vegetable and root-crop production has not

been observed. Given that yields have been low in Guyana during the past three decades, reduction in the number of fragments represents one of the underlying reasons for declines in food production.

5.1.2 Commercially Oriented Small Farms

Commercially oriented small farms are typically larger than their semi-subsistence counterparts, as average farm size varies between 1 and 4 ha. These farms are found throughout the settled coast, but there is a concentration in certain areas, for example, Parika, the lower Pomeroon River, Black Bush Polder, Clonbrook, and Canals Polder. Commercially oriented small farms are essentially market gardens that supply urban centres such as Georgetown, Linden, and New Amsterdam with vegetables, provision crops and fruits.

In terms of spatial arrangement, commercially oriented farms tend to have about 65-75% of their area in pure stands of one or two food crops in which the farms specialize. The remaining 25-35% is devoted to mixed plantings, usually for home consumption.

Prior to the questionnaire survey in 1994, it was thought that East Indian farmers predominated in this category of small farms. This perception was substantiated by the questionnaire survey as East Indians constituted the largest proportion of farmers possessing commercially oriented small farms, i.e., 33% compared to 21% for Afro-Guyanese (Table 5-2). However, the cross-tabulation of data on farm-size and

racial background of farmers revealed that overall, there was no significant difference in farm size between Afro-Guyanese and East Indian farmers. The probability of the null hypothesis being true was 0.35 (Table 5-2). This finding was unanticipated in view of the historical exodus of Afro-Guyanese from farming as a main source of income. One explanation for the statistically insignificant relationship between farm size and racial background of farmers is that the farm-size data reflected the amount of agricultural land occupied by individuals and not the amount of land actually cultivated. Therefore, while there may be differences in the amount of land actually cultivated by the two racial groups, there is no significant difference in the amount of agricultural land occupied by the two groups of small farmers.

In Chapter Two, it was mentioned that small farms on Guyana's coast are generally located in such a manner that the farmer's place of residence and his farm are on two different properties removed from each other by a few kilometres. One exception to this pattern is in the more recently laid-out communities, such as Black Bush Polder, where conscious efforts were made to develop homesteads. The sample survey revealed that for all small farms, the average distance of the principal plot from farmers' place of residence was 2.6 km. For commercially oriented small farms, the principal plot was located at an average of distance of 3.3 km from farmers' place of residence, while for semi-subsistence farms, the average distance was approximately 1.8 km.

Table 5-2 Farm Size by Racial Groups

Farm Size	Count Exp Val Col Pct	Racial Groups			Row Total
		Afro- Guyanese	East Indians	Mixed Descent	
0.4 - 0.9 ha	34 31.2 79.1%	43 45.6 67.2%	8 7.3 80.0%	85 72.6%	
1.0 - 3.9 ha	9 11.8 20.9%	21 17.5 32.8%	2 2.7 20.0%	32 27.4%	
Column Total	43 36.8%	64 54.7%	10 8.5%	117 100.0%	
	Chi-Square ----- 2.125	df ----- 2	Significance ----- .34561		

Source: Questionnaire Survey Data, 1994.

Note: The values in each cell of the contingency table are labelled "count", "exp val" and "col pct", respectively. "Count" refers to the actual number of farmers in each cell of the contingency table. "Exp Val" is the expected frequency assuming that no relationship exists between the dependent and independent variables, i.e., farm size and racial groups. "Col Pct" is the column percentage. The significance value is the probability that no relationship exists between the dependent and independent variables. A probability value of 0.05 or lower is regarded as statistically significant.

The principal plots that comprised commercially oriented small farms were located in a more dispersed manner than semi-subsistence farms. For example, 34% of them were located less than 1 km from farmers' place of residence; 43% were located between 1.1 and 3 km away; and 23% were located more than 3 km from farmers' residence. On the other hand, 69% of the

principal plots that comprised semi-subsistence farms were located less than 1 km from farmers' place of residence; 24% were located between 1.1 and 3 km away; and 2% were located more than 3 km away. A related feature is that in proprietary villages, the principal plot of both types of small farms is located closer to farmers' place of residence than in communal-type villages. For example, semi-subsistence and commercially oriented small farms were located at an average of 1.2 km and 2.4 km away from farmers' place of residence in proprietary-type villages. In communal-type villages the average distances were 2.4 km and 4.2 km respectively.

Regarding farm income, the survey data revealed that 65% of commercially oriented small farmers obtained three-quarters or more of their total income from the sale of farm output, as compared to 43% of semi-subsistence farmers who obtained the same proportion from the sale of farm products. The fact that such a substantial proportion of semi-subsistence farmers received three-quarters or more of their income from this source was an unexpected finding. The expectation was that rural non-farm income would have contributed a greater proportion to the income of people associated with this type of farming. Since this relation was not borne out by the survey data, then it is concluded that the lack of employment in other sectors of the rural non-farm economy has forced people to become more dependent on marginal income from semi-subsistence farms. In view of the near collapse of Guyana's economy in the 1980s, such a deduction is plausible. The high proportion of semi-subsistence farmers who receive three-quarters or more of their income from their small plots is not an indication of the increasing commercialisation of these farmers. Rather, it is a reflection of rural poverty that is

increasingly pervading villages on Guyana's coast (Thomas 1993).

As anticipated, due to their larger size commercially oriented small farms have had a much more positive history of government financial support than their semi-subsistence counterparts. This observation is based on the high frequency with which names of places where commercially oriented small farms predominate appear in agricultural project reports, and the low frequency of names of villages in which semi-subsistence small farms predominate. Reliable estimates of levels of public agricultural investment by types of villages where certain small farms predominate were not available. Despite the possibility that commercially oriented small farms have benefitted significantly more from public agricultural investment than semi-subsistence small farms, levels of investment have not been sufficient to prevent massive declines in the number of commercially oriented small farms. Between 1952 and 1978 - the period for which reliable data is available on the number of farms in the country - the number of commercially oriented small farms declined by 35%, from 13,352 to 8,638 (Table 5-3). This decline, is undoubtedly one of the main reasons for the decrease in per capita food production in Guyana.

5.1.3 Decline of Small Farms

The 1952 census and later surveys do not distinguish between small farms producing for the domestic market and those producing rice and sugar for export. Still, the patterns identified in the census and surveys are indicative

of what is happening to domestic food farms. Between 1952 and 1978, the number of small farms in Guyana decreased by 69%, falling from 21,625 to 14,890 farms (Table 5-3). Whereas 78% of all farms were below 4 ha in 1952, this proportion had fallen to 60% by 1978. The table also shows that the percentage decline in the number of commercially oriented small farms was greater than that of semi-subsistence farms; namely 35% in comparison with 24%, indicating, most likely, the declining profitability of small-scale commercial farming in Guyana during this period.

Table 5-3 Changes in Farm Types, Guyana, 1952-1978.

Farm Type	Number of Farms		Percentage Change
	1952	1978	
Semi-Subsistence	8,263 (29)	6,252 (25)	- 24
Commercially Oriented Small Farms	13,352 (47)	8,638 (35)	- 35
Mini-estates	5,426 (19)	8,595 (35)	+ 58
Estates and Ranches	1,146 (4)	1,150 (5)	+ 0.3
Total	28,187 (99)	24,635 (100)	- 12.6

Sources: Blaich (1954), USAID and Ministry of Agriculture 1979.

In the absence of a national agricultural census since 1978, it cannot be determined whether this trend of decline has persisted into the 1990s. Currently, there is no agreement as to whether the number of small farms has continued to decrease or not. In 1991, a joint IFAD and IICA assessment of Guyana's agricultural sector concluded that:

There is no evidence to suggest that there has been a significant change in the pattern of land use since 1978, except that many small farms which were previously productive have been abandoned because of their lack of economic viability (IFAD & IICA 1991, p 16).

There is basis to this observation in that broad agricultural land-use patterns have remained essentially static for the last five decades. Rice and sugar continue to be the main land users while ageing coconut and other tree-crops occupy the bulk of the remaining land. Field visits to the backlands of villages also confirmed that large areas once used for vegetable and root-crop farming are now abandoned and covered with bush.

Despite ample evidence of widespread decline in farming, the 1994 sample survey of 700 farmers by IICA and the Ministry of Agriculture indicated that the proportion of farms below 4 ha had actually risen above the 1978 levels, accounting for 85% of all farms in Guyana. The survey also indicated that the amount of land occupied by these farms was 22.2% of all farmland, a proportion substantially higher than the 1978 estimate of 13.5%.

From the perspective of this study, the number of small farms in Guyana has both decreased and increased since the early 1980s. During the early 1980s, the number of small

farms increased as severe food shortages caused many people to turn to their kitchen gardens and semi-subsistence small farms for an increasing proportion of their food needs. After the mid-1980s, many of these farms were abandoned with the reappearance of greater quantities of imported foodstuff on local markets, particularly wheat flour, a staple whose importation was banned in the early 1980s. On the assumption that a direct relationship exists between food output and the number of small farms in existence,^{3/} then both the increase and decrease in the number of small farms in the 1980s are reflected in food output trends during this period (Figure 3-1).

From 1990 onwards, the number of small farms increased once again, judging from the fact that per capita food output started to increase. As in the early 1980s, increases in the number of farms were due to people resorting to subsistence cultivation in response to high prices for food on local markets. Table 5-4 indicates that there is some basis to this deduction. In the five years preceding the field survey in 1994, semi-subsistence farms showed a greater tendency to increase output compared to commercially oriented small farms. Forty-six percent of these farms increased output in comparison with 15.6% of commercial farms.

In terms of decreases in farm output, the table shows that again semi-subsistence farms performed better than their

^{3/} This is not an implausible assumption as annual yield increases during the 1980s were not particularly striking i.e., 0.78%. Most of the growth in output evidently came from increases in the number of small farms.

commercial counterparts. Fifty-nine percent of commercially oriented small farms decreased output compared to 37.6% of semi-subsistence small farms. The chi-square test returned a probability value of 0.011 indicating that a strong relationship existed between output levels and farm size with semi-subsistence farms showing a greater tendency to increase output than commercially oriented small farms.

Table 5-4 Cross-tabulation of Variations in Farm Output (1989-1994) by Size of Farms.

Output	Count Exp Val Col Pct	Farm Size (ha)		Row Total
		0.4 - 0.9	1.0 - 3.9	
Unchanged	14 16.0 16.5%	8 6.0 25.0%	22 18.8%	
Decreased	32 37.1 37.6%	19 13.9 59.4%	51 43.6%	
Increased	39 32.0 45.9%	5 12.0 15.6%	44 37.6%	
	Column Total	85 72.6%	32 27.4%	117 100.0%
<u>Chi-Square</u>	<u>df</u>	<u>Significance</u>	<u>Contingency Coefficient</u>	
9.08	2	.01069	0.26832	

Source: Questionnaire Survey Data, 1994.

5.2 Mini-estates

Mini-estates are defined as farms between 4 and 19.9 ha. They are associated primarily with rice cultivation, but there are some that concentrate on the production of sugar cane, coconuts, beef and milk. Many fruits, for example, mangoes, and sapodilla, are also grown on mini-estates in conjunction with coconut and other crops. In the questionnaire sample survey, only 6% of farms dedicated to domestic food production were large enough to be classified as mini-estates and these all specialized in coconut production. Secondary data were thus used to identify patterns and changes in this farming system.

The most obvious feature of mini-estates in Guyana is the large increase that has occurred in their numbers since the 1950s. Unlike small farms, which declined in number between 1952 and 1978, the number of mini-estates increased from 5,426 to 8,595 or by 58% (Table 5-3). The principal reason for their increase in number was the increased emphasis placed on rice cultivation during the early 1960s. In the five years from 1960 to 1965, the area cultivated in rice increased from 89,153 ha to 136,531 ha. Subsequently, this area declined to 114,847 ha by 1978 (Table 5-5). Nevertheless, between 1960 and 1978 the overall increase was 30,000 ha; an amount substantially above that registered for coconut cultivation or private cane farming. Data are not available for the number of cattle raised on mini-estates, but with beef production generally decreasing during this period, it is reasonable to assume that there was no increase in land devoted to cattle production.

Table 5-5 Total area in hectares reaped for paddy and sugar cane, 1960 - 1993.

Year	Rice	Sugar Cane	
		Private Holdings	Government-owned Estates
1960	89,153	1,845	38,073
1963	81,435	1,599	37,733
1965	136,531	2,906	40,781
1967	100,631	3,383	43,176
1970	119,142	4,622	38,709
1973	92,822	5,196	40,511
1975	116,543	7,328	36,478
1978	114,847	8,026	50,440
1980	95,900	na	49,800
1983	75,800	na	48,300
1985	77,700	na	43,500
1988	73,800	na	34,700
1990	51,300	na	37,000
1993	100,300	na	41,500

Sources: Ministry of Agriculture and IICA (1980); Bureau of Statistics (1994).

Table 5-5 shows that the decade of the 1980s was characterized by an exceptionally large decline in rice cultivation area. This decline was due to: reduced public investments in agriculture; inadequate supplies of fertilizers, pesticides, and spare parts for agricultural machinery; and excessive government control of the pricing and marketing of rice (Lakhan et al. 1988; Saul 1991). By 1990, only 51,300 ha or 37.5% of the peak 1965 area was cultivated in rice. This was the smallest area cultivated since 1960. After 1990, the impact of market liberalization on rice

cultivation can be readily seen from data in Table 5-5. The total area cultivated increased suddenly from 51,300 ha in 1990 to 100,300 ha in 1993. With the resumption of emphasis on rice cultivation, the number of mini-estates has most probably increased.

Ironically, the long-term expansion of rice cultivation has contributed to the decline of local food production in Guyana. This observation is not new, having been made as far back as 1953 by officials from the World Bank (IBRD 1953). They linked declining output of beef and dairy products on the coast to the expansion of land devoted to rice cultivation during the 1940s and 1950s; a situation that created a shortage of land on which to raise herds of cattle. The decrease in the supply of raw milk was so significant that the single pasteurization plant in the country had to resort to producing reconstituted powdered milk which was imported, and Guyana was forced to become a large-scale importer of tinned milk (Hanley 1981).

In the 1960s, Dumont, a FAO consultant, was also critical of the stifling of the beef and dairy industry by the rapid growth of the rice industry (Dumont 1963). In addition, he demonstrated that: i) many domestic food crops had higher rates of return than small-scale rice cultivation; and ii) greater emphasis on the cultivation of domestic food crops could result in higher incomes for small-scale farmers. The latter situation would be the case particularly if efforts

were made to expand the demand for local food crops by strengthening the local food-processing sector.

Although the World Bank and subsequent governments of Guyana recognized that widespread emphasis on rice negatively impacted on domestic food production in Guyana, there is little evidence to indicate that any sustained or significant efforts were made to modify the pattern of public agricultural investment. Lending agreements between the World Bank, other international agencies and the Government of Guyana have all continued to focus almost exclusively on rice and sugar production, with comparatively little support for domestic agriculture. Evidence of the World Bank's position on domestic food production in the late 1960s is provided by the following quotation:

The key to Guyana's agricultural development, future as well as past, lies in expansion of exports. Apart from bauxite, this means principally rice for now, and beef potentially, while holding the present position in sugar. Crop diversification for import substitution offers only limited economic promise. Soils and climate are poor for many kinds of fruits or produce such as apples, pears, tomatoes, carrots and potatoes (IBRD/IDA 1967, p. 22).

The Bank's basic position towards the domestic sector has changed little over the years, so that in its 1992 review of Guyana's agricultural sector, there was much scepticism expressed about this sector. The Bank noted that the prospects for increased production, and hence investment returns, from most domestic food products were not promising,

and that the quality of most commodities only make them suitable for domestic consumption (World Bank 1992:14-18).

Given the financial support from national and international sources and benefiting from rising prices and guaranteed market for rice in the Caribbean, the reasons for the growth of rice production outpacing that of crops between the 1950s and early 1970s are evident. Nevertheless, the rapid growth of the industry concealed the fact that rice, during this period as well as currently, was and still is profitable only to a small number of individuals and companies who operate large farms (O'Loughlin 1958; Nathan and Associates 1980; Hanley 1981). In addition, the input cost of the industry relative to the value of output is high and profitably to farmers has been due to heavy subsidies, particularly for drainage and irrigation (Lewars 1977; Waddel 1994).

The reason for the sustained and substantial emphasis on rice lies in the capability of this crop to earn foreign exchange. Moreover, rice is the main staple of the bulk of the population. With approximately 30% of total output being consumed locally, rice plays an important role in both the domestic and export sectors of Guyana's economy. Still, it has been the extreme priority given to this crop that partly underlies the problems Guyana faces with domestic food production. By devoting large amounts of resources to rice (as well as to sugar), for example, land, drainage and

irrigation infrastructure, farm credit and marketing facilities, and so little for other crops and livestock, the already weak domestic food sector has become progressively weaker to the extent that annual change in the rates of food production cannot keep pace with population growth rates.

The limited public investment in the local food production sector also contributes to rural unemployment because the public infrastructure necessary for the successful pursuit of non-export agriculture is largely unavailable. Rural poverty is related thus to the weak nature of the domestic food production sector. For the country as a whole, the disproportionate attention given to rice production has meant higher prices for locally produced foodstuff, as well as higher food import bills because of inadequacies in the local food production system.

The high cost of food imports became so problematic in the late 1970s and 1980s that the importation of a wide range of foodstuffs had to be either curtailed altogether or significantly reduced. Such action resulted in severe food shortages throughout Guyana, since the build-up of structural problems in the local food production sector prevented it from responding adequately to the new demands placed on it. Food shortages in Guyana became so dire that daily caloric and, particularly, protein intake, in 1988 were well below the average for the West Indies (Table 5-6).

Table 5-6 Daily per capita Caloric and Protein Intake, West Indies, 1958-1988.

Country	1958 ^a		1970 ^b		1980 ^b		1988 ^b	
	Kcal. (grammes)	Protein (grammes)	Kcal. (grammes)	Protein (grammes)	Kcal. (grammes)	Protein (grammes)	Kcal. (grammes)	Protein (grammes)
<u>Leeward Is.</u>								
Antigua	2,040	na	2,317	62	2,116	67	2,222	70
St Kitts/ Nevis	2,040	"	2,159	46	2,321	66	2,801	66
<u>Windward Is.</u>								
Dominica	2,040	"	2,191	54	2,493	64	2,877	70
Grenada	"	"	2,430	62	2,623	70	2,979	82
St Lucia	"	"	2,172	55	2,329	59	2,821	78
St Vincent	"	"	2,280	52	2,480	57	2,818	67
<u>MDCS</u>								
Trinidad	2,532	"	2,553	65	2,927	77	2,960	74
Jamaica	2,110	"	2,542	67	2,587	60	2,572	64
Guyana	2,200	"	2,291	57	2,436	61	2,373	59
Barbados	2,040	"	2,881	79	3,112	84	3,228	98
Average (All Countries)	2,112	"	2,382	60	2,542	67	2,765	73

Source: a - United Nations (1991a); U.S.D.A. (1963).

Beginning in the early 1980s, global economic restructuring resulted in developing countries placing emphasis on the export potential of some crops previously destined only for the domestic market (Green 1995). This emphasis has been in response to decreases in the volume and value of traditional agricultural exports. Non-traditional agricultural exports are thus seen as constituting one avenue to continue deriving foreign exchange and employment from agriculture.

In Guyana, the volume of non-traditional exports increased by 82.5% between 1990 and 1991, i.e., from 1,205 tonnes to 2,199 tonnes (Ministry of Agriculture 1992). The main commodities included fresh pineapples, limes, cherries, plantains, pumpkins, and hot peppers. Minor items included some processed commodities, such as heart of palm, pineapple chunks, preserved carambola, achar, and cassareep. Except for heart of palm, these products all occupy important places on the domestic market, but their recently discovered export potential has increased their value. The estimated export earnings from these products in 1991 was US\$1.1 million, as compared with US\$0.1 million in 1990 (Ministry of Agriculture 1992).

Should the growth in non-traditional agricultural exports continue, then sugar and rice may no longer be the only significant agricultural foreign-exchange earners. To fully exploit the possibilities that could arise from increased overseas demand for non-traditional crops, government's investment programme in agriculture should further reflect the needs of both the traditional and non-traditional export sectors. By the end of 1991, such inclusiveness in government's investment programme was far from being a reality. On the contrary, the Ministry of Agriculture was reporting that output for some non-traditional exports was decreasing because local arrangements for exporting produce was inadequate (Ministry of Agriculture 1992). In addition,

there were problems related to the lack of infrastructure necessary to support the cultivation of these crops. These problems lend support to the argument that government must reform its agricultural priorities and strategies if farming is going to evolve to take advantage of new global realities.

5.3 Estates and Ranches

These holdings are defined as those possessing more than 20 ha of land. Estates specialize in the production of sugar cane, rice and coconuts while ranches produce beef and milk for the local market. In 1952 estates and ranches accounted for 4% of all farms in Guyana. This proportion increased to 5% in 1978, primarily because of an increase in the number of rice farms (Table 5-3). Estates and ranches accounted for 47% of agricultural land in Guyana in 1978.

5.3.1 Sugar Estates and Domestic Food Production in Guyana

Sugar estates in Guyana have a virtual monopoly of the most fertile, best drained, and best irrigated agricultural lands on the coast (Thomas 1984). These large units are the result of amalgamating scores of smaller estates which predominated during the 19th and early 20th centuries (Thomas 1988). As pointed out earlier (*supra* pp. 43-44), during the 19th century, sugar planters subordinated the domestic food sector by using the legislature, which they controlled, to

limit resources to small farming, and to legislate onerous laws aimed at inhibiting small farming (Rodney 1981). Currently, such adversarial relations between the two farming systems do not exist, but the gulf separating them is such that the advanced technology used for production, marketing, and administration in the sugar sector has not trickled down to the domestic food sector.

Sugar estates, nevertheless, have had some impact on the domestic food sector through their agricultural diversification programme in the 1970s and 1980s. This programme was initiated because of continued uncertainty about the terms that guarantee entry of Guyana's sugar into the European Economic Community's (EEC) market (Thomas 1984). To execute its diversification programme, Guysuco, the state-owned company that managed all the sugar estates, established a special "Other Crops Division" and began cultivating a range of domestic food crops such as sorghum, corn, cassava, pumpkins, black-eyed peas and rice. The company also supplied livestock and fish to the local market. Despite its impressive start, Guysuco began reporting serious underachievement of projected targets after 1977, and by 1982 it had ceased cultivation of many crops (Thomas 1984).

In 1985 Guysuco renewed its emphasis on diversification and in addition to root and vegetable crops, efforts were made to produce rice, coconuts, onions, orchard crops, beef, dairy products, mutton and tilapia (Clowes 1990). Available

information does not allow a proper assessment of Guysuco's latest emphasis on crop and livestock diversification. Still, it appears that with the company's drive to restructure itself and improve profitability, diversification is no longer a priority. If Guysuco is indeed downsizing its diversification programme, then the impact on domestic food production could be significant, as not only Guyana's potential for increased food production would be reduced, but also that for modernization of the domestic food sector. With Guysuco's participation in domestic food production, the possibilities for modernization in different areas, such as domestic cropping systems, pest and disease control, food processing and marketing, were significantly greater compared to the situation where their involvement with the sector is minimal.

5.3.2 Coconut Estates and the Decline of Food Production.

Coconut estates occupy approximately 25,000 ha of land in Guyana. Eighty-three percent of them are more than 20 ha and 65% are larger than 40 ha (Minsters Agriculture Ltd 1984). These estates were highly productive in the 1930s and 1940s (IBRD 1953), but the majority of them are now characterized by a high proportion of aged trees, 40 years or more; poor drainage; unacceptable levels of brush and weed control; and lack of proper estate maintenance (Minsters Agriculture Ltd 1984). Deterioration in the condition of coconut estates began in the 1950s after the government started importing

edible oils as a means of controlling the price of locally produced oil (IBRD 1953). Consequently, many estate proprietors started neglecting their property owing to low prices for copra, high production costs, and the resultant marginal profits that were obtained. This neglect persisted well into the 1970s because of continued controls on the price of edible oils. Relaxation of price controls since the late 1970s is, perhaps, the main reason for recovery in the coconut industry (Figure 3-3).

During fieldwork in Guyana in 1994, many of the coconut estates visited were observed to be in poor condition. Evidently, current market prices are still too low to encourage efficient utilization of these estates. These low prices are due to competition from imported edible oils. In order for coconut estates to become more profitable, there is a dire need for the planting of new trees, proper maintenance of estates and adoption of new industry technology to improve productivity and reduce cost of production.

