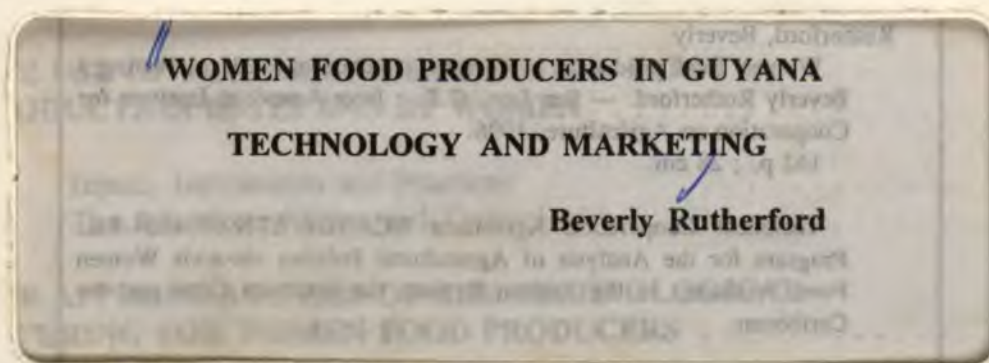


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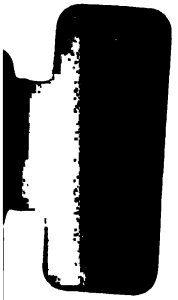
INTER-AMERICAN DEVELOPMENT BANK

Program for the Analysis of Agricultural Policies
vis-a-vis Women Food Producers
in the Andean Region, the Southern Cone
and the Caribbean



TECHNICAL COOPERATION AGREEMENT IICA/IDB/ATN-SF-4064-RE

AREA OF CONCENTRATION IV
SUSTAINABLE RURAL DEVELOPMENT



TECHNICAL COOPERATION AGREEMENT IICA/BID/ATN-SF-4064-RE

**PROGRAM FOR THE ANALYSIS OF AGRICULTURAL POLICIES
VIS-A-VIS WOMEN FOOD PRODUCERS IN THE
ANDEAN REGION, THE SOUTHERN CONE AND THE CARIBBEAN**

// **WOMEN FOOD PRODUCERS IN GUYANA**

TECHNOLOGY AND MARKETING

Beverly Rutherford

**AREA OF CONCENTRATION IV
SUSTAINABLE RURAL DEVELOPMENT**

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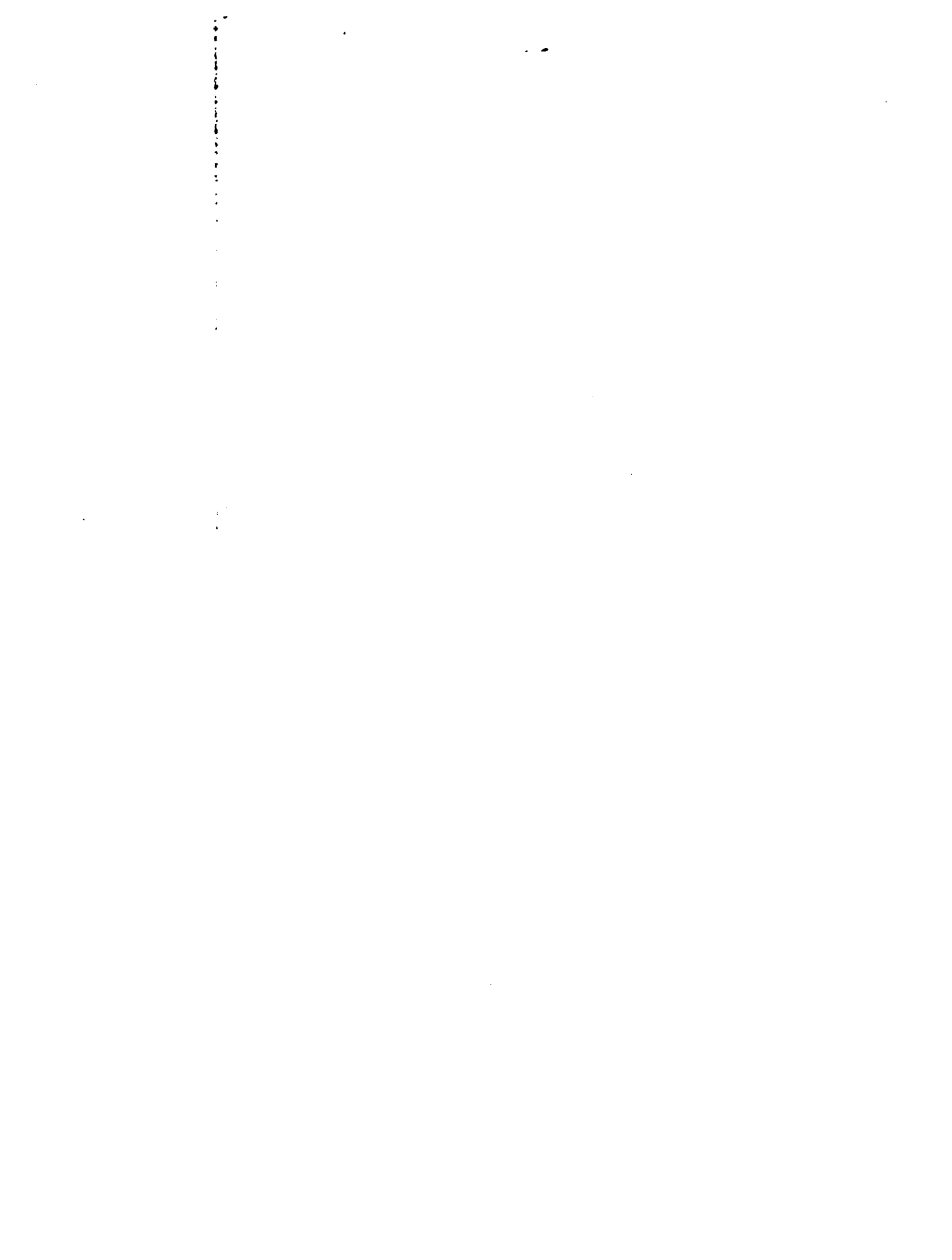
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Conversion factors from metric to imperial measurements

Imperial		=	Metric	
1 pound (lb)		=	0.45359 kilogram (kg)	
1 ton (t)		=	1.0160 tonne	
1 mile (mi)		=	1.6093 kilometre (km)	
1 yard (yd)		=	0.9144 metre (m)	
1 square yard (yd ²)		=	0.8361 square metre (m ²)	
1 square mile (mi ²)		=	2.58999 square kilometre (km ²)	
1 acre		=	0.4047 hectare (ha)	

Average annual exchange rate G\$: US\$

Year	=	Rate
1986	=	4.27
1987	=	9.76
1988	=	10.00
1989	=	27.16
1990	=	39.53
1991	=	118.28
1992	=	126.00
1993	=	125.00



PREFACE

The Program for the Analysis of Agricultural Policies vis-a-vis Women Food Producers in the Andean Region, the Southern Cone and the Caribbean, executed by the Inter-American Institute for Cooperation on Agriculture (IICA) and financed by the Inter-American Development Bank (IDB) under Technical Cooperation Agreement ATN/SF-4064-RE, is the second phase of a program which included 18 countries in Latin American and the Caribbean: Barbados, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela.

The first phase of the Program was implemented in 1992-1993 in six countries in Central America, under the auspices of the Council of Central American Ministers of Agriculture. The second phase was carried out by request of the First Ladies during their Summit Meeting on the Economic Advancement of Rural Women, held in Geneva, Switzerland, in February 1992.

This document is one of three reports per country which present the technical results from the four areas of Program research, as well as the recommendations and preliminary action proposals related to women food producers. The three documents are:

***Assessment and Policies.** Assesses the participation of women in the agricultural sector and their contribution as food producers on small-scale farms, and presents an analysis of the agricultural policy and program environment and its effects on rural women.*

***Technology and Marketing.** Analyses the technology utilized on small farms and by women in food production processes, and the role of women in the processing and marketing of farm food production; agricultural technology and marketing policies and programs and their effects on rural women are also examined.*

***National Summary.** Drawing from the above two reports, this document synthesizes the major findings and research results, and presents the principal policy, program, and project proposals.*

Other activities carried out under this Program included the elaboration of regional comparative documents; the formulation of policy proposals and other actions in conjunction with the ministries of agriculture, the Offices of the First Ladies, and other public and private organizations involved in agricultural and rural development; national and regional seminars to present and discuss Program recommendations; and the publishing and distribution of the final results.

I. INTRODUCTION

A. Guyana Country Overview

1. Location and size

Guyana is located on the north-eastern coast of the continent of South America. The country is bounded on the north by the Atlantic Ocean, on the south by Brazil, on the east by Suriname and on the west by Venezuela.

Guyana occupies a total land mass of approximately 215,000 km² with most of its population concentrated on a small strip of land of approximately 20,000 km², stretching from east to west in the northern portion of the country.

2. Topography

Three basic topographical features have been identified: the coastal plain, the peneplain or white sand region, and the highlands (Parsons *et al*, 1970).

The coastal plain occupies approximately 7% of the land (Table I.1). Much of it varies between 10 and 50 miles in width (18 km and 90 km), is very flat and lies below sea level.

The coastal area extends some 270 miles (440 km), 150 of which is protected by extensive sea wall works. Without these protective walls almost all of the more densely populated part of the country and most of its economic base would be subject to severe inundation.

3. Climate

The country's climate is tropical with coastal temperatures in the 25-30 °C (70°-95°) range. Little seasonal temperature variations occur and seasons are defined by 'wetness' and 'dryness' rather than by temperature.

4. Population

The population is estimated at 765,070, with 383,755 females and 372,317 males.¹ Most of Guyana's population is concentrated on the narrow coastal plain. About 68% of the population is officially classified as rural.

Population density per square kilometer is estimated to be 4 persons (9 persons per mi²). On the coastal plain, the population density per square kilometer is estimated to be 48 persons (120 persons per mi²).

¹ Bureau of Statistics, Georgetown, Guyana: 1993.

B. Background: Agriculture in the Economy

Agriculture has traditionally been one of the key economic activities. Of the country's 21.5 million hectares, about 500,000 hectares are suitable for cultivation. In 1982-1990, its contribution to the gross domestic product (G.D.P.) averaged 25%, remaining consistent during this period (Table I.2).

Agricultural activity has historically been a way of life for most of Guyana's rural women. Their involvement dates back to the days of slavery and indentureship when women worked in the sugar-cane fields, on rice plots and dominated the work of drying and preserving agricultural produce.

Today, the rural population of about 520,248 persons (68%) continues to make "tilling" of the land its mainstay. In 1993, the Bureau of Statistics estimated "usually employed" persons in agriculture to be 66,605 (27%) of the total work force. Women made up 18.6% of the agricultural work force.

Guyanese women are involved in all forms of agricultural activities, ranging from planting to harvesting. Unfortunately, they have received very little or no training in the use of improved technology, are unaware of projects which may help them to improve productivity, and are exposed to harsh market conditions.

Women's issues have not been addressed in agricultural research carried out in Guyana. The limited data available is not disaggregated to allow for identification of women's participation and their contribution to production. Extension work assumes that problems in the farming community are identical for men and women.

In 1989, the Conference on Global Consultation on Agricultural Extension emphasised that the formulation of government agricultural development policy should identify target groups and streamline developmental strategies that will have direct effects on such groups.

"... Subsistence-level women farmers, particularly those in female-headed households, and young farm families have special technological and educational needs...

These women have many demands on their time and few resources, which results in low levels of productivity..."²

To sustain agricultural activity and to increase its cost effectiveness, there is a need to improve efficiency and productivity of limited resources. This can only be achieved through national investment in agricultural research, marketing and extension (for human resource development

² Report of Conference on Global Consultation on Agricultural Extension, Rome: 1989, p.12.

and technology) and through investment by farmers in technological inputs and in land and farm improvement.

Women make a major contribution to agricultural development. This study centers on this perspective and seeks to assess the conditions under which small farmers operate, with special emphasis on women.

C. Objectives

1. General objectives

a. Technology

Technologies used in food production, including those used by women, will be analysed. On the basis of this analysis, recommendations will be formulated for policies, institutional systems and possible programs and projects that will provide rural women access to more advanced, but appropriate technology.

b. Processing and marketing

The characteristics of the processing and marketing of agricultural products will be identified, including how they affect women producers; emphasis will be placed on the role of women in these processes. On the basis of this analysis, recommendations will be formulated regarding policies, institutional systems and possible programs and projects.

2. Specific objectives

- a) To assess sectoral policies in the agricultural sector and their specific effect on rural women food producers in small-scale production systems, specifically as concerns technology and marketing.
- b) To analyse technologies used in food production, including those used by women.
- c) To analyse the marketing systems operating in Guyana, as well as the characteristics of the processing and marketing of agricultural products, with specific emphasis on the role of women in these systems.
- d) To formulate recommendations for policies, for implementing and improving institutional systems that will positively affect women's participation, and for boosting access to more advanced but appropriate technology.

D. Methodology

1. Research approach

This study takes a comprehensive approach to the issue of women food producers in small-scale production.

At the macro level, the study analyses agricultural production systems, the agri-food system, agricultural policies, technology generation and transfer systems, and processing and marketing *vis-a-vis* women food producers.

At the micro level, the study focuses on the participation of women in agricultural production and in processing and marketing at the production unit level.

Data to support the research was obtained from both secondary and primary sources.

Secondary sources included national statistics, research material on agriculture and development, as well as local, international and baseline studies that relate to the topic.

The primary source of information is a small survey that was conducted during the course of the study, which served to provide more detailed information on the participation of women in the production unit, on food crops and on the nature and level of women's contribution.

2. Survey methodology

a. Survey design and sample selection

- a) A stratified sample design was adopted.
All target farmers were stratified into four crop-groups:
 - i) rice
 - ii) fruits
 - iii) vegetables
 - iv) cassava
- b) A predetermined sample size of 500 households was proportionately allocated in five farming areas.
- c) A random sample of households allocated to each crop-group was taken and the main female in each household was interviewed using the structured questionnaire.
- d) A total of 150 females were interviewed (30 in each farming area).

- e) The data collection was undertaken by agricultural field assistants and agricultural project officers employed by the Ministry of Agriculture and the Guyana Agricultural and Industrial Development Bank.

b. Survey areas

The survey areas were selected based on:

- the number of families involved in small-scale farming
- the most important foods and where they are cultivated
- common production factors
- marketing and technical services in these areas

The areas, therefore, represented sections of small-scale farming units where the principal foods consumed in Guyana are produced.

They were representative of problems encountered by small farmers, including women food producers.

Survey areas are located in four of the ten Administrative Regions in Guyana: Regions 2, 3, 4 and 6 (see Appendix 1).

The survey areas were as follows:

- Sub Area 1 - Cane Grove District, East Coast Demerara (Region 4).
- Sub Area 2 - Parika/Salem District, East Bank Essequibo (Region 3).
- Sub Area 3 - Black Bush Polder, Corentyne, Berbice (Region 6).
- Sub Area 4 - Upper and Lower Pomeroon River, Essequibo (Region 2).
- Sub Area 5 - Canals Polder # 1 and 2, West Bank Demerara (Region 3).

The ethnic composition of these areas is predominantly East Indian, African and Amerindian. There is also a significant mixed race population.

Details of agricultural activity in these areas can be found in Appendix 1.

E. Plan of Document

Throughout the document, the focus will be on technologies used in the production of three crop groups: a) cassava, b) vegetables (bora, ochro, blackeye pea, tomato, cucumber, eschallot, and calaloo), and c) fruits (pineapple, watermelon, mango, coconut, guava, citrus, and banana).

To a lesser extent, technologies used in rice production will also be discussed.

Chapter I - Introduction.

Chapter II - Sectoral policies on technology and marketing are reviewed. Technology generation and transfer policies, strategies and their impact on small-scale production. The current status of technology transfer programmes, marketing programmes and institutions undertaking same are highlighted.

Chapter III - Describes the traditional technologies used on small-farm production units and the offering of improved technology as it relates to the focused crops.

Chapter IV - The use of technologies in small production units and by women are analyzed.

Chapter V - A critical analysis of the appropriateness of the improved technologies recommended to small units is undertaken, in the context of working conditions of women.

Chapter VI - The national market for agri-food products generated by the small farm production sector is discussed.

Chapter VII - An analysis of food processing by gender is undertaken.

Chapter VIII - A summary of the findings of the study with conclusions, recommendations and proposals is presented.

II. SECTORAL POLICIES ON TECHNOLOGY AND MARKETING

Since the early 1970s, government has sought to formulate marketing and technological policies within the context of:

- Achieving self-sufficiency in food, clothing and housing, as well as an adequate supply of energy and materials for the needs of the nation.
- Developing natural resources and conserving and improving the natural environment.
- Strengthening the economy and promoting full employment through scientific and technical improvements.

The traditionally export-oriented sub-sectors of rice and sugar benefitted tremendously through programmes and projects set up to transfer technology. Costs for such programmes were substantially borne by the government, directly or indirectly, through tax concessions, rebates, incentives and subsidies.

To a lesser degree, non-traditional crops (vegetables and fruits) and the livestock sub-sector received attention in both marketing and technology, factors that today affect the effectiveness of production in these industries.

Current programmes and the institutional structure as it relates to agricultural technology and marketing are discussed in this chapter. Table II.1 Programmes, projects and institutions involved in agricultural development during the period 1970 to 1993.

A. Review of Technological Policy

In the framework of self-sufficiency in food production, technological policies were executed through:

- the provision of incentives
- land development (including drainage and irrigation)
- improved extension services
- credit
- research in the agricultural sector.

1. Incentives

Government provided substantial direct and indirect incentives which augured well for technological development. Direct incentives included import subsidies for farm inputs and machinery, foreign exchange, cooperative organisation concessions and farmer production award systems.

The most significant indirect incentives were the major structural development projects and programmes outlined in Table II.1. Government also sought to improve major service and extension institutions, for example, GAIBANK and the Ministry of Agricultural Extension Division.

2. Ministry of Agriculture extension services and the farming community

Guyana has experienced various extension approaches. During the period 1985 to 1993, the formerly centralised extension services operated under the supervision of the regional administration.

Agricultural extension services had varying degrees of strength and effectiveness, due to: the variation in administrative and organisation structure, and financial support, followed by agriculture extension approaches and relationships with both the regional and central agriculture extension systems.

The move to re-centralise the organisation of the extension services has been a welcome one. In spite of this, both researchers and extensionists admit that research and extension linkages will go a long way to promoting the productivity of improved technology at the farm level. (The Extension Division of the Ministry of Agriculture is poorly equipped, basic facilities are lacking, and remuneration is poor.)

These shortcomings have caused the dissemination of information and the transfer of technology to be limited. (See Chapter II - Institutional Structure).

3. Drainage and irrigation programmes

Although the government focused on massive programmes incurring heavy expenditure on drainage and irrigation throughout the country, major setbacks and almost total collapse resulted because of:

- (a) weak operations and management systems were in place
- (b) inefficient land tenure and land distribution systems

Stringefellow, in an examination of the present state and the future of drainage and irrigation policies, refers to the "the common property resource problem:"

A drainage and irrigation system represents what economists refer to as restricted access, and which therefore it is difficult to change for use. As a result, everyone tries to

individually maximise their use of the good. But if the good is limited in quantity, it would be rapidly exhausted¹.

In Guyana, where the system is shared by many farmers, management by a public entity becomes extremely difficult. The responsibility of rate collection, not clearly distinguished in some Regions where this function is shared by several authorities, has proven to be ineffective. The end result is poor revenue collection, insufficient to support any rigid maintenance programme.

a. Effect of drainage and irrigation technology on small farmers

- The system of land tenure and the issuing of individual titles is an important factor that directly influences the benefits of drainage and irrigation technology to be derived by farmers. (Appendix 2 classifies the type of land tenure arrangements generally found in Guyana).

Rights to the use of lands are characterised by short-term leases, in itself a disincentive to the farmer. The World Bank Development Report contains the following:

The legal recognition of property rights, that is, rights of exclusive use and control over particular resources, gives owners incentives to use resources efficiently. Without the right to exclude others from their land, farmers do not have an incentive to plough, sow, weed and harvest. Without land tenure, they have no incentive to invest in irrigation and other land improvements that would repay the investment over time.

- The issuing of short-term leases and the cumbersome process of land acquisition in Guyana have generated results that support the above statement.
- The lack of land ownership as encouraged by the land tenure systems handicaps farmers in their quest to secure loans for farm development (since this creates great risks for the lender); thus, possible attractive returns from investment in drainage and irrigation become an impossibility for small farmers.
- The drainage and irrigation system exhibits economies of scale. There must be cooperation by all farmers sharing the system to work efficiently. Unfortunately, cooperatives have failed, and farmers operating larger units are more likely to benefit.

¹ Stringefellow, Review of Agriculture Sector in Guyana, IICA, 1993, Georgetown, Guyana.

- It is necessary for government to revise its policies to achieve efficiency in the operations and management systems of drainage and irrigation programmes. There is also an urgent need for total land reform in order to increase the benefits to small farmers.

4. Credit and its effect on technological policies

During the review period, credit facilities allowing the acquisition of suitable farm machinery and the purchase of inputs favored the rice sector. Table II.2 presents GAIBANK's disbursements in the agricultural sector during 1981-1992.

Approximately 80% of the loans disbursed during this period were targeted at the rice sector. The small producer may not benefit from these credit facilities, since in most rice producing areas the average size of a rice farm is approximately 5 hectares.

The Rural Farm Household Survey of 1978 (see Table II.3) indicates that approximately 60% of farmers are classified as small farmers, occupying less than 4 hectares. A study conducted by IICA in 1993 (covering a selected area) depicts this continuing disproportion of land distribution, where approximately 85% of farmers (Tables II.4, II.5) occupy farms smaller than 4 hectares. Further, if we consider GAIBANK's partiality to the rice sector and, therefore, to those farmers occupying more than 4 hectares of land, then government's provision for credit clearly defeats any policy for lending to small farmers.

GAIBANK's declining disbursements by number and value for food crops as against a corresponding increase in disbursements to the rice sector not only indicates partiality, but also the absence of a funding programme and credit policy for the benefit of the non-traditional crops and livestock sub-sector. Since the conclusion of the Food Crop Production and Marketing Programme in 1984, there have been no other credit programmes for non-traditional crops.

B. Review of Marketing Policy

There are two major marketing structures in Guyana: traditionally supported crops such as sugar and rice; agricultural produce, consisting of animal products and non-traditional crops (fruits, root crops and vegetables). Most of the latter production is consumed locally.

During the period 1970 to 1993, there were several approaches in marketing policies. Policies in the first decade (1970-1980) for both traditional and non-traditional crops were clearly defined, while in the second decade and subsequent years, they were difficult to understand.

To support agricultural marketing, government adumbrated policies on:

- price controls
- distribution

- market guarantees
- protection of the supply of produce on the local market

1. Price policies for non-traditional crops

a. 1970-1985

On the supply side, commodities were produced by a large number of farmers working on very small areas of land. Each farmer attempted to sell his produce, thus aggravating the typical problems associated with small-scale farming (variation of prices at the retail markets).

The government, through its marketing agency The Guyana Marketing Corporation (GMC), sought to regulate price disparities by mandating the function of purchasing of non-traditional crops to this agency. The GMC established a number of marketing outlets throughout the country, and attempts were made to purchase farmers' produce at fixed prices.

The GMC's activities were met with dissatisfaction from farmers due to:

- lack of adequate facilities
- lack of adequate market information
- trading policies inimical to successful trading
- inflexibility in responding to upward changes in market prices
- the GMC purchasers had no discretionary power to vary prices (all instructions and base prices were set by officials at the head office in Georgetown).