Apart from the low productivity of coconut estates, conflict between the proprietors of some estates and small farmers has emerged as another factor restraining increased domestic food production. In proprietary-type villages, such as Central Mahaicony, most of the cultivable land is occupied by a few large coconut estates in excess of 400 ha, while the majority of people live on houselots situated on narrow strips of land bordering the main public road. Traditionally, these coconut estates had policies allowing small farmers to

cultivate the ground between coconut trees on a rent-free basis. The only expectations of estate owners were that small farmers should not reap the coconuts and that land leased to them should be kept clear of unnecessary vegetation. More recently, many of the estates have changed ownership and the new proprietors have restricted access to their land, partly as a means of reducing larceny of coconuts and also because the estates are now being used for grazing cattle. Whatever the reason for estates owners limiting access to their land, it is evident that such actions have had negative consequences for food production.

5.4 Livestock Farming

Livestock farming is predominantly a small-scale activity. According to the 1978 Rural Household and Farm Survey, approximately 60% of livestock in Guyana were raised on small farms, i.e., farms 3.9 ha or less. The most frequent herd size for cattle, sheep, and goats was 1 to 4 animals; one-half of the households raising pigs had one breeding sow; and between 5-14 chickens were the norm for most farms. Except for a few large ranches where cattle are the central focus, livestock farming is characterised by a variety of farm animals and poultry being raised simultaneously, similar to the system of mixed cropping practised by small farmers. A recent overview of the livestock sector by Carmichael (1994) revealed livestock production to be a low-input enterprise.

Sheep, goats and cattle are allowed to roam at will and animals are housed in crowded pens, more as a precaution against larceny than as critical input for improved husbandry. Noteworthy is the fact that this description of the livestock sector does not differ from that provided by David in 1969. The similarities in the two descriptions suggest there has been no significant development in Guyana's livestock sector during the past two and a half decades.

Between 1952 and 1994, there was an absolute increase in the number of livestock in the country (Table 5-7). This was due to increases in the country's population, but the per capita increase in the livestock population was disappointing as they were all insignificant. The pig population per capita showed no appreciable increase, moving from 0.05 to 0.06; per capita goat population increased from 0.02 to 0.17; and per capita sheep population increased from 0.08 to 0.17. Per capita chicken population showed the greatest increase, moving from 0.05 to 14.49, but the cattle population per capita declined during the period from 0.33 to 0.25.

Not only did the livestock population per capita show insignificant changes, but also the actual proportion of farm households raising livestock declined considerably over the study period. In 1952, for example, 57% of farm households raised one or more head of cattle. By 1978, this proportion had dropped to 24%. Only 18% of the sample population interviewed for this study reported raising livestock. For poultry rearing, the proportion of farm households raising

chickens decreased from 88% in 1952 to 77% in 1978. Only 43% of households in the thesis sample survey reported raising chickens. Households raising pigs also declined from 12% of households in 1952 to an estimated 9% in 1994.

Table 5-7 Percentage of Farmers Raising Livestock and Livestock Population, 1952-94

Livestock	% of Farms with L/stk ^a	L/stk pop. in Guyana ^a	% of Farms with L/stk ^b	L/stk pop. in Guyana ^c	% of Farms with L/stk ^d	L/stk pop. in Guyana ^e
	1952		1978		1994	
Chicken	88	422,800	77	11,500,000	43.4	11,000,000
Cattle	57	174,400	24	270,000	18.0	297,234
Pigs	12	25,200	13	135,000	9.0	50,000
Sheep	14	43,000	13	112,000	13.0	131,000
Goats	7	11,900	7	66,000	6.5	79,000

Sources: a - Blaich (1954); b - USAID and Ministry of Agriculture (1979); c & e - FAO (1994); (d) Questionnaire Survey Data, 1994.

Note: The large increases in the poultry population between 1952 and 1978 suggest that the FAO may have overestimated the poultry population in 1978 and again in 1994. Local statistics to verify the accuracy of these numbers were unavailable, but developments in the livestock subsector during this period do not justify apparent this increase in the poultry population.

Since the late 1980s, the Ministry of Agriculture has reported improvements in the cattle industry both in terms of beef output and milk production. Much of this improvement can be credited to the work of organizations such as the National Dairy Development Programme and CARDI. Increases in beef and milk production represent important developments in the cattle industry, but given the recent resurgence in the amount of land devoted to rice production and the historical conflict between the rice and cattle industries, it is unlikely that, without planning intervention, the recent momentum in the cattle industry will be sustained. In order for the cattle industry to continue expanding on the coast during this present period of intense competition for land, innovative land-use planning directed at enabling the co-existence of the two types of agricultural land uses is necessary. In addition, improved breeds of cattle as well as improved methods of raising them should be considered; for example, using better variety of grass, thereby requiring less land to sustain the same amount of cattle.

5.5 Kitchen Gardens

Kitchen gardens in Guyana are typically about 0.1 ha, although some can be as large as 0.4 ha. They are usually located on the same plot of land as the dwelling unit of the household. A variety of crops are grown in mixed plantings. These include: vegetables (bora, okra, eggplant, spinach,

cabbage, tomato, etc); tree crops (mango, sapodilla and star-apples); root and tubers (cassava, eddoes and dasheen, etc.); and condiments (e.g. chive, thyme). Crops are primarily for home consumption, but some may be given away or sold to neighbours. Kitchen gardens represent an important source of food for Guyanese households and contribute perhaps between 10-15% of total household food supply.

Data available from the 1970s suggest that a marked reduction has occurred in the proportion of households tending kitchen gardens. In 1976, the National Food and Nutrition Survey reported that 45% of rural households had kitchen gardens (PAHO/WHO 1976). Estimates from field observation plus anecdotal evidence from farmers, indicate that less than 35% of rural households in the villages surveyed had kitchen gardens in 1994. Apparently, kitchen gardens are becoming less important to Guyanese rural households as a source of food supply.

One reason for the apparent decline in kitchen gardening is deterioration in village drainage systems that has resulted in regular flooding and loss of crops (Semple 1981). Another reason is that during the mid-1970s kitchen gardens were widely promoted and supported by government as part of a national drive to feed, clothe, and house the nation. Farm inputs, such as seeds and implements, were thus readily available at shopping outlets. Since the late 1970s such governmental backing has not been as readily available as in the mid-1970s levels, so that farm inputs have become scarce

and more expensive. Thus, rural households have had less incentive to maintain these gardens. Furthermore, increases in remittances flowing into the rural economy from abroad may be a factor contributing to this decline. The high level of emigration of Guyanese in the 1980s resulted in large numbers of rural households having family members living abroad. It is possible that remittances from these persons enable many village households to purchase food in village markets rather than cultivate crops about their homes. This may be true particularly for households composed of elderly persons.

5.6 Summary

Significant transformations are taking place in the farming systems associated with domestic food production in Guyana. Such changes include declines in the proportion of households maintaining kitchen gardens, reduction in the number of small farms producing for the domestic market, a stagnation and decline in the livestock sector, and growth in the amount of land used for rice cultivation. In general, the research confirmed that many of these changes have negatively impacted on the level of domestic food production in Guyana between 1960 and 1994. Market liberalization since the early 1990s has led to a reversal of some of these changes and to increased output in the domestic sector, but most of the increased output appears to be coming from semi-subsistence farmers. Notwithstanding recent increases in output, without

adequate research and infrastructural support in the domestic food sector, market liberalization could result in imported products undermining gains in domestic agriculture.

There are also consequences for continued increase in the area occupied by rice farms and the consequent reduction of resources flowing to the domestic food sector; and the removal of small farmers as tenants on coconut estates. It is not entirely clear how these processes are affecting economic development in rural areas of Guyana, but one certainty is that the rural economy's ability to generate employment for people in non-export farming is being further weakened.

The next chapter considers the impact of government's pricing policies on domestic food production between 1960 and 1993.

CHAPTER SIX

6.0 GOVERNMENT INTERVENTION IN MARKET PRICING AND THE IMPACT ON DOMESTIC FOOD PRODUCTION

Since 1945 the government of Guyana regularly intervened in the marketing of domestic food products so as to achieve specific policy objectives. These can be summarized as follows:

- 1) to increase food supply for local consumers given declining levels of food production experienced in the 1950s and 1960s (Levie 1965);
- 2) to increase and diversify agricultural production in order to reduce over dependence on two main export crops, sugar and rice (Levie 1965, IDB 1980); and
- 3) to promote import substitution in order to offset the rising cost of imported foodstuffs (Levie 1965; IDB 1980).

Analysis of available data shows that market intervention in the early 1960s was modest in comparison with that which occurred in the 1970s and 1980s and was also different in nature. During the 1960s and early 1970s, market intervention strategies were mainly in the form of subsidies on imported food items and price support for various local food-crops (FAO 1965). After 1973, intervention took the form of various direct and indirect methods to suppress food prices below their true market value in order to protect consumers from high rates of inflation (Downer 1983). In this chapter, a detailed review is made of government's involvement in market

pricing of domestic agricultural products during the 1960s, 1970s and 1980s. The hypothesis to be tested is that deliberate government intervention in market pricing for foodstuffs was a contributing factor to decreased domestic food production in Guyana.

6.1 Government's Price Support Programme

In the 1960s, both the PPP and PNC governments utilized the Guyana Marketing Corporation (GMC) or its predecessor, the Marketing Division of the Department of Agriculture, to provide price support to domestic food farmers (FAO 1965, IDB 1980). Throughout the 1960s and 1970s, GMC was mandated to encourage domestic food production by ensuring a guaranteed market to farmers for all produce offered to it at guaranteed minimum prices (IDB 1980). These prices were based on cost-of-production calculations made by the Ministry of Agriculture, but occasionally with input from farmers (IDB 1980). Because GMC was the largest single purchaser of domestic agricultural products, the prices set by the corporation effectively emerged as the wholesale floor prices for all products purchased at the farmgate throughout the country. Often, prices paid by GMC for farm products were criticised for being too low in comparison with general wholesale prices (Nathan and Associates 1974), but they were accepted by many farmers, since a basic minimum income was ensured even in times of glut.

Farm products purchased by GMC were resold in many parts of Guyana by the corporation acting either as a wholesaler or a retailer. Prices of commodities sold by GMC tended to be lower than those offered by private hucksters because an important objective of the corporation was to stimulate competition with hucksters in order to reduce overall food prices (IDB 1980). Although partially subsidized by government, GMC started to accumulate large losses as a result of: i) having to guarantee minimum prices even in times of seasonal surplus; ii) absorbing transport costs not reflected in consumer prices; iii) not resolving internal management problems; and iv) having to perform an incompatible mix of commercial and non-commercial functions (IDB 1980).

By the late 1970s GMC's annual financial losses were estimated at 30-40% of gross sales value (IDB 1980). Given the magnitude of these losses, the not-for-profit role of GMC was extensively curtailed and downsizing of the corporation's operations was initiated in 1978 as part of IMF conditions on loans to Guyana. As a result of these initiatives, GMC became less popular as a marketing agency among farmers who complained about the corporation's tardiness to pay for commodities delivered and the low prices offered for them. By the early 1980s, GMC had evidently lost its influence and was no longer a factor in the pricing of domestic agricultural products.

6.1.2 Banning of Imported Food

Another important aspect of government's interventionist strategy designed to bolster local food production was the placing of a partial or complete ban in 1973 on a wide variety of food imports. These imports ranged from potatoes, salted fish and pork, processed meats, apples, other canned fruits, raisins, chocolates, and chewing gum (Ford 1992). Major exceptions were key staples, such as wheat, evaporated milk and cooking oil. This import restriction programme aimed to encourage production of local substitutes by reducing competition from foreign abroad. In addition, it was an effort to deal with a growing balance-of-payment problem resulting from declining export earnings from sugar, bauxite and rice, and rising cost of imports, particularly fuel. Following the ban, food imports dropped from an average of 13.5% of total imports between 1960-73 to just 6.9% during the 1974-77 period (IDB 1980).

6.2 Government's Input Subsidy Programme

In addition to various price support measures, the government in the late 1960s and early 1970s regularly granted a variety of subsidies to farmers for agricultural inputs (Carter and Telfer 1975). These subsidies were intended to decrease farmers' cost of production in order to stimulate production. Examples where input subsidies were provided included: poultry and pig feed; fertilisers and seeds; and

duty-free concessions for the importing farm machinery and tools such as cutlasses, forks, files and hoes. Costs for transporting agricultural products were also widely subsidized. Another production incentive to domestic food farmers was the availability of cash for each 0.4 ha (1 acre) under cultivation.

Although most of these subsidies were instituted by the PNC government as part of its food self-sufficiency drive in the 1970s, the granting of cash payment for each 0.4 ha of land cultivated, dated back to the early 1960s and the PPP administration (FAO 1965). An approximate value of the total amount of subsidies granted to the agricultural sector could not be estimated from the data at hand.

6.3 Impact of Price Support and Input Subsidies on Food Output

Analysis of data in Table 6-1 reveal that the government's policies of providing guaranteed minimum prices for certain farm produce and input subsidies to farmers did little to prevent an overall decline in domestic food production during the 1960s. After 1962, per capita food production showed a downward trend until the mid-1970s when the intensification of government subsidies along with the banning of certain food imports managed to halt the downward trend in per capita food output. Production increased for

most of the 1980s but failed to achieve levels comparable to those of the early 1960s.

Table 6-1 Retail Prices and Output Levels for Selected Food Products, 1960 - 1989¹

Year	Average Retail Price/kg) G\$*	Output (kg per capita)
1960	0.75	185.5
1962	0.92	203.3
1964	0.91	145.5
1966	0.75	123.1
1968	0.69	97.4
1970	0.72	92.3
1972	0.71	93.5
1974	0.85	86.4
1976	0.96	102.0
1978	1.03	118.8
1980	1.07	90.6
1982	1.08	98.1
1984	1.10	121.0
1986	1.62	156.8
1988	2.02	144.0
1989	2.50	142.2

Sources: Computed from data provided by Ministry of Agriculture Guyana and IICA (1980) and Bureau of Statistics (1994).

1. See Table 3-1 for list of selected products

* Prices were deflated by the CPI for food. Base year, 1970.

For the 1969-89 period as a whole, the average price for commodities shown in Table 3-1 showed an overall increase of 43%. At the same time, per capita output of these commodities decreased by 51.4%. One explanation for this anomaly between

retail price and per capita output is that price controls, which were particularly evident during the latter half of the 1970s, suppressed prices at levels below their true market equilibrium. Thus, although prices were increasing, they did not reflect the true scarcity value of domestic food products. This failure to allow prices to reflect the true scarcity value of food products, undoubtedly served as a disincentive to production, and thwarted governments efforts to stimulate output during the 1970s.

Another factor which could have minimised the effectiveness of government's incentive programmes was the nature of the input subsidies provided to farmers. A large proportion of these subsidies were in the form of direct monetary incentives, such as cash payments for additional hectareage cultivated, reduced prices for seeds and fertilisers and reduced transport costs (Carter and Telfer 1975). One of the problems with such operational subsidies is that their positive impacts last only as long as budgetary surpluses exist. Hence, after 1976 when shortfalls in export earnings forced the government to cut spending on operational subsidies, there was an immediate contraction in food output. Had government been subsidizing prices by investing in infrastructure, such as improved farm-to-market roads, and drainage and irrigation schemes, then the decline in food production would probably have occurred with a far greater lag and with less intensity, thereby preventing the country from experiencing such severe problems with food availability in the 1970s and 1980s.

6.2 Consumer Protection and Food Production

In order to protect consumers from rapid inflation and the rising cost of food in the late 1970s, government employed various strategies to suppress market prices for food. These strategies eventually resulted in further declines in local food production because, although faced with higher input costs, farmers were prevented from fully recovering them, which consequently led to cutbacks in production.

Prices of locally produced food were held down in the first place by the government placing heavy subsidies on staples (Budget Speech 1977). These staples included imported wheat, evaporated milk and edible oil, as well as rice and sugar which were produced locally. The budget speech reported that of the G\$100 million spent directly on subsidies in 1976, G\$47.8 million alone were used to suppress prices on a wide range of food items. Flour alone was subsidized to the tune of G\$16.9 million to keep the price of this commodity at 35 cents/kg, well below its import cost. Another G\$16 million were spent to keep the price of sugar at 13½ cents/kg, while G\$12 million were spent on rice. Similar to flour, sugar and rice were sold on the domestic market at prices lower than their true cost of production (Budget Speech 1977), thereby acting as indirect controls on the general price level for food.

Secondly, government maintained an extensive regime of retail price controls on food items. Price controls were

placed on more than one hundred food items (Budget Speech 1977). These items included rice, wheat flour, butter, evaporated milk, powdered milk, margarine, chicken, pickled meat, salted fish, lard, cheese, peanut butter, chowmein, aerated drinks, cooking oil, fruit juices, imported curry powder, bread, tea, garlic, onions, stock feeds, barley, baby food, sago and split peas (Budget Speech 1977).

When the combined effects of these pricing policies are taken into consideration, it is evident that a substantial part of the cost of combating inflation was placed on local farmers. In particular, the cost of living in the urban sector was being subsidized by this implicit taxation of the local food production sector. Unfortunately, this sector was least able to bear this burden and it is not surprising that food production declined rapidly in the late 1970s.

Between 1982 and 1986 Guyana experienced a paradoxical situation, in that although retail food prices were restrained by government and subsidies for farm inputs were being curtailed, at the same time per capita output of food actually increased (Table 6-1). The main explanation for this situation is that during this period an extreme balance-of-payment problems caused the government to take the unprecedented measure of restricting the importation of wheat, a major staple. Also, a large number of other items were placed under price controls, making them unprofitable to retail. Writing about this period, Thomas notes:

The desperate economic circumstances have led to severe prohibitions on imports and widespread shortages of all categories of goods. In the food sector, such basic items as milk, cheese, flour, chicken, salt, butter, peas, coffee are all virtually unavailable to the average working class household (Thomas 1982:35).

With the limited supply of imported food available in the early 1980s, particularly wheat flour, farmers found it profitable to increase production of local food. As well, many households turned to semi-subsistence farms and their kitchen gardens to provide for some of their food needs. This increase in farming activity led to a marked rise in food production, notably with respect to roots, tubers, plantains, coconuts and vegetables. Pork, chicken, and beef failed to show improvements in output owing to shortages in livestock feeds. After 1987 per capita food production started, once more began to due to the lifting of the ban on wheat flour, the relaxing of price controls and the importation of increasingly large amounts of food from the Caribbean, Brazil, Venezuela and Surinam by hucksters operating in the informal economy.

Faced with deepening macro-economic imbalances in the late 1980s, for example, rising current account deficits on the balance-of-payments and escalating public-sector deficits, the PNC government, under pressure from the IMF, began an accelerated process to remove price subsidies and price controls on a wide range of food items. Consequently, there were substantial price increases for all categories of

products. The overall level of price increase for food products between 1989 and 1991 was 65% (Ministry of Agriculture 1992). For specific crops, the Ministry reported that increases in real prices between 1989 and 1991 based on 1990 prices were of the order of 132% for cabbage, 80% for eddoes, 75% for sweet potatoes and cucumber, 70% for plantains, 50% for pumpkin, and 42% for spinach (Ministry of Agriculture 1992).

Given the price responsiveness of farmers, as well as an increase in semi-subsistence farming because of high prices, per capita domestic food production began to increase once again in the early 1990s. Importantly, this increase took place without any major effort by government to address structural problems within the food production system, such as poor drainage and irrigation or inadequate farm-to-market roads. Accordingly, it is conceivable that this increase in production represents only a short-term response to overall price increases. This increase is not likely to be sustainable in the long run unless the requisite infrastructure and other support systems for domestic agriculture are put in place within the immediate future.

6.3 Evaluation

By tracing the history of government intervention in the market for local food produce, it is evident that government

has been extensively involved with the price mechanism for food in Guyana. One positive effect of government intervention in market pricing was that during the height of intervention in the 1970s, farm incomes were stabilized as a result of the GMC providing guaranteed markets for products. Also, seasonal fluctuations in the prices obtained by farmers for some commodities were reduced as a result of the GMC policy to offer a minimum floor price for produce purchased by the corporation. Over the long run, extensive government involvement in the pricing of locally produced foodstuffs failed to ensure sustained high levels of food production and, in many cases, resulted in declining production.

One reason for the failure of interventionist measures to provide for sustained high levels of food output was that they made farmers overly dependent on government assistance to deal with high production costs. In retrospect, a better alternative would have been to encourage the development and use of innovative techniques to improve efficiency and lower production cost on a sustained basis. This strategy was actually considered, but not pursued because of the perceived high initial cost (Carter and Telfer 1976). In the long run, interventionist strategies proved to be very costly because farmers were unprepared to deal with the high cost of production when the extensive regime of input subsidies was curtailed, and production subsequently declined sharply.

Excessive market intervention also failed to stimulate sustained high levels of food production because it detracted

from the need for structural changes in agriculture, such as improved drainage and irrigation, greater access to farm credit, and the need for improved technology and farming practices. The operating environment created by subsidization of input prices and guaranteed markets also resulted in production increases without the need to be concerned about the impact of foreign competitiveness on local markets and improved product quality for sustained demand.

In studies dealing with how to stimulate local food production after years of excessive government intervention in market pricing, researchers have pointed to market liberalization as an important strategy for inducing farmers to increase production (e.g. Kydd and Spooner 1990; Yao and Hay 1991). Guyana's experience with decontrolling prices and subsequent increases in food output gives credence to this policy prescription. However, market liberalization can only be successful when farmers are able to supply food at prices that the local market can bear. Otherwise discontentment over high food prices could result in a search for cheaper products abroad and displacement of local farm products. In order to enhance the competitiveness of local producers, governments need to take a more active role in assisting with infrastructure and institutions which facilitate marketing of agricultural products.

In Guyana, the current situation is one where the government has resorted to playing an extremely limited role in the internal marketing of domestic agricultural products.

In the five villages surveyed in this study, all the domestic food-crop farmers reported that they had received no assistance from any government agency to market their produce. By contrast, those farmers who reported some involvement in rice and sugar-cane cultivation all reported that they regularly receive assistance from government-sponsored agencies or sugar estates to help market these products.

Most domestic food farmers are either unaware of, or do not use the services of the New Guyana Marketing Corporation. This entity arose from the old Guyana Marketing Corporation, but instead of directly intervening in the market, its role has been restricted to the dissemination of information about current market prices, product quality and standards for non-traditional agricultural exports (Ministry of Agriculture 1994). Conceptually, the corporation's new role is in keeping with current trends of emphasising non-traditional exports. However, there is a need for greater commitment by GMC to provide similar services to farmers catering for the domestic market. At present, domestic food farmers rely on their own initiatives to market their produce.

Analysis of the thesis survey data shows that a high proportion of farmers in all villages sell their produce to hucksters who purchase at the farmgate and then resell in distant periodic markets or in the capital city. Clonbrook and Ann's Grove had the highest proportion of farmers selling to hucksters, 94% and 83% respectively. Slightly more than 75% of farmers in Bush Lot sell to hucksters, but the proportion

fell sharply to 44% for farmers in Craig/Friendship where the proximity of these communities to the capital city, Georgetown, undoubtedly, affects the role of hucksters. A small proportion of farmers in all the villages travel to distant markets to sell their produce directly to consumers, while the remainder do so in periodic village-markets or make house calls.

One of the persistent problems with current marketing arrangements for domestic food products is the high degree of spoilage that occurs between the farmgate and the market. In 1974, Nathan and Associates calculated that up to 45% of produce transported to the market by private hucksters was spoiled because perishables were inadequately packed and transported under poor conditions. Typically, perishables were placed into tightly closed jute bags, rather than into crates, and the trucks, van and boats used to transport produce over long distances are unrefrigerated. These packaging and transportation arrangements are still pervasive, thus the problem of spoilage remains a serious issue. Furthermore, the Guyana Transport Service (GTS), a publicly owned company, which played a major role in transporting agricultural produce on coastal roads in the 1970s and early 1980s, is no longer in operation.

The impact of the demise of the GTS on the shipping of agricultural produce in Guyana is yet to be formally analyzed. However, a vacuum has been created in transportation because the private sector is more involved carrying commuters than

moving agricultural produce. Given the problems associated with shipping agricultural products, the problem of spoilage has undoubtedly increased. As the risk of spoilage expands, hucksters must lower the price paid to farmers for their produce, with the net result that farmers have less incentive to increase their production. To counter this disincentive, there is a clear need for greater public, as well as private investment, in all facets of transportation infrastructure. Without improved roads, storage facilities and proper means of transport, farm productivity will inevitably decline, while production costs will increase, thereby making food prices untenably high (Mellor 1988).