During this period, the corporation's activities rarely bore any relation to the forces of supply and demand. In 1985, restructuring of the GMC's operations simultaneously marked the termination of controlled pricing for non-traditional crops. The renamed New Guyana Marketing Corporation (NGMC) assumed the role of providing information on market prices to farmers and assisting in technology transfer as it relates to marketing.

b. 1985 to present

Since the disappearance of controlled pricing for non-traditional crops, marketing has been supported by a price liberalization policy. Buying and selling is now in the hands of private individuals (farmers, middlemen and private agencies). The price of produce is set according to the forces of demand and supply.

In the main municipal markets, there is evidence of perfect competition where, although there are no set norms for grading according to size and quality, prices hardly vary from vendor to vendor.

However, price liberalization has encouraged exploitation of the farmer by middlemen and other traders, and the margins between farmgate, wholesale and retail prices indicate that returns to the farmer are minimal.

2. Pricing policy for rice

a. 1970-1980

During this period, production of rice was shared by the government and private farmers. On the basis of factors such as cost and input subsidies, price policies and profit margins of the state-owned mills (Guyana Rice Board GRB), the government fixed the price for paddy.

Government then claimed that the pricing policy executed through the GRB was geared towards enabling the average-sized farmer with a fifteen-acre holding who was fairly efficient to achieve a reasonable living for his efforts.

His return on investment and labour was calculated to be not less than he would have earned in other semi-skilled employment at minimum rates.²

Apart from this, surpluses earned by the GRB were returned to the industry in the form of remunerative prices to the farmers (that is, invested in infrastructural works and loans for input acquisition).

b. 1980-1993

In the early 1980s, government embarked on programmes which eliminated subsidies for agricultural inputs in the rice sector.

Cost of production per acre rose, causing returns on investment to decrease since there were no corresponding increases in the price paid for milled rice.

Government's intervention in the rice sub-sector was viewed as detrimental. Implicit taxation on rice varied between 43% and 4%³ and rice prices decreased by about 25%. Through the divestment of government-owned mills (1991-1993), the monopoly for rice production and marketing has been eliminated.

In the wake of divestment, private rice millers were free to sell their produce abroad, which augured well for competition, allowing them to offer more attractive prices to producers than those offered by the government.

² Sutherland: *The Rice Industry in Guyana: Scope and Programme for Expansion*; West Indian Agricultural Economic Conference. 1979, p.19.

³ Implicit taxation was imposed through controlled prices during this period.

3. Pricing policies for sugar

The marketing arrangements for sugar production are controlled by the state-owned Guyana Sugar Corporation (GUYSUCO). Prices paid to farmers are fixed by the corporation based on the export price for sugar.

4. Policies for distribution and supply

Before 1985, the distribution policies for non-traditional crops, although not clearly stated, were implicit in the operations of the GMC. Fresh farm foods were purchased at farmgates and strategic assembly points by the corporation's officials and moved to various distribution centres throughout the country. The intention was to ensure the movement of fresh farm foods around the country, guaranteeing an "even" supply at affordable prices for the entire nation.

This system was unsuccessful because of inadequate storage facilities and a poor transportation network that failed to ensure movement of produce on time. Since 1985, there has been no set distribution policy, and movement of produce is controlled by farmers and other private entrepreneurs.

The provision of guaranteed markets was implicit in GMC's previous operations: set production targets for non-traditional crops before 1985. There are no guaranteed market arrangements with the government. Production on a contractual basis between private individuals is also virtually non-existent.

Production is based on market demand because in the absence of an agricultural plan, there are no guides for production targets.

C. Institutional Structure and Current Programmes

The processes of technology transfer and marketing are aided by three major categories of institutions.

- Public institutions funded by the government of Guyana.
- Non-governmental organisations.
- Other institutions including farmers' groups and organisations.

For convenience, a review of these institutions follows, according to their functions in the following groups:

- a) Agricultural planning.
- b) Agricultural credit.
- c) Agricultural research.

- d) Extension.
- e) Marketing.

1. Agricultural planning

Responsibility for agricultural planning under the governmental structure rests with the Planning Department of the Ministry of Agriculture. Prior to 1993, (1975 - 1993) planning was done in conjunction with the State Planning Secretariat.

The Ministry of Agriculture's Planning Department is responsible for two major areas:

- a) Policy analysis and programme development
- b) Monitoring and evaluation of plans and programmes of public sector agencies involved in agriculture.

The planning department is small, currently supported by the government and aid from international organisations such as the Inter-American Development Bank and the Food and Agricultural Organisation.

Since the publication of the 1986-1989 agricultural development plan, no other similar publication has been made available to the public. The ministry however, executed a number of projects and programmes including drainage, irrigation and land development projects, during 1970-1993 (listed in Table II.1).

2. Agricultural credit

a. Government institutions

Government's main provider of credit to the agricultural sector is the Guyana Agricultural and Industrial Development Bank (GAIBANK) and the Guyana National Cooperative Bank (GNCB).

GAIBANK was established in 1973 and its mission was to provide support to the agricultural sector through lending and credit support programmes. (Supervised credit).⁴

The bank's disbursements to the agricultural sector moved from G\$3.6 million (1.1% of G.D.P) in 1975 to G\$210 million (1.0% of G.D.P) at the end of 1992. Loans were granted for the production of rice, vegetables, fruits, ground provisions, fishing and livestock.

In 1982, the government transferred the credit functions of the Guyana Rice Board to GAIBANK, as the institution's focus for lending was primarily in the rice sub-sector.

⁴ This programme is called the Rice Production Credit Programme. Loan approvals are speedy and the requirement for collateral are much softer than other areas.

Lending in this area during 1982-1992 averaged 61% of the total value of agricultural disbursements.

The percentage on value of disbursements for rice increased by 150% in 1992 as related to 1982. (Table II.2).

GNCB is a commercial bank, but has provided loans for both agricultural and industrial purposes. It is now clear that credit for agricultural production other than rice was minimal. There are no current programmes for credit to livestock and non-traditional crop farmers at GAIBANK.

b. Non-governmental organizations (NGOs)

Institute of Private Enterprise Development

The Institute of Private Enterprise Development was established in 1986. This is a development bank which has been rapidly increasing its lending portfolio for agriculture.

Futures Fund

This organisation has been funding small drainage and irrigation projects.

Social Impact Amelioration Programme

Some aid for agricultural development has also been obtained from this institution.

Cooperatives and credit unions

Cooperatives and credit unions lend funds primarily for sugar-cane cultivation, fishing and peanut cultivation.

Commercial banks

The share of total commercial bank lending to the agricultural sector has consistently increased. In 1992, total disbursements reached G\$2938 million dollars (7% of G.D.P).⁵

⁵ Statistical Report, Bank of Guyana, 1993

3. Agricultural research

Institutions engaged in research are the government-controlled National Agricultural and Research Institute, the Guyana Sugar Corporation (GUYSUCO), the University of Guyana and the Caribbean Agricultural Research and Development Institute.

Government-controlled institutions are characterised by inadequate staffing at various levels, poor remuneration and lack of funds to carry out research. The lack of funds for research has resulted in the under-utilisation of limited available scientific manpower in many of these institutions.

Poor salaries result in high staff turnover; research can only be successful if stable resources and well-planned programmes are executed over medium- and long-term periods.

a. The National Agricultural Research Institute (NARI)

The National Agricultural Research Institute, established in 1984, is the principal research center in the agricultural sector. The institute is the product of a merger of the Rice Experimental Station and the Agricultural Experimental Unit of the Ministry of Agriculture.

NARI's research undertakings are broad-based and include the five major agro-ecological areas:

1. The coastal plain
2. The upland rain forests
3. The mountains
4. The rupununi savannahs
5. The intermediate savannahs.

Research linkages are maintained with the University of Guyana (UG), the Guyana School of Agriculture (GSA), the Guyana Sugar Corporation, the Caribbean Agriculture Research Institute (CARDI), the Inter-American Institute for Cooperation on Agriculture (IICA), the Ministry of Agriculture (MOA) and other research institutions abroad.

The National Agricultural Research Institute's Coastal Plain Field Research Unit (CPFRU) conducts research in root crops, vegetables, pasture improvement and rice. During 1991 and 1992, the institute was able to produce tissue cultures of plantains, pineapples, cassava and sweet potato. The institute was also able to release a high-yielding and blast-resistant variety called "Guyana 91" in 1991.

Although NARI's establishment is a boost to agricultural research, the dissemination of research funding has been limited. Linkage with extension is weak and extension personnel have not been fully utilising research results in their programmes. Small farmers have not truly benefited from the presence of this institution, nor have women in agriculture.

b. The University of Guyana (UG)

The University of Guyana Faculty of Agriculture is currently not engaged in any major research. The faculty offers a B.Sc. degree course in agriculture. There are insufficient facilities and inadequate staff for research.

c. The Caribbean Agricultural Research and Development Institute (CARDI)

CARDI is currently conducting research in postal management and grass varieties for sheep and goats, with intermediate savannahs. The institute has made a significant contribution to research and extension in tissue culture of various crops, citrus cultivation and carambola. The Ministry of Agriculture's extension department and NARI work closely with this organisation.

d. Guyana School of Agriculture (GSA)

The Guyana School of Agriculture is presently a teaching institution. In the early 1980s, the school evaluated varietal fruit quality difference and plant density and its effects on carambola. The school was also instrumental in experimenting with the preservation of carambola (dried), and the utilisation of production residue to make sauces. GSA's salaries are relatively low and cannot attract scientists to carry out research; facilities are also limited.

e. Guysuco Sugar Corporation (GUYSUCO)

The Guyana Sugar Corporation, formerly owned by Bookers Limited, is a nationalised (1970) state corporation involved in the production of sugar. The corporation plants approximately 90% of the sugar cane in the country and has been formally conducting its own research since 1992. High-yielding and disease-resistant varieties have been developed, work has also been done on chemical ripeners, soil surveys, design, modification and field testing of agricultural equipment.

In the 1970s and early 1980s, GUYSUCO embarked on a crop diversification programme. Crops grown included black-eye peas, cassava, oil palm, cucumbers, cherries and corn. Experiments were carried out on planting schemes, with limited research on plant varieties. There are no formal channels for dissemination of information directly to farmers. Information is made available on request.

4. Agricultural extension

Extension activities were first organised in 1990. At that time, the important crop for export was sugar. Activities were centered on crops for local consumption. Extension activities, with the exception of work with cane farmers, were under the Ministry of Agriculture, Division of Extension and Education. Since then, the extension service has been fragmented, resulting in a number of government agencies and private individuals currently providing agricultural extension services.

Apart from the MOA, other institutions providing extension services include GUYSUCO, the Livestock Development Company, GAIBANK, the New Guyana Marketing Corporation, the Inter-American Institute for Cooperation on Agriculture, the National Agriculture Research Institute and the Caribbean Agricultural Research and Development Institute.

a. The Ministry of Agriculture Extension Division

The Division has an office at Mon Repos on the east coast of Demerara, responsible for formulating the yearly work programme.

The extension division is responsible for:

- Promoting increased production and productivity among farmers.
- Educating farmers in the utilisation of basic extension techniques.
- Organizing agricultural production groups.
- Procuring and selling needed production inputs to farmers.
- Providing plant protection services.

The management of extension services was decentralized in each administrative region of Guyana in the 1980s through June 1993, but is now centralised.

The division's structure is:

- a) Division of extension and education.
- b) Division of veterinary service and livestock.

The service provided to farmers by extension personnel leaves much to be desired. There are many communities where extensionists have never been seen or heard of. The staff are poorly remunerated, do not have transportation, and experience great difficulty in reaching farmers.

Apart from this, extension services have not been targeted at specific groups of farmers. Their needs have not been properly assessed, hence little use has been made of the extension services.

There have been no extension programmes for women.

b. GUYSUCO

GUYSUCO does not have an extension unit, but extension functions are performed by offering technical production packages for varieties, fertilizer, water control and planting.

c. Livestock Development Company (LIDCO)

LIDCO encourages development of production schemes with beef and dairy cattle. Extension services are provided to farmers, primarily in the intermediate savannahs.

d. The New Guyana Marketing Corporation (NGMC)

The New Guyana Marketing Corporation has a responsibility for marketing. It has provided extension services to exporters of non-traditional crops in the areas of sorting, grading and packaging.

e. Guyana Agricultural and Industrial Development Bank (GAIBANK)

The bank operates a "supervised credit" system, whereby farmers are advised on the planning and management of the financial aspect of their business.

5. Marketing

a. New Guyana Marketing Corporation

The New Guyana Marketing Corporation (NGMC) currently engages in the marketing of non-traditional crops for export. This organisation was restructured in 1985 and now comprises the following Units: Market Intelligence, Post-harvest, Technical, Commercial and Marketing Policies.

Through these units, producers and exporters of non-traditional crops receive assistance in identifying markets, meeting standards, prices and the securing of fiscal incentives.

The corporation's activities are insufficient to allow the majority of small producers to benefit, marketers of produce sold locally benefit only from information on prices.

b. Guyana Sugar Corporation (GUYSUCO)

This corporation markets all the sugar processed by its mills.

c. Guyana Rice Export Board (GREB)

GREB is responsible for negotiating and entering into contracts with other government and non-government organizations, and providing market information to government and the industry.

d. National Paddy and Rice Grading Centre (NPRGC)

The Centre has the responsibility for;

- certifying all paddy delivered to rice mills throughout the country
- grading and certifying all rice milled
- disseminating relevant data on grading and quality control
- licensing and inspecting rice mills

e. The Guyana Rice Milling and Marketing Authority (GRMMA)

GRMMA is responsible for the marketing of rice on the domestic market.

f. Other NGOs in marketing

Apart from the government-appointed agencies, two very active nongovernmental organisations, the Rice Producers Association (RPA) and the Guyana Rice Millers and Exporters Association (GRMEA), participate in the organisation of local and export markets.

Government's policies support and promote the activities of these organisations. The policies clearly dictate the recognition of farmers groups by all the agencies concerned.

III. TRADITIONAL TECHNOLOGIES AND THE SUPPLY OF IMPROVED TECHNOLOGY IN GUYANA

In Guyana, the cultivation of crops is basically traditional. However, through limited extension services, small farmers are exposed to training in the use of improved technologies.

This Chapter briefly identifies the traditional technologies used on small farms and by women, as against the use and supply of improved technology.

The Ministry of Agriculture has prepared technical packages which contain recommendations on:

- a) Varieties to be planted
- b) Methods and forms of land preparation
- c) The use of organic and inorganic fertilizers
- d) Planting methods
- e) Crop husbandry practices
- f) Post-harvest handling and storage

Information is disseminated through its Extension Division and liaison with non-governmental organisations.

The services offered by the Ministry of Agriculture are limited because of a number of problems (see Chapter II, Section C).

The supply of improved technology is further discussed in Chapters IV and VII.



IV. THE USE OF TECHNOLOGIES IN SMALL FARM PRODUCTION UNITS AND BY WOMEN

The range of activities and operations that are carried out during the production of foods in small units includes processes executed during planting, harvesting, cleaning, grading, sorting, processing and marketing.

Technologies used vary from traditional to improved technologies. Knowledge of the use and application of technology is a function of production and productivity. More importantly, the suitability of available technologies for women influences their ability to effectively utilise their time, maximizing their contribution to production and family income.

The use of technologies in small farm units and their adoption by women is the focus of this chapter. Section A examines the inputs, instruments and practices commonly used; an analysis of the adoption of improved technologies is summarised in Section B.

A. Inputs, instruments and practices

1. Inputs

a. Types of inputs used

The types of inputs commonly used on small farms in Guyana can be categorized as follows in Table IV.1.

b. Use of inputs and farm size

Traditional and improved seeds are used on small, medium and large scale farms. The use of traditional or improved seeds is more directly related to the type of crop planted. For example, in the cultivation of rice there is a tendency to use improved (certified) seeds, regardless of the size of the plot cultivated.

Insecticides, fungicides and weedicides are widely used. Most farmers engaged in cash-crop cultivation are aware of the availability of such inputs and their benefits as regards crop protection.

These chemicals are frequently utilised with a general view that maximum yields may be obtained, hence the highest possible profit margins.

However, recommended dosage, methods of application, and side effects stemming from their misuse are not fully understood by many farmers, mainly because of lack of training in these areas.

Inorganic fertilizers are also very widely used on small farms. As in the case of other chemicals, there is a general tendency to use fertilizer to obtain maximum yields.

The use of organic fertilizers (compost, litter) is not as popular as the use of inorganic fertilizers in cash-crop cultivation. Because the preparation of composts is a lengthy process, farmers opt for the use of readily available fertilizers that generate desired results.

On the sandy belt, however, the use of litter¹ is necessary for moisture retention in the soil. Thus in these areas, where the cultivation of pineapples and pumpkins is favored, there is evidence of the common use of litter.

c. Source of inputs

Imported

Inputs such as pesticides, weedicides and inorganic fertilizers are imported and readily available from retailers throughout the country. Eggs for the commercial rearing of broilers and layers are usually imported by a number of private agencies. Most improved seeds for vegetables are also imported.

Local

The National Agricultural Research Institute (NARI) and the Ministry of Agriculture are the main agents for propagative material for plants. Both institutions are engaged in tissue culture programmes, making planting material available from nurseries which they operate. Semen for breeding stock (dairy animals) can be obtained from the National Dairy Development Programme (NDDP). Other firms from which breeding stock for sheep, goats, and beef and dairy animals can be obtained include:

- The Guyana Sugar Corporation (Dairy Programme)
- The Saint Stanislaus School Farm (supported by IICA)
- Caribbean Agricultural Research Institute

There are no local poultry breeders. Creole eggs produced locally are commonly used on small farm units. Eggs for rearing broilers and layers are imported.

d. Use of inputs by gender

Women use all of the inputs outlined above. They tend to be involved very little in the mixing and application of chemicals used for plant protection because of ignorance, fear of detrimental effects and the lack of appropriate gear used when applying chemicals.

¹ Poultry litter comprised of chicken 'down', rice paddy, and wood shavings is used as manure and to retain moisture on sandy soils.

Survey results indicate that of the 92 farms that use insecticides, only on 19.5% of these are chemicals used by women, as compared with 47.9% in the case of men. A similar trend exists in the use of fungicides and weedicides, where the percentage of men using these inputs on farms is 70% and 60.9%, respectively; on the same farms, 30% of women use fungicides and 21.7% use weedicides.

Both inorganic and organic fertilizers are used by women. There is a need for training and information on their use and application. Traditional and improved seeds and traditional planting material are used by both sexes, although there is a higher incidence of use by women.

Except in the case of dairy animals, small farmers utilize stock developed on their own farms or purchased from the immediate neighboring communities. There is widespread use of locally produced feed purchased from small mills or produced on the farm. Both men and women use animal feed. The tendency is for its use to be dominated by women as the size of the production unit decreases.

e. Use of chemicals by crop type

Vegetables

On surveyed farms it was found that chemicals are widely used in the production of rice (see Table IV.3). The highest percentage of fertilizer and insecticides used was found on the farm-size category of 0.4 - < 2.0 ha.

Rice

The use of chemicals (fertilizers, weedicides and insecticides) was found on all the farm-size categories. Fertilizers and insecticides were used on all of the farms, while 34.6% used weedicides.

Cassava

Compared with rice and vegetables, there was relatively little use of fertilizers and insecticides, whereas 31.6% of the farms surveyed used weedicides.

f. Training in the use of inputs

Women have received very little training in the use of farm inputs. The survey revealed that out of a total of 150 female respondents, none received training in seed selection and seed production. Two women (1.3%) were trained in the use of fertilizers and pesticides. On the other hand, 31 women (20.7%) would like to receive training in seed selection and seed production, while 35 women (23.3%) expressed their desire for training in the use of fertilizers and pesticides.

The survey further revealed that respondents in the Cane-Grove and Parika-Salem districts are more interested in such training in comparison with respondents in the other districts. When asked about other areas in which they would like to receive training, respondents replied as follows: post-harvest storage (14.7%); marketing (22.7%); feeding and grazing (9.3%); farm management (31.3%); packaging (8%); processing (14.0%); and other areas (0.7%).

2. Instruments and equipment

a. Types of instruments and equipment used

Instruments are utilized at every stage of crop and animal production. The type of instrument, origin, cost, and user suitability determine the effects of its use in production. Additionally, the availability of instruments and knowledge of their use and benefits are also contributory factors regarding quantity and quality of output.

Women who participate at almost all levels in the production process need to be exposed to the use of farm equipment and machinery, and selection of equipment and machinery should relate to their needs and their income levels.

The use of traditional farm tools is still widespread in Guyana, although relatively low cost modifications of such tools can contribute to savings in time.

Table IV.4 analyses the types of instruments used on small scale units.

b. Source of instruments and equipment

Local

Most of the hand tools used for land preparation and weeding (clearing) are manufactured locally. In some cases the metal parts are imported while wooden handles are supplied locally. It is rare for such tools to be made on the small farm.

Solar dryers are produced locally.

Imported

Imported farm tools and equipment include: pots, pans, ploughs, harrows, tractors, combine harvesters, and mills (hand and automatic).

Estimating conservatively, one can safely say that approximately 80% of tools, equipment and machinery used on small farms are imported. Currently they are readily available from local agents and retailers at various prices.

c. Use of equipment by gender

The participation of women in agricultural production at all levels requires their use of almost all of the equipment listed in Table IV.4.

As farm size increases, women's use of such tools as forks and shovels becomes less since land preparation is mainly performed by tractors and ploughs, generally operated by men.

The results presented in Table IV.5 indicate a more traditional approach to farming in Guyana.

The use of hand tools was found on 98.6% of the farms surveyed. On 19.6% of these farms, hand tools were used only by women, while on 75%, they were used by both men and women.

Tractors and ploughs were more common to farms in the Cane-Grove and Black Bush Polder districts, where farm size was relatively larger than in the other districts. Men were the principal users of such machinery (93.5% used tractors and 94.3% used ploughs).

From a technological standpoint, the use of more advanced forms of technology (tractors and ploughs) may have lessened demand on the time women spent on productive activities.

Light agricultural equipment such as mechanical diggers, planters and hand ploughs are uncommon on small farms.

Mechanical diggers were used by men on two farms. Sprayers were used on 108 farms with use by: men only (50.9%), women only (14.8%), and by both men and women (33.3%). However, it must be noted that the apparent imbalance in use of sprayers by the two sexes does not necessarily indicate that this equipment is not available to women, but is due more to their reluctance to expose themselves to chemicals, as discussed in section 1.4 of this chapter.

Drying equipment such as rooftops, pans, and solar dryers are mainly used by women because they are the dominant participants in this activity. However, solar dryers were found only on one farm in the Upper and Lower Pomeroon district (see Table IV.5).

In the rice industry, concrete drying floors are used by both men and women.

3. Farming practices

a. Vegetable cultivation

The cultivation of vegetables is the major form of operation on small farms. Vegetable production is viewed as highly labour intensive since the degree of mechanization is considerably low.

Most of the vegetables are cultivated on clayey soils along the coastal belt (see Appendix 1) which is below sea level and requires a water control system to effect drainage and irrigation. The high water retention capacity of these soils is another reason for the need for water control management systems.

The relatively fertile soils were originally covered by tropical shrubs and trees, which if cleared and not immediately replaced by crops, burst into the secondary growth popularly referred to as "under-bush". Vegetable cultivation therefore ranges systematically from land clearing to harvesting.