6.4 Summary

It is evident from the foregoing analysis that extensive government intervention in the market for domestic agricultural produce led to many commodities being sold at prices far below their true scarcity value. Because of the extensive regime of input subsidies that has existed, many people either entered agriculture or expanded existing production levels with a misconceived notion of the true costs involved. When government subsidy programmes collapsed, these costs became evident. Even so, farmers were prevented from recovering the full costs of production because of various direct and indirect means of price control. This caused many of them to leave agriculture altogether or reduce their

production because of low prices. Market liberalization in the 1990s has resulted in an increase in output due to higher prices. However, the persistence of problems such as flooding, and the lack of storage and transportation infrastructure, is likely to prevent rapid expansion of food production in the long-run. In the following chapter the impact of flooding and other environmental constraints on domestic food production is examined for the three decades following 1960.

CHAPTER SEVEN

7.0 ENVIRONMENTAL CONSTRAINTS AND THE DECLINE OF DOMESTIC FOOD PRODUCTION

The review of literature suggested that flooding was the single most important environmental problem contributing to the decline of domestic food production in Guyana. In this chapter, the relationship between increased flooding and declining food production in Guyana is examined in detail. The impact of other environmental problems on the food production system is also scrutinized. Data on this subject were obtained from various government reports, farms surveys and academic studies produced over the last 20 years. Information obtained from the thesis questionnaire survey provided additional insights about the perceived impact that flooding and other environmental factors have upon current production levels.

7.1 Flooding

Although flooding, historically, has been a constraint to domestic food production in Guyana (Young 1958), the critical issue now confronting farmers is the dramatic increase in flooding of previously well-drained farmland, especially during the late 1970s and 1980s. Official estimates are not available as to the area of previously drained farmland now removed from production since the mid-1970s because of flooding. However, the perception of survey respondents in

the five villages is that approximately one-third of previously drained farmland is now withdrawn from production due to regular flooding. This estimate is corroborated by data for provision crops in Table 3-2 which shows that cropland cultivated decreased from 11,823 ha in 1973 to 4,000 ha in 1993, with a low of 2,000 ha between 1983 and 1986. Such a reduction in cropland cultivated has certainly contributed significantly to declining food output.

The term "flooding" is itself a source of debate. Official data on flooding refer to major inundations. In consequence, the frequency of flooding from the perspective of small farmers is not reflected in such statistics. For small farmers in the sample survey, flooding is considered to occur when a crop cannot be planted because their holdings are covered with water, or when planted crops are destroyed because excessive water cannot be removed from the land in time to save the crop.

Available data on the proportion of small farmers affected by flooding over the past two decades show some, though not conclusive, evidence of increases in the extent of flooding. In 1974 Nathan and Associates estimated flooding to be a major constraint to production for more than 47% of farmers in Guyana. Data from the thesis questionnaire survey revealed an increase over this proportion, for 65% of farmers believed flooding to be a major constraint to production while 55% reported it to be their main environmental problem.

Although the two data sets prevent an ideal comparison of the extent to which flooding has increased, there is ample evidence from the survey data that a strong relationship

exists between farmers with the highest probability of experiencing flooding (those with inadequate drainage) and those who had decreased output (Table 7-1). The table shows that 68 of the 125 farmers in the sample suffered from poor drainage and of those who suffered from poor drainage, 60.3% had decreased output between 1989 and 1994. Overall, the chi-square analysis revealed that a significant relationship existed between variations in farmers' output levels and whether their land was adequately drained ($p = 0.00257$). The clear pattern is that as farmers experience regular flooding of farmland, they generally reduce output which, in turn, has negative impacts upon overall food production. Flooding, however, is not the only reason why farmers decreased production as approximately 30% of the sampled farmers had adequate drainage, yet decreased output between 1989 and 1994 (Table 7-1). Possible reasons for this decrease include low farm-gate prices, lack of access to credit, and destruction of crops by untethered cattle.

The seriousness of the problem of flooding is further apparent by the fact that it is geographically widespread, as it affects farmers to a similar degree in each of the five villages studied. For example, the proportion of farmers affected in the proprietary-type villages, i.e., Mahaicony, Bush Lot and Craig/Friendship, was 56%, 50%, and 36% respectively, whereas in the communal-type villages of Ann's Grove, and Clonbrook, the corresponding levels were 66% and 65% respectively. One reason for this large proportion of farmers suffering from flooding is that the drainage systems of these villages have similar design features and are also

interconnected. Hence, except for minor variations, villages experience the same type of drainage problems.

Table 7-1 Cross-tabulation of Variations in Output by Adequacy of Farm Drainage

	Count Exp Val Col Pct	Is Farm Adequately Drained?		Row Total
		No	Yes	
Output (1989-1994)				
Increased	17 24.5 25.0%	28 20.5 49.1%	45 36.0%	
Unchanged	10 12.0 14.7%	12 10.0 21.1%	22 17.6%	
Decreased	41 31.6 60.3%	17 26.4 29.8%	58 46.4%	
Column Total	68 54.4%	57 45.6%	125 100.0%	
<u>Pearson Chi-square</u>	11.926	<u>Significance</u> .00257	<u>Contingency Coefficient</u> 0.295	

Source: Questionnaire Survey Data, 1994

Note: The contingency coefficient gives the proportion of changes in the dependent variable, i.e row values, that is explained by changes in the independent variable, i.e column values. Contingency coefficients are conceptually similar to R^2 values in regression analysis. Thus a coefficient of 0.29 means that 29% of variation in the dependency variable can be explained by changes in the dependent variable.

Amongst the sampled respondents, the principal reason stated for flooded farmland was not the absence of water-control systems, but, rather, the malfunctioning of existing systems. Farmers could recall that canals and "kokers" (sluices), which were fully operational in the 1950s and 1960s, are now choked and blocked with silt and weeds, making them incapable of relieving flood waters. The occurrence of improperly functioning drainage canals was also mentioned by Nathan and Associates (1974), Checchi and Company (1982) and IICA (1994) as the principal reason for flooding. Lakhan et al. (1995) in their study of rice production in Guyana likewise noted silted and blocked canals to be the fundamental reason for uncontrolled flooding of rice fields.

An article appearing in the *Guyana Chronicle*, February 1994, provided further credibility to the view that the deteriorated condition of trenches and canals was the main reason for village-level flooding (Appendix Three). This article further observed that, due to constant flooding, farmers had sustained thousands of dollars in losses, either because crops could not be planted owing to constant inundations or planted crops were destroyed by excessive water. More recently, a devastating flooding was experienced in July 1996 after prolonged, heavy rainfalls throughout the country caused rivers to overflow their banks. Although many parts of the country were affected, coastal communities, with silted and blocked canals were among the worst affected localities. Damage to crops, livestock and other property was so extensive that the government declared a state of emergency (*Caribbean Insight* Vol 19, No 8, 1996, p. 1).

7.2 Reasons for Breakdown of Local-level Drainage and Irrigation System

A variety of reasons can be advanced for the poor condition and malfunctioning of much of the drainage and irrigation (D&I) system on Guyana's coast. Among the most important are the lack of finance to operate and maintain drainage and irrigation systems, the piecemeal structure of the administration of drainage and irrigation, and the minimal participation of farmers in the operation of the D&I system (World Bank 1992). Each of these reasons will be explored in detail.

7.2.1 Lack of Finance as a Contributor to Drainage and Irrigation Problems in Guyana

Based on the frequency with which the lack of finance was mentioned in World Bank and government reports and in conversations with local elected officials and farmers, it is probably the most important hindrance to the efficient operation and maintenance of D&I systems in Guyana. The nature of the problem varies somewhat between Declared Drainage and Irrigation Areas (DDIAs) and areas that are under the administration of village and district councils for the purpose of drainage and irrigation. DDIAs have fully-developed D&I facilities, although presently most are in varying stages of disrepair. Within DDIA, rice is the principal crop, although other food crops depend on this infrastructure in order to be successfully cultivated.

In DDIAs, the cost of operating and maintaining D&I systems is borne largely by farmers. Water fees are calculated by dividing 90% of the annual cost of operation and maintenance by the area of farmland to be served (World Bank 1992). The remaining 10% of the cost is financed by the central government. In 1992 it was estimated that the average rental fee for state-owned land in DDIAs was only US\$0.05/ha in contrast to US\$30-45/ha charged by private landlords for well-drained and irrigated lands (World Bank 1992). Assuming that the price charged by private landlords closer reflects the true costs of providing D&I services, then the magnitude of the revenue shortfall for D&I services in DDIAs is apparent. Such revenue shortfalls are a major contributing factor for the collapse of D&I infrastructure.

It is worth noting that in the early 1960s Dumont (1963) referred to the average fees paid by Guyanese farmers in DDIAs as "ridiculously low" and called for a more realistic pricing policy; one that should take into account the extent to which the land had been developed by the government, i.e., the presence of drainage and irrigation canals, roads and protective dykes against the sea. Dumont also called for water rates to increase in proportion to the size of holdings as a means to avoid underutilization of large estates - a situation which still prevalent along the coast. Based on the level of water rates existing in 1992, it is obvious that very little was done to rationalize water rates with maintenance costs; hence, the unavailability of revenue to maintain

existing facilities and resultant increases in the extent of flooding.

In addition to low fees charged for drainage and irrigation services, the assessed valuation of agricultural lands in Guyana is very dated, thereby making them even less capable of yielding the revenue to service them properly. Tax collection rates are also poor. For lands in declared drainage and irrigation areas, the World Bank estimated that between 1988 and 1989, only 26% of rates due were collected.

For village and district councils which provide the lower-order D&I services that many domestic food farmers depend directly, financial problems are particularly acute. Currently, these councils do not possess the financial resources necessary to provide even the most basic services to agricultural lands in the villages. The most obvious example of this lack is the badly silted or non-functional council-owned trenches and canals that are prevalent in the agricultural areas of villages.

An idea of the precarious revenue and expenditure situation of district councils can be obtained by scrutinizing the 1993 budget of a typical council, the Woodlands/Farm Neighbourhood District Council (Table 7-2). This council is representative of others in that: it services a predominantly agricultural community; its officials are few, consisting of a district chairman and councillors who provide part-time services, and one full-time overseer/clerk; and its budget is sufficiently limited to prevent it from effectively carrying out its statutory mandate.

The most obvious aspect of the district council's budget in Table 7-2 is the large difference between budgeted and actual expenditures. Council officials explained that although the budget catered to the barest level of services, revenue obtained from property taxes, central government transfers via the Ministry of Regional Development and charges levied for the use of council facilities, e.g. market and abattoirs, and from fines, was inadequate to cover planned expenditure. Council officials conceded that the lack of financial resources was a main factor preventing them from carrying out their statutory mandate to provide and maintain drainage and other services necessary to support village-level agriculture and other economic activities.

From the standpoint of expenditure, Table 7-2 reveals that although relatively large sums were budgeted for the maintenance of existing infrastructure and provision of services, only minimal amounts were actually spent on these during the year. Most of council's actual current expenditure was for salaries. Capital expenditure for 1993 was nil, despite the fact that \$44,000 was budgeted for construction of trenches and kokers. With such a pattern of expenditure, it is not surprising that village-level D&I systems have deteriorated so that both the incidence and area subject to flooding have increased.

Table 7-2 Statement of Revenue and Expenditure, 1992-1993,
Woodlands/Farm Neighbourhood District

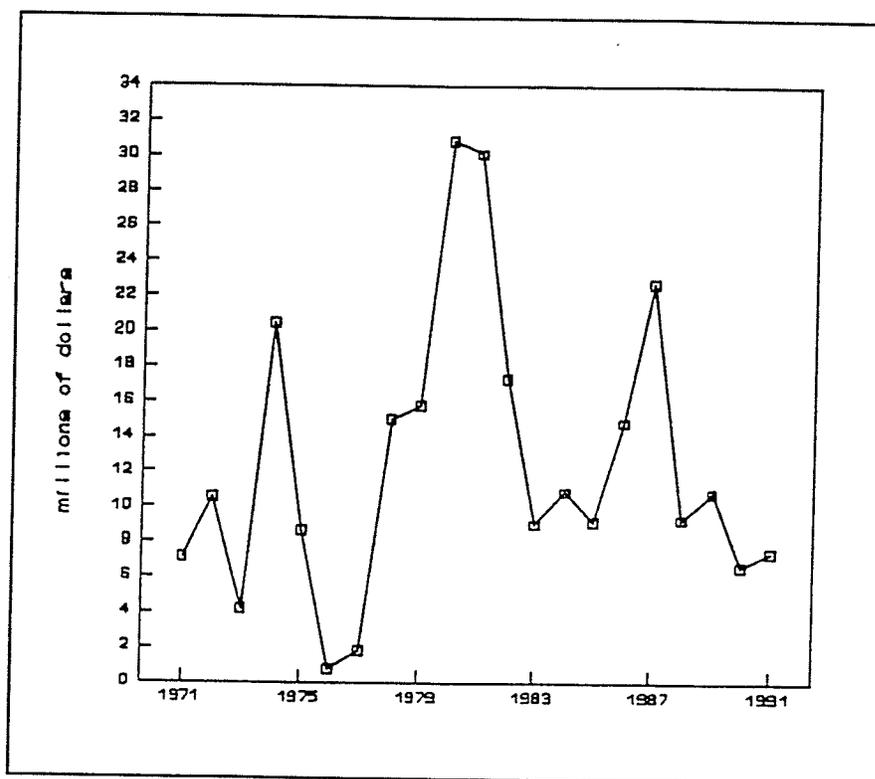
Items	1993 (Budgeted) G\$	1993 (Actual) G\$
<u>Current Revenue</u>		
Rates on land	131,340	101,621
House Tax	76,429	58,604
Arrears on Rates	267,672	36,058
Arrears on House Tax	48,345	18,151
Other Revenue	254,536	174,908
Total Revenue	778,322	389,342
<u>Current Expenditure</u>		
Personal Emoluments	221,348	145,846
Drainage & Irrig.	160,000	27,000
Maint. of Kokers	30,000	4,000
Maint. of Streets, Bridges, and Dams	50,000	0
General Admin & Office Expense	215,601	27,516
Education & Community Dev.	55,401	3,300
Sundry Expenses	45,972	7,017
Total Current Exp.	778,322	389,342
<u>Capital Works</u>		
Const. of Canal, Trenches and Kokers	44,000	0

Source: Woodlands/Farm Neighbourhood District

Further insights into the financial aspects of drainage and irrigation in Guyana were obtained by analysing government expenditure patterns for drainage and irrigation between 1971 and 1991. Figure 7-1 shows that central government capital expenditure on drainage and irrigation fluctuated markedly between 1971 and 1991. Since 1980, most of this expenditure for drainage and irrigation has been channelled through Regional Democratic Councils (RDCs), rather than through the Ministry of Agriculture as was previously done. This change was in keeping with government's policy of administrative decentralisation (Potter 1987). Examination of the capital budgets of these RDCs indicated that there has been a concentration of spending on a few large-scale drainage and irrigation projects, with comparatively little directed to medium- and small-scale projects (Table 7-2).

The large-scale projects with which RDCs were mostly involved were the Tapacuma Irrigation Project and the East Bank Essequibo Drainage and Irrigation Project. These projects, along with the Mahaica-Mahaicony-Abary Irrigation Project, represented government's strategic thinking for promoting agricultural development, particularly rice, and were not projects aimed primarily at assisting local food-crop farmers to cope with flooding of farmlands. This fact does not imply that the benefits of the larger projects are not felt locally, but rather that there is a limited focus on flooding as it affects domestic agriculture.

Figure 7-1 Central government capital expenditure on drainage and irrigation, 1971 - 1991. Constant Guyana dollars, 1970 = base year.



Source: Computed from statistics provided by State Planning Secretariat, Ministry of Finance, Guyana

Admittedly, the concentration of spending on large-scale drainage and irrigation projects in RDCs' capital budgets is a result of the special role these organizations play in executing works that were previously done by centrally administered government ministries. However, a conceptual problem is present; namely, that RDCs do not have control over their tax base, hence, they are limited in the kinds of D&I

projects they can plan and execute. Given this situation, coupled with the already limited finance generated from the collection of water rates, RDCs find it difficult to carry out the needed works to prevent flooding.

Table 7-2 Regional Expenditure on certain Large-scale Drainage and Irrigation Projects as a Percentage of Total Regional Capital Projects on Drainage and Irrigation

Region	1984		1986		1988		1990	
	G\$ (mil.)	%	G\$ (mil.)	%	G\$ (mil.)	%	G\$ (mil.)	%
Two	6.3	100	7.1	70	6.5	80	1.5	0
Three	0	0	0.4	100	9.7	89	28.2	97
Four	1.0	0	0.5	0	1.2	0	0.7	0
Five	0	0	2.5	0	3.8	0	0.9	0
Six	0.2	0	0.9	0	1.5	0	0	0

Source: Details of Government Capital Expenditures

Note: This table is interpreted as follows. In 1984, Region Two spent all of its drainage and irrigation funds on large-scale projects whereas it spent 70% in 1986 and 80% in 1988. Region Three, on the other hand, spent all of its funds on large-scale projects in 1986, 89% in 1986 and 97% in 1990

7.2.2 Divided Administrative Responsibility for Drainage and Irrigation as a Contributor to Flooding.

The piecemeal nature of the structure of D&I administration hinders the smooth operation of drainage and irrigation systems and can be regarded as an important contributor to current problems of flooding (World Bank 1992). At the apex of the national drainage and irrigation administrative structure is the Hydraulics Department of the Ministry of Agriculture which is responsible for setting national drainage and irrigation policy. Operation and maintenance of drainage and irrigation systems in different parts of the country are the responsibility of a number of agencies; namely Regional Democratic Councils, the Water Conservancy Board, Village and District Councils and government-owned sugar estates (World Bank 1992).

Regional Democratic Councils are responsible for drainage and irrigation in the former DDIAs, but since they do not have the authority to levy rates, they rely on district councils to collect them. The Water Conservancy Board administers the large conservancies or reservoirs which are located in the backlands of the coast and which provide water for both agricultural and non-agricultural purposes. Sugar estates operate their own D&I systems, but they collaborate with other agencies responsible for D&I in instances where water control systems become interconnected with each other. Village and district councils are responsible for:

... maintaining in good order, the dams and trenches and main drains, having the outfall and with the kokers or sluices, necessary for effectually draining the authority's district for sanitary purposes (Local Government Act, Chapter 28:02, p.40).

In practice, these trenches, drains and kokers are used to provide not only for sanitary conditions in residential areas, but also for drainage and irrigation to land used for small-scale domestic agriculture. As such, the upkeep of these canals is vital for sustaining food production in the villages. Village and district councils are also responsible for drainage and irrigation in areas not classified as DDIA's. The D&I system is further complicated by instances of private, large landowners assuming responsibility for water control on their property.

The piecemeal nature of D&I administration hinders effective water management because organizations have access to different levels of financial and technical resources, hence different abilities to implement D&I plans. Also, there are frequent quarrels over jurisdiction (Nathan and Associates 1974). Currently, moves are underway to rationalize the administration of the D&I so as to eliminate its piecemeal nature, thereby enabling it to provide better quality of services.

7.2.3 The Collapse of Local Democracy as a Contributor to Problems of Flooding

A breakdown in local democracy beginning in the early 1970s is yet another factor contributing to the deterioration of drainage and irrigation infrastructure in Guyana. The breakdown in democracy affected drainage and irrigation operations because it eroded confidence in local government and led to reduced opportunities for solving local-level water-management problems. Erosion of confidence in local government began in 1973 when the PNC government suspended local elections as part of an effort to reorganize the local government system. In the process, some statutory functions of district councils were taken over by RDCs, six of which were created in 1973 (Potter 1987). Further reorganization of the local government system occurred in 1980, with promises by government to allow greater participation of people in "the management and development of the areas in which they live and in the various decision-making processes of the state" (Hoyte 1980:4).

In reality, local government reorganization led to severe weakening of the local government system. Four of the five lower-level administrative units of the new six-tier regional administrative system, which were to have replaced village and district councils, never came into existence. A possible reason for this failure was the system was judged to be too cumbersome, or the country would have suffered from over-administration. Thus, sub-regional councils, district

councils, community councils, and neighbourhood councils were not organized though the Local Democratic Organs Act of 1980 provide for their existence. The lowest-level units, People's Cooperative Units, were partly organized, but survey respondents expressed the view that these served mostly as geographical areas for distributing scarce foodstuff, rather than as administrative areas for local government. Since village and district council elections continued to be suspended throughout the 1980s, avenues for democratic participation in village-level planning and decision-making were effectively restricted, if not curtailed, during this decade.

In the light of the weakened state of the village district councils, RDCs emerged as the only political institutions of importance at the sub-national level. Thus, these councils assumed responsibility for local economic development throughout the 1980s. Given their position at the apex of the intended six-tier local government system, RDCs have concentrated on providing regional level services and infrastructure. Such services include health care and education, while infrastructure included schools, health-care centres and higher-order drainage and irrigation canals. Provision of health-care services and rehabilitation of major drainage canals are activities not carried out by village and district councils because their administrative capability limit them to only small-scale endeavours. The focus of RDCs

on regional-level services meant that many lower-order local government services, including drainage, were neglected in the 1980s.

Survey respondents expressed the view that the new local government system has rendered villagers powerless to elect individuals who they consider will most effectively represent them politically. Prior to the new regional system of administration, councillors, including village and district chairpersons, were elected directly by villagers and were responsible to villagers for the management of the community environmental systems. Under the new regional system, political parties contest for seats on RDCs and councillors, including regional chairpersons, are appointed by the party to fill seats won at elections. Naturally, within this system councillors are more responsible to their party than to their constituents. The fact that councillors are neither directly elected nor responsible to the electorate for their actions has contributed to the present state of disillusionment with local government, a view frequently expressed by people in the communities visited for field work. One complaint was that because many councillors do not live in the local areas they feel no obligation to push for development in those areas.

Erosion of public accountability is at the heart of village and district councils' financial problems because citizens do not feel morally obliged to be prompt with payment of property taxes. Also, disillusionment with community affairs means that citizens do not feel morally obliged to be prompt with the payment of property taxes.

In 1994 the PPP government took steps to revise the local government system, more specifically, to re-institute elections at the district council level. While laudable, these moves have not gone far enough. In fact, some confusion has been created because the local government system is now characterized by one set of statutes and practices under which the old village and district councils operate, and another set of statutes and practices under which RDCs operate. One operational problem created by this situation is that village and district councils are treated as lower tiers of the RDCs and not as autonomous self-governing bodies, which is their legal status. As a result, village and district councils have been made financially accountable to Regional Democratic Councils and not to their electorate.

Many of the reports done by the World Bank on the rehabilitation of drainage and irrigation systems in Guyana (e.g. World Bank 1992), have been preoccupied with strategies to improve revenue collection at the local level. For most domestic food farmers, this would mean paying higher taxes or user fees. However, unless confidence is restored in local democracy and in the ability of village and district councils to respond to farmers' needs, attempts at cost recovery through levying higher taxes may not be successful.

7.3 Other Environmental and Related Problems

Although frequent flooding resulting from a breakdown in drainage systems was the main environmental problem mentioned

by sampled farmers, a range of other environmental and related problems also affects small farming (Table 7-4). These problems include destruction of crops by pests, inability to control the growth of weeds, lack of irrigation water, praedial larceny and destruction of crops by untethered and wild animals.

Destruction of crops by pests is very widespread. Except for Bush Lot, farmers in all villages reported being affected by pests, but the incidence was highest in Craig/Friendship, Clonbrook and Ann's Grove. Farmers in Bush Lot and Craig/Friendship were affected by weeds more than in any of the other villages sampled.

Although there are no available data to determine whether crop loss due to pests and weeds is on the increase, anecdotal information from farmers suggests that this is the case. One of the reasons for this increase is the virtual breakdown of the extension services provided to small farmers. While these services were formerly provided by the Ministry of Agriculture, with the implementation of the Regional Democratic System since 1980, they have increasingly come under the purview of the Regional Administration Councils. A shortage of trained agricultural specialists is one of the main reasons for the collapse of extension services. Shortages of technical personnel resulted from large-scale emigration of skilled people from Guyana during the 1980s, following the economic crisis experienced by the country (Ministry of Agriculture 1992). The effect of the lack of technical personnel for extension services is reflected by the

fact that between 83 and 96% of sampled farmers reported no contact with agricultural extension officers over the five years preceding the survey in 1994.