Land clearing

On small farm units, clearing land of both original vegetation and under-bush is performed manually, with cutlasses and axes for chopping, or with some degree of mechanization, utilising manually operated chain saws. The use of heavy land clearing equipment such as bulldozers is rare, especially because of farmers' reluctance to lose valuable "top-soil", sometimes lost when heavy machinery is used.

Land preparation

Depending on farm size and crop type, land may be prepared either manually or with the use of machinery. Small rice farmers and vegetable growers have more recently been utilizing tractors for ploughing. In some cases a tractor may be used for the "first-plough"², after which the land may be more finely chopped using hand tools such as hoes and cutlasses or oxen-drawn ploughs.

Planting

Planting is predominantly done by hand.

Weeding and cleaning

These are manual operations performed with the use of hand tools. Weedicides are sometimes applied using the very popular "knap-sac" spray cans.

Fertilizing

Inorganic fertilizers are widely used and applied by hand. Usually the fertilizer bag is hung on the backs of men and women, allowing for easy throwing ("shying") as they walk along the cultivated fields.

² Turning of the soil immediately after clearing. Usually ploughing is performed more than once.

Pest control

Pests are controlled with the use of chemicals applied using "knap-sac" spray cans.

Harvesting

Harvesting is manual. Mechanical harvesters are not used on small farms in Guyana.

Drying

Only about 10% of the vegetables produced are dried since demand is for fresh vegetables. Vegetables dried are mainly legumes, which are first shelled manually and then dried on concrete or mud floors.

Storage

There is very little storage of vegetables since produce is generally sold on the same day it is harvested. Dried vegetables are kept in jute bags, commonly stored under houses (most farm houses are on stilts about 2.5 to 3.0 metres high) or heaped on drying floors and covered by water resistant gear.

Cropping cycles and patterns

Most vegetable cultivation lasts from two to three months, from planting to harvesting. Usually three crops are cultivated annually.

On small farms, cultivation patterns are characterized by a mixed crop consisting of two to five types of vegetables. Crop rotation is common to permit full use of soil nutrients afforded by the preceding crop.

b. Fruit cultivation

Production practices

The cultivation of fruits is less labour intensive when compared with vegetable cultivation. Fruit trees are given attention in the earlier stages of growth

After the first and second harvest they are left to bear, with a minimum amount of husbandry practices applied.

Land clearing, land preparation, planting, weeding and cleaning activities are all similar to those performed for vegetable cultivation.

There is little or no use of fertilizers. Chemicals are used for pest control and applied with spray cans. Harvesting is manual.

Preservation

The preservation of fruits is discussed in Chapter VII.

Storage

Storage of fresh fruits before marketing is relatively short (1-2 days). Fruits are packed in jute bags or straw baskets and kept in storerooms or under houses.

c. Root crops and plantains

Cultivation practices are similar to those for vegetables. Processing of cassava and plantains is discussed in Chapter VII.

The cassava is a six to nine-month crop (the time span from planting to harvesting), and not more than two crops can be harvested in any year.

Cultivation of cassava is generally "pure-stand", meaning that only cassava is planted on the cultivated area.

Plantains, on the other hand, take approximately 9-12 months before the first harvest and are sometimes "intercropped" with a variety of vegetables.

This permits a source of income before the end of the 9-12 month period.

4. Participation of women in crop production

As stated earlier, women participate in almost all crop production activities. An analysis of family member participation in crop production (see Table IV.6) reveals that a higher percentage of women than men participate in all production activities for vegetables, cassava, fruits and rice.

The only exception in this area is "crop care", where participation by men is more evident: vegetables- men 86.0%, women 72.7%; cassava- men 54.3%, women 31.2%; fruits- men 20.6%, women 10.8%; rice- men 40.0%, women 8.2%.

There is no doubt that women need to be integrated into programmes targeted at training and educating farmers in crop production practices.

B. The Adoption of Improved Technologies

The level at which improved technologies have been adopted is related to the extent to which they have been transferred to the farmer. As discussed earlier in Chapter II, agricultural extension services have been, and remain, fragmented.

The country's wide-ranging terrain characterized by rivers, canals and impassable roads makes dissemination of information difficult. Income levels have proven to affect the adoption of new technologies on small farms. Household incomes are so low that production depends on available income for farm use, and quite often it is impossible to cultivate the total area owned, due to lack of funds.

1. Technology adoption by farming activity

a. Land clearing

Most farmers cannot afford to purchase chain saws or hire labour to benefit from the use of such equipment, and as a result are compelled to perform land clearing activities with traditional tools. Custom hire of chain saws is not available.

b. Drain digging

Technology for this activity is still dominated by traditional methods, that is, the use of spades and shovels.

c. Planting

Seeds and plants are placed in the soil manually. There are no mechanical planters available for use by local farmers.

d. Harvesting

The only harvesters on the local market are combine harvesters used in rice fields. Other mechanical harvesters have not been introduced to small farmers, thus requiring that harvesting operations be performed manually.

e. Processing

Most farms still employ traditional processing methods. Solar dryers, although made locally, are seldom used.

2. Technology adoption by input

a. Planting material

The use of improved planting material depends on its availability. Although farmers are willing to utilise any available tissue culture, demand currently exceeds supply. The few nurseries operated by the Ministry of Agriculture are inadequate.

In 1992, the National Agricultural Research Institute distributed a total of 14,883 plantlets for cassava, sweet potato, pineapple and plantains. This was way below the demand at that time. There are a few privately operated nurseries whose output is extremely limited.

b. Chemicals

Farmers readily use available weedicides, insecticides and fungicides. While most acknowledge their awareness of recommended dosage, there are instances of misuse. Chemicals are both imported legally and smuggled into the country; sale is widespread and control of distribution is minimal.

The country's two largest importers of chemicals for the small farm sector are Amazon Chemicals and Caribbean Chemicals.

Distribution of chemicals by these agencies is supported by technical assistance. Through a farm development project, the International Fund for Agricultural Development (IFAD)³ also offers technical assistance to farmers on the use of chemicals.

c. Fertilizers

The use of inorganic fertilizers is a common form of improved technology on farms and is accepted almost universally. As in the case of chemicals, there is evidence of misuse.

3. Improved technology adoption and women

The adoption of improved technologies on small farms has had various effects on women. Several studies have proven that technological change can increase women's workload, reduce their income, displace female wage earners and lower their standard of living. On the other hand, some technological changes have proven beneficial to women in every respect. The effects of improved technology on women in Guyana are analysed below:

³ IFAD is currently pursuing a drainage and irrigation development project on the east bank of Essequibo and west coast of Demerara.

a. Effects on wages and income

In the rice industry, women formerly performed tasks such as land preparation, planting, weeding, harvesting and processing. With increased mechanization of land preparation, harvesting and processing, women field workers have been displaced considerably; as a result, their incomes have been reduced and they have been left without alternate employment. Mechanization in the rice industry has also caused small scale landowners to either abandon or rent their lands, since profit margins on mechanized farms rapidly decrease as farm size decreases.

Small-scale female farmers (as well as males) cannot maintain expensive tractors and combine harvesters and are therefore forced to hire machinery at a high cost. They also experience much difficulty in securing machines for land preparation and harvesting at the necessary moment. The time factor is very important, since rice cultivation is dependent upon water supplied by an intricate drainage and irrigation system. The small farmer who cannot harvest on time sometimes suffers from floods caused by other (larger) farmers in the same area who release water to irrigate their fields.

Women cannot compete with larger producers in the preservation of fruits, mainly because they cannot benefit from fiscal incentives (discussed in Chapter VII), which in turn limits their ability to purchase machinery and equipment. The lack of credit facilities for technological development is also a constraining factor in production and has contributed to keeping income limited.

b. Projects for women

Most training for rural women has not been centered on agricultural development; instead, women have received training in traditional skills such as craft, sewing, etc. Guyana lacks programmes that address issues of credit and distribution of land to women, or which would increase the demand for women's paid labour.

c. Households and household structure

Regardless of the type of household within which women operate, agricultural extension projects fail to address the problems of female farmers. Variations regarding head of household and household dynamics affect who gains and who loses during the introduction of technological change in agriculture.

Unfortunately, most farming systems research and extension workers consider the household as a homogenous unit of production and consumption and ignore different household arrangements and interests. Very often the assumption is that in male-headed households, all decisions are made by the male. The contrary was found in Guyana; while women may not be the functional head of household, they nevertheless play a major role in decision making on the farms.

Nwike's analysis of improved technology adoption in one of Guyana's major agricultural regions is two-fold: a) it serves as an indicator of technology adoption by small farmers including women, and b) it highlights the point that real adoption levels (rates) by women can be misjudged because of the methodologies and approaches used in research

The study assessed adoption levels (by a selected sample of farmers) of technical packages which were specific to each of five crops: paddy, plantain, pineapple, cassava, and cabbage.

Table IV.7 presents a summary of the adoption levels.

The Project achieved an overall mean adoption score of 92%. About 80% adopted over 85% of the packages and 31% adopted all packages. The female farmers adopted less than their male counterparts, but the difference was not significant. According to Nwike, the difference in adoption between the two sexes could be "related to their farming experience and income, as male farmers had more experience and earned more farm income than the females."

Unfortunately, the study received responses only from heads of households, and contributions and decisions made by women in these households may not have been recorded. The analysis therefore excludes the participation of women in male-headed households, and thus does not accurately assess technology adoption.

There is a need, therefore, for special programmes to assess these issues if the ultimate objective is to increase productivity.

V. THE APPROPRIATENESS OF THE TECHNOLOGICAL OFFERING FOR WOMEN FOOD PRODUCERS

The development of new technologies has had very little effect on women as agricultural food producers. Most equipment is designed to be used by men who are generally responsible for clearing large areas of land and who benefit increasingly from technology.

In Guyana, women also participate in land clearing and ploughing. Their participation is evident on relatively small vegetable farms where investments in expensive machinery and equipment such as tractors may not be economically viable. Women, therefore, rely on the use of rudimentary hand tools which make work stressful and time-consuming.

Appropriate technology for women can only be made available if policy-makers and developers of new technology are conscious of women's participation in food production.

The question of whether technology offered to women is appropriate can be addressed by examining:

- the principle problems women face when utilizing available technology
- access to improved technology for women
- women's perceptions of farming

A. Some of the Problems Women Face when Utilizing Appropriate Technology

In the survey conducted, when asked about the problems they faced as farmers, 29.33% of the respondents experienced problems with drainage and irrigation; 26.67% identified "strenuous work and fetching of heavy loads"; 15.33% the lack of and/or unsuitability of equipment for women; 11.3% poor marketing facilities; and 15.3% input and packaging costs (see Table V.1).

The women stated they were not aware of equipment to substitute traditional hand tools, but 14.7% felt that access to farming equipment and spares would improve their farming (see Table V.2).

B. The Availability of Improved Technology to Women

In Chapter 2 we discussed the technological policy and its effects on small farmers. In Guyana, several factors inhibit women's access to improved technology:

- Drainage and irrigation systems do not allow maximum benefits to be derived by small farmers and women
- Lack of sufficient collateral to secure loans limits the extent to which women can improve technology

- Very few women have received training in farm management and husbandry practices
- Inadequate water supply for domestic use

Women spend as much as four hours daily fetching water. This activity is both time-consuming and burdensome. Recognising that women must successfully manage productive, domestic and community functions, technology should assist in reducing the burden on women caused by this multiplicity of functions.

In Guyana, approximately 6% of the time spent by rural women in performing domestic activities is dedicated to fetching water (an average of 8.38 hrs weekly). The real burden of this activity can be better appreciated by analysing Table V.3.

Out of a possible 168 hours per week, rural women spend an average of 140 hours performing domestic activities. This does not include time devoted to processing or the marketing of goods.

Women in the Canal Polder district seem to be most affected, since survey results revealed that they spend up to an average of 14 hours fetching water.

The sources from which water for domestic use is obtained have implications for women's health and this affects their ability to perform as farmers and housekeepers.

Table V.4 reveals startling results concerning the dependency of rural women and their families on unhygienic sources of water supply for domestic use. In the five districts surveyed (out of a total of 30 respondents per district) dependance on stored rainwater for domestic use in districts 1-5 was 56.7%, 100%, 76.6%, 96.7% and 80% respectively. Dependance on the canal as a source of domestic water was 50%, 73.3%, 36.7% 3.3% and 0.0% respectively, while water supply by means of pipes in yards was 36.7% and 6.7% in districts 1 and 2, respectively, and 73.3% in district 5.

C. Women's Perception of Farming

The question is often asked, why should women be given appropriate technology?

The answers are many. Rural women make a significant contribution to family income through farming. They perform a multiplicity of roles and therefore deserve to benefit from technology that lessens their burden and reduces time spent on specific activities. There is a need to protect women from health hazards.

Most women perceive farming as a business. Access to appropriate and improved technology will therefore enhance and sustain their operations as farmers. Table V.5 shows that 99.33% of respondents shared the view that farming is a business; 13.3% of the women have spent 5-10 years in farming, 40% have spent 10-20 years and 38.7% have been farming for more than 20 years (Table V.6).

VI. THE NATIONAL MARKET FOR AGRI-FOOD COMMODITIES PRODUCED ON SMALL PRODUCTION UNITS

A. General Production Patterns and Constraints on Small Farms: An Overview

Most farming in Guyana is concentrated on its coastal plain, a narrow strip of land which stretches from east to west (approximately 240 km) occupying the northern portion of the country (approximately 18-90 km in width). Farming is also practiced along the river banks, and to a lesser extent in the interior.

As established in Chapter II.A, approximately 60% of the farms are concentrated on plots of less than 2.5 hectares in size, and non-traditional crops are cultivated that are partly consumed on the farms; surplus produce is sold in either local or foreign markets. The coastal plain has provided a fertile base for almost 80% of Guyana's total agricultural output.

With the exception of rice and sugar cane, and to a lesser extent coconuts, it is very rare to find large expanses of land cultivated with the most commonly grown non-traditional crops such as cassava, plantains, pumpkins, pineapples, watermelon, other fruits, and vegetables. These crops generally form part of a mixed cultivation (consisting of four or five crops), scattered throughout the coastal plain.

Non-traditional crop farming is essentially labour intensive; except for ploughing, all farm operations are performed manually. The lack of mechanization can be attributed to:

- the small size of individual operations
- tradition
- high cost of machinery
- high maintenance costs coupled with high labour costs, which severely limit profit margins

The traditional mixed cultivation plots make data collection extremely difficult, and an accurate assessment of the areas cultivated for each particular crop is almost impossible. This factor has probably contributed to the underestimation of total production, as published by the Ministry of Agriculture.

Nevertheless, there is every indication that farmers supply 99% of fresh foods on the local market (imports of carrots, grapes and apples are recorded for 1991 and 1992). The unavailability of consumption statistics by crop makes it difficult to estimate local demand. Evidence of wastage and spoilage in the major municipal markets suggests that the supply of fresh foods is currently greater than demand in these areas. However, in some rural areas distribution of a wide variety of fresh foods should be improved.

Production is centered in coastal areas that benefitted from major drainage and irrigation infrastructure; land development schemes have also been common. (See area profiles in Appendix 1). In most of these areas land has been developed primarily to promote the

cultivation of traditional crops of rice and sugar cane, with vegetables found on either abandoned rice fields or, as in the case of the Black Bush Polder, specific designated areas.

Riverain areas, such as Pomeroon, Berbice, Essequibo and Demerara, have been the centers for cultivation of ground provisions, coconuts, corn, and to a lesser extent, vegetables.

Mangos, guavas, gooseberries and other perennials are traditionally found scattered in groups of two and three on the borders of rice fields, in backyards, or on dams bordering vegetable plots. Citrus, pineapples, and coconuts are grown commercially on areas ranging from 0.25 to 2.5 hectares.

Technologies used on small farms are very basic. If adopted, technical packages provide advice on use of fertilisers, pesticides, planting and harvesting, and plant spacing.

To develop the non-traditional food crop industry and increase supply for foreign markets, improved husbandry practices and technology are required. Suppliers also need to acquire a better understanding of these markets.

B. Women and their Contribution in the Agro-industrial Workforce

1. Labour force participation in agriculture

The 1992-93 Household Income and Expenditure Survey (HIES) conducted in 1993 estimates that out of a total population of 717,458 persons, 245,492 (approximately 34%) were regarded as economically active. Women represented 31.7% of the economically active (77,714 persons) with approximately 5% involved in agriculture, fishing and forestry.

These estimates are even more startling when the percentage of the female economically active population is weighed against survey results concerning the rural population. Of an estimated rural composite of 494,536 persons, female involvement in agriculture is 2.5%.⁶

Such statistics are alarming since women, whether they are part of female-headed or male-headed households, are actively involved in agricultural activities ranging from planting to marketing.

The critical factor here is what has been regarded as "work", which is the basis for collection of statistical data.

Traditionally, women's work in the fields, especially in cases where it is performed on "family" land, is neither remunerated nor viewed as "work". Instead, it is regarded as a way of life and is often uncounted or disregarded. This phenomenon is particularly evident in male-headed households. Unless questionnaires are specially designed to include "work" contributed by other members of the family as well as heads of household, women's contributions will be ignored.

2. Labour force participation in industry

The HIES estimates 3.3% female involvement in the manufacturing industries (which includes agro-based industries) out of the total economically active population, and 2.2% in private households with employed persons.

Women employed in the manufacturing industries perform tasks such as sorting, packaging, labelling, etc. These are generally low-paying jobs as compared with more labour intensive jobs in the industry.

C. Demand, Price and Supply

Small farmers have played a significant role in the production and marketing of agricultural foodcrops. Their involvement has moved from subsistence level to cash crop cultivation over the years. Despite their limited access to modern technologies and credit and a landownership system that acts to their disadvantage, they have not been entirely daunted in their efforts to continue the process of production.

Guyanese women farmers form a significant part of the rural farming population. Increasing economic pressures have forced many of these women to spend more time on the farm in an effort to subsidise family income. The general conditions under which small farmers operate, their contribution to national output, and price and demand for their products will be discussed in Section A of this chapter.

Marketing channels for agricultural produce and the agents involved in the marketing process are examined in Sections B and C, respectively.

1. Local demand for food crops

Local demand (market) is predominantly for fresh fruit and vegetables. Guyana is known to be self-sufficient in rice, sugar, fruits, and vegetables. There is evidence of fruit and vegetable importation, which is merely a result of consumers' desire for a wide variety of such produce.

Domestic consumption is difficult to estimate since in many instances, production is not recorded and there is a high incidence of illegal imports and exports.

2. Foreign demand for food crops

Although the CARICOM market offers Guyana the most promising food crop export possibilities, export potential is modest in terms of both quantity and range of commodities. A World Bank review of Guyana's economic position cited that:

In the case of fruits and vegetables, the prospects of these crops are very limited and are unlikely to provide ... at least in the short and medium term ... a viable alternative to the production of major crops (i.e., rice and sugar). First, the production of non-traded commodities is severely limited by the size of the domestic market; secondly, the difficulties in developing a significant non-traditional export market are great. They encompass many aspects of both production and marketing, none of which are likely to be solved in the near future.

While this may be true, there are other limitations in the export potential to CARICOM countries:

- the agro-climate environment of CARICOM members is similar, thus reducing opportunities for specialization
- the larger members- Barbados, Trinidad and Jamaica- are themselves pursuing self-sufficiency, thus encouraging indigenous production of food crops
- import of food commodities by other CARICOM countries is similar to that of Guyana
- there is an absence of regular shipping services to CARICOM countries and, more specifically, an absence of vessels to handle perishable commodities.

The limitations of the CARICOM market are better explained in Table VI.1, where it is clear that Guyana's potential for export to CARICOM members is heavily weighted towards rice, pineapples and to a lesser extent, coconuts.

a. Volume and types of agricultural products exported

Agricultural produce from small farm units is exported in both natural and processed forms. About 95% of the vegetables exported are in their natural form; the remaining 5% make up some of the ingredients in processed products, such as sauces, spices, and pickles.

Fruits are exported primarily in their natural state and to a lesser extent, in juices, jams, and jellies. Primary commodities exported include:

- Natural: oranges, pineapples, papaw, avocado, tamarind, golden apple, gooseberry, pepper, coffee, thyme, cucumber, and plantains
- Processed: pineapple juice, pineapple chunks, pineapple jam, guava jelly, guava puree, hot pepper sauce, casareep, frozen cherries, carambola (dried), canned papaw, and copra

Table VI.2 presents the volume of exports of selected non-traditional crops during the years 1987-1992.

b. Comments on export volume

Pineapples

Pineapple exports increased by 37% from 1987 to 1988. In fact, the highest recorded export volume was achieved in 1988, at 718.73 tonnes. This amount gradually decreased from 1988 to 1992. Exports in 1992 were approximately 50% of the total volume exported in 1988.

Coconuts

Export of coconut ranged from a low of 6.2 tonnes in 1987 to a high of 134.92 tonnes in 1989. Exports in 1990 represented only 4% of that in the previous year. Despite this marked reduction, volumes shipped over the years 1990, 1991, and 1992 increased gradually.

Plantains

Variations in exports of this crop are not significant except in 1989, when there was a marked reduction from 108.8 tonnes, in the previous year, to 13.3 tonnes. This decline was primarily due to restrictions on imports of plantains in Barbados. Since then other markets have been sought, increasing exports in 1992 to a high of 274.16 tonnes.

Heart of palm

Guyana has exported significant volumes of this product to France and other European countries. In fact, in 1992 this product represented 40% of non-traditional exports. For the purposes of this study, the production of heart of palm is not regarded as a product of small farm units.

c. Value of exported non-traditional crops

There has been a steady increase in the value of exports over the years, primarily due to the increase in volume of pineapples exported. For example, in 1990 the value of exports was US\$127,000, of which pineapple exports to Barbados accounted for roughly 50% (see Table VI.3).

d. Geographical coverage

Most fresh and processed foods are marketed in the CARICOM region, although the processed foods market now extends to Japan, the United States, and Canada.

Table VI.2 analyses the volume of total exports to various countries during the period 1987 to 1992.

The major importers are the countries of the **CARICOM**:

Barbados

During 1987 to 1989, Barbados was the largest importer of fresh and processed food commodities from Guyana, but imports dropped significantly from 1990 to 1992 as compared to the previous years (1987-1989). This situation was due to a number of problems, such as unreliable transportation, including the unavailability of air cargo transport facilities, problems experienced by Barbadian importers in obtaining import licenses, and restrictions on imports of plantains from Guyana, due to in-field problems.

Current exports to Barbados consist of fresh fruits and vegetables, with pineapples and limes occupying approximately 90% of the total volume exported.

Trinidad

The drop in export volume to Barbados in 1990 was offset by increased export volume to Trinidad in the same year. Total exports increased in volume from 42.05 tonnes in 1989 to 616.3 tonnes in 1990. There were significant increases in the total volume of pineapples and plantains shipped. Today, exports to Trinidad are greater than exports to Barbados.

Volumes of exported commodities to other countries include frozen cherries to **Japan**, heart of palm¹ to **France** and dried coconuts to **Holland**.

It should be noted that the export volumes discussed represent those quoted by the New Guyana Marketing Corporation (NGMC), the government agency responsible for monitoring exports of non-traditional crops. Quotations therefore represent declared exports through the Customs and Excise Department. Currently there is a high incidence of illicit trading from Guyana to CARICOM and other neighbouring countries. Actual export volumes are therefore not totally represented.

3. Underestimation of production on small farms

As stated earlier in this chapter, the type of cropping systems and the numerous problems facing the Ministry of Agriculture (the major data collection source) has contributed to gross underestimation of production on small farms.

An examination of the production figures published by the Ministry of Agriculture as compared with those quoted as exports by the NGMC reveals startling disparities and thus, in fact, indicates very little of the real contribution by small farms to national production.