Table 7-4 Frequency Distribution of Main Environmental and Other Constraints Perceived by Farmers

Environmental and Other Constraints	Villages					
	Bush Lot	Mahai-cony	Clonbrook	Anns-Grove	Crai F/sh	Total
Flooding	6	9	20	20	9	64
Pests	0	3	7	5	9	24
Weeds	6	2	0	1	6	15
Lack of Irrigation Water	0	3	5	4	1	13
Infertile Soils	0	0	0	1	1	2
Stray and Wild Animals	0	3	2	1	1	7

Source: Questionnaire Survey Data, 1994

The problem of untethered farm animals - cattle, goat, sheep - roaming cultivated areas and destroying crops was mentioned by 6% of farmers as the main problem affecting their operations. Problems associated with untethered animals were concentrated in Ann's Grove and Mahaicony, the two predominantly Afro-Guyanese villages. Destruction of crops by

wild animals was mentioned in conjunction with problems related to those of untethered farm animals. Complaints about wild animals were, however, marginal compared to those related to crops being destroyed by untethered farm animals. The problem of untethered farm animal destroying crops stem from the fact that many owners of these animals are landless farmers and allow their livestock to roam freely to find pasture. Frequently, these animals enter unfenced fields and do considerable damage to crops. Farmers did not regard institutional measures for dealing with this problem, principally the impounding of animals, to be effective because the fines imposed are very low.

Also mentioned by many farmers but not reported in Table 7-4 was the problem of praedial larceny - stealing of planted crops from farm grounds. Many farmers cited praedial larceny as their main secondary environmental problem. The magnitude and impact of this problem is dealt with fully in Chapter Eight where it is discussed in relation to land tenure.

Lack of irrigation water during the dry season affected about 10% of farmers. This problem was not as acute as flooding and contributed substantially less to declining food production because, historically, farmers have better adapted to this environmental uncertainty. For example, farmers regularly reduce production during the dry season or vary their cropping pattern to suit the lack of moisture.

7.4 Conclusion

It is evident that the problem of flooding presents significant obstacles to small-scale farming on the coast and serves as a deterrent to increases in food production. Immediate alleviation of flooding would require large public sector expenditure, and the successful operation and maintenance of the drainage and irrigation system depend, ultimately, on realistic pricing of water resources. Even if higher water rates are set, people's willingness to pay will depend on the extent to which the present government can find ways to restore their confidence in the local democratic process, and to involve them more in community planning and development. Once this is achieved, then it is conceivable that greater progress will occur, not only in the rehabilitation of existing drainage and irrigation systems, but also in implementing both cost-effective and cost-recovery strategies to ensure the continued viability of these systems. Having discussed the impact of environmental uncertainties on food output in this chapter, the following chapter will focus on the relationship between land tenure and food production.

CHAPTER EIGHT

8.0 LAND TENURE AND DOMESTIC FOOD PRODUCTION IN GUYANA

Much of the literature on land tenure in Guyana focuses on the agricultural sector as a whole and treats small farmers as a homogeneous group. Consequently, the peculiarities of land tenure among domestic food farmers as a distinct group are barely discussed as they are overshadowed by the concerns of small farmers in general. Among small farmers as a whole, one of the principal land-tenure problems constantly alluded to in the literature is the absence of any secure title to land. Those lacking such titles are prevented from applying for credit so as to develop their farms and increase agricultural output (Williams 1981; World Bank 1991). In this chapter the hypothesis to be tested is that domestic food farmers have been handicapped by existing land-titling arrangements to the extent that food production has declined considerably since 1960.

8.1 Distribution of Land Titles Among Domestic Food Farmers

Table 8.1 shows the distribution of land tenure among the sampled farmers in the five villages studied in 1994. Farmers with either individual freehold titles or joint freehold titles (family land) constituted close to 60% of all forms of tenureship. Both individually and jointly owned freehold titles (family land) are secure forms of tenure and could have

been used at Gaibank, the main agricultural development bank, as collateral with which to obtain loans (Hunte 1993). An additional 5% of farmers had long-term leases (leases of 21 years or more for state lands) that could be considered as secure forms of tenure. In all, nearly 65% of farmers in the sample survey had secure titles to land.

Table 8.1 Distribution of Land Tenure Among Sample Farmers by Type of Villages (Percentages)

Villages	Type of Tenure					
	Individ. Freehold	Family Land	Long-term Lease	Rented from private indiv.	Rent Free	Squatting
<u>Proprietary</u>						
Bush Lot	5.8	0	5.0	0.8	0	0
Mahaicony	7.4	0	0	0	6.6	0
Craig/ Friendship	3.3	7.4	0	2.5	4.1	0.8
<u>Communal</u>						
Ann's Grove	8.3	5.8	0	5.8	5.0	0.8
Clonbrook	21.4	0	0	9.1	0	0
Total	46.2	13.2	5.0	18.2	15.7	1.6

Source: Questionnaire Survey Data, 1994

8.1.1 Individual Freehold Titles

Farmers with individual freehold titles constituted 46% of the sample (Table 8-1). One reason why individual freehold title for agricultural land is so prevalent is that this is the preferred form of tenure among East Indian farmers

(Despres 1967). East Indians represented 59% of all of the sampled farmers in Table 8-1, but accounted for 68% of individual freehold titles. By contrast, Afro-Guyanese farmers, who accounted for 41% of the sample, constituted 32% of individual freehold title holders. Notwithstanding these differences, a chi-square test revealed no significant difference between the racial background of the two main groups of farmers and the type of rights they possess to agricultural lands (8-2).

The large proportion of Afro-Guyanese small farmers who possess individual freehold titles to land might be a result of the fact that while their foreparents were quick to subject residential property to fragmentation, they were less eager to do so with agricultural land (Semple 1980). In many instances, individual property rights were maintained for agricultural land because dividing one hectare among an average of five children rendered each fragment too small for economic cultivation. This subtle difference in approach to land fragmentation in residential and agricultural areas is worth further investigation as it has not been widely discussed in the literature.

Table 8-2 Cross-tabulation of Land Titles by
Afro-Guyanese and East Indian Small Farmers

Count Exp Val Col Pct	Racial Groups		Row Total
	Afro- Guyanese	East Indians	
Individual Freehold	17 21.6 37.0%	36 31.4 53.7%	53 46.9%
Joint Freehold (Family Land)	8 5.7 17.4%	6 8.3 9.0%	14 12.4%
Rent	6 7.7 13.0%	13 11.3 19.4%	19 16.8%
Other	15 11.0 32.6%	12 16.0 17.9%	27 23.9%
Column Total	46 40.7%	67 59.3%	113 100.0%

<u>Chi-square</u>	<u>df</u>	<u>Significance</u>
6.33	3	.09682

Source: Questionnaire Survey Data, 1994

A noteworthy feature of individual freehold title to agricultural land is their geographical distribution. Most farmers who possess freehold title to agricultural land live in communal rather than proprietary villages (Table 8-1). It is this pattern which points to one of the fundamental

problems with land tenure in Guyana, namely; that farmers in proprietary villages have less flexibility with what they can do with the land than do their counterparts in communal villages. This fact stems from most of the land in proprietary villages are owned by large estates which, in turn, rent land to small farmers. As discussed with respect to coconut estates, conflicts between small farmers and some of these estates have resulted in small farming in proprietary villages becoming less extensive than is the case in communal villages.

8.1.2. Joint Freehold (Family Land)

Family land constituted 13% of the total number of land titles (Table 8-2). Afro-Guyanese farmers accounted for 50% of farmers with joint freehold titles while East Indians accounted for 37.5%. Farmers of mixed descent accounted for the remaining 12.5%. These statistics reflect the point made earlier, namely that East Indians prefer individual freehold title to land, but it also identifies a scarcely mentioned point in the literature that many East Indians, like Afro-Guyanese, find family land to be a convenient tenurial arrangement. However, Afro-Guyanese do share ownership of land to a greater degree than East Indians.

8.1.3 Long-Term Leases

Long-term leases are usually granted for the use of state lands developed by government. Table 8-2 shows only 5% of domestic food farmers in the sample possessed long-term leases and most of these were East Indians. This pattern indicates that, in general, domestic food farmers have not had much access to newly developed state lands on Guyana's coast. Data for the 1960-1986 period show rice farmers to have been the principal beneficiaries of government's efforts to bring new coastal lands under cultivation via land development schemes (Table 8-3). These data indicate that rice constituted the primary economic basis for four of the five coastal land-development schemes established in Guyana since 1960. This dominance of rice in land-development schemes reflects both the perception of government that rice is of crucial importance to Guyana's economy, and the preoccupation of East Indian farmers with this crop. The area of land involved in the four rice-oriented schemes, especially the Mahaica-Mahaicony-Abary and Tapacuma Schemes, dwarfs that made available in the non-rice schemes; underlining once again the emphasis on export-oriented crop production. In general, it can be said that security of tenure is not a major problem for the majority of small farmers in Guyana. However, the lack of access to land for new entrants into small farming is an concern as it serves to deter young individuals from entering farming.

Table 8-3 Coastal Land-Development Schemes since 1960

Name of Scheme	Date of Establishment	Economic Base	Hectares
Black Bush Polder	1960	rice, food crops	10,931
Bandwagt/Sari	1964	vegetables, citrus	4,048
Tapacuma	1965	rice	12,146
Mahaica/Mahaicony Abary	1980	rice, sugar cane	59,109
East Bank Essequibo Project	1986	rice, sugar cane, food crops	na

Source: Vining (1975); Fact Sheet, Abary River Water-Control Project, Phase 1 Development, Mahaica-Mahaicony-Abary Agricultural Development Authority (not dated).

8.1.4 Renting and Other Insecure Modes of Tenure

More than one-third (35.5%) of all farmers had insecure forms of tenure, i.e., rented land, rent-free land, and squatting (Table 8-1). Slightly more than half of these farmers rented land from coconut estates or private individuals under various short-term leasing arrangements. For example, some paid nominal rent with few restrictions, while others operated under strict leasing agreements that prohibited them from planting certain crops, particularly perennials and altering drainage systems to suit their needs.

The majority of the remaining farmers had rent-free access to land or various forms of caretaking arrangements with few restrictions. Less than 2% of the sample of farmers were squatters.

Although the majority of small farmers in the sample had secured forms of tenure for land they cultivate, the present level of 36% of farmers who are without such security could still create problems for agricultural productivity. Given that the granting of farm credit is now increasingly in the hands of private commercial banks, strict loan qualification requirements have replaced the liberal requirements of Gaibank, the main government funded development bank that was prominent in the 1970s and 1980s. Farmers without secure titles to land they cultivate could thus be disqualified from receiving loans to expand output because of a lack of collateral. In order for farmers to survive in this economic environment, greater efforts must be made to provide them with secure forms of tenure so that their eligibility for credit is improved.

8.2 Land Tenure by Village Type

Table 8-4 shows summary statistics on different aspects of land tenure in both proprietary-type and communal-type villages. These data show that, with respect to mean farm size and the number of fragments that constitutes a farm, there is hardly any variation across village types. Freehold titles are generally popular, but less so for small farms in

proprietary-type villages. This difference is directly attributable to land in proprietary villages being occupied principally by a few large estates. The data also indicate that more people in communal-type villages rent land than those in proprietary-type villages. This tendency reflects the presence of a more active land market in communal-type villages than in proprietary villages.

In both types of villages, small farms have been occupied for an average of 13-14 years. However, as farms increase in size, length of farm occupancy increases. This relationship reveals the tendency of small farmers to cultivate larger plots of land after several years of farming. Little variation exists between village types in regard to the proportion of a farm that is left idle. On average, approximately 20% of land in a given farm is left idle. These summary statistics confirm that coastal villages have similar geographical characteristics, however substantial differences exist in land tenure patterns and these should be taken into considerations when collateral requirements are being determined by institutions that grant farm credit.

Table 8-4 Summary Statistics on Land Tenure

Farm Size (ha)	Mean Farm Size (ha)	Mean No. of Plots	% Freehold title	% Joint Freehold title	% Long-Term Lease	% Renting	% Rent-Free Land	% Care-taking	Mean Number of Years Farm Occupied	% of Farm left Idle
<u>Prop. Villages</u>										
0.4 - 0.9	0.5	1.25	48.0	8.1	13.5	8.1	13.5	2.7	13	22
1.0 - 3.9	2.5	1.21	6.7	33.3	0	6.7	33.3	6.7	14	17
4.0 -19.9	5.9	1.0	33.3	33.3	0	0	0	33.3	20	28
20 +	20	1.0	0	0	100	0	0	0	30	25
<u>Comm. Villages</u>										
0.4 - 0.9	0.5	1.29	50.0	10.4	2.1	22.9	6.3	6.3	12.2	20
1.0 - 3.9	2.5	1.0	58.8	11.8	0	29.4	0	0	16.7	19
4.0 - 19.9	5.8	1.0	50.0	-	0	50.0	0	0	10.7	30
20 +	-	-	-	-	0	0	0	0	-	-

Source: Questionnaire Survey, 1994.

8.3 The Impact of Land Tenure on Domestic Food Production

Contemporary understanding of the relationship between land tenure and food output maintains that insecure modes of tenure prevent farmers from applying for credit in order to develop their farms, which in turn, restrict possible increases to food production (Lele 1975). The anticipated relationship between tenure and credit was not borne out by the thesis survey data since a cross-tabulation of data between tenure and credit showed that no significant relationship existed between these two variables. The probability level associated with the null hypothesis was 0.95. In general, all farmers, regardless of their tenurial status, hardly ever applied for credit. For example, only 8.9% of farmers with individual freehold titles to land ever applied for credit as compared with 9.9% for those who rented land, 6.3% for those with joint ownership, and 7.7% for those with rent-free access. The rationale as to why so few farmers applied for credit is a topic that will be discussed in the next chapter.

Longitudinal data on tenure were not available for the entire study period so it could not be determined whether a direct connection exists between tenure and output. However, the OUTPUT variable in the questionnaire survey was cross-classified with the LAND TENURE variable to determine whether output and tenure were statistically related. Table 8-5 presents the results of the cross-tabulation which shows no significant relationship between farmers' decision to increase or decrease output and type of land tenure (probability =

0.22). Owing to the present high risks involved with private investment in domestic agriculture in Guyana, the decision to increase output does not appear to be affected by the type of tenurial occupancy of land.

Table 8-5 Cross-tabulation of Output by Tenure

Count Exp Val Col Pct	Tenure				Row Total
	Indiv. Free- hold	Family Land	Rented Land	Other	
Increased	19 20.2 %	4 5.8 %	7 7.9 %	15 11.2 %	45 36.0%
Unchanged	7 9.9 %	6 2.8 %	4 3.9 %	5 5.5 %	22 17.6%
Decreased	30 26.0 %	6 7.4 %	11 10.2 %	11 14.4 %	58 46.4%
Column Total	56 44.8%	16 12.8%	22 17.6%	31 24.8%	125 100.0%

Chi-square

8.25

df

6

Significance

0.22007

Source: Questionnaire Survey Data, 1994

Although no significant relationship existed in the sample data between tenure and credit and tenure and output, this should not deter government from continuing with present efforts to grant secure titles to more farmers. With frequent flooding of land being the main reason as to why farmers are reluctant to invest capital in expanding their farm operations, then resolution of this long-standing problem should lead to a re-establishment of the expected relationship between tenure and farm credit and tenure and output. If this occurs, then the demand for farm loans might increase and the need for collateral, particularly secured titles to land, will also rise. Government should continue with its programme of granting secure land titles to farmers, but for this programme to be meaningful, a simultaneous plan for flood control is necessary.

The question of what to do about land-tenure patterns in proprietary-type village remains a politically charged issue - one requiring further study to clarify the specific dimension of this problem. Finally, it should be mentioned that Guyana's land registration system is in need of a complete overhaul. Presently, the system suffers from serious overlapping of functions by different agencies; a situation which has resulted in large backlogs of unprocessed applications for land titles. Also, the process of gaining access to unutilized state land with agricultural potential is

cumbersome and could be speeded up through re-organization of existing procedures.

Finally, the use of computerized forms of record keeping could be a significant improvement in the storage, retrieval, and manipulation of land records at the Deeds Registry and the Lands and Surveys Department. Up to the time field work was done in 1994, there was little indication that a modern land registration system (LIS) was being planned for Guyana. This is unfortunate as the technology for constructing a LIS, e.g. computers, scanners, digitisers, and trained personnel, is widely available and the system could be built up incrementally over time.

8.4 Tenure-Related Constraints to Increased Food Production

Among the tenure-related problems mentioned by sampled farmers, the unmitigated effects of farmland being located some distance from the farmers' place of residence were perceived as contributing significantly to declining food production in the villages. As pointed out earlier, the average distance of a farmer's principal area of cultivation from his or her place of residence is 2.35 km, with the maximum being 8 km in one instance. Most farmers cover this distance by walking or, in some cases, by boat. This separation of farmer and principal area of cultivation has given rise to widespread praedial larceny; the incidence of

which escalated during the late 1970s and 1980s as economic conditions worsened in Guyana. Farmers also complained that because their arable land was not fenced, unattended livestock, mainly cattle and pigs, enter their holdings and destroy crops. In many instances, the joint effects of praedial larceny and destruction of crops by livestock have caused sufficient damage as to make it unprofitable for farmers to tend their plots. As a result, plots subjected to frequent plundering are either abandoned or production is reduced considerably.

The small average size of farms involved in local food production is widely held by development planners and agricultural authorities to be a reason for declining food output. A main argument is that small plots, i.e., plots less than 1 ha, usually do not provide adequate income for households and, hence, lead to land abandonment and consequent reduction in output as people look elsewhere for employment (Weir 1980; Nathan and Associates 1980).

Within the study area, the relationship between farm size and output levels during the last five years was tested by means of chi-square analysis. For farmers who had increased their output, 86% were semi-subsistence while only 11% were commercially oriented. Among those who had decreased output, semi-subsistence farmers were again the largest group, 55%, while corresponding proportion for commercially oriented small farmers was 33%. Among farmers whose output levels remained

constant over the last five years, 64% were semi-subsistence farmers and 36% commercially oriented small farmers. The probability level associated with the overall cross-tabulation of farm size and farmers' perception of their output levels between 1989 and 1994 was 0.02 indicating that a definite relationship exists between the two variables.

A more direct relationships between farm size and declining output could not be substantiated from the data at hand. The available data suggest, however, that semi-subsistence farms are more likely to either increase or decrease output in accordance with changing circumstances than commercially oriented small farms.

8.5 Conclusion

The hypothesis that domestic food production is handicapped by current land tenure arrangements was only partly supported. Ownership rights to land used for domestic food production in Guyana were not a major issue among farmers, since the majority of them had secure titles to the land they occupied. Also, due to problems of flooding that affected all farmers, regardless of the nature of land tenure, no significant relationship existed between tenure and whether or not farmers ever applied for farm credit to develop their farms.

The main tenure-related issue affecting farmers was the fact that land used for domestic food production is generally

located about 2.35 km from farmers' place of residence. This separation of farmer and principal area of cultivation provides opportunity for a high degree of praedial larceny and destruction of crops by cattle. Many farmers reported that, in the past, security arrangements were in place to help safeguard their crops. For example, two or more rangers had been frequently employed by village councils to patrol areas of cultivation. These rangers had authority to apprehend persons involved in praedial larceny or impound cattle found to be destroying crops. Farmers reported that these security systems collapsed with the weakening of district-level local government in the 1970s. A reinstatement of these security systems would be one means of coping with these problems. As well, updating of Guyana's land registration system is needed to reduce backlogs in the granting of land titles and to allow the operation of more efficient land markets.

Given that secure land tenure is not a major problem for many domestic food farmers, the next issue of concern is whether government's agricultural credit policy has been effective in providing assistance to small farmers engaged in domestic food production. The following chapter deals with the impact of government farm credit policies on local food production.

CHAPTER NINE

9.0. FARM CREDIT AND THE DECLINE OF DOMESTIC FOOD PRODUCTION IN GUYANA

Of significant importance to the subject of farm credit has been the creation in 1973 of the Guyana Agricultural and Industrial Development Bank (Gaibank). Its mandate included the provision of credit assistance to all sizes of farms in both the export and domestic sectors. One of the reasons for the establishment of Gaibank was to counter the well-documented tendency of commercial banks in Guyana, as elsewhere in the developing world, to favour large-scale farms in granting of farm credit (Bourne 1972; Von Pischke 1981; Lipton 1976). This bias is largely a reflection of the ability of larger farms to provide the requisite collateral and hence better security for loans, as well as their tendency to have more secured markets for their products through marketing contracts, especially for export crops.

This chapter intends to show that, despite official government policy in the 1970s and 1980s insisting that all categories of small farmers would benefit from farm credit provided from public sources, farmers specializing in domestic food production received only marginal amounts of credit. The hypothesis to be tested here is that government credit policy in the 1970s and 1980s failed to address the needs of farmers in the domestic sector and, as a result, contributed to a decline in food production. Discussion will focus first on

the level of credit received by the domestic food sector, and then be followed by an analysis of the reasons for credit patterns that existed up to 1994. Finally, by using available data, the process by which limited credit has affected production levels will be examined. The analysis will also examine the extent to which female domestic food farmers have benefited from credit. Female farmers predominate in the domestic sector (Odie-Ali and Rutherford 1994) and limited amount of credit to this group can be an important factor restricting the development of their farms, and hence the output potential of the domestic food sector.

9.1. Credit Supply to the Domestic Food Sector

Table 9.1 shows loan allocation disaggregated by crop and livestock emphasis for Gaibank, the main publicly-funded institution for farm credit in Guyana between 1973 to 1994. Data for this period indicate that the value of loans provided to the domestic food sector fluctuated between 25% and 54% of total loans disbursed by the Bank. This fluctuation reflects the Bank's changing priorities with respect to agricultural lending. In the early stages of its existence (1973-1975), lending patterns reflected the Bank's original mandate of providing credit to a wide cross section of agricultural activities, though rice farmers were to be the main beneficiaries (Gaibank's Annual Report 1973).

Table 9-1 Gaibank: Value of Agricultural Disbursements by Economic Activity, 1975 - 1991, Real Terms (1970 = 100)
(Millions of G\$)

Economic Activity	1973 - 1975		1978 - 1982		1987 - 1991	
	\$	%	\$	%	\$	%
<u>Export Sector</u>						
Rice	2.69	56.87	7.74	40.67	63.27	74.97
Sugar cane	0.72	15.22	1.06	5.57	0.12	0.14
<u>Domestic Sector</u>						
Food & Tree Crops	0.57	12.05	3.00	15.76	4.76	5.64
Beef	0.06	1.27	0.84	4.40	1.13	1.34
Dairy	0.03	0.63	1.37	7.20	2.15	2.55
Pigs	0.24	5.07	2.68	14.08	3.66	4.34
Poultry	0.35	7.40	1.91	10.04	4.80	5.69
Other livestock, e.g sheep, goats.	0.07	1.49	0.43	2.26	0.45	0.53
Food crop Revolving Fund	-	-	-	-	4.05	4.80
Total	4.73	100.0	19.03	100.0	84.39	100.0

Source: Computed from statistics in Gaibank's Annual Reports, 1973 to 1993.

As producers of an export crop, rice farmers obtained 57% of loans disbursed during this period. In all, a total of 72% of loans disbursed between 1973 and 1975 went to producers of export crops. Of the remaining 28%, 15% went to those raising livestock while only 13% being designated to producers of a range of domestic crops.

Although disbursements for rice and sugar production increased between 1978 and 1982, Gaibank increased its lending to the domestic food sector relative to the rice and sugar sectors (Table 9-1). The relative increase in lending to the domestic food sector stemmed from government's attempts to stimulate domestic food production in the mid-1970s. By increasing its support of domestic food sector, Gaibank gave particular attention to livestock production, i.e., pig and poultry rearing (Figure 3-4) so that between 1978 and 1982 poultry output peaked, while pork production was maintained at a respectable level. Clearly, a strong connection existed between Gaibank's credit support for livestock production in the second half of the 1970s and the increases in output which occurred during that period.

By the late 1980s and continuing into the 1990s, an almost complete reversal took place in Gaibank's relative priorities for sectoral lending. Allocations to the domestic food sector were severely reduced, while loans to rice farmers accounted for 75% of the total allocation of funds between 1987-1991. This reversal in sectoral priority coincided with government implementing its IMF-sponsored Economic Recovery Programme which required extensive support for the export

sector. The result was a massive withdrawal of credit to farmers in the domestic food sector.

After 1987 Gaibank's credit policy became strikingly similar to that of the private commercial banks. For example, its collateral requirements became more stringent, thereby making it difficult for small farmers to access loans (IFAD and IICA 1991). Also, its previous policy of granting credit at negative real interest rates was reversed, so that interest rates followed closely those of the commercial banks, i.e, at levels above the rate of inflation (IICA and IFAD 1991). The similarities between Gaibank's recent lending pattern and that of private commercial banks suggests that during the last decade the Bank has been unable to reconcile its developmental mandate with that of the current conservative approach to economic management. In the process, domestic food farmers became the first casualties, as they could no longer meet the stringent requirements for private-sector borrowing.

It should be pointed out that the process of economic restructuring, which began in the late 1980s in Gaibank, finally resulted in that organization merging with the government-owned Guyana National Cooperative Bank (GNCB) in 1995. Due to problems with loan defaults, low interest rates, and the viability of the bank, government took the view that small farmers and businesses could be better served by channelling credits through commercial banks.

9.1.1 Responsiveness of Output to Farm Credit among Survey Respondents

When output data from the questionnaire survey were cross-tabulated with data on whether farmers had ever received a loan, it was noted that overall, there was an insignificant relationship between the two variables (Table 9-2). The probability level associated with the prediction was 0.44. Five of the six sampled farmers who received credit reported increases in their output between 1989 and 1994. Thus, for those receiving farm credit there is some evidence that they benefited from doing so. However, the sample size was too small for any definitive conclusion to be made on this subject.

Table 9-2 Variation in Output by Credit Receipt

	Count Exp Val Col Pct	Credit Receipt		Row Total
		No	Yes	
Output (1989-94)				
Increased	40 42.8 33.6%	5 2.2 83.3%	45 36.0%	
Unchanged	22 20.9 18.5%	0 1.1 .0%	22 17.6%	
Decreased	57 55.2 47.9%	1 2.8 16.7%	58 46.4%	
Column Total		119 95.2%	6 4.8%	125 100.0%
<u>Chi-square</u>		<u>Significance</u>		
6.23		0.44		

Source: Questionnaire Survey Data, 1994

9.2 Credit Demand in the Domestic Food Sector.

Historically, the demand for credit by the domestic food sector has been low. For instance, in a study of 420 farmers in Guyana in the early 1970s, Lewars (1976) noted that less than 4.7% of food crop and livestock farmers actually applied for loans before 1968, and only 5.5% had applied for loans between 1968 and 1970. Later, in 1979, the Guyana Rural Household and Farm Survey presented data revealing only 9.5% of all farm households had ever applied for loans of which one-tenth were food crop producers (USAID and Ministry of Agriculture 1979). In the thesis questionnaire survey, only 7% of farmers reported applying for loans at some point, and 5% reported ever receiving loans. A cross-tabulation of data on farm credit by location of farmers revealed that there was little variation among farmers in different villages (Table 9-3). The lack of demand for farm credit is thus widespread and is not restricted to a particular type of village or ethnic group.

Table 9-3 Farm Credit Receipt by Villages

Villages	Percentage of farmers who never received credit	Percentage of farmers who never applied for credit
Mahaicony	94.4	89.0
Bush Lot	100.0	100.0
Ann's Grove	96.9	94.0
Clonbrook	100.0	100.0
Craig/Friendship	84.0	80.0

Source: Questionnaire Survey Data, 1994.

9.2.1 Explanations for Low Credit Demand in the Domestic Food Sector

In the course of the thesis questionnaire survey, farmers were asked to state their main reason for not requesting loans. The majority (59%) indicated that they did not desire credit because of the risks involved. These risks were due to poor infrastructure, praedial larceny, and lack of extension services; all of which meant that substantial losses could result in any planting season and make loan repayments difficult, if not impossible.

Lewars (1976) found that, in one district he surveyed, over 40% of the farmers had no desire for farm credit. His explanation for the lack of demand for credit among these farmers was that the physical input requirements of domestic food farming were low due to the small scale of operations.

However, in the thesis questionnaire survey, only 8% of farmers reported that their lack of desire for farm credit was due to the scale of their operations. Input requirements were indeed low, but most farmers expressed the view that input costs were substantially high in relation to their income. Thus, simple tools and chemicals could not be purchased in required quantities because of their high prices.

Prices for small tools reported by farmers, and substantiated by Gaibank for July 1994^{4/}, were as follows: a fork, G\$12,000; a 20-litre spray can, G\$12,300, a hoe G\$900; a cutlass, G\$500; and a garden spade G\$2,542. Prices for fertilisers were as follows: a 50 kg bag of sulphate of ammonia, \$1,770; a 50 kg bag of urea, \$1,830; and a 50 kg bag of Triple Super Phosphate \$2,300. Prices for larger equipment were sufficiently high that, in the majority of cases, they were beyond the financial means of most farmers. For example, a 7.5cm centrifugal irrigation pump was valued at G\$87,000.

Given that approximately 72% of self-employed farm households in 1992/93 earned less than G\$22,000 (Bureau of Statistics 1993), it is evident that although farmers' physical input requirements may be small, the costs of their capital requirements are very high relative to their income. Farmers' demand for credit is low not because of a limited need for credit, but because the probability of crop losses and loss of collateral is perceived to be high.

^{4/} Unpublished Report on Prices for Available Machinery, Equipment and Agricultural Inputs, Gaibank 1994.

Lewars (1976) also suggested that another reason for low credit demand by small-scale farmers is their reluctance to incur debt. He attributed debt aversion to the conservative nature of small farmers and to their ignorance of the facilitatory role that credit can play in expanding production and income. This argument is unconvincing, however, in the light of data from the thesis questionnaire survey which revealed that only 8.6% of farmers did not apply for loans because of a dislike for indebtedness (Table 9-4). As rational economic decision-makers, farmers are not unaware of the facilitatory role of credit. Rather, according to their calculations, the risk involved in securing a loan is often too high in relation to their chances of making a profit on the borrowed capital, hence the lack of demand for credit.

From the foregoing review, it is evident that in addition to a strong rice bias in the allocation of agricultural credit in Guyana, a major factor explaining the limited amount of credit to the domestic food sector has been the limited demand for credit by domestic food farmers. Government's attempts to liberalize and privatize the economy has also had negative impact on the level of credit to the domestic sector since the late 1980s. The research hypothesis that government credit policy was not constructed to meet the needs of domestic food farmers because of inherent export bias in farm-credit policy was only partly substantiated. Government credit policy during the 1970s and early 1980s reflected a concern for both export and domestic agriculture. This policy was eventually eroded by demands for more financially-rigid approaches to

credit management. Unfortunately, these new approaches will not benefit domestic food farmers because of ingrained structural problems affecting small farming. These problems, such as constant flooding, high levels of praedial larceny, and low prices as a result of extensive price control regimes, present high capital risk. As such, farmers will continue to be reluctant to borrow even if interest rates are concessionary.

Table 9-4 Frequency Distribution of Reasons for Farmers not Applying for Loans

Reasons for not applying for loans	Frequency Distribution (%)
Did not need loan	59.2
Lacked collateral	17.6
Unfamiliarity with credit process	15.2
Fear of debt	8.0

Source: Questionnaire Survey Data, 1994.

Since domestic food farmers have a history of low demand for farm credit, and given the fact that the domestic food sector accounted for an average of 35% of Gaibank's loan disbursement since 1973, it is evident that most of the loans to this sector went to a relatively small number of medium- and large-scale farmers. Table 9-1 suggests that most of these

farmers were concentrated in the poultry and pig sub-sectors, which received most of the domestic loans disbursed by Gaibank. The average loan size for poultry farmers was \$39,000, and that for pig farmers was \$15,726 (IFAD 1982). A sizeable amount of loans was also disbursed for food and tree-crop production, but most of these loans went to tree crop farmers. For example, the average loan for citrus growers was \$21,000 in comparison with \$8,424 for farmers who practised mixed cropping, and between \$1,160 to \$2,742 for farmers who grew plantains (IFAD 1982).

Emerging from this assessment is the realization that simply providing access to credit in and of itself will not induce farmers to borrow money so as to expand production. Credit has to be provided within the context of an integrated approach to agricultural development (Lele 1975). Such an approach must advocate the simultaneous solution to problems relating to infrastructure, extension services, local governmental services, as well as farm credit. The government's present approach of directing small farmers to commercial banks for credit while not emphasising rehabilitation of infrastructure across a broad spectrum of farms is unlikely to have any impact on food output.

9.3. Women Food Producers and Farm Credit

Women food producers are not well-represented among recipients of farm credit in Guyana. During the period 1985-1986 Gaibank approved 3,825 loans, of which 71% went to male farmers (CARICOM 1988). Twenty-one percent of approved loans

went to joint borrowers, usually father-and-son combinations, brothers, relatives, and to a lesser extent, husbands and wives. Female borrowers on their own accounted for only 7.8% of all approved loans (CARICOM 1988) although they constitute about 14% of all farmers in Guyana.

Based on a sample of 430 borrowers from Gaibank between 1987 and 1991, Hunte (1993) reported that just 3% of loans went singularly to female farmers, while 72% went to males. The remainder went to joint borrowers, such as husband and wives and brothers. He also noted that whereas males accounted for \$12.4 million of disbursement, females accounted for only \$100,000. Furthermore, the average value of loans to females was only \$6,154 as compared with \$40,000 for males. These data clearly show that female food-crop producers did not benefit greatly from farm credit provided by Gaibank.

Loan statistics obtained from the Institute of Private Enterprise Development (IPED) reveal that their record is only marginally better than Gaibank's with respect to women benefiting from farm credit. IPED is a non-profit development organization established in 1985, with its objective being to encourage the growth and development of the private sector in trade, commerce, manufacturing, agriculture, and fisheries through technical assistance and non-traditional credit to small and micro entrepreneurs (IPED 1993).

Of a total of 2,922 IPED loan recipients between 1986 and 1993, just 270 or 9% of recipients were women applying on their own. However, a total of 919 or 31% of loans were joint ventures involving men and women. The extent of gender bias in IPED's lending pattern is surprising, given the fact that

its entire period of operation has been at a time of increased awareness of the needs of women for credit. One reason for this pattern could be that many female farmers are simply unaware of IPED's functions, particularly with regards to its micro-enterprise lending facility whereby small businessmen and women who have no collateral could obtain loans from the organization, provided certain criteria are met.

Altogether, it is not clear whether or not there is a distinct pattern of improvement in women's receipt of farm credit. Historical biases are still present and although women constitute a sizeable proportion of domestic food farmers, their lack of access to credit only contributes to the food production problems in Guyana.

9.4 Policy Options

Based on the above analysis, the following policy options are proposed:

a) There is a clear need for government to invest in infrastructural development, particularly drainage and improved farm-to-market links, whether by road or water. This strategy will reduce the level of risk taking in the agricultural sector, thereby encouraging farmers to approach commercial banks and other financial agencies for loans to develop or extend their farms.

b) The economic climate is currently not conducive to start new, extensively-subsidized credit programmes for the domestic food sector. Such schemes have been extensively criticised

during the 1980s (e.g. Graham, Solis and Weisenborn, 1981; Von Pischke 1981), and are presently considered unsustainable because there are not enough inbuilt mechanisms to recover public funds spent on subsidies. If proper infrastructural, extension services, and marketing systems are in place, then the need for highly subsidized credit programmes could be reduced, since farmers might be more willing to invest capital in agriculture because of the reduced risk from factors such as, flooding, pests, and inadequate farm to market roads.

c) Government should seek to develop new and creative rural finance policies. Establishment of more rurally located financial institutions could be one way of increasing both the supply of and demand of funds for rural economic development. Such institutions would need to have a strong developmental orientation, but at same the time, operate on both the supply and demand sides of rural financial markets. In other words, they should be allowed to accept deposits as well as provide loans at rates high enough to ensure their own sustainability.

The model currently utilised by IPED presents another interesting scenario. For farmers with little collateral, IPED uses a modified version of the system utilised by the Grameen Bank to guarantee its loans (Conversation with IPED's Manager, November 1994). Loans are made to individual members of a group, but the group is ultimately responsible for the repayment of the loan. The group therefore plays a strong monitoring role in the use of the loan. In 1994, the model was still in its pilot phase, but results were encouraging.

Having considered the effect of farm credit on domestic food production in this chapter, the next chapter considers the effects of human resources and technology on food output levels.

CHAPTER TEN**10.0. HUMAN RESOURCES, TECHNOLOGY AND DOMESTIC FOOD PRODUCTION**

The issue of an impending shortage of manpower in Caribbean agriculture was highlighted at a UNESCO conference in 1984 (CEESTEM and UNESCO 1984). A principal concern among conference participants was that younger people were not becoming farmers in large enough numbers to prevent a noticeable ageing in the farm population of the region. According to Gomes (1984:57), the average age of Caribbean farmers in 1984 was 50 years, an age well above that considered desirable.

Closely related to the issue of the ageing of West Indian farmers is the fact that most farmers in the region, particularly those in the domestic food sector, continue to rely on simple tools and implements in the production process. Additionally, the use of higher-yielding varieties of plants and superior breeds of livestock are not widespread in the domestic food sector. The technology currently in use has limited scope for increasing farm productivity; a critical concern given the fact that the proportion of the labour force involved in agriculture is diminishing, and the possibility that the average age of farmers is increasing.

The aim of this chapter is to examine first the proposition that farmers in the domestic food sector of Guyana represent an ageing population. Secondly, the relationship between the age of the farm population and declining production of certain crops and livestock will be reviewed.

Past research has suggested that as farmers grow older, they are more likely to grow more tree crops and less vegetables because the latter activity is considered to be physically strenuous work (Brierley 1974; Spence 1996). Similarly, an older farming population is less likely to raise cattle and pigs because these activities are also physically demanding. Finally, the chapter will focus on the level of technology used in the domestic food sector of Guyana and the relationship that exists between the level of technology and food output.

10.1 Demographic Characteristics of Farmers

Historical data on the changing demographics of Guyanese farmers are scanty. Nonetheless, what data are available do not support the notion that a significant ageing is taking place among domestic food farmers. In Table 10-1 data from the 1978 Guyana Rural Farm Household are presented, along with data from the 1994 thesis questionnaire survey. As the 1978 survey did not make any distinction between domestic and export farmers, a direct comparison is not possible between the two surveys. If the 1978 data, however, are assumed to be a rough guide to the demographic characteristics of domestic food farmers in 1978, then it is noted that the average age of domestic farmers in 1978 (51.5 years) was above that of farmers in 1994 (46.3 years).

Table 10-1 Selected Demographics Characteristics of Guyanese Farmers.

Demographic Characteristics	1978			1994		
	Male	Female	Average	Male	Female	Average
1. Average age of farmer	48.4	54.5	51.5	44.4	48.1	46.3
2. Years of farming experience	18.0	15.3	16.7	25.4	23.3	24.4
3. % of farmers with agri. training	19.2	3.6	11.4	8.1	7.6	7.9
4. % of farmers with formal education						
a. No Schooling	6.7	22.8	14.8	2.0	0	1.0
b. Primary	85.0	74.7	80.0	90.0	100.0	95.0
c. Secondary	8.2	2.3	5.3	3.8	14.0	8.9
d. post-second.	0	0	0	0	0	0

Source: Guyana Rural Farm Household Survey, 1978; Field Survey, 1994.

The average age of domestic food farmers being 46.3 years is not much different from that observed in a sample survey of 80 rice farmers in Guyana by Lakhan et al., (1995). Their study found the average age of rice farmers to be 44 years. One explanation for the possible decline in the average age of farmers between 1978 and 1994 is that high levels of unemployment in the 1980s following the downsizing of the public sector forced many younger people into agriculture.

Another demographic feature of the labour force for domestic food production in Guyana is that its share of the total labour force is decreasing (Table 10-2). Between 1960

and 1993, the agricultural labour force in Guyana as a percentage of the total labour force is estimated to have decreased from 34% to 27%. If the supply of supply of labour in domestic agriculture is assumed to have decreased from 60% to 55% of the total agricultural labour force between 1960 and 1993, then the proportion of the total labour force involved in domestic agriculture would have decreased from 20.4% in 1960 to 14.9% in 1992-92.

With respect to the composition of the labour force for domestic food production, it is often stated that small farmers depend largely on their families for labour supply (Ellis 1988). It is not known precisely the extent to which this characteristic may be changing, but the sample survey revealed that fully 40% of farmers in the sample hired labour, usually one or two persons. Finding people to hire was reported by 50% of the farmers to be difficult. In terms of the family-oriented nature of the farms, it was found that 63% of farmers obtained assistance from other members of the household. Most of this assistance came from the farmer's sons. Forty-four percent of farmers received assistance from their sons, 37% from spouses and 14% from daughters. The general conclusion from these statistics is that a significant amount of labour for small farming comes from hired help. Consequently, production levels may be affected by the level of wage rates for farm labour. The fact that 50% of farmers reported problems finding hired labour suggests that the present low wage rates for farm labour may be an important constraint to food production.

Table 10-2 Percentage of Total Labour Force Involved in Agriculture in Guyana.

Year	Export and Domestic Agriculture	Domestic Food Production
1960	34 ¹	20.4
1970	28 ¹	16.2
1980	31 ¹	17.7
1992/93	27 ²	14.9

Sources: (1) Hope 1984; (2) Bureau of Statistics (1994).

10.2 Educational and Technical Training of Farmers

Most farmers in the 1994 sample had been exposed to primary education (Table 10-1). Ninety percent of male farmers had been exposed primary education, while all the female farmers had exposure to the same. Comparable figures for secondary education are 3.8% for males and 14% for females. The majority of those who were exposed to secondary education completed up to the third year. In both the 1978 Rural Household and Farm Survey and thesis survey, farmers with post-secondary education were noticeably absent from farming as an occupation. This absence could possibly be a result of the low income and status associated with small farming and the relative ease of them obtaining higher-income

jobs elsewhere in either the private and/or the public sectors.

While the labour force for domestic agriculture in Guyana could be considered literate, only a few farmers had received any formal training in agriculture (8.1% of male farmers and 7.6% of female farmers). Most farmers had acquired their knowledge about agriculture from parents, personal experience, friends and neighbours. As mentioned previously, between 83% and 96% of the farmers in each of the villages surveyed reported no contact with agricultural extension officers. Also, only 2% to 4% of them in each village reported ever belonging to a farmers' organization. These statistics underline the fact that, apart from traditional sources of knowledge, there are few formal means by which farmers could obtain technical and other useful farming information. The general conclusion is that while the average Guyanese farmer in the domestic sector is mature and literate, his or her approach to agriculture is still bounded by traditional beliefs and practices, much like farmers in Grenada and elsewhere in the region (Brierley 1974; Weir 1980).

In discussing the situation in Grenada where literacy among farmers is also high but where traditional beliefs and practices are prevalent in farming, Brierley (1988) called attention to the nation's school curricula which he believes do not provide adequate or appropriate instruction or information on farming. While this comment is probably valid

for Guyana, it should also be stressed that there is a need for more research to be done on the problems affecting domestic agriculture, as well as upgrading extension services so as to disseminate new information and technology. The fact that traditional beliefs and practices are widespread in domestic food production is highly related to the lack of dissemination of available scientific information on crops and livestock that are found in tropical countries like Guyana.

10.3 Farm Technology and Food Production

Except for cases where operations are undertaken on a large scale, technology for domestic food production in Guyana continues to be rudimentary. Wherever widespread dependence on low levels of technology exists, large increases in food supply usually occurs through expansion in cropland cultivated (Lee and Shane 1987). When this possibility reaches its limit, the next available alternative is to increase the productivity of cropland by applying greater measures of science, technology and infrastructure to agriculture. In Guyana, while expansion of cropland may not have reached its limit, the labour force required for such expansion may not be present, hence increases in food production is a matter of improved technology and greater application of science to domestic agriculture. Sustained efforts to shift domestic agriculture along these lines are not yet evident.

The principal farming implements used by domestic food farmers are cutlasses, forks, hoes and shovels (Table 10-3). Most farmers typically owned one of these tools, while approximately one-third of the farming population owned two or more tools. For example, 61% of farmers owned only one cutlass while 39% owned two or more cutlasses. This compares with 72% of farmers who owned one fork, and 21% who owned two or more forks. Ownership of mechanized equipment is infrequent with less than 10% of all farmers owning any form of mechanized equipment. Furthermore, only 20% of farmers reported knowing anything about mechanical equipment specially designed for small-farm operations.

Given the low level of technology utilized in the domestic food production system (Table 10-3), the relationship between age and crop emphasis posited by Spence (1996) for Jamaica could have implications for sampled farmers in Guyana. The anticipated relationship is that as farmers grow older, they are likely to grow more tree crops and less vegetables because the latter activity is considered strenuous work. Also, an older farming population is less likely to raise cattle and pigs because these activities are strenuous ones. In both instances, the physically demanding nature of the activities is due to the non-mechanized tools and implements that are utilized.

Table 10-3 Type and Number of Tools, Implements and Machinery by Percentage of Farmers Owning Tools, Implements and Machinery.

Type of Tools, Implements and Machinery	Percentage of Farmers Owning Different Numbers of Tools, Implements and Machinery				
	0	1	2	3	> 4
Cutlasses	0	61.0	26.0	5.0	8.0
Forks	7.2	72.0	19.2	1.6	-
Hoes	9.6	73.0	16.0	2.4	-
Shovels	6.4	73.0	20.6	-	-
Portable Sprayers	53.3	45.9	0.8	-	-
Irrigation pumps	80.0	16.8	3.2	-	-
Pick-ups	97.5	2.5	-	-	-
Vans	99.2	0.8	-	-	-
Cars	99.2	0.8	-	-	-
Tractors	91.2	8.0	0.8	-	-
Trucks	96.8	3.2	-	-	-

Source: Questionnaire Survey Data, 1994.

To explore the hypothesised relationship, farmers below the age of 46 years, the average age of sampled farmers, were referred to as younger farmers while those above 46 years were classified as older farmers. The most profitable crops and livestock produced were used as the independent variables rather than crops and livestock actually raised because these

give a better indication of the crops and livestock that are most important to the farmers. Information on the most profitable crop was obtained from the 1994 questionnaire survey. Separate questions were asked on the most profitable crops and livestock raised during the last five years. The most profitable crop grown by farmers were classified as tree crops, vegetables, and roots and tubers. The most profitable livestock were classified as poultry, cattle, pigs, and others - sheep, goats, horses, and donkeys. Table 10-4 shows the results of a cross-tabulation between AGE and the MOST PROFITABLE CROP grrown by farmers, while Table 10-5 shows the variable AGE cross-classified by the MOST PROFITABLE LIVESTOCK raised.

Table 10-4 Cross-tabulation of Age of Farmers by Most Profitable Crop Cultivated

Count Col Pct.	Tree Crops	Veget.	Roots & Tubers	Row Total
Farmers Below 46 Years	5 33.3%	49 58.3%	12 75.0%	66 57.4%
Farmers Above 46 Years	10 66.7%	35 41.7%	4 25.0%	49 42.6%
Total	15 13.0%	84 73.0%	16 13.9%	115 100%
<u>Pearson Chi-square</u>		<u>df</u>	<u>Significance</u>	
9.686		2	0.84	

Source: Questionnaire Survey Data, 1994.

Table 10-5 Cross-tabulation of Age of Farmers by Most Profitable Livestock Raised

	Poultry	Cattle	Pigs	Other	Row Total
Farmers Below 46 Years	9 52.9%	7 46.7%	5 62.5%	3 75.0%	24 54.5%
Farmers Above 46 Years	8 47.1%	8 53.3%	3 37.5%	1 24.0%	20 45.5%
	17 38.6%	15 34.1%	8 18.2%	4 9.1%	44 100.0%

Chi-square

df

Significance

1.93

3

0.86

Source: Questionnaire Survey Data, 1994.

From Tables 10-4 and 10-5, it is apparent that the sample was mainly comprised of crop farmers. This fact is inferred from the data which show that significantly more farmers cultivate crops than raise livestock. In particular it is the cultivation of vegetables, roots and tubers which predominate. According to Table 10-4, 73% of the crop farmers regard vegetables as being the most profitable type of crop to cultivate. More importantly, the difference in proportion between younger and older farmers who grow vegetables is not as large as those for farmers who grow tree crops and roots and tubers. A greater proportion of older farmers plant tree

crops as compared to a much smaller proportion who are involved in the cultivation of roots and tubers.