¹ Heart of palm is not considered a small producer crop.

Pineapple - In 1991 and 1992, for example, there was a recorded production of 6.5 tonnes and 8.8 tonnes respectively, whereas exports of this fresh fruit as quoted by the NGMC in the same years were 634.13 tonnes and 390.03 tonnes respectively. Moreover, pineapple exports were also recorded as processed commodities, which should be added to the fresh fruit export volume.

Plantain - Total production was treated in a similar way as for pineapples in 1991 and 1992, and recorded as 13.0 tonnes for each year (Ministry of Agriculture). In the same years, however, the NGMC stated that 163.3 and 274.4 tonnes of this crop were exported.

Bora - Total production of 2.4 tonnes and 2.6 tonnes recorded in 1991 and 1992, whereas export volumes were quoted as 5.03 tonnes and 17.1 tonnes for the same years.

4. Price and supply

a. Cassava

Cassava, a starchy root crop, is currently sold on the local and export market both in its natural state or processed as cassava bread, casareep, starch, and flour. From 1979 to 1986 cassava was used for the production of flour as a substitute for wheat flour. Demand therefore was relatively high and production of this commodity increased.

In the period under review (1986-1992), the level of cassava production fluctuated, reaching a record high of 50.3 tonnes in 1987 and a low of 10.7 tonnes in 1990. In 1986 production stood at 44.5 tonnes, increasing by 5.8 tonnes in 1987. In 1988, however, there was a steep decline of 68.2%, with production dropping from 50.3 tonnes in 1987 to 16.0 tonnes in 1988. (See Table VI.4.)

The 1987 price of cassava at G\$1.69/kg represents an increase of 7.1% over the 1986 price, at G\$1.56/kg. But in 1988 the price fell by approximately the same percentage at which it had increased from 1986 to 1987. G\$1.53 was the lowest price recorded for the period reviewed. (Please see Table VI.5 and Appendix 3, Figure 1)

b. Plantains

The level of plantain production ranges from 20.8 tonnes in 1986, to 13.0 tonnes in 1992. However, this does not represent a continuous decline in production over the years. (See Table VI.4.)

In 1987 and 1988 there were increases of 1.6 tonnes and 0.3 tonnes respectively over the preceding years. A significant decline in production occurred in 1990 with an achieved production level of 13.0 tonnes, amounting to a 41.7% (9.3 tonnes) reduction from the previous year. This level was constant during 1991 and 1992. (Appendix 3, Figure 2)

The price of plantains decreased from G\$2.13/kg in 1986 to G\$1.96/kg in 1987. In 1989, 1990, and 1991 there were increases in price of 108%, 293% and 87%, respectively. In 1992 prices declined slightly (6%).

c. Bora and ochro

Both crops are sold widely in their natural state on the local market, and there is little processing. Production estimates for these crops are only available for 1991 and 1992, at 2.4 tonnes and 2.6 tonnes for bora and 1.3 tonnes and 1.5 tonnes for ochros. In both cases the increase of 1992 production over 1991 was 0.2 tonnes. (See Table VI.4 and Appendix 3, Figures 3 and 4)

Except for 1991, when there was a slight decrease in price (2.2%) over that of 1990, the price per kilogram for ochro increased continuously over the years. The price of bora also increased continuously during the years 1986 to 1992 (Table VI.5).

d. Blackeye peas

Production estimates are only available for the years 1991 and 1992, at 0.45 tonnes and 0.44 tonnes respectively. Sold countrywide as a dried bean, this crop has been known to be produced on many small farms throughout the review period. Again, the unavailability of production data for several years illustrates that production on small farms is underestimated.

The 1992 price of G\$141.98/kg for blackeye peas was the highest recorded for the period 1986-1992. This showed a steady increase over the years, from G\$22.42 in 1987 to G\$141.98 (Table VI.5, Appendix 3, Figure 5).

e. Watermelon

This fruit is consumed locally, primarily in its natural state. The relative price per kilogram, which is considerably higher than other readily available fresh fruits, contributes to post-harvest losses both on the farm site and local marketplaces. Recorded production in 1991 was 1.9 tonnes, while 1992 production fell slightly to 1.7 tonnes.

The price of watermelon fluctuated throughout the years, being highest in 1992, at G\$40.33/kg, and lowest in 1986, at G\$3.51/kg (Table VI.5, Appendix 3, Figure 6).

f. Pineapple

Pineapples are widely grown on small- and medium-sized farms in Guyana. It has great export potential and because of this, total area cultivated has increased over the years. Producers of pineapple benefit from specialised extension services and other training related to packaging, storing, and processing. On the local market pineapple is consumed mainly in its natural state. It is also processed as jams, jellies, chunks, and pineapple juice.

It was noted that during the review period, production levels ranged from a low of 5.3 tonnes in 1986, to a high of 11.2 tonnes in 1989. From 1987 to 1989, production increased continuously, but at a decreasing rate of 49%, 25% and 13%. The decline continued until 1992 when an increase in production was recorded.

The price per kilogram of pineapple in 1987 was approximately 50% of that obtained in 1986, but since 1988 prices have increased continuously. (See Appendix 3, Figure 7)

D. National Marketing Channels

The national marketing subsector is an integral part of the food crop sector, connecting demand and production sub-sectors both functionally and economically. It consists of two basic components:

- the physical system that moves commodities in space and time, from the farmer to the consumer
- the economic system which equates supply and demand through price signals and other information that induces market participants to determine what, how much and when products should move from the farm to the retailer.

In a physical sense, marketing covers all of the functions required to move produce from the farmgate to consumers in local communities. The remainder flows through a more formalized system that carries produce from distant farms to the larger consuming centers such as Georgetown, New Amsterdam, and Linden.

These functions include farm operations (sorting, bagging, packaging, etc.) at the production sites; operations at assembly points in food crop farming areas; a transportation system for moving products by land, water, or air; wholesaling and distribution; in some cases, processing and storage; and ultimately retailing. In addition, these functions involve all of the methods and practices used to exchange title, and incentives that make the system dynamic.

1. Marketing systems

In Guyana there are two marketing systems that move products produced by farmers:

- (i) The highly localized system (local direct system) where there is an exchange in commodities produced in neighbouring communities
- (ii) A more formalized system (distant marketing system) that centers largely on municipal markets in Georgetown, New Amsterdam, Linden and Corriverton.

a. The local direct system

The local direct system is basically one through which farmers sell their produce directly to neighbours and consumers in their communities. In many cases sales are to other farmers who may specialise in producing crops other than those they purchase. Produce is either sold on small roadside stands or purchased directly at the farmer's homestead.

The formal marketing system is bypassed so that there are no middlemen between farmer and consumer, with each farmer performing all or part of the functions in marketing.

Generally all sales are for cash and margins or market costs tend to be minimal. Produce is sold primarily in its natural state; there is no packing, washing, or grading at this level.

b. The distant market system

This system is both functionally and economically more complex. Usually the producer takes his or her produce to concentration or assembly points (within the farm area) by land or water transport. Assembly points are located throughout the coastal belt and in a few riverain areas. They include wharves, stellings, bridges or any suitable location readily accessible by the majority of farmers and buyers in the farming community.

In other cases, produce is bought at the farmgate or the farmer transports his/her produce to the more central municipal markets.

Most of the food crops produced are transported to major municipal markets where wholesaling and retailing activities are carried out (generally in the same market and simultaneously by the same persons or agents).

Appendix 4 schematically presents the movement of farm produce from production point to consumer.

c. Brief description of markets

Organisation

In Guyana markets are in closed buildings, partly covered buildings, or open stalls along roadsides. The larger enclosed and partly covered markets are open for business throughout the week. On the other hand, most roadside markets are periodic in their days and hours of business, functioning generally on weekends.

There are no distinct wholesale markets as opposed to retail markets; both wholesale and retail activities take place in close proximity and, in some instances, simultaneously. However, wholesaling of produce is more commonly practiced on specific days.

Selling

Retailing

Market authorities do not supervise trade practices, nor do they intervene in the pricing system. Each stall operator is responsible for his/her own procurement, display, and sale of produce, and determines the price for each commodity.

The price of ground provisions is often determined by weight and type, while the price of fruits and vegetables is generally determined by the size of "bundles", "parcels" or "type". "Bundles" and "parcels" normally sell for the same price over an extended period of time; the size may vary with changes in the supply situation or with quality.

Wholesaling

Wholesaling is conducted similarly to retailing. There are no price controls. Sellers present their produce in bags, numbers, or by weight. Price variations may exist due to differences in quality.

Grading

There is very little evidence of formal grading. The type of fruit, vegetable, or other produce, and its size, quality, and relation to price is determined by the seller and to some extent, measured against offerings of other sellers.

No agency or authority controls the grading of non-traditional crops. However, while there is little or no formal grading, there is, in effect, a modest quality-differentiating market.

The role of marketing centers

Under the Food Crop and Marketing Programme, funded by the Inter-American Development Bank (IDB), marketing centres were a vital component which was to provide buying and storage facilities for farmers.

Using the Guyana Marketing Corporation (GMC) as intermediary, it was hoped that a system could be developed to provide information on sound pricing and supply scheduling.

Located in food crop producing areas, the centres were also designed to accommodate outlets for the sale of vital farm inputs (fertilizers, seeds, pesticides, and insecticides). In addition, it was intended that space would be made available (for rental) to farmers and particularly wholesalers; for storage and preparation for shipping.

Currently very few of these functions are operative because of management and other reasons.

C. Marketing Agents

1. Participants in the marketing of non-traditional crops

a. Farmer

In many instances the farmer acts as producer and retailer. Many farmers are owners of market stalls from which they sell their own produce, and produce purchased from wholesalers.

There is a tendency to complement produce offered for sale (that is produced on the farm) with a variety of other agri-products in order to provide a "balanced" basket for the buyer.

This retail function is performed primarily by the female members of farming households.

b. Wholesaler

Wholesalers are either farmers or hucksters. Again, this function is dominated by women.

c. Retailer

Retailers consist of farmers and hucksters. In one of Guyana's largest municipal markets (Bourda), out of a physical count of 751 stalls, 621 (82%) were operated by women.

Products sold included a variety of fresh and processed agricultural produce together with other "dry" goods.

d. Women as marketing agents

Women are the principal marketers of non-traditional crops grown on small farms. In Guyana, it was found that most women who participate in the production of crops are responsible for selling. Table VI.6 illustrates farms that produce and market a variety of crops and indicates the participation of women in marketing.

Rice (a traditional crop) was found to have the lowest participation of women as marketers. On the other hand, marketing of non-traditional crops in their natural state is performed by women, either at the farmgate or at retail stalls in the market.

e. Losses incurred by women

Unstable market conditions contribute to a relatively high degree of losses by women farmers. Apart from post-harvest losses on the farm, a significant proportion of crops is lost as a result of poor transportation facilities, inadequate markets, and spoilage of produce at the market site.

In Table VI.7, post-harvest losses for bananas were 3.47% of total production for the last production year (3137 kg). Loss percentages were 39.34% (10,887 kg) for carambola, and 7.30% (22,239 kg) for cassava. This represents income losses of G\$470,550, G\$970,970 and G\$47,019 for bananas, carambola and cassava, respectively.

It is interesting to note that these losses occurred on 18 farms that produced and marketed bananas, three carambola farms and 57 cassava farms.

It was found that small farmers and women who sell their produce wholesale are at a disadvantage because of the ridiculously low prices offered by buyers. Percentage mark-up for non-traditional crops was approximately 150%.

In 1993, for example, percents of price increases per kilogram of a selected group of non-traditional crops were:

tomato	-	14.5%
cucumbers	-	40.1%
lettuce	-	23.1%
callaloo	-	25.9%
pumpkin	-	46.0%
bora	-	18.4%
limes	-	29.1%



VII. THE PROCESSING AND MARKETING OF FOODSTUFFS ON SMALL PRODUCTION UNITS AND BY WOMEN

Processing of agri-products has always been practiced on small farming units to satisfy household needs, and in many cases to preserve fruits and vegetables grown on garden plots and small subsistence farms.

Perhaps the earliest food processors were the Amerindian women, who skillfully made many products from cassava and successfully obtained the greatest possible benefits from the seasonal production of this root plant.

In their own ways, both Afro- and Indo-Guyanese women engage in simple methods of preserving the wide variety of fruits and vegetables at their disposal. The processing of fruits, however, has dominated the possible forms of food preservation in small production units.

In the 1970s, government policy of restricting imports of selected food commodities such as fresh and dried fruits, salted fish, milk, cheese, margarine, and at a later stage, wheat flour, triggered an awareness of the value of "substitute" and/or "replacement" food products and consequently an increase in fruit and vegetable production and their preservation.

This chapter assesses the types of products processed, the relationship between product type and specialization of processing by gender, markets, and factors that influence the participation of women in food processing.

A. Processing: Relationship between Type of Product and Specialization by Gender

1. Forms of processing

Products are processed in various forms for their preservation, such as pickles, jams, jellies, syrups, powders (flours), concentrates, sauces set in brine, and salted, dried, and fried products.

a. Types of products produced at household level

All the forms mentioned above are produced at the household level. Dried fruits, jams, jellies, juices, salted fish, and coconut oil are produced in many cottage industries throughout the country. The production of jams and jellies, copra, coconut oil, salted fish, and flour is typically performed in larger manufacturing firms whose production is mainly export-oriented.

b. Participation of women in food processing

Table VII.2 analyzes a selected number of food crops, their products and gender orientation as related to participation in processing. It is evident that women produce a wide variety of processed foods.

Agro-industrial activity was found on only a few farms in the survey. Products produced included dried coffee beans, cassava bread, cassareep, copra, and preserved fruits. All raw material originated from the farms on which they were processed (Table VII.1).

2. Processed fruits

The most widely processed agri-products are fruits, usually used in the production of jams, jellies, dried fruit and nectar.

The most commonly used fruits are carambola, tamarind, guava, pineapple, cherries, and passion fruit. Other fruits such as bilimbi, gooseberries, and unripe mangoes are blended with peppers and spices to make pepper sauces, or stood in brine as pickles.

It must be noted that the total volume of produce spoilt on farms relates to the relatively little processing that took place (Table VI.7). This could provide an opportunity to train women in food processing and post-harvest handling in an effort to reduce such losses.

a. Carambola

Preservation of this very versatile crop as dried fruit and other mouthwatering by-products has had significant impact on employment and income generation for many Guyanese women. As stated in the introduction of this chapter, import restrictions on fresh and dried fruits in the early 1970s stimulated a substantial increase in cultivated acreage and the introduction of processing on many small, medium, and large farms.

The cut and sugared fruit is boiled and dried, while the dried fruit is blended with herbs and spices to make all-purpose and barbecue sauces.

The process of drying as practiced in small units is very tedious and time-consuming (approximately 2 weeks), since it involves the use of very basic technology. Women are involved in peeling, washing, chopping, boiling, mixing, and drying. Quite often this is done while simultaneously performing other domestic chores (eg., while cooking meals for the family).

Carambola processing is a female-dominated production activity in small scale units. Even in larger units of operation where boilers and solar dryers are used, activities such as peeling, washing, and sorting are performed predominately by women.

b. Pineapple

Pineapple is made into jams and jellies or chopped into chunks and candied. Such processing is not commonly performed at small production units because of the high price offered for fresh fruit. Jams and jellies are sold widely on the local market and provide good income at the cottage level. Pineapple chunks are the major form of processed pineapple for the export market.

c. Guava

In Guyana there are very few orchards or large holdings of guava. Large scale cultivation of this crop is directly linked to one or two major producers of guava jams and jellies. Scattered trees intercropped with other crops in the backyards of residential plots provide the source of a seasonal supply of fruits for small production units. Activities involved in the making of jams and jellies from this fruit are performed by women. Quite like the making of preserves from other fruits, housewives very rarely perceive these activities as a form of processing and therefore pay little attention to this utilization of their time and the frequency with which these products are made.

d. Papaw

Papaw is made into purees and candied chunks, mainly at the cottage level. These products are consumed locally and exported.

e. Coconuts

Over-ripe fruit (referred to as dried coconuts) is the raw material for copra and coconut oil. The copra industry is rapidly increasing, with lucrative export markets available in the CARICOM region. This product is made on both small and medium scale production units, providing employment for both males and females. Coconut oil production is also evident on small and medium scale production units.

f. Other fruits

Surplus production of other fruits are either left to rot or in some cases processed into jams, jellies, juices, and syrups with individual flavors or blended to make similar products.

3. Plantains and root crops

a. Plantains

The plantain is a widely used commodity in processing activities. It is dried and ground into a flour which is mainly used as a food for weaning and pre-weaning. Plantain flour is also utilised by snack food manufacturers to produce biscuits and breakfast cereals.

The plantain chip is a popular salted snack. It is one of the earliest products of micro and cottage industries, and remains popular today.

The elaboration of plantain flour and chips is a female-dominated occupation and provides a worthwhile source of income for women in small production units.

b. Cassava

Of all the root crops, cassava is the most versatile in the processing industry. It is used in the production of cassava starch, farine, cassava bread, tapioca, and cassareep.

Cassava starch is also utilised in the bauxite industry, cigarette production, and the manufacture of corrugated cartons. It is a product of both small and medium sized production units. At both levels, women dominate the production activities involved.

Cassareep is a popular sauce and is made by Amerindian and other women on small-scale units. Quite often they plant and process the cassava, although in the past five years or so more women have been purchasing cassava for the production of cassareep, creating employment for themselves at the cottage level.

4. Processed vegetables

There is very little evidence of processed vegetables in Guyana; traditionally, consumption patterns show a strong preference for fresh foods. A minute selection of vegetables are either blanched, dried, or blended in sauces and pickles.

5. Pepper sauce and achars

A wide variety of peppers are ground and blended with onions, mustard, and vinegar to make hot sauces. The making of such sauces is a common task in almost every rural household. Processes involved in their preparation are predominately viewed as "women's work".

Tables VII.1, 2, 3, and 4 all indicate that the processing of agro-products on small farm units is a female-dominated occupation.

Men are seldom involved in processing (except in the examples of dried fish and dried shrimp) and quite often their participation is irregular. As processing moves from the microentrepreneur size (on small production units) to cottage, and then larger manufacturers, there is a tendency for women's ownership of businesses to decline. However, women make up a greater proportion of the workforce involved in packaging, sorting, labelling, etc.

In the aromatic and spice industry, for example, at the commercial level women constitute approximately 75% of the work-force, while over 95% of cottage level businesses are owned and operated by women.¹

¹ Ismay Sam. The Aromatic and Spice Industry in Guyana. FAO. G.M.C., 1993.

B. Marketing: Access to Different Types of Markets

Chapter VI contains a discussion of available markets, but it must be noted once again that the internal market for locally processed products is becoming increasingly competitive since liberalization in the late 1980s.

There are no government agencies responsible for the promotion of locally produced preserves and private advertising is very costly.

Opportunities for export to the CARICOM market have been increasing, but their sustainability will depend on the level of technology adopted and the cost of producing these products.

C. Factors that Influence the Participation of Women

Much of women's participation in the processing of agri-products will depend, first, on the extent to which women can satisfy their families' consumption needs, and second, whether or not there are opportunities for their surplus products to be sold at prices that permit them to gain from this entire process. Currently, the opportunities for women to penetrate the local market are hindered by their limited access to improved technology and competition from the numerous imported processed foods on the market. The major factors influencing women's participation are:

- current economic conditions
- physical conditions
- technology

1. Current economic climate

a. Incentives

The Fiscal Incentives Act provides various types of concessions to all manufacturing entities, including:

- Tax holidays for a maximum of five years with extensions of not more than five years
- Import duty remission, waiver or refund
- Consumption tax exemption or refund
- Duty and consumption tax remissions which are granted for the establishment of new businesses or the development of existing ones

The extent of the benefits derived by an enterprise depends on its contribution to the national economy. This contribution is measured broadly in terms of local value added, but other specific criteria are also considered.

Generally, operators of small units in which the majority of women are found do not benefit from these concessions, since:

- a) They do not satisfy the value-added criteria
- b) The incentives offered often apply to registered companies, particularly in the case of manufacturing industries
- c) Sourcing and procurement arrangements make it difficult for them to benefit from duty-free concessions
- d) They are unaware of the availability of such concessions or of procedures required to acquire them

b. The availability of packaging material

The main types of packaging material used in the agroindustrial sector are bottles, plastic bags, plastic containers, and carton boxes. Most of these materials are imported. Quite often, bottles are recycled but caps must be replaced. Replacement caps must be imported and high costs make this less cost effective. In addition, most of the constraints experienced by small producers regarding fiscal incentives also apply in this area, as well.

The type of plastic bag currently produced in Guyana is not suitable for the processing industry, thus making importation imperative.

Most small units can ill afford these costs and are forced to operate at substandard levels, producing on the basis of the availability of packaging material.

2. Physical conditions

Deteriorating ingress and egress to farms constrains production efforts.

It is the opinion of many small farmers that difficulties moving produce from farm to market act as a major disincentive to production. In response to the question, "What would you like to see done to improve your farming activities?", 54% (82 respondents) felt that their activities could be improved if they had better dams and roads. This number includes 30 women living near the Pomeroon River. None of them felt this was necessary since the main type of ingress and egress in the Pomeroon is by water.

With improved roads and dams, it is felt that the time spent in transporting produce could be better used in productive activities.

3. Technology

Currently, technology applied in the processing industry is very basic. In the processing of fruits, for example, the widely used traditional forms of drying and making of jellies are time-consuming and greatly limit output.

Most women are not able to process all the fruit they produce, which leads to a significant amount of spoilage and dumping.

In the Pomeroon River area, for example, limited technology and lack of markets and transportation has contributed to the spoilage of hundreds of tonnes of carambola (Table VI.7).

Training in food preservation methods such as dehydration of fruits and vegetables using solar dryers has been confined to women in urban communities; such training has not been offered to any extent in the rural areas, the source of agricultural production.

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VIII. RECOMMENDATIONS AND PROPOSALS

A. Recommendations

1. Awareness of women's contribution to agriculture

Ample evidence has shown that agricultural work performed by women in Guyana has little or no recognised economic value. Their participation is either an unpaid family contribution or, when remunerated, underpaid.

It is therefore recommended that the contribution made by women receive adequate recognition and that women themselves be made aware of the value of this contribution to production, and of its role in economic development.

2. Access to land

Access to land and other resources is limited; the few female landowners are not aware of their rights.

It is recommended that a land reform programme be implemented and that criteria for land selection be reviewed, with special consideration for rural women and particularly for those in female-headed households.

3. Access to credit

Credit for small farmers is difficult to access and there is an absence of small-farm/small-producer credit programmes, which also limits technological development.

It is recommended that credit programmes be designed to provide capital for small farm investment.

4. Women's projects

Women are seldom consulted or invited to participate in project planning, implementation, or follow-up.

It is recommended that women be consulted when formulating and developing projects.

5. Research

- a) Agricultural research currently conducted by the National Agricultural Research Institute is on a commodity basis, and has concentrated heavily on rice. There is a need for more research on the vegetables and fruits grown by women.

It is therefore recommended that more research be performed on crops such as vegetables and fruits.

- b) Data collection in the field leaves much to be desired. Chapter VI described the disparities between reports on production and exports. Such inconsistencies distort estimates for future planning; they either underestimate or overstate production and consumption, and inhibit sound planning.

It is therefore recommended that a systematic approach be established for the collection of production data.

- c) Statistical information on production, technology adoption, marketing and other aspects of agriculture is difficult to access. Although there may be efforts to conduct research and compile statistics, many research papers are not stored in libraries. This is a waste of valuable information that can be used in planning and decision-making.

It is therefore recommended that an agricultural documentation centre be established at the University of Guyana's Faculty of Agriculture.

The methodologies employed in researching various aspects of agricultural production influence the quality of data and type of information generated. The discussion of recommended improved technology adoption, in Chapter IV, shows how easily a group's participation may escape assessment: if only heads of households are questioned on their use of technologies, women who are not household heads but participate in production are excluded.

It is therefore recommended that methodologies used in agricultural research should be appropriate and address issues of both men and women.

6. Extension

Extension programmes are too fragmented. In Chapter II.C we discussed the several institutions and departments that are involved in extension education.

Most of these institutions have limited staff who received similar training at the Guyana School of Agriculture, but utilize different methodologies and approaches to extension, depending on the commodity interests of their respective organizations.

There is a significant amount of duplication of efforts in technology transfer by each institution.

If extension activities were integrated into a single functioning unit, more efficient use would be made of limited personnel and less duplication and conflicts would arise in technology transfer.

It is recommended that the extension service be integrated into a single functioning unit. The extension service should be organized to provide general extension services at the farm level with commodity specialists available from national centres.

- a) Technical packages developed by the Ministry of Agriculture have not been fully disseminated by extension personnel. Women producers in many rural communities are not aware of the existing packages or benefits to be derived from their use.

It is recommended that the Ministry of Agriculture's Extension Division plan more aggressive programmes to ensure that developed and recommended improved technology is transferred to the small-farmer community.

- b) Field demonstrations on technology transfer are rare. If organized, they do not address the case of technology transfer to women.

It is recommended that the appropriateness of improved technology transfer be carefully studied when extension programmes are being constructed. Field demonstrations and other forms of disseminating information should therefore be conducted in such a manner that both men and women can benefit.

7. Planning

The absence of an agricultural plan after 1989 has been detrimental to small farmers, who constitute about 60% of all Guyanese farmers, because production was not organized on the basis of set targets. This has led to dumping and wastage whenever markets were unavailable.

Women's time, labour, and income are lost when such circumstances prevail.

It is therefore recommended that the government (Ministry of Agriculture) prepare and publish an agricultural plan to guide farmers on what, when, and how much to produce.

8. Marketing

The New Guyana Marketing Corporation (NGMC) has a Market Intelligence Unit which provides information on retail and wholesale prices of agricultural produce.

Their publications are primarily distributed to government agencies and more centrally located marketing agents.

There is no organized channel for disseminating this information to individual farmers and farmers' groups, who may be located in areas far away from town centres.

Ignorance of current prices offered for agri-produce sometimes causes exploitation of the producer by middlemen. Women are particularly vulnerable in such cases.

It is therefore recommended that the NGMC establish linkages with women's groups, regional extension officers, and other farmers' groups to ensure that information on prices reaches the farmer.

9. Food processing

Food preservation and processing on small farms is performed using traditional methods and techniques. Women have demonstrated an interest in acquiring skills and sourcing appropriate equipment to improve techniques used. Unfortunately, post-harvest losses are high and significantly reduce family income. It is therefore recommended that rural women be trained to use appropriate and improved techniques in food preservation and post-harvest handling.

B. Proposals

1. Proposal for the Implementation of an Awareness Programme for Women in Agriculture

a. Background

Guyanese women farmers have often remained "behind the scenes" because they are uncertain of their rights in all aspects of life. Complicated legal systems, credit regulations, land tenure systems, and trading regulations have magnified their problems and uncertainties, resulting in withdrawal or dismissal of issues which may be vital for their progress.

Women farmers in Guyana demonstrate a lack of knowledge of the legal system, credit procedures, market information, the use of chemicals, etc. This situation has caused considerable loss of family income.

It is therefore proposed that an "Awareness Programme" be launched to educate our women on issues relating to agriculture that may have direct or indirect influence on the improvement of their lives as well as their families'.

b. The project: Women in Agriculture Awareness Programme

Goals

- To construct and design pamphlets on various issues that relate to agriculture for distribution to women producers and processors.

- To educate Guyanese women farmers on operations of:
 - the legal system
 - credit procedures
 - marketing and selling
 - use of chemicals

Approach

1. Preparation of pamphlets in simple language on the topics mentioned
2. Distribution, in collaboration with women's groups in farming communities
3. Distribution should be accompanied by short informative meetings of groups of women to allow for clarity, especially for those who may have reading limitations.

Topics to be discussed

Legal issues

- a) procedures in land acquisition
- b) land tenure rights
- c) legal requirements for starting a small business (processing)

Credit issues

- a) identification of credit needs
- b) types of credit available
- c) sources of credit
- d) borrowing and banking regulations

Marketing and selling

- a) identification of markets
- b) quarantine regulations
- c) exporting - how to export
- d) customs regulations
- e) quality control regulations

Chemicals

- a) **sourcing agri-chemicals**
- b) **use of chemicals**
- c) **drug regulations**

Funding

Funds for the introduction and implementation of this programme could be accessed by non-governmental organizations such as the Social Impact Amelioration Programme and Futures Fund.

Impact

Such a programme will ensure that:

- a) **women understand the issues discussed**
- b) **barriers created by lack of knowledge will be removed**
- c) **beneficiaries will develop self-confidence**
- d) **living standards will be improved**

2. Proposal for the Establishment of a Research Centre and a Documentation Centre within the Faculty of Agriculture of the University of Guyana

a. Background

The consultant experienced a general lack of information in the agriculture sector in Guyana, due mainly to:

- a) **Inadequate and poor research**
 - (i) **very little is documented**
 - (ii) **research is performed by unsuitable personnel**
 - (iii) **badly constructed questionnaires**
 - (iv) **poor data collection**
 - (v) **poor data analysis**
- b) **Ill-equipped and disorganized storehouses of information**
 - (i) **lack of all types of resources**
 - (ii) **collections are not properly catalogued, classified, or indexed**

- c) unavailability of past research papers
 - (i) researchers selfishly keep their papers
 - (ii) papers locked away in cupboards

This disastrous situation is a result of the country's economic constraints and government's apparent lack of recognition over the years of the importance of information to the developmental process.

Planning and policy-makers in this sector require timely and relevant information to enhance their decision making.

The issues and problems of small farmers, particularly women, cannot be addressed if information on their operations are not properly documented and made accessible.

The absence of information can therefore result in decisions being made either too late or not at all. In some cases, the wrong decisions are made.

Past plans which did not address women's issues regarding land tenure, credit, technology, marketing, and social needs serve as indicators of information needs.

The process of agricultural development, therefore, presents challenges and opportunities for the establishment of an effective and efficient research and documentation system, so greatly needed in Guyana.

It is recommended that the University of Guyana establish research and documentation centres at the Faculty of Agriculture. These should be well equipped and adequately staffed by suitable personnel. Each head will report directly to the Dean of the Faculty.

b. The project

The Research Centre

Goals

- To conduct in-depth research on all agricultural development, including the contribution made by women.
- To satisfy the research needs of both established groups (GAIBANK, NARI, Repaha) and unrecognized community groups (i.e., women's groups).

Objectives

- To assess the agricultural research needs of the country and initiate relevant studies.

- To establish a core of trained researchers, specifically for the effective functioning of the centre
- To conduct seminars and workshops in research techniques and methods for staff, students and external researchers
- To maintain a copy of every research paper in the Documentation Centre

The Documentation Centre

Goals

- To identify, acquire, process, and store for retrieval and dissemination, information which is relevant to agricultural research and development
- To fulfill the information needs of staff and students of the Faculty of Agriculture, as well as researchers from external agricultural agencies
- To act as a depository for all research papers produced by the Personnel Centre.

Objectives

- To engage in an effective acquisitions policy
- To catalogue and classify all documents
- To offer an effective current awareness service
- To maintain an efficient staff and inter-library loan system
- To maintain a close relationship with other libraries, especially the major ones, as well as agencies involved in women's affairs
- To acquire and organise all research papers produced by staff of the Faculty

c. Impact

The centres will complement each other and be an integral part of the Faculty. Their goals and objectives must be integrated into those of the Faculty and they must operate within its policies and regulations.

Funding for the proposed system could be provided by international agencies, as well as the university itself.

The former could be approached for the establishment of the centres, and the latter for their maintenance.

Establishment of the proposed research centre and documentation centre will ensure that:

- i) Research is performed in almost all areas of agricultural development
- ii) Research will be better planned and conducted
- iii) Researchers will be better equipped
- iv) Information will be properly organised for easy retrieval and dissemination
- v) Analysis of issues in the agricultural sector will be based on adequate information, the basis for decision making and planning.
- vi) The benefits of correct decisions made by agricultural planners will impact on producers and marketers in the production system.

3. Proposal for the Development of a Policy Paper on Micro- and Small-Scale Enterprises in Agriculture

a. Background

Micro and small-scale enterprises make up a large part of enterprises in developing countries and are increasingly valued by governments and donor agencies as units of production and generators of employment.

While few precise definitions exist, this form of production can be characterized as being relatively small-scale, family-owned, and reliant on raw materials using indigenous material; technology is labour-intensive, and it operates in unrelated markets (USAID, 1983).

The scope of activities in the informal sector is varied. For women with family responsibilities and few formal skills, the informal sector is often their only source of income.

In Guyana, while there is an awareness of the potential economic contribution which small/microenterprises can make to development, there are no definite public sector policies and programmes to assist growth and development in this vital sector. The small and micro-sized entrepreneurs, therefore, continue to operate under very difficult conditions, mainly as a result of organizational, systemic, and financial problems.

In principle, it is desirable that all sectors of the economy - small, medium, and large - be permitted to function in the most efficient manner through the government's sound and effective economic, financial and fiscal policies.

b. Definitions

One of the country's major problems in small business development is that government has failed to define the small/microenterprise. This has led to much confusion and, very often, the exclusion of women in agriculture (processing) from benefits on tax concessions, developmental programmes, etc.

The definition of the small/microenterprise is thus governed by the interests of the perceiver, and usually upper and lower limits are set to such parameters as volume of labour, the amount of capital employed, or annual sale figures.

The Guyana Manufacturing and Industrial Development Agency (GUYMIDA) perceives a small enterprise as one with a maximum capital investment of US\$200,000 but not less than US\$5,000, while the Guyana Small Business Association (GBSA) defines it as one employing a maximum of 25 persons with annual sales of G\$50,000-G\$5,000,000. The Deeds Registry sets an upper limit of 21 employees. Such an enterprise may be single proprietorship, partnership, cooperative, or private company.

Where do small producers of agricultural products fit in with these definitions? Where do women fit, when capital investment in small agri-enterprises can be as low as US\$1,000?

It is against this background that a proposal is made to assess small/micro enterprises in Guyana and, based on its findings, define such enterprises in order to allow those involved to benefit from training, marketing, fiscal incentives, financing, and developmental programmes.

c. The project: Development of a Strategy for Micro- and Small-Scale Enterprises in Agriculture

Goals and objectives

- To produce a policy paper on micro and small-scale enterprises with clear definitions.
- To ensure that women who operate small enterprises benefit from programmes and policies on small/micro enterprises.
- To reduce restrictions on the production of local agri-processed goods by developing a system which allows small-scale operators to legally source credit and other forms of financial assistance.

- To improve the quantity/quality of output.
- To improve the standard of living of women in agriculture and their families.

Approach

1. In defining small and microenterprises a set base should be established. It is important that a distinction be made between small and microenterprises in agriculture. Such a definition should consider:
 - a) number of persons employed by the business
 - b) maximum capital investment (equity)
 - c) type of business
2. After defining the two groups of enterprises, a register of the businesses should be compiled by the Deeds Registry and classified according to:
 - a) size of business (small and micro)
 - b) type of business
 - c) economic sector
3. The Ministry of Finance and other policy institutions will then have a guideline for allocation of fiscal incentives and other concessions.
4. The approaches and policies to lending by public institutions should be set within the guidelines of enterprise definitions.
5. Market information should be disseminated on the basis of enterprise definitions.
6. Research should also be approached on a similar basis.

Given the above guidelines, a policy document on micro and small enterprise development should be formulated.

Impact

1. The institutionalization of small and microenterprises in agriculture will have direct impact on the operational standards of such businesses.
2. It will aid in increasing the total agricultural output.
3. It will increase income for women and families.



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TABLES



Table I.1. Land area of Guyana.

Topographical Region	Area (hectares)	% Total
Coastal Plain	1,553,683	7.2
Forest	17,798,423	82.8
Savannah	2,145,557	10
Total	21,497,663	100

Source: Lands and Surveys Department, Ministry of Agriculture, Guyana: 1980.

Table I.2. Agricultural contribution to GDP in Guyana in 1993.

Year	GDP at factor cost	Contribution by agriculture	%
1982	890	220	24.7
1983	804	208	25.9
1984	845	200	23.7
1985	829	215	25.9
1986	831	223	26.8
1987	805	218	27.1
1988	785	198	25.2
1989	751	198	26.4
1990	726	165	22.7

Source: The State Planning Secretariat, Georgetown, Guyana: 1993.

Table II.1. Marketing and technology institutions and programmes in Guyana in 1970-1993.

Institutions & Programmes	Description	Product Orientation	Type of Extensions				Orientation by Size of Producer			Gender Orientation
			Research & Development	Training & Extensions		Large	Medium	Small		
				Production	Marketing				Post-harvest Manufacturing & Food Processing	
I. PUBLIC INSTITUTIONS A. Ministry of Agriculture PROGRAMMES										
o Tapacuma Irrigation Project	D&I to benefit: 57,000 acres	a - Rice b - Other Crops				✓	✓	✓		
o Black Bush Polder Irrigation Project	58,000 acres	a - Rice b - Other Crops				✓	✓	✓		
o Mahaica Mahaicony Abary Water Control Project	37,000 acres	a - Rice b - Other Crops		✓		✓	✓	✓		
o Food Crop Production & Marketing Programme	Increase Food Production in 5 Administrative Regions	a - Other Crops								
1. National Agricultural Research Institute PROGRAMMES										
o Tissue Culture	General Improvement of Plant Propagation Material	Rice, plantains, pineapples, cassava & sweet potato	✓							
o Seed Propagation			✓							
o Variety Development			✓							
o Soil Development			✓							
2. National Dairy Development Programme PROGRAMME										
o Dairy herd improvement	Increase Milk Production	Milk		✓		✓				
o Pasture Development										
										NOT STATED

Institutions & Programmes	Description	Product Orientation	Type of Extensions				Orientation by Size of Producer			Gender Orientation
			Research & Development	Production	Marketing	Post-harvest Manufacturing & Food Processing	Large	Medium	Small	
<u>3. Extension Division</u> PROGRAMME o Crop & Livestock Development		Crops other than sugar	✓							
<u>B. Ministry of Education</u> <u>1. Guyana School of Agriculture</u> PROGRAMMES o Diploma in Agriculture o Certificate in Agriculture	2 year practical & theoretical programme	N/A	✓	✓	✓					
<u>2. University of Guyana Faculty of Agriculture</u> PROGRAMME o Degree in Agriculture	4 year practical & theoretical programme	N/A	✓		✓					
<u>3. Carnegie School of Home Economics</u> PROGRAMME o Food Preservation Course	Short & long courses in varying fields	Rice, cassava, fruits & vegetables			✓					
<u>C. New Guyana Marketing Corporation</u> PROGRAMMES o Identification & Acquisition of Export Markets	Market surveys & price publication	Food crops (referred to as non-traditional)		✓						
<u>D. Guyana Sugar Corporation</u>										NOT STATED

Institutions & Programmes	Description	Product Orientation	Type of Extensions				Orientation by Size of Producer			Gender Orientation
			Research & Development	Training & Extensions		Large	Medium	Small		
				Production	Marketing				Post-harvest Manufacturing & Food Processing	
E. National Padi & Rice Grading Centre PROGRAMME o Grading and Marketing of Rice	Dissemination of relevant information on grading	Rice		✓		✓	✓	✓	NOT STATED	
G. Guyana Rice Milling & Marketing Authority PROGRAMME o Domestic Marketing & Milling of Rice	Negotiating contracts for rice export	Rice				✓		✓		
H. Guyana Rice Export Board										
I. Guyana Agricultural & Industrial Development Bank PROGRAMME o Rice Production Credit o Food Crop & Marketing	Participation in input acquisition	Rice and non-traditional food crops						✓ ✓	✓ ✓	

Institutions & Programmes	Description	Product Orientation	Type of Extensions				Orientation by Size of Producer			Gender Orientation
			Research & Development	Training & Extensions		Large	Medium	Small		
				Production	Marketing				Post-harvest Manufacturing & Food Processing	
II. NON GOVERNMENTAL ORGANISATIONS										
A. Caribbean Agricultural Research & Development Institute		Milk, sheep & goats	✓							
B. Inter-American Institute for Co-operation on Agriculture		Carambola, pineapples	✓	✓						
C. Social Impact Amelioration Programme										
D. Futures Fund		Rice, fish	✓							
E. Commonwealth Fund for Technical Co-operation		Rice	✓							
E. United Nations Development Fund		Rice & other crops	✓	✓						
G. International Fund for Agricultural Development		Fish	✓	✓				✓		
H. Canadian International Development Agency		Rice & other crops	✓	✓				✓		
I. Inter-American Development Bank		Rice & other crops	✓	✓				✓		
I. Institute of Private Enterprise Development										
										NOT STATED

Institutions & Programmes	Description	Product Orientation	Type of Extensions				Orientation by Size of Producer			Gender Orientation	
			Research & Development	Production	Marketing	Training & Extensions	Large	Medium	Small		
III. OTHER											
A. Rice Producers' Association		Rice									
B. Guyana Rice Millers & Exporters Association		Rice									NOT STATED

Table II.2. Breakdown of GAIBANK's lending to the agricultural sector by subsector (in G\$ millions).

Subsector	1981	1982	1983	1984	1985	1986	1987	1988	1991	1992
In/Off-Shore Fishing	0.4	0.7	0.9	1.2	1.4	1.4	1.3	2.2	5.6	13.3
Rice Investment	3.2 ³	3.3	1.6	0.9	8.7	1.1	4.4	5.0	11.5	21.0
Rice Production Credit		0.9	7.0	6.7	9.2	6.1	11.1	17.8	125.6	158.0
Sugar Cane	0.7	0.7	0.6	0.8	0.4	0.4	0.4	0.2	0.2	0.8
Crops	0.7	0.9	2.0	4.0	2.2	3.0	3.5	2.8	2.3	0.6
Tobacco	0.02	0.7	0.2	0.3	0.2	0	1.1	0	0	0
Beef	0.04	0.08	1.0	0	0.09	0	0.1	0.1	0.2	0.5
Dairy	0.3	0.2	0.8	1.8	1.3	2.0	1.2	3.9	1.3	1.3
Pigs	0.7	3.4	0.5	0.3	0.3	0.5	0.5	0.4	1.1	1.6
Poultry	1.5	1.3	0.8	0.7	0.5	0	0	1.4	9.7	11.7
Other livestock	0.1	0.2	0.2	0.04	0.1	1.4	1.3	1	1.8	1.3
Total	7.21	12.38	15.6	16.74	24.39	15.9	14.9	34.8	159.3	210.1

Source: GAIBANK.

³ Only combined figure available in 1981.

Table II.3. Size and distribution of landholdings in Guyana in 1978.

Size of farms up to (hectares)	Percentage of total farms	Percentage of total area
1.00	25.4	1.9
2.00	15.1	3.3
4.00	19.9	8.3
6.00	13.8	9.8
10.00	14.6	16.3
20.00	6.5	13.4
above 20.00	4.7	47.0

Source: Rural Farm Household Survey, 1978.

Table II.4. Distribution of farms by farm size and survey areas.

SURVEY AREA	No. of farms in various farm size groups							
	Under 0.20 hectares	%	0.20-3.9 hectares	%	4.0 hectares and above	%	TOTAL	%
EBD	280	55.7	190	15.6	32	6.3	502	100
ECD	846	35.5	1285	53.2	268	11.3	2399	100
MMA	2564	63.2	1076	26.5	418	10.3	4058	100
BBP	765	24.3	1627	51.7	760	24.1	3152	100
TOTAL	4455	44.1	4178	41.3	1478	14.6	10111	100

Source: Rural Farm Household Survey, 1993, IICA (unpublished).

Table II.5. Average size of farms in surveyed areas by land use.

	EBD	ECD	MMA	BBP	OVERALL AVERAGE
Paddy fields	0.00	4.72	17.12	4.04	9.32
Other crops	1.48	1.76	0.36	0.76	0.72
Fallow land	8.68	1.16	1.32	4.52	3.76
Planted pasture	8.00	0.48	0.12	2.92	2.64
Natural pasture	0.00	0.36	43.84	8.96	19.00
Non-agricultural land	3.44	1.12	2.52	1.00	2.24
Homestead	0.16	0.16	0.12	0.16	0.16

Source: Rural Farm Household Survey, 1993, IICA (unpublished).

Table III.1. Traditional and improved technology used on small farms.

Crop	Traditional Methods of Cultivation	Improved Technology for Crop Production
Legumes and Grasses	Seeds from the parent crop are used for replanting fields. Farmers depend upon organic manure. No strict plant spacing is done. Planting and harvesting is done by hand.	Specially selected and bred seeds are used as planting material. Seeds produce crops that are noted for resistance against pests and diseases and relatively high yields. Instead of using organic manure, farmers use inorganic fertilizers. Planting is done by hand and with the use of machines.
Orchard Crops	Most orchard crops are grown from seed selected at random. No chemicals are used and fruits produced from the parent plant are of varying sizes, shapes and quality.	Reproduction by vegetative means: budding, grafting, layering and cutting. Main advantage: offspring bears resemblance to the parent plant and there is a high possibility of producing standardized fruits. Orchard crops which are produced vegetatively come into bearing earlier than those propagated by seeds.
Cassava and Sweet Potato	Use of individual stem cuttings. No inorganic fertilizers. No strict adherence to positioning of cuttings nor to plant spacing. Planted and harvested manually.	Reproduction of planting material is by scientific means - tissue culture. Main Advantage - production of a large number of plants from one stem cutting. Planting is done with strict adherence to recommended plant spacing, positioning and time of planting.
Banana and Plantain	Reproduction is through the use of suckers. There is very little use of chemicals. No strict adherence to plant spacing.	Reproduction is similar to the traditional method, as well as through tissue culture. Improved farm practices include pest and disease control, land preparation, water control systems.
Vegetables and Vain Crops	Reproduction is from traditional varieties. Crops are usually cultivated on mounds or raised beds. There is no strict adherence to recommended plant spacing. Organic manure is commonly used. Planting, crop-care and harvesting is normally done manually.	The method of cultivation is basically the same. Inorganic fertilizers and improved varieties are used. These varieties in many instances have a shorter production cycle. Chemicals are used for pest and disease control. Planting, crop husbandry and harvesting is performed by mechanical means and manually.
Pineapple	Reproduction is through the use of parts of the plant - crowns, basal slip, side suckers. Organic manure is used. Most activities are done manually	Reproduction is through tissue culture and using parts of the plants of improved varieties. Chemicals are used for pest and disease control and ripening.

Table IV.1. Inputs commonly used on small farms.

Traditional	Improved
Land Clearing	
Fire	Weedicides
Planting Material	
Traditional seeds, stem cuttings, seedlings	Improved seeds (HYV) ¹ , propagated matter from tissue culture
Crop Protection	
Weeding, smoking, burning	Weedicides, insecticides, fungicides
Fertilizing	
Animal dung	Inorganic fertilizers, compost
Feeds	
Farm produce, household residue	Concentrates

Source: Derived.