Since vegetable growing is considered a strenuous activity, only a small proportion of older farmers were expected to be in this category. That this was not the case meant the hypothesis that older farmers avoided strenuous activity was not supported. Furthermore, the test of significance for the contingency table was 0.84, indicating that, overall, there is no statistically-significant relationship between age and crop emphasis.

In terms of the relationship between age and type of livestock raised, Table 10-5 shows that there is no significant relationship between these variables. Just as many younger farmers raise livestock as older farmers, but there is a clear preference for older farmers to raise poultry and cattle and to avoid pigs. The significance level for this contingency table was 0.86, indicating a high probability that no association exists between the observed and expected frequencies.

Data from the questionnaire survey also indicated that there was no relationship between farm size as the dependent variable and experience and age of farmers. On a stepwise regression, both independent variables were excluded as their adjusted R^2 s were below 0.02.

10.4 Conclusion

The evidence presented in the foregoing analysis does not support the proposition that farmers in the domestic food sector of Guyana represent an ageing population. Guyanese farmers, on average, are younger than the average age of 50 years identified by UNESCO for the Caribbean as a whole. Secondly, there appears to be no relationship between age and crop emphasis in Guyana. Most farmers, regardless of age, grow vegetables, and they are evenly distributed among different types of livestock raised. Finally, Guyana's food crop sector is characterised by a high degree of low-level technology, and little crop and livestock research. Given the declining proportion of people involved in agriculture in Guyana, the present state of agricultural technology is, undoubtedly, a significant contributor to per capita declines in domestic food production in Guyana.

The preceding six chapters considered the impact of various structural problems on the domestic food production in Guyana. As a contribution to the design of policies aimed at alleviating the problems discussed in this study, the next chapter attempts to prioritize their significance by using logit modelling.

CHAPTER ELEVEN

11.0 LOGIT ANALYSIS OF PROBLEMS AFFECTING DOMESTIC FOOD PRODUCTION IN GUYANA

Logit analysis provides a statistical means of assessing the relative importance of the variables discussed in the preceding chapters as they contribute to the central problem of declining food production. Table 11-1 shows the results from estimating the logit model. The net effect of farmers decreasing or holding output constant rather than increasing output is measured by the constant term. With a value of -1.97, the constant term suggests that overall, during the five years preceding 1994 when the survey was undertaken, farmers were more likely to decrease or hold output constant rather than increase output. The t-value for this prediction was -3.15, indicating that it was significant at the 0.05 level.

That there was a greater likelihood of farmers decreasing or holding output constant, rather than increasing it between 1989 and 1994 was not a surprising result of the application of the logit model. In Chapter Five, it was stated that despite an overall trend of decreases in food production between 1960 and 1994, output increased between 1989 and 1994. This increase was due to many people starting semi-subsistence farms as a means of coping with loss of employment and increasing economic difficulties. Unfortunately, many of these new entrants into semi-subsistence farming operated their holdings well below capacity because of poor

infrastructural support for agriculture, and low prices for some products, such as poultry meat. These problems gave rise to frustration and uncertainty about future prospects in domestic agriculture and account for the situation in 1994 whereby the majority of farmers had started reporting decreases, rather than increases, in output.

Table 11-1 Parameter Estimates for the Logit Model

Parameters (predictor variables)	Logits (Log-odds)	Standard Error	t-value
Constant	-1.968	0.623	-3.154
Farm Credit	3.736	1.123	3.326
Drainage	1.107	0.418	2.645
Age	1.032	0.430	2.393
Tenure	0.432	0.415	0.968
Distance	0.433	0.447	0.642
Technology	0.659	0.446	0.147
	Maddala R-Square	0.22	
	Cragg-Uhler R-Square	0.29	

The relative importance of predictor variables in Table 11-1 was determined by inspecting the value of their log-odds. Farm credit emerged as the most important variable affecting output since it had the highest log-odds of occurrence. Other things being equal, once farmers receive farm credit, the log of the odds of their increasing production goes up by ≈ 3.7 .

This relatively large log-odds for farm credit was unanticipated, because given the numerous complaints about poor drainage, the expectation was that drainage would have emerged as the variable with the highest potential for increasing food output. The prediction of the logit model was, however, based on the survey data which showed that farmers who benefited from farm credit were more likely to increase output than those who benefited from improved drainage. One behavioural explanation for this finding is that a farmer who receives credit from government or commercial banks is likely to do everything within his or her power to ensure that the farm operation is successful, both in order for borrowed capital to be repaid and for collateral to be recovered. The motivation to be successful is thus greater when credit is involved than when credit is not involved.

The log-odds of the drainage variable was just 1.1, well below the 3.7 obtained for farm credit. One reason for such a low log-odds is that there was not much difference in the proportion of farmers who reported inadequate drainage for their farms versus those who reported adequate drainage, i.e. 54% to 46%. The small difference in proportion between the two groups of farmers helps to explain the low log-odds. Furthermore, among those farmers who had adequate drainage, not all of them increased output. In fact, 51% either decreased or maintained a constant level of output. This suggests that the presence of adequate drainage, by itself, is not a guarantee that output will increase.

Age emerged as the third most important factor affecting output levels. Other things being equal, when farmers are

below 46 years, the log of the odds of their increasing production goes up by ≈ 1.03 . The other variables, i.e, technology, distance from farms, and tenure have no statistically significant effect on the log of the odds of output increasing.

The Maddala and Cragg-Uhler R^2 s associated with the model were 0.22 and 0.29 respectively. These values suggest that the explanatory variables accounted for only 22% to 29% of variations in the data. One important factor which could have prevented the logit model from better reproducing the data frequencies was the omission of prices. Prices were excluded from the logit analysis because the thesis questionnaire survey did not generate data on the effect of prices on output. Prior to the survey being conducted, it was assumed that the removal of price controls following market liberalization in the late 1980s had caused prices to increase to reflect the true scarcity value of farm products. This being the case, low prices were not believed to be a factor affecting output. Fieldwork subsequently showed that while prices were no longer distorted by price controls, they continue to be at levels lower than those required for many local producers to break even, e.g. poultry meat and eggs. The main reason for this is that liberal trade policies resulted in increased importation of lower-priced commodities from abroad, so that high-cost local food products could not compete with these imports. Existing market prices for many products act, therefore, as disincentives to production, but this feature was not incorporated into the logit analysis.

11.1 Policy Implications of Model Results

Apart from the effects of prices, the results of the logit model suggest that the provision of farm credit has the potential to increase domestic food production more than any other variable considered in the study. It is noteworthy that the lack of farm credit was cited by an IFAD study in 1992 as being the primary factor restraining increased food production in Guyana. There is, probably, some validity to the finding that the provision of farm credit has a greater potential to increase output more than that of any factor considered in this analysis.

Given that farm credit is of such importance to increased production, more effort should be made to provide credit to small-scale farmers, while simultaneously providing the conditions necessary for them to feel less threatened by the high risk involved in taking out loans. The present system of centralising farm credit, so that commercial banks are mostly responsible for providing loans to small farmers, may not be especially effective in channelling investment capital to these farmers, primarily because of the documented biases these banks reveal when dealing with small farmers. The proposals put forward in Chapter Nine, therefore, need to be assessed from this standpoint.

In Chapter Eight, it was indicated that the level of demand for farm credit is related to the existence of drainage and other infrastructure. This being the case, it can be seen that despite the importance of credit to increased food output, effective drainage of coast land is one of the primary factors that needs to be addressed. Rodney (1981) mentioned

that, in the 1860s, all it took for farmers in villages on the coast to get agriculture going was the rehabilitation of the drainage system. To some extent, this is still true today. During the survey, farmers expressed the view that provided many of the canals and trenches they depend on for drainage were cleared of silt and weeds so as to make them operational, they could immediately double present production levels (See Appendix Two). The government has already embarked on a programme of rehabilitation of drainage canals, which is commendable. However, rehabilitation of drainage and irrigation infrastructure should not be restricted to major rice-producing areas or areas where commercially oriented small farms predominate. Rather, it should include the agricultural lands in the numerous villages where semi-subsistence small farming is practised.

The logit model indicated that there is a slight relationship between age and farmers' decision to decrease or increase output. This result is slightly different to that indicated by the simple cross-tabulation between age and output in Chapter Ten, which reported no significant relationship between age and output. The difference is due to the logit model not making any distinction between crop and livestock farmers as did the chi-square test. Also, the logit model incorporated into its results a pattern noticed in Tables 10-4 and 10-5 that older farmers tend to be less involved in certain aspects of livestock production; namely, pig production and the cultivation of roots and tubers. Pig, root and tuber production represent areas that have shown significant decline during the last several years.

Appropriate policy ought to encourage younger farmers to become involved in pork production as well as roots and tubers. Alternatively, there is a need for more attention to be given to the nature of farm technology. If the food production system is characterised by a large number of older farmers, then productivity could be improved through widespread adoption of technology specially designed for use on small farms, and which could reduce dependence on heavy manual labour for basic farm activities. As a matter of fact, such technology should be promoted regardless of whether or not the agricultural sector is dominated by older farmers.

The logit analysis confirmed the earlier finding that the lack of secure tenure is not a major factor restricting food production in Guyana. Many small farmers in Guyana own their land and those who do not own land have reasonable access to land. Since agricultural credit is now mostly under the purview of commercial banks with strict collateral policies, a suggested policy response is for government to search for ways of helping farmers without secure land titles obtain such titles.

The physical distances farmers have to travel to their principal holdings, however inconvenient, was not one of the major deterrents to increased production. This observation does not, however, reduce the need for greater investment in farm-to-market roads as deteriorated dams and roads prevent farmers from moving their products swiftly to markets and contributes to high levels of spoilage.

11.2 Conclusion

Logit regression analysis proved to be a useful tool for determining the relative importance of the variables restraining food output in Guyana. This model was particularly useful given the fact that the variables were in the form of categorical data which made them difficult to analyze using standard OLS regression analysis. One of the important contributions of the logit analysis was that it identified the unavailability of farm credit and proper drainage as critical restraints for increased domestic food output. The main limitation of the technique, as utilized in this study, was that the effect of prices was not included in the analysis. Fortunately, the significance of price to increased output has been established in previous studies (Ford 1992). The next chapter concludes the study by offering a summary of the research findings and recommendations for improved domestic food output in Guyana.

CHAPTER TWELVE

12.0 SUMMARY AND RECOMMENDATIONS

The purpose of this study was to analyze patterns of change in the domestic agricultural sector of Guyana and to determine the significance of these changes upon food output. Data accumulated revealed that, between 1960 and 1994, there were concurrent declines in both the per capita levels of food output in Guyana and food imports. Such a combination resulted in widespread food shortages, especially in the 1980s, and contributed to the emigration of thousands of Guyanese.

A variety of factors were identified as being responsible for declines in food production. Firstly, racial politics which has characterised Guyana since the split between the East Indian and Negro factions in the People's Progressive Party (PPP) in 1953, led to skewed investment patterns in agriculture in the late 1950s and early 1960s. During this period, large investments were channelled into agriculture by the East Indian-dominated PPP government. These went mainly to promote rice cultivation - an activity mostly associated with East Indian farmers. Rice production increased significantly during the 1960s, but the simultaneous neglect of the infrastructure required to support small-scale domestic food farms, especially in Afro-Guyanese villages, resulted in substantial decreases in food production during the 1960s. In terms of specific produce that declined in output, provision crops declined more than others. The cultivation of provision

crops was mostly associated with Afro-Guyanese who left the rural areas in large numbers in the 1960s due to the numerous problems faced with village-level agriculture, and the fact that new, better-paying jobs were being created in the mining and service sectors.

A second factor contributing to the decline of food production was the reduction in the number of small farms producing domestic crops. For instance, small farms with less than 4 ha of land declined by 31% between 1952 and 1994. Also, the average number of plots cultivated by farmers declined from 2.3 in 1952 to 1.2 in 1994, resulting in further declines in output because of unchanging technology and smaller area of land being cultivated. Since it is these small farms which produce the bulk of domestic food in Guyana, and in view of the fact that there is no discernible trend of vegetables and provision crops being cultivated on larger farms, then the decrease in the area as well as the number of small farms is responsible for the decline in food production during the study period.

A third factor contributing to the decline of food output between 1960 and 1994 was the extensive use of both explicit and implicit price controls. Price controls kept the price of food well below market equilibrium prices and proved beneficial to urban consumers. However, low prices were major disincentives to increased output, particularly after the mid-1970s when government subsidies to reduce production costs were abruptly removed owing to escalating balance-of-payment difficulties. With the removal of certain input subsidies, output declined further because government was hesitant in

removing price controls, so that farmers had to struggle under a regime of extensive price controls and no input subsidies. The research hypothesis that government's involvement in market pricing had detrimental effect on domestic food production was substantiated as prices only accounted for a small amount of variation in per capita output (supra p. 134).

From an environmental point of view, another contributing factor to decline in food production was escalation of flooding. It was revealed that the proportion of farmers affected by flooding has increased (supra p. 147), which, in turn, precipitated land abandonment thereby decreasing farm output. Although the infrastructural basis for effective drainage and irrigation of farmland is already in place in most of the agricultural areas on the coast, the major cause of flooding is lack of maintenance of existing infrastructure which has rendered them non-functional.

In accordance with hypothesis 3(a) (supra p. 82), the lack of maintenance of flood-control infrastructure stemmed, in part, from the inability of regional- and village-level governments to impose water fees and taxes to better reflect the cost of providing drainage and irrigation services on the coast. The inability of regional- and village-level governments to provide adequate local services, including flood control, was also hampered by the breakdown in local level democratic institutions in Guyana between 1973 and 1993. This resulted in a lack of democratic avenues for participation by citizens in village-level development problems. This lack of participation by villagers in matters pertaining to flood control contributed to the breakdown of

maintenance systems, as critical input from villagers was not reflected in the care of drainage and irrigation systems.

The lack of farm credit was established as another major contributor to declines in per capita food output in Guyana. Findings of this study indicate that a pronounced rice bias existed in Gaibank's lending patterns. As such, rice farmers were the principal beneficiaries of credit as opposed to domestic food producers. Of the domestic food producers who received credit, livestock farmers benefited more from Gaibank's credit schemes than did food-crop farmers.

The rice bias in farm credit only partly accounts for the low level of credit received by domestic food farmers. More importantly, it was found that these farmers have a history of demanding very little credit. From the various surveys consulted it was found that, overall, more than 90% of farmers never applied for loans of any sort from financial institutions. Such low demand for credit stems from the perceived high risk associated with taking credit owing to poor drainage and the lack of supporting services to small farmers. Due to the majority of farmers never applying for farm credit, it was found that a high correlation existed between the periods when credit to the domestic sector was high and when food output was rising.

The absence of secure titles to land was hypothesised as another key factor contributing to declines in food production. However, since the study revealed that 65% of domestic food farmers had secure forms of tenure to the land they occupied, insecure tenure was not deemed a major factor in the decline of food production. Given the secondary data

available for analysis, the research hypothesis could not be verified as to whether the proportion of farmers with secure titles to land was changing. From analysis of the sample survey data, it was determined that no significant relationship existed between land tenure and farmers' decision to vary output over the five years prior to the study.

One important issue relating to land tenure among domestic food producers was that farmers in proprietary-type villages were being increasingly denied access to traditional farming grounds on coconut estates because of increased praedial larceny, and because some estates are being used to graze cattle. The study indicated that, since 1945, most of the state's land that has been developed for agriculture was allocated to rice cultivation with very little going to domestic food production. Altogether, it appears that the main land-related issue facing domestic food farmers is not the lack of security of tenure, but rather the lack of access to land to existing or would be small-scale farmers.

This research also revealed that the type of tools, implements and machinery utilised by most domestic-food farmers represents low-level technology and has contributed to declines in food output. With the migration of labour from domestic food production, the rudimentary tools used by most farmers have been unable to maintain the levels of productivity of former times when more labour was available.

Unlike findings of surveys done in other parts of the West Indies, most Guyanese farmers were found to be below 50 years and, contrary to the research hypothesis, age was not found to be a factor influencing output. Also, the study did

not find any relationship between age and crops grown among farmers in Guyana.

In addition to the above factors, it was determined that international financial agencies played a role in declining food output, because their policies helped to divert resources away from domestic food production. In Guyana, international lending agencies since the 1950s, particularly the World Bank and more recently the IMF, have consistently required that the bulk of agricultural investment go towards rice and sugar production. Large public investment in food crops and livestock for local consumption was not promoted because the foreign exchange earning capacity of these commodities is limited. The extent to which investment in the domestic sector has been neglected, nevertheless, is a cause for concern as the opportunity cost is significant. Not only does the neglect of the domestic food sector lead to burdensome food import bills, but employment and income for thousands of people in rural areas are put at risk. Furthermore, the lack of development of this sector could result in a significant loss of foreign exchange through the non-realization of the full potential of so called 'non-traditional exports', such as pineapples, limes, cherries, pumpkins and hot peppers.

Along with its preference for supporting investment in export crops, the impact of the IMF on food production has been felt through the Structural Adjustment Programmes that it sponsored in Guyana. Significant cutbacks in agricultural programmes, removal of input subsidies, downsizing of the GMC's operations, and closure of the Gaibank, the country's main agricultural development bank, have all occurred as a

result of IMF Structural Adjustment Programmes. Although the reasons for these actions can be understood in terms of the need to deal with balance-of-payment and public sector deficits, what has been problematic is that alternative systems promoting both efficiency and equity have not been established to deal with the void created by government removing itself from various aspects of the country's agricultural undertaking.

Despite the negative aspects of IMF conditionalities on local food production, it needs to be pointed out that one of their main benefits is that price controls have been removed from a wide variety of foodstuffs. As a result, real prices for many farm products increased significantly between 1989 and 1994, and resulted in some increases in output. It is evident, though, that liberalising of prices is not the only variable that must be adjusted for food production to increase.

Data presented in the study also lend support to Thomas (1982) who claimed that declines in domestic agriculture must be seen as part of the general collapse of Guyana's main productive sectors in the late 1970s and the 1980s. The fact of sugar and rice also declining significantly and simultaneously with major domestic food crops suggests that the same forces which negatively affected rice and sugar production similarly affected domestic food production. Analysis of economic policy in Guyana during the period leaves little doubt that the government's over-involvement in the economy, to the point where it controlled over 80% of the productive forces, was mainly responsible for declines in the

country's productive capacity (Thomas 1982). Over-regulation of the economy, extended bureaucracy, and a general disillusionment with the government's emphasis on socialism led to widespread emigration of skilled personnel and reduced productivity among those who remained in the country. The combined effect of these factors undermined Guyana's ability to maintain adequate food supply for its people during the latter half of the 1970s and 1980s.

In terms of current directions of Guyana's agriculture, analysis of recent policy statements issued by the government gives the overwhelming impression that agriculture will continue to be centred on the rice and sugar industries. With respect to the rice industry, the Senior Minister of Agriculture noted in 1994:

The rice industry is particularly important since it is, in many ways, the backbone of the agricultural sector. Unlike sugar - which depends largely on wage labour - the rice industry consists of many individual entrepreneurs of various sizes who have a continuing and lasting relationship with the land. The continued profitability of this industry is therefore important, not only in economic terms but also in terms of its contribution to social stability. This is why government will ensure that maximum attention is given to the infrastructural, technological and marketing needs of this industry (Statement by the Senior Minister of Agriculture on Agricultural Policies and Programmes, Ministry of Agriculture, 1994, p.3).

There is no doubt that the rice industry is critical to the economy of Guyana. However, the observation that this industry is the backbone of the country's agricultural system and, therefore, requires maximum attention in terms of

infrastructural and other support systems is not supported by evidence. The contribution of the rice industry to both total and agricultural GDP, as well as to foreign exchange earnings, in comparison with the sugar industry certainly is relatively small. Even the combined contribution of domestic food crops and livestock to total and agricultural GDP has been greater than rice during the last decade. It appears, therefore, that the social significance of the rice industry far overshadows its economic importance. One result of the current official perception of the rice industry being the backbone of Guyana's agricultural system is that agricultural investment will continue to be highly skewed in favour of rice. Sugar will have access to investment capital because of its large contribution to export earnings, but there is little evidence to suggest that domestic crops and livestock would receive any greater public financial support than in the past.

Insofar as the domestic sector is concerned, a few short-term actions have been proposed by the Minister of Agriculture to revitalize this sector (Ministry of Agriculture 1994). They include broadening the role of the Guyana Marketing Corporation to include research and technological development, and to develop and implement a plan for rehabilitation of marketing infrastructure; development of an association of agro-processors; and the rehabilitation of nurseries. In terms of actual projects, a rural infrastructural rehabilitation project under World Bank/FAO sponsorship, which will benefit

2,500 farm households, appears to be one of the important initiatives that will be taken in the domestic sector.

As with many of the previous government programmes designed to assist the domestic sector, the initiatives mentioned above are small in scope and, hence, their impact on productivity in the sector is likely to be minimal. Also, clearly evident from the places selected to benefit from the World Bank/FAO project is the government's continued commitment to investing in areas where commercially oriented small farms predominate. In this case, the areas to benefit are Cane Grove/Mahaica, Black Bush Polder and Canals Polder. As observed in the discussion on small farms, unless there is a clear policy of supporting all categories of small farms on a much more spatially-extensive scale, production levels could still fall well below desired levels. The vast tracts of idle land that form the backlands of villages throughout the coast offer potential for substantial increases in food production. By neglecting to address the structural problems endemic in these villages, the government may be unwittingly setting the stage for further rounds of decline in food output in Guyana.

That Guyana's agriculture sector has a very narrow focus is one of the striking features of agricultural organization in the country. If this narrow focus persists, it is not likely that the country's agricultural system would be able to meet the nutritional, income and employment needs of thousands of people in rural areas. These people will continue to

remain marginalized and will probably migrate to urban areas, thereby compounding the already difficult problems of unemployment and housing in the large urban centres. In addition, the benefits of a vibrant food-processing sector, which tends to have a larger multiplier effect than other sectors, will be lost to the country. Unless conscious and sustained efforts are made to deal with the problems in the domestic food sector, Guyana is likely to remain a major food-deficit country in the Caribbean region.

The specific problems mentioned above in connection with the decline of the domestic food sector in Guyana point to the broader theoretical issue, alluded to at the beginning of the study; namely that rapid population growth is not necessarily the cause of declining rates of food production in many developing countries. In the case of Guyana population growth rates have been declining since the 1960s. But, even with declining rates of population growth, food production did not keep pace with population growth. Evidently, failure in agricultural policy rather than demographics was the main cause for declines in food production in Guyana.

It is not known how widespread this problem may be, but evidence from the West Indies suggests that failure of governments to address critical public infrastructural needs for agriculture is responsible for the decline in agriculture and food production in many island nations (Axline 1986). Certainly, rapid population growth is an important constraint

on the ability of many developing countries to feed their population. However, it may be that greater attention should be paid to the role of governments' agricultural policies and their effect on prices, resource management, land use, and technological adoption when considering the constraints imposed on plans to increase food production.

12.1 Recommendations for Increased Food Production in Guyana

Based on the observations made during this study, the following recommendations are made as possible ways to reverse the trend of declining food production in Guyana:

1. There is a pressing need for Guyana's politics to advance beyond divisive racial issues and move to a point in which the various racial groups will not feel that they are the subject of discriminatory investment policies. Fairness in public investment across racial groups and different types of communities is an important prerequisite for confidence to be restored in the state's economic management policy. Such confidence is important for greater private investment in domestic agriculture on the part of Afro-Guyanese, East Indians and citizens of other racial groups.
2. Community participation and empowerment of farmers and other citizens are important ingredients for a strong

agricultural sector. Therefore, further efforts should be made to strengthen local-level democracy. Village and district council elections should be held regularly and local government should be based on the principles of accountability, transparency, and the rule of law.

3. Input and product markets should be encouraged to operate as freely and as efficiently as possible. However, in order to reduce excessively high prices for food, private investment in agriculture should be supported by public investment in agricultural infrastructure that would serve to reduce cost. Such infrastructure includes drainage and irrigation facilities, farm-to-market roads and research institutions.

4. Taxes which are levied for the use of public infrastructure and water resources should reflect economic cost as much as possible in order to ensure the availability of finance for the proper maintenance of these kinds of infrastructures.