Table IV.2. Types of inputs used in the farms surveyed in Guyana in the 1993-1994 period (by district and use by family members)

Inputs	Total no. of farms	% no. of farms	District (%)					Use by family members			
			1	2	3	4	5	Women	Men	Both	Other
Traditional Seeds	88	58.6	22.7	13.6	27.3	25.0	11.4	18.2	6.8	75.0	-
Improved Seeds	41	27.3	19.5	14.6	41.5	4.9	19.5	14.6	2.5	82.9	-
Traditional Planting material	77	51.3	10.4	31.0	10.4	32.6	15.6	26.0	5.29	68.8	-
Improved Planting material	24	16.0	-	4.0	29.0	-	63.0	16.6	8.4	75.0	-
Inorganic fertilizers	101	67.3	27.7	22.3	30.0	-	20.0	14.8	28.7	56.5	-
Organic fertilizers	28	18.6	17.9	7.1	50.0	3.6	21.4	10.7	21.4	67.9	-
Insecticide	92	61.3	28.3	14.1	31.5	12.0	14.1	19.5	47.90	32.6	-
Fungicide	10	6.6	-	20.0	60.0	10.0	10.0	30.0	70.0	-	-
Weedicide	69	46.0	18.8	37.7	17.4	5.82	20.3	21.7	60.9	17.4	-
Nematicide	4	26.6	-	-	75.0	25.0	-	50.0	25.0	25.0	-
Animal feed	84	56.0	21.4	16.7	19.1	26.1	16.7	61.9	19.0	17.9	1.2
Vaccines	9	6.0	44.4	22.2	11.1	11.2	11.1	22.2	55.6	22.2	-
Supplements	7	4.7	14.2	28.6	28.6	-	28.6	42.9	28.6	28.5	-

Source: Rural Women Food Producers Survey, IICA/IDB, 1993/1994.

HYV - High Yielding Variety

Table IV.3. Use of chemicals on farms by farm size, crop group and type of chemical in Guyana in the 1993- 1994 period.

Farm Size (ha)/Crop Type	Fertilizer		Insecticide		Weedicide	
	#	%	#	%	#	%
Vegetables						
< 0.4						
0.4 - < 2.0	50	49.0	47	46.1	19	18.6
2.0 - < 4.0	13	12.7	15	14.7	13	12.7
4.0 - < 10.0	30	29.4	31	30.4	24	23.5
10.0 and over	7	6.9	9	8.8	6	5.9
		98.0		100.0		60.7
Rice						
< 0.4	2	3.8	2	3.8		
0.4 - < 2.0	2	3.8	2	3.8		
2.0 - < 4.0	5	9.6	5	9.6	3	5.8
4.0 - < 10.0	29	55.8	29	55.8	9	17.3
10.0 and over	14	26.9	14	26.9	6	11.5
		99.9		99.9		34.6
Cassava						
0.4 - < 2.0	4	7.0	1	1.8	2	3.5
2.0 - < 4.0	3	5.3	1	1.8	9	15.8
4.0 - < 10.0					7	12.3
		12.3		3.6		31.6

Source: Rural Women Food Producers Survey, IICA/IDB 1993/1994.

Table IV.4. Instruments and equipment used on small scale farm units in Guyana.

Traditional	Improved
Land Clearing	
Fire, axe, cutlass,	Power saw (chain saw), bulldozers
Cultivation	
Shovel, hoe, spade, fork (digger), cutlass, rake	Tractor and plough, tractor and harrow
Harvesting	
Sickle (grass knife), scythe, cutlass, knife	Combine harvester
Cutting and Chopping	
Knife, hand chopper	Electric knife
Grinding	
Mortar, plate-mill (hand operated)	Hammer mill, electric mill
Cooking	
'Fire-side' (mud oven), coal-pots, pots, pans	Stoves (electric, kerosene, gas)
Drying	
Drying pans, drying floors (wooden & concrete), roofs (troolie roof) ²	Dehydrators (electric), solar dryers
Storage	
Jute bags, bins, boxes, concrete floors (loose bulk storage)	Ventilated silos
Transportation	
Horse drawn carts, canoes	Tractor and trailer, van, mini-bus, boat and engine

Source: Derived

Troolie roof - roof made out of the etc palm leaf, used for drying cassava bread in Amerindian communities

Table IV.5. Types of equipment and tools used on the farms surveyed in Guyana in the 1993-1994 period.

Equipment and Tools	Total no. of farms	% no. of farms	Survey District					Use by family members (%)			
			1	2	3	4	5	Women	Men	Both	Other
Hand tools	148	98.6	20.9	19.6	20.3	20.3	18.9	19.6	4.7	75.0	0.7
Plough	108	72.0	22.2	25.0	26.9	0.9	25.0	4.6	93.5	1.9	-
Cart	21	14.0	52.4	9.5	23.8	-	14.2	-	80.9	19.1	-
Animal power	21	14.0	52.4	-	23.8	-	23.8	-	80.9	19.1	-
Tractor	106	70.7	27.3	23.6	27.4	-	21.7	4.7	94.3	1.0	-
Trailer	32	21.3	59.4	3.1	37.5	-	-	3.1	96.9	-	-
Mechanical digger	2	1.3	50.0	50.0	-	-	-	-	100.0	-	-
Irrigation equipment	14	9.3	-	50.0	42.9	-	7.1	14.3	71.4	14.3	-
Sprayer	108	72.0	25.9	25.9	26.0	10.2	12.0	14.8	50.9	33.3	1.0
Solar dryers	1	0.6	-	-	-	100	-	-	-	-	100.0
Indigenous	3	2.0	-	33.3	-	-	66.7	-	33.3	66.7	-
Other	3	2.0	-	66.6	-	-	33.4	33.3	-	66.7	-

Source: Rural Women Food Producers Survey, IICA/IDB, 1993/1994

Table IV.6. Family member participation in agricultural (crop) production by type of activity and type of crop group - Guyana 1993-1994.

Activity	Vegetable				Cassava				Fruit				Rice			
	Women				Women				Women				Women			
	R	O.W.	F	M	R	O.W.	F	M	R	O.W.	F	M	R	O.W.	F	M
1. Purchasing/preparation of planting material	44.0	-	28.6	11.1	34.7	6.2	23.5	17.3	13.3	1.2	9.0	3.7	0	0	0	12.0
2. Land Preparation	65.3	14.8	47.6	31.7	36.0	22.2	31.2	16.5	15.3	2.5	10.8	7.8	5.3	0	3.5	11.7
3. Planting	68.0	13.6	48.9	33.3	40.7	22.2	34.2	18.9	15.3	2.5	10.8	7.8	10.7	0	6.99	11.5
4. Crop care	64.7	14.8	72.7	36.0	37.3	19.8	31.2	54.3	15.3	2.5	10.8	20.6	12.7	0	8.2	40.0
5. Purchase/use of fertilizers & chemicals	50.0	13.6	37.2	31.7	24.7	12.3	20.3	14.4	10.6	2.5	7.8	4.9	13.3	1.2	9.1	12.3
6. Harvesting	56.7	23.5	45.0	33.7	39.3	19.8	32.7	23.9	13.3	0.1	9.0	7.4	4.0	2.5	3.5	5.3
7. Post-harvest operations	48.7	23.4	39.0	26.3	38.0	21.0	32.0	23.5	12.0	0.1	8.2	6.2	1.3	0	0.9	3.7
8. Marketing	52.0	22.2	41.6	29.6	36.7	17.3	30.0	22.0	13.3	0.1	9.1	6.9	15.3	2.4	10.8	12.3

Key: R - Respondents
O.W. - Other women
F - Total female participation
M - Men

Source: Rural Women Food Producers Survey, IICA/IDB 1993/1994.

Table IV.7. Overall mean adoption levels.

	Male	Female	Area I	Area III	Project Total
No. of cases	182	12	82	112	194
Minimum score	66	76	66	70	66
Maximum score	100	98	100	100	100
Mean score	92.2	89.7	86.7	95.8	92

Source: Agricultural Technology Adoption Study, East Bank
Essequibo Development Project (unpublished).

Table V.1. Principal problems which women faced in Guyana in the 1993-1994 period.

Problems	# of Women	As % of all Resp.
Strenuous work/fetching heavy loads	40	26.67
Poor marketing facilities	17	11.33
Poor roads	18	12.00
Transportation costs	8	5.33
Input/packaging costs	23	15.33
Applying chemicals/fertilizers	9	6.00
Pest/animal damage	20	13.33
No access to land/market	2	1.33
Time/household chores	14	9.33
Poor drainage/irrigation	44	29.33
No price controls	8	5.33
No/little access to credit	3	2.00
Lack/unsuitability of equip. for women	23	15.33
No/unknown extension services	2	1.33
No/unlimited market	18	12.00
No problems	2	1.33
Unavailability of transportation	23	15.33
Theft	10	6.67
Unavailability of inputs	6	4.00
Disease/natural disaster	10	6.67
Support from Min. of Agri.	5	3.33
No electricity or water	1	0.67
Soil problems	1	0.67
Taken advantage of by middle man	1	0.67

Source: Rural Women Food Producers Survey ,IICA/IDB, 93/94.

Table V.2. Principal improvements needed for farming, marketing and processing.

Improvements Needed	# of Resp.	As % of Resp.
Improved market facilities	20	13.3
Improved drainage/irrigation	81	54.0
More readily available credit	5	3.3
Cheaper inputs: equip./chemicals	42	28.0
Restrict foreign imports	1	0.7
Improved transportation services	12	8.0
More farming equipment/spares	22	14.7
Training/crop husbandry	7	4.7
Training/processing	18	12.0
More markets (export)	27	18.0
Improved roads/dams	76	50.7
Lenient credit agencies	5	3.3
Availability of inputs	6	4.0
Better price for produce	16	10.7
Visits/extension officers	14	9.3
Improved potable water/electricity	12	8.0
Capital to expand	9	6.0

Source: Rural Women Food Producers Survey, IICA/IDB, 1993/1994.

Table V.3. Sources of water for domestic and farm use in Guyana in 1993-1994.

Source	Total		District									
	Domestic (%)	Farm Use (%)	Domestic (%)					Farm Use (%)				
			1	2	3	4	5	1	2	3	4	5
Public, piped to yard	23.3	0.6	36.7	6.7	-	-	73.3	-	-	-	-	3.3
Public, stand pipe	14.3	-	46.7	6.7	43.3	-	-	-	-	-	-	-
Public tank	6.6	-	-	-	33.3	-	-	-	-	-	-	-
Stored rain water	82.0	6.7	56.7	100.0	76.6	96.7	80.0	-	3.3	3.3	-	26.7
Private, piped to yard	2.0	-	3.3	6.7	-	-	-	-	-	-	-	-
Private catchment	3.3	2.0	-	-	-	-	16.7	-	-	-	-	10.0
River/spring/well/pond	24.0	30.0	-	6.7	1.0	100.0	3.3	-	-	36.7	90.0	23.3
Canal	32.6	62.0	50.0	73.3	36.7	3.3	-	100.0	30.0	66.7	1.0	40.0
Rainfall	-	84.0	-	-	-	-	-	76.7	96.7	83.3	100.0	63.3
Other	0.6	0.6	-	-	-	-	3.3	-	-	0.3	-	-

Source: Rural Women Food Producers Survey, IICA/IDB, 1993/1994.

Table V.4. Women's use of time on domestic activities in Guyana in 1993-1994.

Domestic Activities	Avg. hrs/week					
	District 1	District 2	District 3	District 4	District 5	Total
Prepare food	31.23	27.90	23.26	34.61	38.93	31.19
Gather firewood	5.00	6.12	2.31	2.75	8.25	4.89
Carry water	7.77	10.50	7.32	7.86	14.00	9.49
Wash clothes	7.66	10.26	5.11	5.93	8.03	7.40
Iron clothes	3.64	3.00	1.67	1.97	2.93	2.64
Clean house	11.41	9.69	7.50	7.45	10.66	9.34
Child care	21.5	23.69	10.29	19.83	51.56	25.37
Shopping	2.93	6.67	2.07	3.00	4.16	3.77
Repair house and furniture		1.00			1.00	1.00
Mend clothes	1.00	1.00	1.00	1.14	1.00	1.03
Pay bills	4.00	1.00		1.50	1.94	1.69
Clean yard	6.85	5.91	5.00	3.92	7.00	5.74
Tend garden	10.50	5.50	32.00		18.87	16.72
Transport children/others			7.00	5.00	7.90	6.63
Other		7.00				7.00

Source: Rural Women Food Producers Survey IICA/IDB, 93/94.

Table V.5. Frequency of respondents who consider farming as a business.

Farming as a Business	No. of respondents	% of all respondents
Total	150	100
Yes	146	97.33
No	4	2.67

Source: Rural Women Food Producers Survey, IICA/IDB, 1993/1994.

Table V.6. Numbers of respondents by years in farming and age group in Guyana in 1993-1994.

Years in farming	Total	Age Group (yrs)								
		15 - <20	20 - <25	25 - <30	30 - <35	35 - <40	40 - <45	45 - <50	50 - <55	55 & over
total	150	1	12	14	20	26	25	25	13	19
>2	3	1	2	-	9	-	-	-	-	-
2 - <3	1	-	-	1	-	-	-	-	-	-
3 - <5	3	-	3	1	3	1	-	-	-	-
5 - <10	20	-	6	5	3	4	2	-	-	-
10 - <20	60	-	1	7	13	16	14	4	3	2
20 & over	58	-	-	-	1	5	9	16	10	17

Source: Rural Women Food Producers Survey, IICA/IDB, 1993/1994.

Table VI.1. CARICOM selected agricultural imports in 1989 and 1990.

Produce	(a) Net Imports		(b) Imports
	1989	1990	1989
Pineapples	328.1	264.8	+ 319.4
Plantains and bananas	524.7	546.1	- 1,937.1
Dasheen and eddoes	948.7	451.2	- 4,122.0
Coconuts	591.4	642.0	+ 261.3
Cassava	283.3	0	- 8,000.4
Peppers and pimento	2,004.3	1,287.1	- 2,954.0
Citrus (excluding oranges)	152.9	105.0	+ 427.2
Oranges	1,223.9	1,243.8	- 1,432.9
Rice	41,405.3	40,506.4	+ 38,859.0

(a) Corresponds to aggregate imports of all member countries excluding Guyana.

(b) The difference between the region's aggregate imports and exports.

Note: 1990 figures exclude information from Guyana, Antigua and Barbuda. Information for Antigua and Barbuda not available.

Table VI.2. Geographic coverage and volume of exported non-traditional crops (fresh and processed) in the 1987-1992 period.

Country	1987	1988	1989	1990	1991	1992
CARICOM						
Antigua	0	4.0	4.4	4.35	15.85	0.52
Barbados	631.2	925.4	965.5	365.02	404.75	316.49
Jamaica	0	0	0.34	0	0.01	0.28
St. Kitts	0	0	0.4	0	0	0
St. Lucia	0	0.01	0.05	0	1.16	0.08
St. Vincent	0.7	0	0.23	0	0	4.31
Trinidad	174.0	162.0	42.05	616.31	766.47	616.05
Grenada	0	0	0	0.2	0.04	0
Subtotal CARICOM	805.90	1,091.41	1,012.97	985.88	1,188.28	937.73
Other						
Canada	0	4.0	31.69	10.29	25.66	57.10
Japan	0	0	0	180.31	48.20	2.15
U.S.A.	3.0	2.0	17.1	22.3	0	0
West Germany	0	0	0.45	1.34	0.21	0
Holland	0	0	0	4.55	82.4	5.46
U.K.	0	233.8	1.42	0.08	0	5.27
Surinam	0	6.59	2.77	0	0	0
France	0	0	0	0	389.0	795.3
Subtotal Other	3.00	246.39	53.43	218.87	545.47	865.28
Grand total	808.90	1,337.80	1,066.40	1,204.75	1,733.75	1,803.01

Source: New Guyana Marketing Corporation (NGMC).

Table VI.3. Value of exports of Guyanese non-traditional agricultural produce for the 1986-1990 period (in G\$ and US\$).

	1986	1987	1988	1989	1990	1991	1992
G\$ (millions)	1.1	3.4	11.0	7.6	14.6		
US\$ (thousands)	98	71	172	120	127		

Source: New Guyana Marketing Corporation and Bank of Guyana

Table VI.4. Production (volume) of selected non-traditional agricultural products (1986-1992).

Product	Unit	1986	1987	1988	1989	1990	1991	1992
Pineapple	M/T	5.3	7.9	9.9	11.2	7.6	6.5	8.8
Cassava	M/T	13.2	11.0	7.4	5.4	6.4	6.4	
Coconut	millions of nuts	51.0	45.4	45.3	48.6	48.7	54.6	25.2
Bora		n.a	n.a	n.a	n.a	n.a	2.4	2.6
Plantain	M/T	20.8	22.4	22.7	22.3	13.0	13.0	13.0
Watermelon		n.a	n.a	n.a	n.a	n.a	1.9	1.7
Blackeye peas		n.a	n.a	n.a	n.a	n.a	0.45	0.44
Cassava	M/T	44.5	50.3	16.0	12.0	10.7	13.7	13.3
Ochro		n.a	n.a	n.a	n.a	n.a	1.3	1.5

Source: Ministry of Agriculture

Table VI.5. Annual average wholesale price (G\$/kg).

Product	1986	1987	1988	1989	1990	1991	1992
Cassava	1.56	1.67	1.53	6.22	15.04	18.91	19.71
Plantains	2.13	1.96	3.91	8.13	10.51	19.73	18.47
Ochro	3.13	3.51	4.89	9.11	20.31	19.87	35.44
Blackeye peas	23.56	22.42	32.91	70.31	73.71	115.47	141.98
Watermelon	3.51	3.87	6.31	8.64	16.53	28.49	40.33
Pineapple	3.02	1.31	5.56	6.29	10.87	25.96	35.18
Bora	7.11	8.44	12.51	22.38	35.96	39.78	63.98
AVERAGE EXCHANGE RATE G\$: US\$							
	4.27	9.76	10.0	27.16	39.53	118.80	126.00

ANNUAL AVERAGE PRICE US\$/kg

Product	1986	1987	1988	1989	1990	1991	1992
Cassava	0.36	0.17	0.15	0.23	0.38	0.16	0.16
Plantains	0.50	0.20	0.40	0.30	0.27	0.17	0.15
Ochro	0.73	0.36	0.49	0.34	0.51	0.17	0.28
Blackeye peas	5.52	2.30	0.33	2.59	1.86	0.97	1.13
Watermelon	0.82	0.40	0.63	0.32	0.42	0.24	0.32
Pineapple	0.71	0.13	0.56	0.23	0.27	0.22	0.28
Bora	1.67	0.86	0.13	0.82	0.91	0.33	0.51

Source: New Guyana Marketing Corporation, 1993.

Table VI.6. Selected crops that are produced and marketed in small farms by women in Guyana.

Crop Type	# of farm prod.	%	# of farms mark	% of resp. that market	%
1. Bora	47	31.3	43	76.7	91.5
2. Cabbage	8	5.3	8	62.5	100.0
3. Egg plant	10	6.7	10	80.0	100.0
4. Okra	37	24.7	32	81.2	86.5
5. Squash	13	8.7	13	76.6	100.0
6. Pumpkin	16	10.7	16	81.2	100.0
7. Banana	18	12.0	17	64.7	94.4
8. Eddo	31	20.7	31	66.6	100.0
9. Cassava	57	38.0	55	63.6	96.5
10. Coconut	10	6.7	9	66.6	90.0
11. Plantain	16	10.7	15	73.6	93.7
12. Cucumber	21	14.0	19	83.3	90.5
13. Pak-choi	14	9.3	14	80.0	100.0
14. Hot pepper	3	2.0	3	66.6	100.0
15. Carambola	5	3.3	5	33.3	100.0
16. Orange	6	4.0	6	50.0	100.0
17. Coffee	5	3.3	5	60.6	100.0
18. Pineapple	6	4.0	6	85.7	100.0
19. Rice	6	4.0	6	22.5	100.0

Source: Rural Women Food Producers Survey, IICA/IDB, 1993/1994.

Table VII.1. Artisan/agro-industrial activities in the farm in Guyana in 1993-1994.

Dist.	No. of farms			Origin of Basic Inputs									
		% per dist.	% no of farms surveyed	Physical Inputs			Labour						
				Farm only %	Farm & purchased	Purchased only (%)	Production			Marketing			
							Res p	Other women	Other family members	Res p	Other women	Other family members	
1	-	-		-	-	-		-	-	-	-	-	-
2	-	-		-	-	-		-	-	-	-	-	-
3	-	-		-	-	-		-	-	-	-	-	-
4	12	46.7	8.0	100	-	-	100	-	-	100	-	-	-
5	4	13.3	2.7	100	-	-	100	-	-	100	-	-	-
Total	-	-	10.7	-	-	-	-	-	-	-	-	-	-

Source: Rural Women Food Producers Survey, IICA/IDB, 93/94

Table VII.2. Processed crops and gender orientation.

CROP	PRODUCT	Gender Orientation	
		M	F
1. Carambola	Dried carambola, carambola juice		x
2. Guava	Jams, jellies, and guava cheese		x
3. Papaw	Candied papaw, and puree		x
4. Tamarind	Shelled tamarind and syrup		x
5. Bilimbi	Hot sauce and pickles		x
6. Nuts	Salted, parched	x	
7. Coconut	Coconut oil, copra, brooms	x	
8. Mango	Achar, syrup		x
9. Ginger	Dried ginger	x	x
10. Coffee	Dried coffee beans		x
11. Pepper	Pepper sauces Dried pepper	x x	x x
12. Pigeon peas	Dried peas		x
13. Blackeye peas	Dried peas		x
14. Black pepper	Dried pepper	x	x
15. Herbs (thyme, shallot, etc)	Dried thyme		x
16. Cassava	Cassava bread Cassareep Starch		x x x
17. Plantain	Plantain chips Plantain flour	x	x
18. Fish	Dried fish Salted fish	x x	x x
19. Shrimp	Dried shrimp	x	x
20. Tumeric, etc.	Dried	x	x

Source: Developed from survey findings and interviews with food processors.

**Specific Processing Activities on Small Production Units
and Gender Orientation of Activities**

Table VII.3. Stages in the production od dried carambola.*

1. Product Dried carambola.
 2. Duration of processing Approximately 5-7 days.
 3. Drying method Osmotic drying with the use of sugar and sunlight.

Activity	Gender Orientation	
	M	F
Selection and sorting		x
Washing	x	x
Peeling and cutting		x
Preparation of syrup (boiling)		x
Straining		x
Drying		x
Supervision of drying		x

Table VII.4. Stages in the production of coconut oil.*

1. Product Coconut oil.
 2. Duration of processing 2-4 days.
 3. Drying method.....Oil is made by two methods: either by adding water to the grated meat and then boiling, or by crushing and extracting the oil from the dried copra.

Activity	Gender Orientation	
	M	F
Picking	x	
Drying	x	x
Peeling	x	x
Grating		x
Squeezing and crushing	x	x
Straining		x
Boiling	x	x
Bottling		x

* Source: Derived.

Table VII.5. Stages in the production of cassava bread.

1. Product Cassava bread.
2. Duration of processing 2-3 days.

Activity	Gender Orientation	
	M	F
Reaping	x	x
Washing		x
Peeling	x	x
Grating		x
Squeezing		x
Sifting		x
Baking		x

Source: Derived .

Table VII.6. Stages in the production of cassava cassareep.

1. Product Cassava Cassareep.
2. Duration of processing 3-4 days.

Activity	Gender Orientation	
	M	F
Reaping	x	x
Washing	x	x
Peeling	x	x
Washing		x
Grating		x
Squeezing		x
Boiling		x
Straining		x
Mixing		x
Bottling		x

Source: Derived.



APPENDICES



APPENDIX 1

SURVEY AREA PROFILES

CANE GROVE SUB-AREA PROFILE

Definition of Sub-Area

The area centers around the Mahaica village, at the junction of the Mahaica River and the main public road in Region 4. Cane Grove is located on the east coast of Demerara; approximately 35 miles east of the sub-area is the Mahaica River.

To the north, a limit of approximately 1.9 miles north of the Mahaica Bridge has been defined (this follows an old property line). The sub-area extends south approximately to the East Demerara Water Conservancy.

The area is estimated to consist of approximately 8,320 acres.¹

General Features

Topography

The area is generally quite flat, with gentle slopes of 2 to 3%. Elevation is low, below sea level, and protected by sea walls along the coast.

In spite of an intricate network of drainage canals, drainage is still considered to be a major problem (during Nov-Dec, 1993, flood was experienced).

Soils

The three basic soils types are Mara clay, Onverwagt clay and sandy loam. These soil types have great water retention capabilities, thus the need for adequate drainage.

The clayey soils are suited for rice and pasture cultivation (however, with the use of fertilizers), while the sandy loam provides an excellent base for the cultivation of ground provisions, vegetables, and coconuts.

Climate

The climate is tropical, characterized by high temperature and humidity. Average rainfall is 100" per year. Two distinct rainy seasons are May-June and Nov-Jan.

¹ Based on a 1988 1:50000 scale map - Govt of Guyana (sheet 21 SW Series E791 (DOS 44))

Natural Vegetation

There is little natural vegetation left. Most of the original vegetation consisted of water-tolerant forests. The original vegetation has been cleared and uncultivated areas are now inhabited by secondary bushes, such as matt grass, razor grass, and bechnum fern.

Institutional Profile

The Cane Grove sub-area (sub-region) is administered by the Regional Democratic Council, a political body.

The Regional Administration is the operating arm for public services. The main areas under its purview are, health, education and drainage and irrigation. Each is headed by a civil servant who reports directly to the Administration.

There are two main local authorities in the region: the Cane Grove Land Development Authority and the Mahaica/Unity Local Authority. These are autonomous bodies, with their own administrative structures. They have the authority to levy taxes in their areas and to undertake maintenance and improvement works on D&I facilities, and to some extent, roads.

However, the split in jurisdiction between the Regional Administration and the local authorities is somewhat confusing and in some respects dictates against comprehensive, area-wide development.²

Population

The 1980-1981 census of Guyana indicates that 12 minor census divisions cover this sub-region (no census maps available). Cane Grove village has the highest population (22%). Most of this area's economically active population is engaged in farming.

Economic Activity

The Cane Grove sub-area is almost exclusively agricultural in character. There are a few shops, transportation facilities, etc.

Land Use

This sub-area covers approximately 3.237 hectares. However, a recent study conducted by Jacfor Management Services estimated a total of 2.886 hectares. Some 90% of all the land in

² The regional structure is currently under review by the Guyana Government.

the sub-area is used for agricultural purposes. The 145.3 hectares indicated as not utilized are located mainly in the back areas south of Cane Grove village, where access is very difficult. (People in this area rely on river transport.)

Agricultural Activity

Rice

Rice is the predominant crop. Over the last 6 years, an average of about 3,000 acres has been cultivated. The crop is planted twice yearly (autumn and spring).

Land preparation for the spring crop usually begins in the latter part of the preceding year, with harvesting occurring around the fourth or fifth month.

Preparation of land for the autumn crop begins as soon as possible after harvesting of the spring crop. (Sometimes land preparation and harvesting occur simultaneously.)

The spring crop is generally more productive; not only are more acres sown, but the yield tends to be somewhat higher. Between 1988 and 1993, an average of 3,130 acres will be sown, with the spring crops producing an average of 24.47 bags/acre and the autumn crops producing 19.78 bags/acre, i.e., 60.5 bags/ha and 48.88 bags/ha for the spring and autumn crops, respectively. (The annual average is about 22 bags/acre.)

Yields over the years 1988-1993 have varied from a low of 16.2 bags/acre (40.03 bag/ha) to a high of 26.27 bags/acre (64.9 bags/ha.)

Fruits

Most of the fruit trees are permanent crops and harvesting is performed throughout the year. (Estimates of fruit crop production are not available.)

Vegetables

Cash crops consist of black-eye peas, bora, tomatoes, boudanger, pepper, pumpkin, cucumber, ochro, squash, cassava, and sweet potatoes.

Bora, cassava, squash, and cucumbers occupy most of the acreage occupied by these crops. Full data on cultivated acreage is not available.

Vegetable cultivation normally follows a three-crops-a-year pattern; however, crop rotation is quite prevalent on homestead, allowing for up to four crops per year in some cases.

Table 1. Human resources.

Area	Male	Female	Total
Good Hope	363	378	741
Helena #1 and #2	754	724	1478
Belmonte	569	554	1123
Supply	407	397	804
Vereeniging	441	477	918
Mary's Hope	24	28	52
Joyce Phillips Alliance	9	11	20
Strathaven	135	126	261
Bagatelle	229	227	456
Upland-Retreat	9	11	20
Virginia	372	359	731
*Cane Grove	940	925	1865
Total Population	4248	4215	8463

*Cane Grove has the highest population density in the area (22%). The population of this area represents 1.1% of the national population.

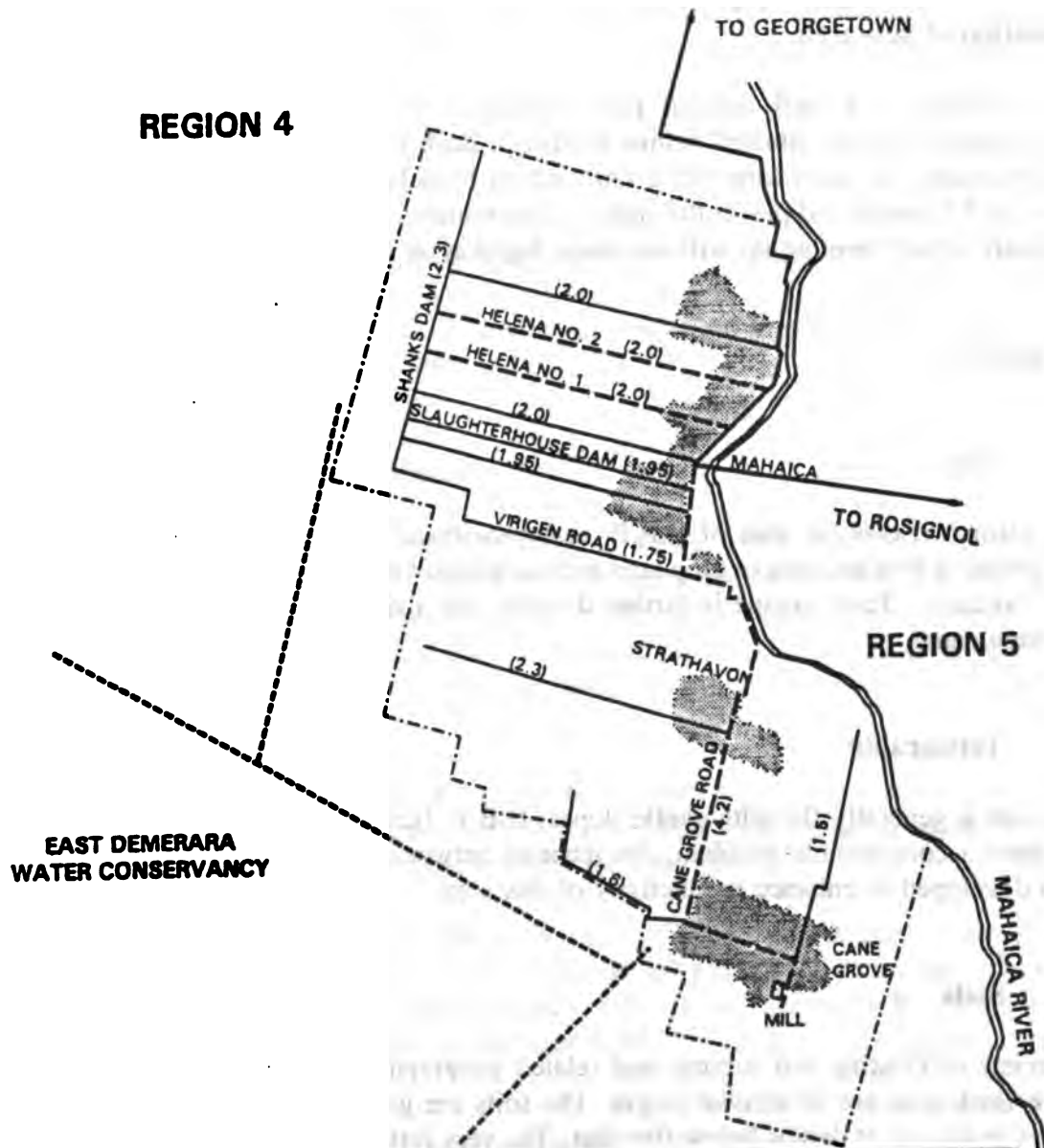
Table 2, Land use.

Type of Activity	No. of hectares	% of Total
Rice cultivation	1821.2	62
Coconut cultivation	143.3	5
Other crops	639.0	22
Livestock	20.2	0.6
Residential	117.4	4.4
Not utilized	145.3	5
TOTAL	2886.4	100

Source: Cane Grove Land Development Authority (As developed by Jacford Management Services)³.

³ The Consultant is a principal director of Jacford Management Services.

CANE GROVE SUB-REGION



LEGEND	
MAIN ROAD	—————
FEEDER ROAD	- - - - -
ACCESS DAM	—————
PROPOSED ROADS
CANAL	- - - - -
AREA OF INFLUENCE	- · - · -
BUILT UP AREA	· · · · ·
APPROXIMATE MILEAGE	(2.2)

REGION 4	
SUB-REGION:	CANE GROVE
AREA OF INFLUENCE :	8,320 ACRES
LENGTH OF ROADS :	
MAIN :	1.9 MILES
FEEDER :	8.2 MILES
ACCESS DAM :	17.35 MILES
PROPOSED :	0.0 MILES

BLACK BUSH POLDER (B.B.P.) SUB-AREA PROFILE

Definition of sub-area

This sub-area is a well defined part of Region 6. (See Map 3 attached.) It is a Land Development Scheme situated behind the Black Bush Frontlands. The area falls around a road approximately 22 miles long (35.2 km), which branches off the Main Corentyne Highway at Hogstye/Adventure and passes through the communities of Lesbeholden, Mibikuri, Johanna, and Yakusari before meeting up with the main highway at Jappa.

Geography

Size

It is estimated that the area of B.B.P. is approximately 63,500 acres (25,698 hectares). It is comprised of four sections of crop land and associated villages - Lesbeholden, Mibikuri, Johanna and Yakusari. Each village is further divided into a north and south portion, separated by a drainage canal.

Topography

The area is generally flat with gentle slopes. B.B.P. lies below sea level and therefore drainage has been a considerable problem. An intricate network of drainage and irrigation canals, has been developed to enhance productivity of this area.

Soils

A review of existing soil surveys and related geographical studies shows that the soils of the Black Bush area are of alluvial origin. The soils are generally deep clays which may become lighter in texture at depths below five feet. The very fertile soils of this area makes it one of the most productive areas in the country. Considerable extension efforts have been made, and good soil management techniques have attributed to the area's productivity.

Climate

The climate is tropical. Average rainfall is 100 inches annually. Like the other areas of Guyana's coastal plain, there are two distinct wet and dry seasons, the wet seasons being May/June and November/January.

Natural Vegetation

There is little natural vegetation left. Most of the original vegetation consisted of water tolerant forests. The original vegetation has been cleared and uncultivated areas are now inhabited by secondary growth.

Institutional Profile

Being a part of Region 6, Black Bush Polder falls under the administration of the Regional Democratic Council (RDC) of Region 6 (a political body). The main areas under the purview of the Regional Administration are health, education, drainage and irrigation. Agriculture does not come under the Regional Administration.

Settlement Patterns and Land Distribution

The project was originally laid out for the settlement of 1,441 families - 1,201 each with an allocation of an approximately 15-acre rice plot and a 2.5-acre homestead plot, and 240 family units with an allocation of 7.5-acre farm plot (for the cultivation of crops other than rice) in addition to the normal 2.5-acre homestead plot. Homestead plots which are in the central area of each settlement are grouped around an area set aside for community purposes (known as community zones).

These zones have been provided to allow each settler to establish his residence and utilize family labour to fully cultivate these integral units with vegetables and some perennial crops, as well as poultry and a limited number of dairy cattle under the byre system.

It must be noted, however, that during the early days of settlement in the Polder "racial problems" between Guyanese of African descent and East Indian heritage encouraged the Land Development Officer to re-allocate the Afro-Guyanese into one section of the Polder - Zambia at Mibikuri. Several 15-acre paddy plots in this area were divided into 2.5-acre plots for the displaced families.

Most of the people at Zambia are engaged in non-farm operations. However, some of the families have been producing vegetables and fruits on the homestead, and a few operate paddy plots.

Land Tenure

The method of tenure is leasehold: a lease is issued to each bona fide settler for 25 years with a right of renewal for a similar period to approximately revised terms and conditions ad-indefinitum. The first set of leases were delivered on July 28, 1967. The lease is a sound title to the land.

Economic Activity

The B.B.P. area is entirely agricultural in character. The polder was developed primarily for agricultural purposes and nothing else has developed of any significance in the sub-area. The only non-agricultural activities are small service fixtures, such as shops.

Population

The 1980-81 population census of Guyana indicates that four minor census divisions cover the B.B.P. area. (In the absence of census maps, it is not clear how closely the census boundaries and the above defined area conformed.).

However, it is felt that the census figures give a fairly accurate indication of the sub-area's population. According to the 1980-81 and 1990-91 census, the population is indicated in Table 2.

Agricultural Activity

As is evident, rice is the predominant crop. Over the last six years an average of 34,000 to 35,000 acres was cultivated, or about 80% of the designated land for rice cultivation. The crop is cultivated twice per year (spring and autumn).

Land preparation for the spring crop usually starts in the latter part of the preceding year, with harvesting occurring around the fourth and fifth month. Preparation of land for the autumn crop begins as soon as possible after harvesting of the spring crop.

Cash crops consist of blackeye peas, bora, tomatoes, boullanger, pepper, pumpkin, cucumber, ochro, squash, carilla, cassava, and sweet potatoes.

Bora, cassava, squash, and cucumbers occupy most of the acreage devoted to these crops. Full data on cultivated acreage is not available.

It is inaccurate to use land allocated for agricultural use as a basis for data collection on "other crops" production. This is because of the prevalent "illegal" cultivation of crops (other than rice) on the banks of canals and along roadways throughout the Polder.

Some fruit is harvested but detailed statistics are not available. Vegetable cultivation normally follows a three-crop-a-year cycle.

Generally, the lowest harvesting season is the September/October period, which is directly linked to low rainfall.

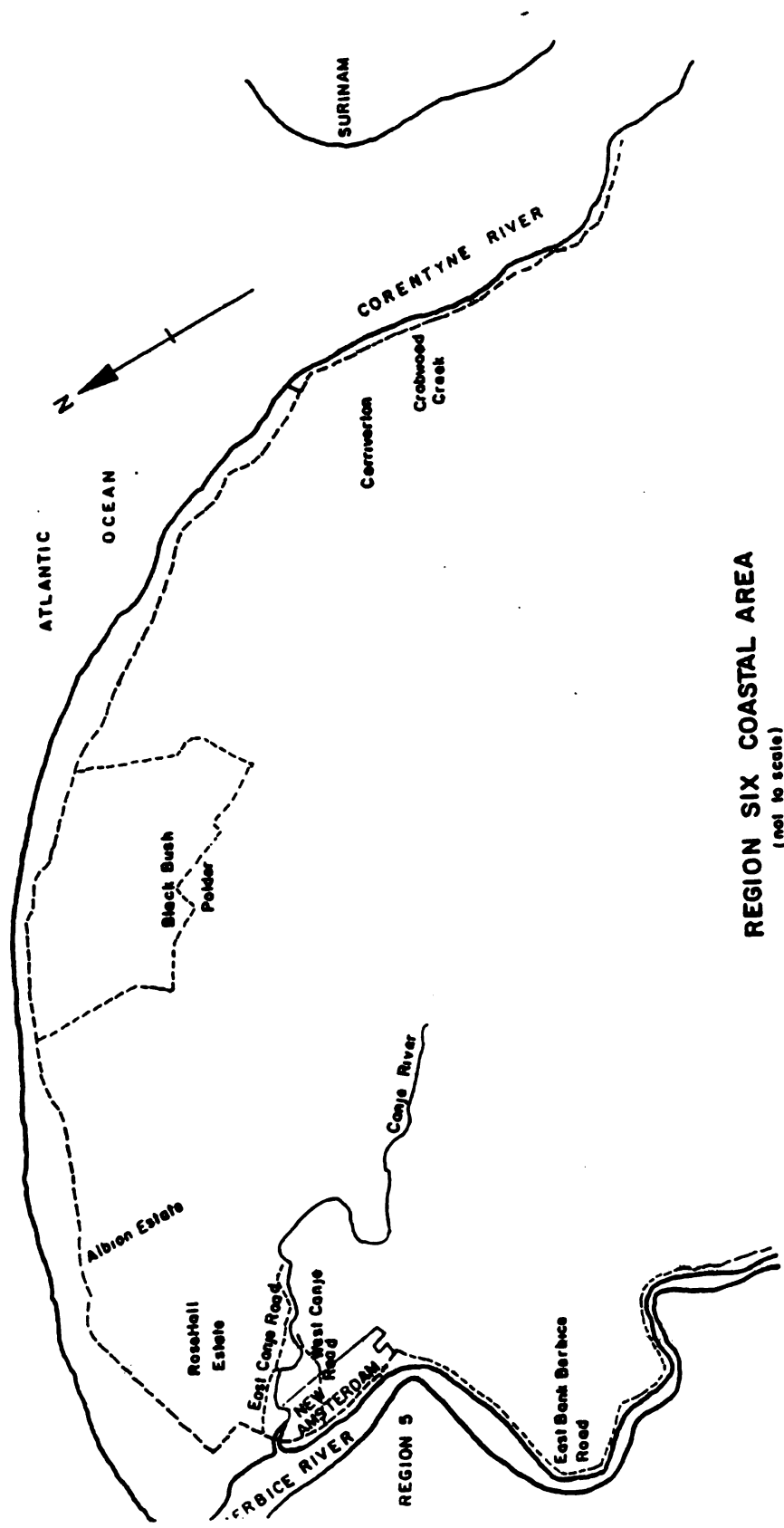
Table 1. Land use.

Available for Cultivation	Acres Cultivated	% Cultivated	% Not Cultivated
Rice - 43,000	34,500	80.0	20.0
Coconut - 2,000	1,300	65.0	35.0
Others - 3,000	1,900	65.0	35.0
Total - 48,000	37,700	78.6	21.4

Table 2. Population of Black Bush Polder.

Area	Population 1980-81 census	Population 1990-91 census
Lesbeholden	2021	1405
Mibikuri	3205	2153
Johanna	1790	1594
Yakusari	2242	1952
Total	9258	7104

Source: 1980-1981 Population Census for the Commonwealth Caribbean, Volume I
1990-91 Population figures are unpublished data obtained directly from the Bureau of Statistics.



REGION SIX COASTAL AREA
(not to scale)

POMEROON SUB-AREA PROFILE

Short Historical Background

Pomeroon experienced settlement by the Dutch, English, and Portuguese during the period of the European advent to the West Indies. The English were the last of the colonial rulers. During this period, the Portuguese, who prior to English rule, were dominant in the Pomeroon, sold their holdings or abandoned them and migrated. As a consequence East Indians and Afro-Guyanese are the two dominant races. Guyana's indigenous people, the Amerindians, also form a significant part of the population.

Most of the main crops, especially coffee and cocoa, were introduced in the area by the earlier settlers.

Definition of Area

This area is in Sub-Region 1 of Administrative Region 2 - Pomeroon/Supernaam. It lies 50° 50' W longitude and 7° 30' N latitude. It is bounded to the north by a portion of Region 1 (Barima/Waini) and the Atlantic Ocean; to the south by Sub-Region 2 of Administrative Region 2; to the east by the Atlantic Ocean and to the west by the Barima/Waini Region. Travellers to the Pomeroon can get to their destination via the Essequibo Coast roadway or the Atlantic Ocean.

Geography

Topography

Areas along the banks of the Pomeroon River are basically flat lands, with the exception being the areas along the banks in the upper reaches of the river, which are hilly. Inland of the river bank the land becomes hilly. Large areas of swamp lands abound the Pomeroon, especially along the creeks leading to Wakapoa, Akawini, and Manawariri.

Soil type

Soil types vary from area to area but the most dominant is pegasse. There is also clay, sand, loam, and combinations of these.

Drainage and irrigation

The entire land is drained and irrigated by gravitational flow through the Pomeroon River into the Atlantic Ocean. Because Pomeroon is not within any land development scheme or local authority, each farmer is therefore responsible for the drainage and irrigation of his individual plot.

Government contribution to drainage and irrigation in the Pomeroon is, however, evident with the excavation of the Aberdeen/Cozier cross canal. Connected to this canal are the Aberdeen, Hackney, Friendship, Dublin, and Cozier Canals, which drain the respective areas into the Pomeroon River. Maintenance of these canals, though, is subject to much criticism.

Amerindian Reservations

There are six Amerindian Reservations in the Pomeroon area:

- | | |
|------------------|------------------------------------|
| (i) Karawab | (ii) Kairimap (St. Monica) |
| (iii) Kabakaburi | (iv) Akawini |
| (v) Wakapoa | (vi) Manawariri (southern portion) |

Institutional Profile

The Administrative body of Region 2, which comprises the Regional Chairman, Regional Vice-Chairman, Regional Executive Officer, two Deputy Regional Executive Officers and an Assistant Regional Executive Officer, along with the Councillors, has the responsibility of managing the affairs of the Pomeroon. However, coordination of all activities within the Pomeroon is undertaken by the District Development Officer, who reports to the Chairman and the Councillors.

Economic Activity

The main economic activities undertaken are fishing and hunting, logging, indigenous crafts manufacturing, labouring, and farming. The latest figures from the crop reporting section of the Ministry of Agriculture, Region 2, reveal the following:

Land Use

According to information obtained from the Ministry of Agriculture, Charity Pomeroon (see Table 1), approximately 72% of the land is cultivated in coconuts. Coffee and citrus account for the next two crop types with seven and five percent of the total area cultivated. Total acreage devoted to carambola was difficult to ascertain; however, farmers responded quite positively to government's call in the 1970s to replace commodities which were at that time restricted. As a result, the substitution of imported raisins and prunes by dried carambola (with sugar), coupled with plans to locate a wood processing plant at Charity, influenced the cultivation of large acreages of this crop.³

³ Production figures from the Ministry of Agriculture, Guyana, reflect total carambola production in 1991 as 2265 kgs; in 1992, 2467 kgs. An estimated 90% of the country's production is from the Pomeroon River.

The most recent Farm Household Survey of 1978 indicates that approximately 44% of total farmland is occupied by farms less than 5 hectares in size, and 60% less than 10 hectares. This is an indication of the significant percentage of farms that may be classified as small and medium sized units.

Table 1. Average acreage and annual production per crop in Pomeroon.