5. Development of the domestic food sector should be actively pursued as a means to increase rural employment and income levels, particularly among youths, women and others who cannot raise the initial capital for pursuit of livelihood in the traditional export agriculture sector.

6. The development of the domestic food sector should also be pursued as a means of diversifying Guyana's agricultural base for greater economic security, and to provide better for the longer-term nutritional needs of local people.

7. Sustained investment in research and extension activities directed at domestic food crops and livestock should be undertaken as a means to improve productivity. Farm productivity could also increase through improved technology. To this end, the news media and agricultural extension services should be involved in informing the farming community of the existence of modern farm technology geared for use on small farms.

8. A wider cross section of farmers should be given the opportunity to benefit from land-development schemes. The existing rice bias excludes most domestic farmers from gaining access to land in these schemes.

9. The procedure for making state land available to people is a complicated process that should be simplified and made more inclusive to allow a wider cross section of people, including women, younger farmers and domestic food producers, to gain access to land. Also, the entire land registration system should be updated in order to allow for more efficient functioning of the rural land market.

10. The provision of farm credit should not be simply a matter for the commercial banks, but newer and creative ways should be explored to make farm credit accessible and viable. The model of the Grameen Bank provides an interesting example and is already being tried in Guyana. Another scenario is that instead of abandoning traditional development banks, the viability of these banks could be enhanced by making them operate on both sides of the rural financial market, i.e., as providers of credit and acceptors of deposits.

11. Due recognition of the role of women in domestic agriculture is required. Such recognition should be reflected in procedures that allow better access to land and higher participation rates of women in farm-credit schemes.

This list of recommendations is not exhaustive, but it provides an idea of the direction in which domestic agriculture should move if the country is to maximize benefits from this sector. Altogether, this study has highlighted a number of key problems affecting domestic agriculture in Guyana. While the nature of these problems has been explored in this study, additional inter-disciplinary studies incorporating considerations from fields such as economics, geography, sociology, environmental sciences and agriculture are needed to better understand changes in the agricultural sector, and how these are affecting employment, income,

nutrition and the general standard of living in rural and urban areas. In such studies, geographical information systems (GIS) can play useful roles in storing, analysing and mapping varied sorts of data pertaining to agricultural change at the village and regional levels. Data amassed from such studies can provide the requisite basis upon which policy makers can implement significant and positive change with regard to the way agriculture is presently organized in the country. This study has only touched the surface of an important issue now confronting the Guyanese nation. It is hoped that the stage has been set for further discussions on how Guyana can reverse this trend of declining food production.

Bibliography

Adamson, Alan, 1970. "Monoculture and Village Decay in British Guiana: 1854-1872". *Journal of Social History*, Vol 3, No 4, pp. 386- 405.

African Development, 1993. *African Development Report*.

Agresti, A., 1990. *Categorical Data Analysis*. Wiley, New York.

Ali, Asgar, 1994. "Pressing the Debt Relief Case". *Sunday Chronicle*, October 19, pp. v, xv, Georgetown.

Axline, W.A., 1986. *Agricultural Policy and Collective Self-Reliance in the Caribbean*, Boulder, Colorado, Westview Press.

Baber, Colin and Jeffrey, Henry B., 1986. *Guyana. Politics, Economics and Society. Beyond the Burnham Era*. Boulder, Colorado, Lynne Rienner Publishers.

Barker, David, 1993. "Dualism and Disasters on a Tropical Island: Constraints on Agricultural Development in Jamaica". *Tijdschrift voor Econ. en Soc. Geografie*, Vol 84, No. 5, pp. 332-340.

Beckford, George, 1972. *Persistent Poverty. Underdevelopment in Plantation Economies of the Third World*. New York, Oxford University Press.

Barry, Tom, Wood, Barry and Preusch, Deb, 1984. *The Other Side of Paradise. Foreign Control in the Caribbean*. Grove Press, Inc., New York.

Besson, Jean and Momsen, Janet, 1987. *Land and Development in the Caribbean*, London, Macmillan Caribbean.

Blaich, O.P., 1952. *Agriculture in British Guiana, Census 1953*. Vol 1, No. 2. Georgetown, Department of Agriculture, British Guiana.

Blaikie, P. 1985. *The Political Economy of Soil Erosion*. London/New York, Longman.

Boodhoo, Ken, 1981. "East Indians Labourers" in *Readings in Caribbean History and Economics*. (Ed.) Roberta Marx Delson, New York, Gordon and Breach.

Bourne, Compton, 1974. "The Political Economy of Indigenous Commercial Banking in Guyana". *Social and Economic Studies*, Vol. 23, No. 1, pp. 92-126.

Bradley P.N. and Carter, S.E., 1989. "Food Production and Distribution - and Hunger" in *A World in Crisis. Geographical Perspectives*, (eds. R.J. Johnson and P.J. Taylor) Oxford, U.K., Basil Blackwell Ltd.

Braithwaite, Farley, 1988. "Unemployment in Barbados: A Preliminary Analysis of Selected Policy Programs" in *Rethinking Caribbean Development*, (Eds. George E. Schuyler and Henry Veltmeyer, Halifax, International Education Centre.

Brierley, J.S., 1974. *Small Farming in Grenada, West Indies. Manitoba Geographical Series 4*. Department of Geography, University of Manitoba, Winnipeg.

Brierley, John S., 1976. "Kitchen Gardens in the West Indies, With a Contemporary Study from Grenada". *Journal of Tropical Geography*, Vol 43, pp 30-40.

Brierley, John S., 1987. "Agricultural Policies and their Impact in the West Indies". *Rural Systems*, Vol. 5, No. 1.

Brierley, John S., 1988a. "A Retrospective on West Indian Small Farming, With an Update from Grenada in *Small Farming and Peasant Resources in the Caribbean* (eds.) John S. Brierley and Hymie Rubenstein. Manitoba Geographical Series 10, Department of Geography, University of Manitoba, Winnipeg.

Brierley, John S., 1988b. "Idle Land in Grenada: A Review of its Causes and the PRG's Approach to Reducing the Problem" *The Canadian Geographer*, Vol. 29, No. 4, pp. 298-309.

Brierley, John S., 1992. "A Study of land Redistribution and the Demise of Grenada's Estate Farming System 1940-1988". *Journal of Rural Studies*, Vol. 8, No. 1, pp. 67-84.

Brockett, Charles D., 1990. *Land, Power, and Poverty. Agrarian Transformation and Political Conflict in Central America*. Boston, Unwin Hyman Publishers.

Bryant, C.R., 1986. "Agriculture and Urban Development" in *Progress in Agricultural Geography*, (ed) Michael Pacione, London, Crown Helm Publishers.

Bureau of Statistics, 1993. *Report on Household and Income Expenditure Survey, 1992-93*. Georgetown, Bureau of Statistics.

Bureau of Statistics, 1994. *Guyana Statistical Bulletin*, Vol 3, No.2. Georgetown, Bureau of Statistics.

Burrough, J.B. 1972. "Ethnicity as a Determinant of Peasant Farming Characteristics: The Canals Polder, Guyana". *The Journal of Tropical Geography*, Vol. 37, pp. 1-8.

Cadwallader, Martin, 1995. "Interaction Effects in Models of Consumer Behaviour". *Applied Geography*, Vol 15, No. 2, pp. 134-145.

CARICOM 1988. *Women in Guyana. Facts and Figures*, CARICOM Secretariat, Georgetown.

Carmichael, Charles 1994. "An Overview of the Livestock Sector" in *Results of Socio-Economic Survey in Coastal Areas of Guyana*, IICA and IFAD, 1994, Georgetown

Carter, Bernard, and Telfer, Irwin, 1975. "The Philosophy and Experience of Maximising Food Supplies in Guyana" in *Proceedings of the 10th West Indian Agricultural Economics Conference*, Vol. 1, St Augustine, University of the West Indies.

Chambers, G., A.E.I. Dharry, and C.E. Russel, 1994. *Environmental Impact Analysis. Emergency Sea Defense Programme of Guyana, Volume 1. Agriculture Sector Programme*, Government of Guyana and Inter-american Development Bank.

Checchi and Company, 1982. *Expanded Production of Food crops. Guyana Agricultural Sector Planning Project*. Report prepared by Checchi and Company for the Ministry of Agriculture, Guyana, USAID Contract No. 504-0077, Washington, D.C.

Clark, W.A.V. and Hosking, P.L., 1986. *Statistical Methods for Geographers*, New York, John Wiley and Sons.

Clowes, John 1990. "Agricultural Diversification - Guyana" in *Agricultural Diversification in the Caribbean* (ed. D. Walmsley), CARDI and CTA, Trinidad and Tobago.

Daniel, J.R.K., 1981. "Coastal Processes and the Dynamics of Coastal Morphology". *The Geographical Association of Guyana Journal*, Vol 3, pp. 1 - 16.

David, Wilfred L., 1969. *The Economic Development of Guyana, 1953-1964*. Oxford, Clarendon Press.

Demaris, Alfred, 1992. *Logit Modelling. Practical Applications*. London, Sage Publications.

Despres, Leo A, 1967. *Cultural Pluralism and Nationalist Politics in British Guiana*. Chicago, Rand McNally and Company.

- Downer, A.V. 1983. *A Directional Framework for Agricultural Development, 1983-1990*. Ministry of Agriculture, Guyana.
- Dumont, R. 1963. *A Report to the Government of Guyana on Planning Agricultural Development*. Rome, F.A.O., Report 1706.
- FAO, 1966. *Report on the Soil Survey Project. British Guiana, Vol. 1, General Report*, Rome.
- FAO, 1968. *Production Yearbook*. FAO, Rome, United Nations.
- FAO, 1988c. *Potentials for Agriculture Rural Development in Latin America and the Caribbean. Main Report*, Rome, United Nations.
- FAO, 1988b. *Potentials for Agriculture Rural Development in Latin America and the Caribbean. Annex iii. Food Systems and Food Security*, Rome, United Nations.
- FAO, 1988c. *Potentials for Agriculture Rural Development in Latin America and the Caribbean. Annex iv. Natural Resources and the Environment*, Rome, United Nations.
- FAO, 1991. *Production Yearbook, FAO Statistics Series*. Vol. 45, No. 104, Rome, United Nations.
- FAO, 1994. *Production Yearbook*, FAO, United Nations, Rome.
- Ford, J.R., 1992. "Guyana's Food Performance in the Caribbean Context". *Food Policy*, October, pp. 326-337.
- Fox, J., 1984. *Linear Statistical Models and Related Methods with Applications to Social Research*. Wiley, New York.
- Furnseth, Owen J. and John T. Pierce, 1982. *Agricultural Land in an Urban Society*. Washington, Association of American Geographers.
- Gilbert, G. Nigel, 1981. *Modelling Society. An Introduction to Loglinear Analysis for Social Researchers*. London, George Allen and Unwin.
- Gomes, Patrick I., 1984 "Some notes on the small farmers' situation in the Anglo-Caribbean" in *Small Farmers in the Caribbean and Latin America. Explorations into a Programme of Research and Action*. CEESTEM and UNESCO, New York, United Nations
- Green, Duncan, 1995. "Trapped by Trade". *The Geographical Magazine*, Vol. Lxvii, No. 12, pp. 12-15.

- Greene, J.E. "The Politics of Economic Planning in Guyana". *Social and Economic Studies*, Vol. 23, No. 2.
- Gregor, H., 1982. "Large-Scale Farming as a Cultural Dilemma in U.S. Rural Development - The Role of Capital". *Geoforum*, Vol. 13, No. 1, pp. 1-10.
- Gregory, S., 1968. *Statistical Methods and the Geographer*. New York, Longman.
- Greig, W.S., 1984. *Economics and Management of Food Processing*, Connecticut, AVI publishing Co.
- Griffin, Keith 1976. *Land Concentration and Rural Poverty*, New York, Holmes and Meier Publishing.
- Grigg, David, 1985. *The World Food Problem, 1950-1980*. New York, Basil Blackwell.
- Grigg, David, 1992. "World Agriculture: Production and Productivity in the Late 1980s". *Geography*, Vol , pp. 97- 108.
- Grossman, Lawrence S., 1993. "The Political-Ecology of Banana Exports and Local Food Production in St Vincent, Eastern Caribbean". *Annals of the Association of American Geographers*, Vol 82, No. 2, pp 347 - 367.
- Haberman, S.J. 1978. *Analysis of Qualitative Data. Volume 1, Introductory Topics*. New York, Academic Press.
- Hanley, Eric, 1975. "Rice, Politics and Development in Guyana" in *Beyond the Sociology of Development*. (eds) I.Oxaal et al. London.
- Hanley, Eric, 1981. *The Guyanese Rice Industry and USAID - Development of a Plan to Keep Them Down on the Farm?*. Paper presented at the Society for Applied Anthropology 41st Annual Conference, Edinburgh, April 12th-17th.
- H.M.S.O., 1945. *Report of the West India Royal Commission*, London.
- Hope, Kempe R. and David, Wilfred L., 1974. "Planning for Development in Guyana: The Experience from 1945 to 1973". *Inter-American Economic Affairs*, Vol. 27, pp. 27-46.
- Hope, Kempe, 1975. "National Cooperative Commercial Banking and Development Strategy in Guyana". *American Journal of Economics and Sociology*, Vol. 34, pp. 309-322.
- Hope, Kempe R., 1986. *Urbanization in the Commonwealth Caribbean*. Boulder, Colorado. Westview Press.

Hoyte, Desmond, 1980. *Local Democratic Organs. Speech made by Desmond Hoyte, Minister of Economic Development and Cooperatives during debate on the Local Democratic Organs Bill in the National Assembly, August 18, 1980.* Georgetown, Publications Division, Ministry of Information.

Howard, Robert W., 1986. *The Vanishing Land.* New York, Ballantine Books.

Hunte, Kenrick, 1993. *Loan Default and the Efficacy of the Screening Mechanism.* Unpublished PhD thesis. Ohio State University, Ohio.

IBRD/IDA, 1967. *An Appraisal of the Development Programme of Guyana.*

IBRD, 1953. *The Economic Development of British Guiana.* Baltimore. John Hopkins Press.

IDB, 1980. *Project Report. Food Crop Production/Marketing Programme.* Inter-american Development Bank, Georgetown, Guyana.

IFAD, 1982. *A Food Sector Strategy for Guyana. Report on the Special Programming Mission to Guyana.* Rome, IFAD.

IFAD/IICA, 1991. *Guyana Agricultural Sector Assessment,* IFAD/IICA, Georgetown, Guyana

IICA, 1979. *Operative Programme for IICA's Office in Guyana, July -December, 1979-1980,* Georgetown, IICA.

Johnson, R.J., 1991. *Geography and Geographers. Anglo-American Human Geography since 1945.* Edwin Arnold, London.

Kennard, G., 1980. *Ten Years of Agriculture in Guyana,* Georgetown, Government of Guyana.

Knox, Paul and John Agnew, 1989. *The Geography of the World Economy.* New York, Edward Arnold Publishers.

Kramer, Klaas, 1991. "Plantation Development in Berbice From 1763 to 1779: The Shift From the Interior to the Coast". *New West Indian Guide*, Vol. 65, No. 1 & 2, pp. 51-65.

Kydd, J. and N. Spooner, 1990. "Agricultural marketing liberalization and structural adjustment in Sub-Saharan Africa. *Oxford Agrarian Studies*, Vol 18, No 2, pp. 64-79.

Lakhan, V.C., R. Heron, and P.D. de Souza, 1995. "Log-linear analysis of factors contributing to the post-independence decline of Guyana's rice industry". *Applied Geography*, Vol 15, No. 2, pp. 147-159.

Lakhan, V.C., D. Rawana, and A. Lall, 1988. "Resource Allocation in Agriculture: The Guyana Experience" in *The Canadian Journal of Development Studies*, Vol. 2, pp. 235-248.

Lee, John E. and Shane, Matthew, 1987. U.S. Agricultural Interests and Growth in Developing Economies: The Critical Linkage" in U.S. Agriculture and Third World Economic Development: Critical Interdependency. Washington D.C., National Planning Association.

Lele, Uma, 1975. *The Design of Rural Development: Lessons from Africa*. Baltimore, John Hopkins University Press.

Levie, E.L., 1965. *Report to the Government of British Guiana on Marketing and Agriculture Development*, Rome, FAO.

Lewars, G., 1977. "Small Farm Financing in Guyana, 1968-1970". *Proceedings of the 7th Agricultural Economics Conference, University of the West Indies, St. Augustine, Trinidad, Jamaica*, ISER, U.W.I.

Lipton, Michael, 1976. Agricultural Finance and Rural Credit in Poor Countries". *World Development*, Vol. 4, No.7.

Long, Frank, 1982. "The Food Crisis in the Caribbean". *Third World Quarterly*, Vol. 4, pp 758-770.

Long, Frank, 1985. "How the Caribbean Food Production Plans Went Awry" *CERES*, Vol. 18, pp 32-35. Journal of the American Planning Association.

Mandle, Jay R., 1973. *The Plantation Economy. Population and Economic Change in Guyana, 1838-1960*. Philadelphia, Temple University Press.

Mandle, Jay, 1989. "British Caribbean Economic History" in *The Modern Caribbean* (eds. Franklin W. Knight and Colin A. Palmer, The University of North Carolina Press.

McCarthy, P.S., 1980. "A Study of the Importance of Generalized Attributes in Shopping Choice Behaviour", *Environment and Planning*, Vol 12, pp. 1269-1286.

McGregor, D.F.M. and D.Barker, 1991. "Land Degradation and Hillside Farming in the Fall River Basin, Jamaica. *Applied Geography*, Vol 11, pp. 143-156.

McLewin, Philip, 1987. *Power and Economic Change. The Response to Emancipation in Jamaica and British Guiana, 1840 - 1865.* New York, Garland.

Mellor, John, 1988. *Food Demand in Developing Countries and the Transition of World Agriculture,* Washington, D.C., International Food Policy Institute.

Minsters Agriculture Ltd, 1984. *Development of the Coconut Industry in the Caribbean. Draft Report.* Caribbean Community Secretariat and European Economic Community.

Ministry of Agriculture, 1992. *Annual Report - 1991,* Ministry of Agriculture, Georgetown.

Ministry of Agriculture, 1994. *Statement by the Senior Minister of Agriculture on Agricultural Policies and Programmes,* Georgetown, Ministry of Agriculture.

Ministry of Agriculture and IICA, 1980. *Crop and Livestock Statistics in Guyana. A Compilation of Existing Data,* Georgetown, Ministry of Agriculture.

Ministry of Economic Development, 1974. *Annual Statistical Abstracts,* Georgetown, Ministry of Economic Development.

Nathan, R. R. and Associates Inc., 1974. *Guyana's Food Crop System: An Analysis for Development,* Washington D.C.

Nathan, R.R. and Associates Inc., 1980. *The Income and Production of Guyana Rural Farm Households. An Analysis Based on the 1979 Guyana Rural Farm Household Survey.* Prepared for the Ministry of Agriculture and the USAID, Washington D.C.

Norusis, Marija, 1988. *SPSS-X Advanced Statistics Guide.* Chicago, SPSS Inc.

O'Brien, Larry, 1992. *Introducing Quantitative Geography. Measurements, Methods and Generalised Linear Models.* London, Routledge.

Odie-Ali, Stella and Beverley Rutherford, 1994. *Rural Women Food Producers in Guyana.* (Forthcoming). Georgetown, IICA and IDB,

O'Loughlin, Carleen, 1958. "The Rice Sector in the Economy of British Guiana." *Social and Economic Studies*, Vol 7.

Omawale and Rodrigues, A.M., 1979. "Agricultural credit related to nutrition and national development in the Caribbean: a study of the Guyana Agricultural Cooperative Development Bank". *Tropical Agriculture (Trinidad)*, Vol. 56, pp. 1-9.

PAHO/WHO, 1976. *The National Food and Nutrition Survey of Guyana*, Washington D.C., Scientific Publication No. 323.

Pollard, Stephen K, and Graham, Douglas, 1985. "The Performance of the Food-producing sector in Jamaica, 1962-1979". *Economic Development and Cultural Change*, Vol 33, No. 4, pp. 731-754.

Potter, Lesley M., 1987. "Guyana: Co-operative Socialism, Planning and Reality" in *The Socialist Third World. Urban Development and Territorial Planning*, (Eds) Dean Forbes and Nigel Thrift. Oxford, Basil Blackwell.

Potter, Robert B., (ed) 1989. *Urbanization, planning, and development in the Caribbean (Chapter One)*. New York, Mansell.

Potter, Robert B., 1993. "Urbanization in the Caribbean and Trends of Global Convergence-Divergence". *The Geographical Journal*, Vol 159, pp. 1-21

Power, R., 1990. "The CARICOM Corn and Soyabean Project in Guyana" in *Agricultural Diversification in the Caribbean* (ed. D. Walmsley), CARDI and CTA, Trinidad and Tobago.

Preeg, Ernest H., 1993. *Cuba and the New Caribbean Economic Order*. Washington D.C. The Center for Strategic and International Studies.

Quigley, J.M., 1976. "Housing Demand in the Short Run - An Analysis of Polytomous Choice", *Explorations in Economic Research*, Vol 3, pp. 76 - 102.

Richardson, Bonham, 1972. "Guyana's 'Green Revolution': Social and Ecological Problems in an Agricultural Development Programme". *Caribbean Quarterly*, Vol 18, pp. 14-23.

Richardson, Bonham C., 1987. "Men, Water, and Mudflats in Coastal Guyana". *Resource Management and Optimization*, Vol 5, pp 213-36.

Rodney, Walter, 1981. *A History of the Guyanese Working People, 1991-1905*. Baltimore and London, The John Hopkins University Press.

Rojas, E. and Meganck, R.A., 1987. "Land Distribution and Land Development in the Eastern Caribbean". *Land-Use Policy* Vol. 4, 157-167.

Saul, H., 1990. "Welcome form CARDI" in *Agricultural Diversification in the Caribbean* (ed. D. Walmsley), CARDI and CTA, Trinidad and Tobago.

Saul, Compton, 1991. "Problems of Agricultural Development in Guyana" in *Problems of Development of the Guianas* (Eds. Henry Jeffrey and Jack Menke), Paramaribo, Antom de Kom University.

Schultz, T.W., 1964. *Transforming Traditional Agriculture*. New Haven, Yale University.

Schmitz, Gerald, 1989. *Population, Food and Debt: The Challenges to North and South*. Library of Parliament, Ottawa, Canada.

Schuh, G. Edward, 1989. "Global Factors Affecting U.S. Markets in the Next Decade" in *Positioning Agriculture for the 1990s: A New Decade of Change*, Washington D.C., National Planning Association.

Semple, Juliana, 1980. *The Underdevelopment of a Rural Community: A Study of Hopetown Guyana*, Unpublished, Georgetown, University of Guyana.

Semple, Juliana, 1981. The Underdevelopment of Hopetown". *Geographical Association of Guyana Journal*, Vol. 3, pp. 69-81.

Smith, R.T., 1964. "Ethnic Difference and Peasant Economy in British Guiana", in *Capital, Saving and Credit in Peasant Societies*, ed. R. Firth and B.S. Yamey, San Francisco.

Smith, Geoffrey C. and Gauthier, Jacqueline, 1995. "Evaluation and Utilization of Local Service Environments by Residents of Low-Rent Senior Citizen Apartments" *Canadian Journal of Urban Research*, Vol 4, No. 2, pp. 305-324.

Spence, B.A.B., 1996. *Domestic Food Production and Small Farming in Jamaica*, Winnipeg, University of Manitoba, Unpublished PhD Thesis.

Spinner, T.J., 1982. "Guyana Update. Political, Economic, and Moral Bankruptcy". *Caribbean Review*, Vol. 11, No. 4, pp. 8-11.

Spinner, T.J., 1984. *A Political and Social History of Guyana, 1945-1983*. Boulder, Colorado, Westview Press.

- St. Pierre, Maurice, 1981. "The 1962-1964 Disturbances in Guyana" in *Contemporary Caribbean. A Sociological Reader*, (ed. Susan Craig). Port of Spain, Susan Craig.
- Strachan, A.J., 1975. "Water Control in Guyana". *Geography*, Vol. 65, pp. 297-304.
- Stynes, D.J. and George L. Peterson, 1984. "A Review of Logit Models with Implications for Modelling Recreation Choices" *Journal of Leisure Research*, Vol. 16, No. 4, pp. 295-310.
- Thomas, C.Y., 1982. "Guyana: The IMF-World Bank Group and the General Crisis". *Social and Economic Studies*, Vol. 31, No. 4, pp. 17-70.
- Thomas, C.Y., 1984. *Plantations, Peasants, and the State. A Study of the Mode of Sugar Production in Guyana*. UCLA, Center for Afro-American Culture and Society.
- Thomas, C.Y., 1988. *The Poor and the Powerless. Economic Policy and Change in the Caribbean*. New York, Monthly Review Press.
- Thomas, C.Y., 1993. *Poverty in Guyana. A Report Prepared for the Economic Commission, Latin America and the Caribbean*, Georgetown, University of Guyana.
- UNCTAD, 1991. *Handbook of International Trade and Development Statistics 1990*. New York, United Nations.
- United Nations, 1991a. *Compendium of Social Statistics and Indicators, 1988*. New York, United Nations.
- United Nations, 1991b. *World Economic Survey 1991/92: A Reader*. New York, United Nations.
- United Nations, 1993. *Trends in International Distribution of Gross World Product*, New York, United Nations.
- USAID, 1963. *Jamaica, Trinidad and Tobago, Leeward Islands, Windward Islands, and British Guiana. Projected Levels of Demand, Supply, and Imports of Agricultural Products to 1975*, Washington, USAID.
- USAID and Ministry of Agriculture, 1979. *Guyana Rural Household and Farm Survey*. Washington D.C., USAID.
- Upton, G.J.G. and B. Fingleton, 1979. "Log-linear models in Geography". *Transactions, Institute of British Geographers*, Vol. 4, pp. 103-115.

Vining, James W., 1975. "The Rice Economy of Government Settlement Schemes in Guyana". *Inter-American Economic Affairs*, Vol. 29, No. 1, pp. 3-20.

Visser, S., 1980. "Technological Change and the Structure of Agriculture". *Economic Geography*, Vol 56, No 4, pp. 311-319.
Von Pischke, J.D., 1981. *The Political Economy of Specialized Farm Credit Institutions in Low Income Countries*. World Bank Staff Working Paper, No. 446, Washington D.C., the World Bank.

Waddell, Ronald, 1994. "MMA Agricultural Development Project - What's Going On? *Stabroek News*, Sunday November 20, p. 1A.

Watts, Michael, 1983. *Silent Violence: food, famine and peasantry in northern Nigeria*. Berkeley, University of California Press.

Weir, C.C., 1980, (ed). *Small Farming in the Less Developed Countries of the Commonwealth Caribbean*. Bridgetown, Caribbean Development Bank.

Whitehead, Judy A., 1979. Select Technological Issues in Agro-Industry (II). *Social and Economic Studies*, Vol 28, pp. 139-188.

Williams, Patrick, 1981. *Land Tenure as a Limiting Factor in Small Farm Development in Guyana. A Case Study of East Bank Berbice*. Department of Geography, University of Guyana Georgetown.

World Bank, 1992. *Guyana Agricultural Sector Review*. Washington D.C., IBRD.

World Bank, 1993. *Caribbean Region. Current Economic Situation, Regional Issues, and Capital Flows, 1992*, Washington D.C., IBRD.

Wrigley, N., 1982. *Categorical Data Analysis for Geographers and Environmental Scientists*. London, Longman.

Yao, S. and R.W. Hay, 1991. "Food Market Liberalization: History and Prospects". *Oxford Agrarian Studies*, Vol. 19, No. 2, pp. 73 - 90.

Young, Allan, 1958. *The Approaches to Local Self-Government in British Guiana*, London.

APPENDIX ONE
SURVEY QUESTIONNAIRE

SAMPLE NUMBER

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DATE _____

VILLAGE _____

REGION _____

SECTION 1. FARM LABOUR

I would like to begin by asking a few questions about how you work on your farm.

1. Do you consider yourself to be a:

part-time farmer...1
full-time farmer...2

b. If part-time, why is this so?

insufficient income from farm output.....1
farm size too small for satisfactory income...2
off-farm work pays more.....3
other (specify)....4

2. What is your principal occupation?

not applicable.....0
unskilled labourer.1
fisherman.....2
taxi\truck driver..3
skilled labourer...4
clerical.....5
sales.....6
teacher.....7
community service professional.....8
technician.....9
engineer\ doctor..10
managerial\admin..11
housewife.....12
other13

3. On average, how many hours per week are you involved in farm related work?

4. Do other member(s) of the household regularly assist you on the farm?

no...0; yes...1

b. Which member(s) of the household regularly help you?

spouse.....		
son(s).....		
daughter(s).....		
other (specify)..		

5. Do you hire additional help on a regular basis?

no...0; yes...1

b. If yes, how many?

c. Do they assist you all year round?

no...0; yes...1

6. Do you have difficulties hiring farm labour?

rarely.....1
 sometimes....2
 often.....3

7. Do you pay them at current minimum wage rates?

lower.....1
 min. wage.....2
 higher.....3

2. Did you sell any livestock in 1993?

no...0; yes...1

3. If yes, which livestock were the most profitable to you in 1993 in order of value?

1 _____
 2 _____
 3 _____
 4 _____

4. Do you operate a crop farm?

no...0; yes...1

SECTION 2. TYPE OF FARMING ACTIVITIES

1. Do you keep any livestock?

no...0; yes...1

b. If yes, please tell me their type and amount.

dairy Cattle..				
beef Cattle....				
pigs.....				
sheep.....				
donkey/Mule....				
goats.....				
chicken.....				
turkeys.....				
ducks.....				
horses.....				
others.....				

b. If yes, what are the most profitable cash crops you cultivated in 1993 in order of value?

1. _____
 2. _____
 3. _____
 4. _____

5. Overall, during the last five years, has the output of the main crops and/ or livestock you produce changed?

unchanged.....1
 decreased.....2
 increased.....3

b. If changed, then why did you?

- labour shortage....
- reduced profits....
- increased profits..
- gov't incentive....
- poor roads.....
- improved roads.....
- improved drainage..
- abandoned land.....
- acquired land
- praedial larceny...
- other (specify)....

2. Do you know of modern small-farm tools that can make your work easier and increase your output?

no...0; yes...1

b. If yes, what type of tools.

- 1 _____
- 2 _____
- 3 _____

Section Three. Land Tenureship and Land Law

Can you provide me with some information about your rights to the land you farm and how exactly you use the land? (See attached table).

Section Four. Technology

1. What type and number of farm tools/equipment do you use regularly?

cutlass.....	<input type="checkbox"/>	<input type="checkbox"/>
fork.....	<input type="checkbox"/>	<input type="checkbox"/>
hoe.....	<input type="checkbox"/>	<input type="checkbox"/>
shovel.....	<input type="checkbox"/>	<input type="checkbox"/>
fert. spreader..	<input type="checkbox"/>	<input type="checkbox"/>
irrig. pump.....	<input type="checkbox"/>	<input type="checkbox"/>
port. sprayer...	<input type="checkbox"/>	<input type="checkbox"/>
van.....	<input type="checkbox"/>	<input type="checkbox"/>
pick-up.....	<input type="checkbox"/>	<input type="checkbox"/>
Land Rover.....	<input type="checkbox"/>	<input type="checkbox"/>
car.....	<input type="checkbox"/>	<input type="checkbox"/>
tractor.....	<input type="checkbox"/>	<input type="checkbox"/>
truck.....	<input type="checkbox"/>	<input type="checkbox"/>
other (specify).	<input type="checkbox"/>	<input type="checkbox"/>

Section Five. Infrastructure Support

1. Does the land you work have an adequate year-round supply of water?

no...0; yes...1

2. Would you consider your farm to be adequately drained?

no...0; yes...1

3. Would you say that your farm has ever benefitted from a drainage and irrigation project?

no...0; yes...1

4. Do you pay any rates or taxes to support drainage and irrigation?

no...0; yes...1

5. If applicable, are all the pieces of your land accessible by motor vehicle?

no...0; yes...1

b. If yes, how often?

monthly.....1
every 2-6 mts..2
every 6-11 mts.3
yearly.....4

6. Has your farm benefitted from a government initiated road project?

no...0; yes...1

c. Have you found the advice of agricultural extension workers helpful?

no...0; yes...1

7. What do you consider to be the main environmental problem affecting your farm?

flooding.....1
lack of water.....2
infertile soils....3
weeds.....4
pests.....5

d. If yes, on what aspects of your farm operations is their advice most useful?

fertilizer type....1
cultivation method.2
choice of seeds/
seedlings.....3
disease/pest
control.....4
farm management....5
introducing new
farm technology....6

8. Are there any other problems you consider important?

1 _____

2 _____

3 _____

9. Do you have contact with agricultural extension workers?

no...0; yes...1

10. How do you think government can best help you in your farming system?

improving D & I.1
improved irrigation.....2
better extension services...3
providing access to credit..4
assisting with transport-
ation infrastructure.....5
access to more land.....6
machinery Pool/Making spare
parts available.....7
marketing products.....

SECTION 4. FARM INCOME,
MARKETING, CREDIT, etc.

1. Can you tell me approximately what proportion of your income comes from the sale of farm produce?

less than 1/41
1/4 - 1/22
1/2 - 3/43
3/4 - all 4

2. Can you adequately support your family from producing crops and/or livestock alone?

no...0; yes...1

3. Do you think that market prices are high enough to cover the cost of your input?

no...0; yes...1

4. Do you receive any subsidy from gov't. for fertiliser, pesticide, seeds, or other farm inputs?

no.....1
rarely.....2
sometimes....3
often.....4

5. Where do you sell your produce?

hucksters.....1
village
markets..... 2
marketing
boards.....3
city markets.....4

supermarkets....5
hotels/
restaurants.....7
other.....8

6. Do you receive assistance from any agency to help you market your products?

no...0; yes...1

7. If yes, which agency?

8. Have you ever received a loan from a bank to assist you in farm operations?

no...0; yes...1

9. Have you ever applied for a loan?

no...0; yes...1

b. If no, why not?

c. If yes, how many years ago?

years_____

d. From what source?

Gaibank.....1
G.N.C.B.....2
Other Commercial
Banks.....3
Informal
Moneylenders....4

10. Were you satisfied with the size and terms of the loan?

no...0; yes...1

b. If yes, what specific purpose was the loan obtained?

farm extension....1
farm improvement..2
purchasing inputs 3

11. What type of security were you required to provide?

mortgage on crops and livestock.....1
mortgage on land and house.....2
co-signer.....3
combination of the above.....4
other.....5

12. How would you rate your chance of obtaining a loan from Gaibank?

poor.....1
moderate.....2
good.....3

13. Do you belong to any farmers' organization(s)?

no...0; yes...1

b. If yes, then which one(s)?

13. Do the organizations inform you about current farming issues and problems?

no...0; yes...1

15. Have you found this information useful?

no...1; yes...1

SECTION 5: SOCIAL CHARACTERISTICS OF FARMER

1. How many years of farming experience do you have?

2. Have you ever received specific training in agriculture?

no...0; yes...1

b. If yes, please specify

certificate.....1
diploma.....2
degree.....3
other.....4
not applicable..5

c. If no, then how did you acquire your knowledge of farming?

trial and error....1
friends.....2
extension officers.3
school.....4
seminars.....5
university.....6

3. What is the **highest** level of education you have completed?

a. No Schooling.....

b. Primary School
Standard completed?

c. Secondary School
Years Completed?

d. Vocational/
Technical School
Incomplete1
Complete.....2

e. University
Incomplete.....1
Certificate.....2
Diploma.....3
Bach. Degree.....4
Post-graduate.....5

4. Would you please give me an indication of your age?

5. Have you suffered any major illness during the last year?

no...0; yes...1

b. If yes, what type of ailment?

6. What is your religious background?

- Roman Catholic...1
- Presbyterian/
Congregational...2
- Anglican.....3
- Methodist.....4
- Seventh-day Ad...5
- Pentecostal.....6
- Indigenous.....7
- Hindu.....8
- Moslem.....9
- Jehovah Witness.10
- Baptist.....11
- Rastafarian....12
- Other.....13

FOR INTERVIEWER

1. Sex of respondent?
male..1; female 2

2. Racial background of respondent?

- Negro.....1
- East Indian..2
- Mixed.....3
- Amerindian...4
- Other.....5

TABLE 1. PARTICULARS ABOUT FARMING UNIT

What is the nature of your plot(s) in relation to the characteristics in the Table shown below?

FRAG/ MENT No.	TENURE	DIST FROM HOME	SIZE (ac)	PRESENT LAND USE					REASON FOR IDLE LAND
				FOOD CROPS		PASTURE (ac) ROUGH/ IMPROVED	RUINATE (ac) FOREST SHRUB	FALLOW (LENGTH OF PERIOD)	
				WET SEASON	DRY SEASON				

Tenure - Freehold...1; Grant...2; Short-term Lease (Under 21 Years)...3; Long-term Lease (More than 21 years)...4; Rental...5; Caretake...6; Family Land...7; Peppercorn rent/Rent free...8; Squatter...9.

Reason for idle land - Poor quality land...1; Poor drainage and irrigation...2; Distance from home...3; Family Dispute...4; Insecure tenureship...5; Praedial larceny...6; Others (specify)...7

Crops cultivated - (A) Ground Provisions: Plantain...1; Banana...2; Cassava...3; Eddo...4; Yam...5; Tannia...6; Dasheen...7; Sweet Potato...8.

(B) Vegetables: Ochra...9; Bora...10; Eggplant...11; Pumpkin...12; Cabbage...13; Pigeon Pea...14; Other Peas and Beans...15; Carrots...16; Lettuce...17; Tomato...18; Corn...19.

(C) Other Crops: Rice...21; Sugar-cane...22; Coconut...23; Avocado Pear...24; Citrus...25; Mangoes...26; Sapodilla...27; Soursap...28; Pawpaw...29; Other...30.

Population decline not mainly due to family planning

by Everton Pollard, Deputy Chief Planning Officer, Ministry of Education

An editorial of the Catholic Standard dated 18th September, 1994 charged that "the emphasis by our Government on family planning" in the Guyana Report prepared for the Cairo Conference "at a time when we need more Guyanese to develop our vast country was most uncalled for".

The editorial also concluded that the major aim of the Guyana Responsible Parenthood Association (GRPA) was "to limit the growth of the Guyanese population" and expressed the view that in the face of our declining population "the expansion of family planning measures as proposed in the report" was

surprising.

Without seeking to defend the activities or motives of the GRPA and the perceived emphasis by Government on Family Planning, I wish to refute the main conclusions of the editorial and in so doing examining the real causes of falling birth rates and population decline in Guyana.

Emigration has played major role

The phenomena of falling population growth rates which lead eventually to the decline of the Guyanese population can only be ascribed partially to the lowering of birth rates. Emigration is the most significant factor. For instance the average number of children produced by Guyanese women declined from approximately 6 children in 1960 to 2.8 children in 1986. Even though the 2.8 chil-

dren produced on average by Guyanese women in 1986 was high enough to ensure "replacement" of the population; the first evidence of depopulation still surfaced between the 1980-1986 period.

In addition, according to projections, fertility is expected to fall below replacement level (i.e. less than 2 children per woman) by the year 2021. Yet, because of the momentum for growth already built into the population (i.e. the proportion of women of childbearing age) the population is still expected to grow to approximately 1.2 million by the year 2026 barring no significant levels of emigration between the projection period 1991 - 2026. If as may be expected, however, high levels of emigration persist (between 13,000 and 15,000 persons annually) the Guyanese population is only expected to grow marginally

to about 767,000 persons by the year 2026.

Decline of fertility

The decline of fertility in Guyana is in keeping with trends observed in other countries, worldwide. The transition from high to low birth rates or the decline of fertility in Guyana as in other countries which have also completed the transition is related to profound social and economic changes in our society which took place as a result of development. Development here is not used in the strict macro-economic sense, but refers to urbanisation, spread of education, mechanisation of industry, industrialisation and other processes of modernisation.

The process of urbanisation is known to foster a more highly skilled and better educated workforce. This meant that individuals could stand on their own accomplishments rather than rely on the family as a base of economic support and succor. This has produced among families a growing sense of individualism and personal aspirations. These factors eroded some of the functions of the family and weakened the pressures favouring high fertility. The decline of births in Guyana may also be explained in terms of the increasing eco-

nomical roles of women outside the home. This coupled with their increasing education opportunities and rising incomes, meant that opportunity cost of childbearing and rearing became higher. The result was that women moved out of their more traditional roles and in so doing sought to regulate their fertility.

In the urban setting changes in the social-economic conditions result in parents having to bear the full costs of their demographic behaviour as the costs of child rearing become internalised. As a direct result of the nucleation of families and the higher employment opportunity costs of mothers, there is increasing difficulty in dispersing the costs of rearing children over relatives. This situation is exacerbated by an increase in direct child costs which parents come to see as necessary as they try to compensate for the loss of larger families which they had to forego. Simultaneously, the value of children to parents declined as their roles as income earners diminished. This was due, in large part to legislation such as compulsory education which limited their economic roles.

Typically as in other countries, the penchant for smaller families originated among the urban middle

class and filtered down to other groups and rural areas as the benefits of small families are realised.

From the foregoing it should be clearly seen that the course adopted by Guyanese, in having fewer children was of their own volition and not as a result of exogenous forces or the machinations of the GRPA in conspiracy with their overseas funding agencies. These changes were brought about as Guyanese families responded to the constraints and opportunities they face in the changing social, economic and cultural milieu in which they found themselves. Surely the availability of safe, effective and low cost contraceptives is preferable to other objectionable means of birth control. The activities of GRPA should therefore be seen as facilitating the decline of births in Guyana, rather than contributing to it directly. Indeed, the perceived social and economic circumstances in some African and Asian countries results in reduced fertility being seen as disadvantageous by individuals and families. Under such circumstances there is persistent high fertility and the efforts of family planning programmes are negated. The demand for family planning services in Guyana is evident and in responding

to this need, the efforts of the GRPA should be lauded.

Low birth rates likely to continue

In conclusion, it should be noted that the prospects for reversal of fertility trends in Guyana are very slim. The experience of other countries that have completed the transition has demonstrated that the trend is irreversible. Pro-natalist incentives on the part of Governments have had some, but modest successes. Low birth rates can therefore be expected to persist in the foreseeable future.

The situation regarding emigration is more difficult to predict. Changing emigration laws and political conditions in host countries can have a significant effect on the direction of emigrant flows, between Guyana and other countries which play hosts to Guyanese emigrants. More particularly, however, the changing economic conditions in Guyana relative to host countries will be the crucible through which our future levels of emigration and immigration will depend.

The most likely scenario in the medium to short term, is for the population of Guyana to experience continued minimal to zero growth.

Cane Grove farmers appeal for help

BY JENNIFER CIPRIANI

FARMERS at Strathavon/ Cane Grove, Mahaica, are appealing to the Government and funding agencies for financial assistance to complete a drainage and irrigation rehabilitation project they have launched with help from Mahaica Creek farmer, Mr Hardat Ramdass.

They estimate Ramdass has helped them save some \$47.5M in paddy, or 3 200 acres of land under paddy and cash crops.

The farmers also want Agriculture Minister Mr Reepu Daman Persaud to visit and see the work being done.

More than 3 000 rods of trenches long blocked with dense bush have been cleared since Ramdass started work about three weeks ago. The farmers said they have been suffering since around 1988 because the trenches had been neglected for about 15 years.

Some told the Chronicle, Tuesday, they have lost several crops or suffered partial losses, and many abandoned the land because of the awful neglect.

During last year March, the farmers said, they applied to the Social Impact Amelioration Programme (SIMAP) to fund the drainage and irrigation rehabilitation project.

Around the same time, a farmer approached Ramdass about the job and Ramdass said he was going to see if he could win the SIMAP tender.

The men got no word from the agency but Ramdass took his

machines in on January 21 this year. However, just before this, Mr Hardat Ramnarine, an executive member of the Rice Producers' Association (RPA) said the Executive Director of SIMAP, Mr Phillip Chan promised to give immediate relief from emergency funds towards the project since the present crop was endangered.

"He promised to send field officers but the men didn't turn up. Later Chan said they didn't find time to come. We still have faith in SIMAP and we're still waiting for help," said Ramnarine.

He noted that drainage and irrigation is pivotal to the success of agriculture and poor infrastructure can lead to poor yields and possibly pest invasion and water-borne diseases.

Since Ramdass took his machines, two draglines, one hymac and one bulldozer, into Cane Grove, many of the farmers are high in praise for the excellent work he and his crew are doing.

President of La Bonne Mere Producers Coop Society, Mr Samuel Jamieson, said he had been planting both rice and root vegetables but had to ease off for about five years because of poor drainage.

"I'm glad foh de place now and de work is quite alright for de time," said the 91-year-old agriculture veteran.

He continued: "We're proud to know dat he is so generous and all de farmers should be proud. De man (Ramdass) should be paid and the Government should be proud with the assistance he is

giving."

Mr Harry Algu, one of the major farmers at Cane Grove, said he could not plant about 70 acres for the past three crops because of the bad conditions of the trenches.

He and his family have about 150 acres and he is also joining the call for funding agencies and the Government to assist with the venture.

Mr Albert Kowlessar of Strathavon makes his living off six acres of land for rice and nine acres for cassava.

During the last rains, he lost 25 bags of cassava valued between \$15 000 to \$20 000 and that was not the first time.

Kowlessar said he used to "bail water day and night" out of his rice field and clean the drainage canal himself.

"Since the trench clear, you only gat foh open the koker and de land dry," he said happily.

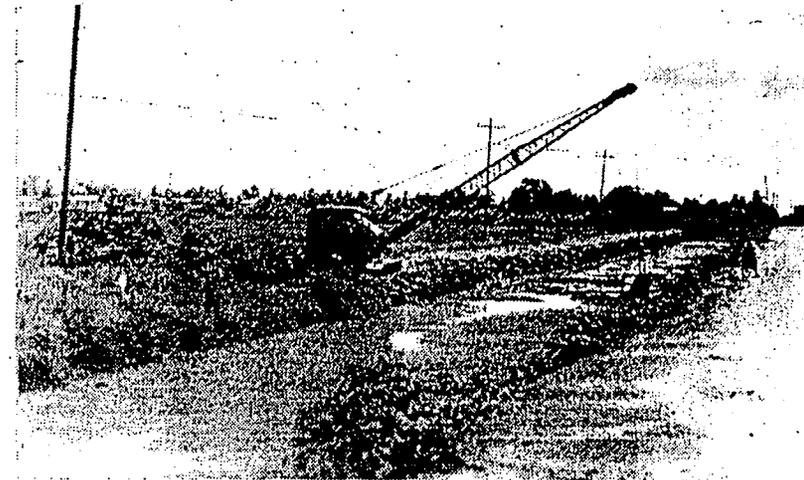
According to Ramdass, work completed so far is valued at nearly \$2M or about \$60 000 a day.

Farmers are being asked to give a contribution to the project but only about \$78 000 has been raised so far. Most of this went towards paying the operators and watchmen's wages with Ramdass providing the fuel.

Jamieson and his Co-op society donated two drums of fuel to the cause.

Ramdass, who was born and grew up at Cane Grove, explained his involvement in the project:

"Since last year de farmers approach me on their losses. A-



At long last!

lot of dem have commitments to the Institute for Private Enterprise Development, Gaibank and other places and deh can't repay. Deh whole family and life at stake. I was working in Region Five and going to Hope Estate and deh stop me at Mahaica and start show me dem plight. So me come in to assist dem."

The Mahaica Creek farmer noted that if all the trenches are cleared, most of the entire 8 000 acres of Cane Grove would be under cultivation.

His other problem, besides financing, is the farmers who have crops on the dams. These he said are hindering work because he has to wait until they reap before working.

Jamieson noted that a sluice at Coconut Dam in Cane Grove was condemned under the previous Government and he is asking that it be reinstated.

"It will help Government and save money," he said, adding, "It will save electricity and therefore cut costs. We don't need to pump de water."

Mr Nehru Motiram, Chairman of the Strathavon Community Development Committee (CDC), said he met with two Inter-American Development Bank (IDB) officials who expressed interest in rehabilitating the entire Cane Grove area.

The bank officials suggested that the farmers them-

selves do the maintenance.

Motiram said that since the regional system was introduced, hardly any maintenance has been conducted.

"I told the IDB the very thing would happen again," he said, adding, "As farmers, we are asking the relevant authorities to work out the cost recovery for maintenance and let the farmers bear this."

Motiram pointed out that Cane Grove farmers pay a minimal \$9 a year tax per acre of land which is insufficient.

"Let the Government pay for the cost of the rehabilitation now and next year they can charge a tax of about \$1 500," he suggested.