Main crops	Acreage (average)	Average Annual Production (lbs)
Coconut (i) Dry	8.000	15.000.000
(ii) Water		2.500.000
Coffee	800	244.900
Citrus (orange)	600	2.150.000
Plantain	550	1.000.000
Banana	550	1.800.000
Pear (avocado)	60	687.000
Ground provision (includes cassava)	460	2.612.890
Carambola ⁴	N.A.	N.A.
Total	11.200	25.994.790

Source: Ministry of Agriculture, Charity.

Table 2. Farm size distribution (ha) in Pomeroon.

Size	No. of farms	%
Less than 1.01 ha	2	2
1.01 - 1.98	7	8
1.98 - 3.64	12	14
3.64 - 6.03	17	20
6.03 - 10.07	14	16
10.07 - 20.23	17	20
20.23 - 40.43	10	12
40.43 - 80.90	3	3.5
80.90 >	4	4.5
TOTAL	86	100

Source: Guyana Rural Farm Household Survey, 1978.
Converted to hectares; 1 acre = 0.4047 ha

CANAL # 1 and 2 SUB-AREA PROFILE

Definition of Survey Area

The Canal # 1 and 2 sub-area is found on the eastern side of Region 3, extending from the West Bank of the Demerara River.

It is bound on the north by a line extending east-west approximately 0.75 miles north of Independence Street.

This extends west to Boerasirie Conservancy Canal and then to a point south of the Canal #2 Road. The eastern boundary is the north-south Vreed-en-hoop Patentia main public road.

This area is scaled off a 1988 1:50,000 topographical map published by the Lands and Surveys Department, Ministry of Agriculture, Guyana.⁵

Map #4 gives an idea of the area, as defined above.

Geography

Size

It is established that the area covers approximately 27,800 acres.

Topography

The area is quite flat - like most areas on Guyana's Coastal Plain, drainage and irrigation is of critical importance. The area is furnished with an intricate network of drainage canals.

Soils

Soils are very fertile, predominated by pegasse and clayey soils.

Climate

The climate is tropical, characterized by high temperatures and humidity. Average rainfall is almost 100" per year. There are two distinct wet and dry seasons; the wet seasons are May-June and November-January.

⁵ Adapted from The Canadian Engineering Company Road Feasibility Study: 94 (unpublished)

Natural Vegetation

There is very little natural vegetation left. Most of the original vegetation consisted of water tolerant forests. The original vegetation has been cleared and any uncultivated areas are now inhabited by secondary bushes.

Institutional Profile

The survey area is part of Region 3, which is administered by the Regional Democratic Council, a political body. Administratively, there is a Regional Executive Officer (REO), who is a civil servant. The Regional Administration is the operating arm for the public services in the Region and the REO and his staff are responsible for supervising and executing public works in the area.

The main areas controlled by the Regional Administration are health, education, drainage, and irrigation. Each is headed by a civil servant who reports directly to the REO. Agriculture no longer comes under regional authority.

Population

The 1980-81 population census of Guyana indicates that 14 minor census divisions are located within the Canal # 1 and 2 sub-region; however, it is not clear how much the census boundaries conform to the defined boundaries in "Definition of Survey Area."

However, it is felt that the figures quoted below will give a sufficiently fair indication of the population in this area.

Table 1 indicates the population in the Canal # 1 and 2 according to 1980-81 and 1990-91 censuses.

Settlement Pattern

As is generally found on the coastal plain, the settlement pattern is linear along the major roadways. This is usually only one house or two houses deep. One village often runs into the next with no visible physical break between them.

Economic Activity

The area (Canal # 1 and 2) is almost exclusively agricultural in character. Apart from that, service economic activities, such as shops, etc., can be found along the main public road.

Land Use

The area covers approximately 12,646 hectares. Exact estimates for land use within the defined sub-region are not available. However, from the regional profile and from local sources, it is possible to develop an estimated profile. This is outlined in Table 2.

Approximately 90% of the land is used for agricultural purposes. Unutilized lands are not accessible and located a back of the major farming areas.

Agricultural Actiuity

Sugar

Approximately 95% of the land available for sugar cane cultivation is currently utilized. A large sugar estate (Wales Sugar Estate) dominates the area's sugar production. There are a number of independent and cooperative sugar cane farmers in the area; however, their crop is processed through the Wales Estates.

Rice

Rice is grown in the sub-area (although in the survey areas "proper" no rice is cultivated). Cultivation follows the general pattern in Guyana, i.e., the establishment of two crops. - spring and autumn. The spring crop is generally more productive; not only are more hectares cultivated, but yields tend to be higher.

Other crops

Cash crops consist of blackeye peas, bora, tomatoes, boulanger, pepper, pumpkin, cucumber, ochro, squash, carilla, cassava, and sweet potatoes.

Bora, cassava, squash, and cucumbers dominate most of the land devoted to these crops. Accurate data on the area with these crops are not available.

Fruit trees and coffee also contribute to the total area under "other-crops".

The cultivation of vegetables normally follows a three-crop-per year pattern. The lowest harvesting periods are May/June and Sept/Oct.

Table 1. Canal roads 1 and 2 population.

Minor Census Division	1980-81 Population	1991 Population
La Grange	3285	3360
Vreed en Vriendschap Java	494	447
Bagotville	1770	1652
Nismes	277	393
L'Heureuse-Mes Delices	834	797
Jacoba Constantia-Govt Lands (S)	1331	1048
Govt Lands (N)	950	852
Toevlugt	32	27
La Retraite	1856	1864
Bellevue	467	460
Middlesex/New Aanleght	1544	1238
The Buff-Mon Desir	614	706
Govt Lands (N)	1313	1058
Govt Lands (S)	932	886
Total Population	15.699	14.788

Source: 1980-81 Population Census of the Commonwealth Caribbean; Guyana; Volume 1. 1990 population figures are unpublished data obtained directly from the Bureau of Statistics.

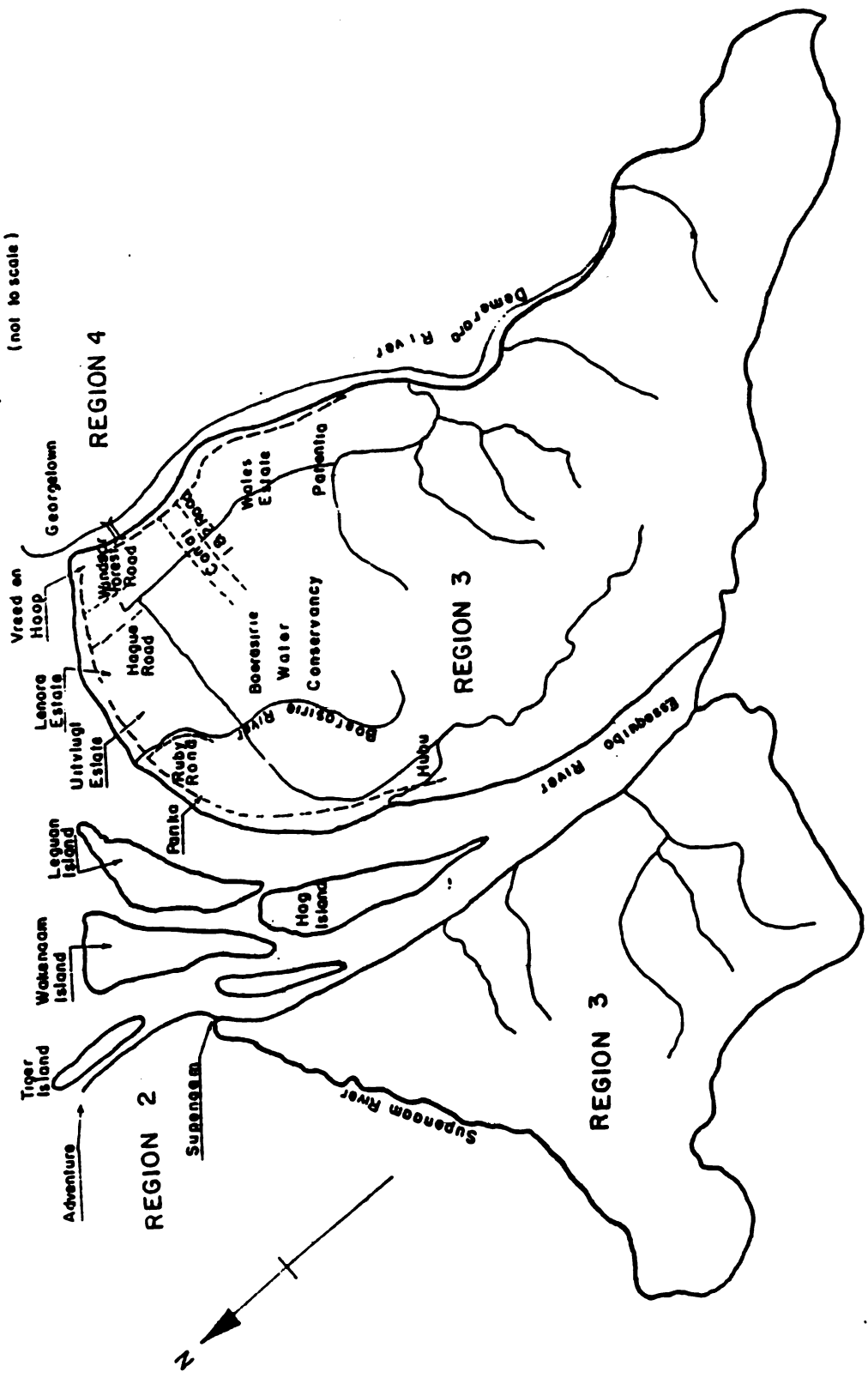
Table 2. Canal Roads 1 and 2 subregion land use.

Land Use	No. of hectares	% of Total
Rice cultivation	2150	17.00
Sugar cultivation	5790	45.00
Coconut cultivation	250	2.00
Other crops	632	5.00
Livestock	1524	12.00
Residential	1000	8.00
Industrial	125	1.00
Not utilized	1254	10.00
Total Population	12.736	100.00

Source: Developed from statistics available from crop reporters and R.A.C. Region 3

REGION THREE COASTAL AREA
(not to scale)

ATLANTIC OCEAN



APPENDIX 2

LAND TENURE

Land tenure systems in Guyana consist basically of five tenure modes:

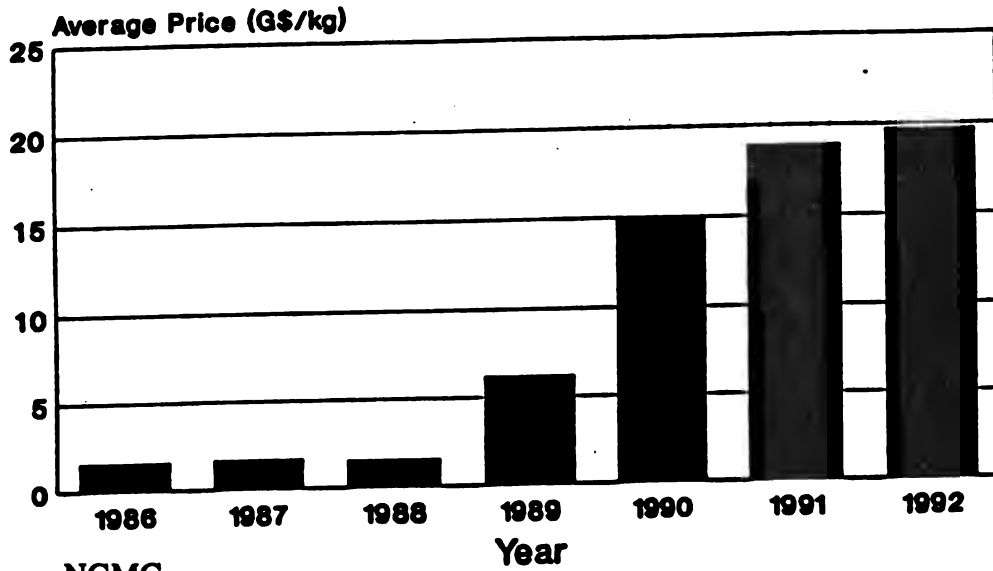
- (i) owner-operated (these include lands owned by individuals who hold title deeds to their properties**
- (ii) rental or lease of less than 21 years**
- (iii) rental or lease of 21 years or more**
- (iv) rented or leased by one person and used by others**
- (v) other types of tenancy¹**

¹ **Guyana Agricultural Sector Assessment, IICA, Guyana. 1994.**

APPENDIX 3

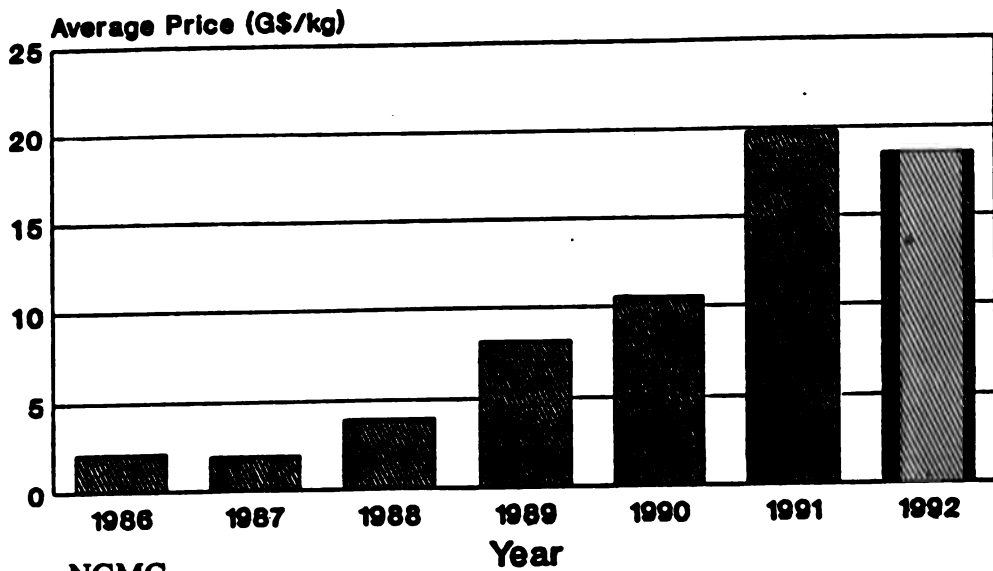
ANNUAL AVERAGE PRICES OF SEVERAL AGRICULTURAL PRODUCTS

Figure 1. Cassava



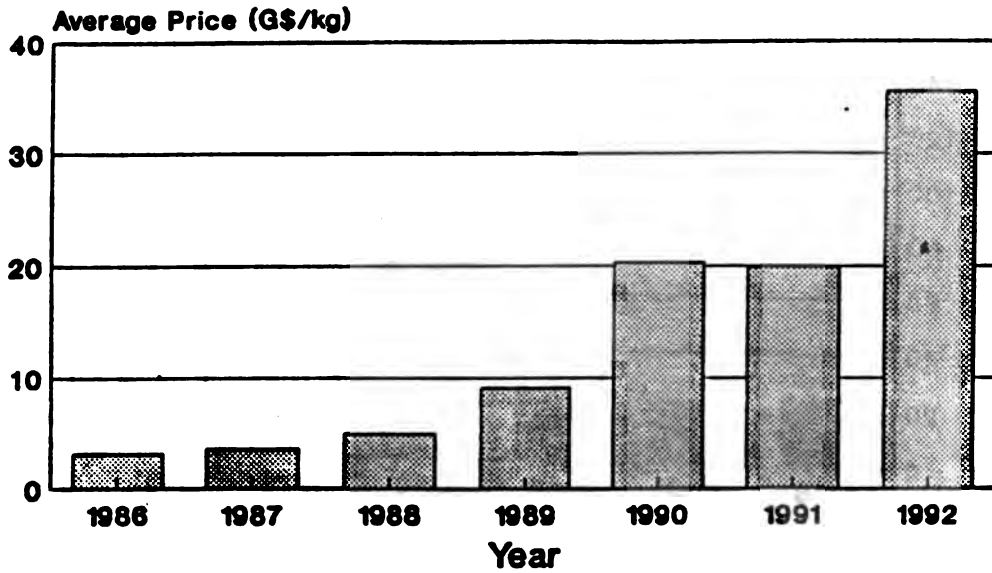
Source: NGMC.

Figure 2. Plantain



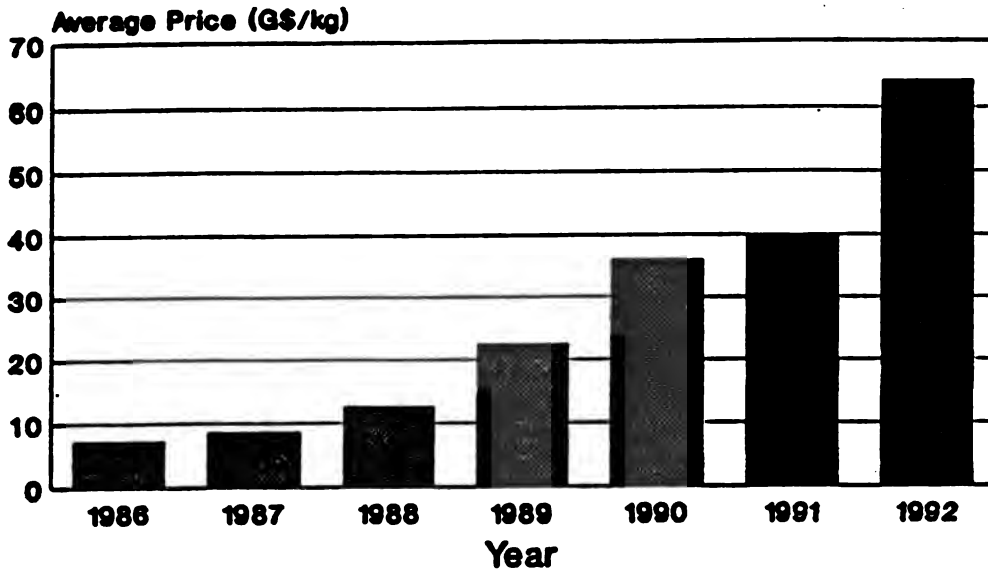
Source: NGMC.

Figure 3. Ochro



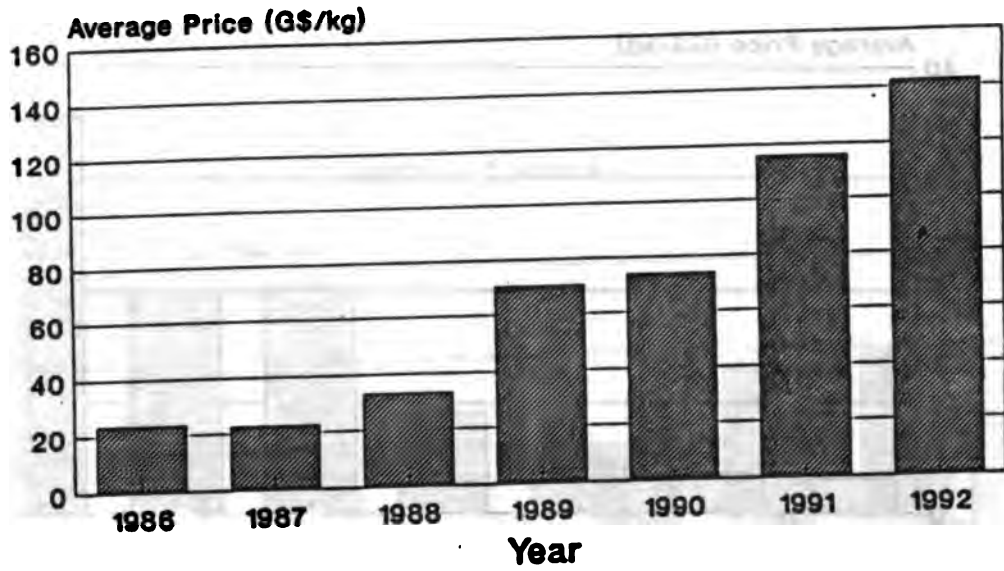
Source: NGMC.

Figure 4. Bora



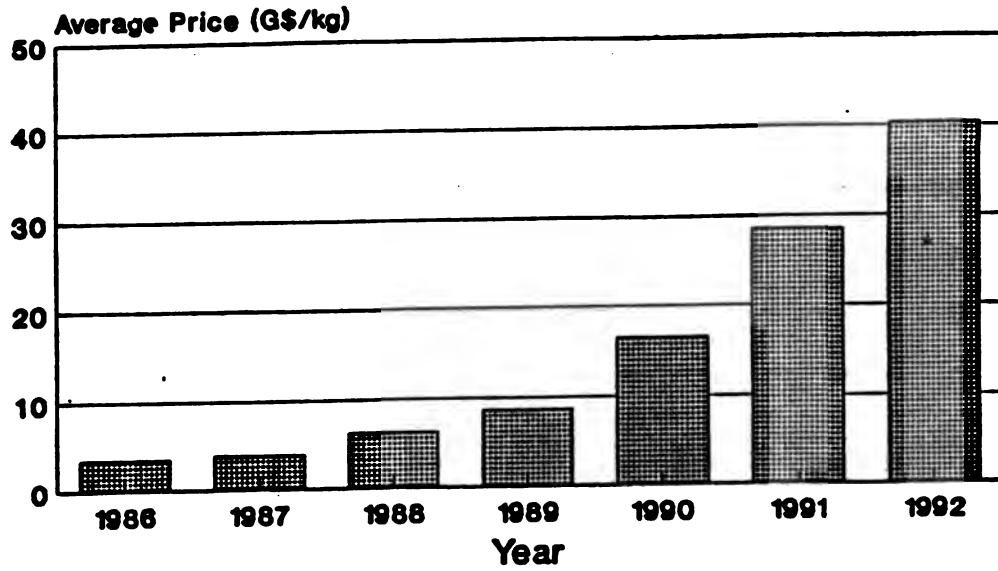
Source: NGMC.

Figure 5. Black-eye peas



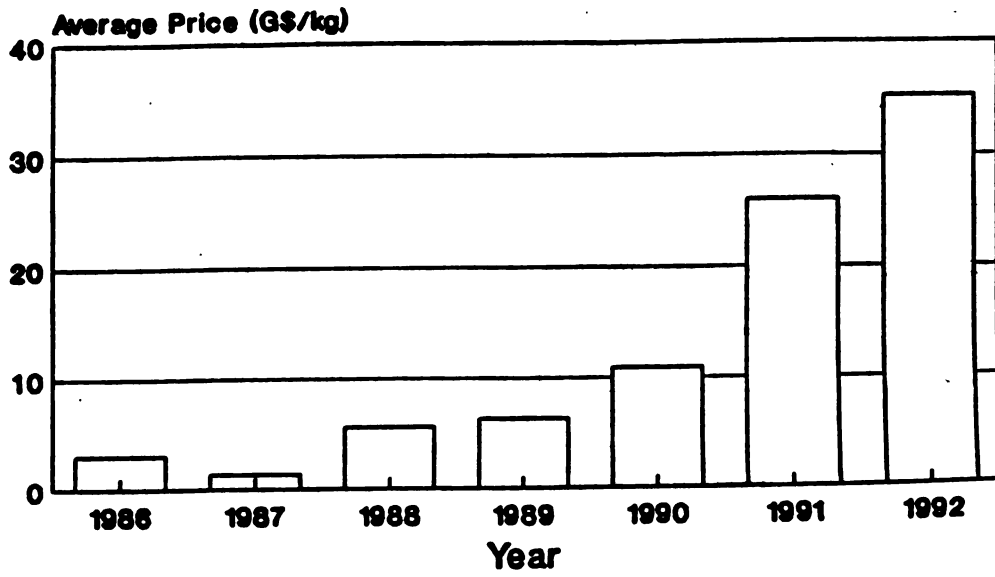
Source: NGMC.

Figure 6. Watermelon



Source: NGMC.

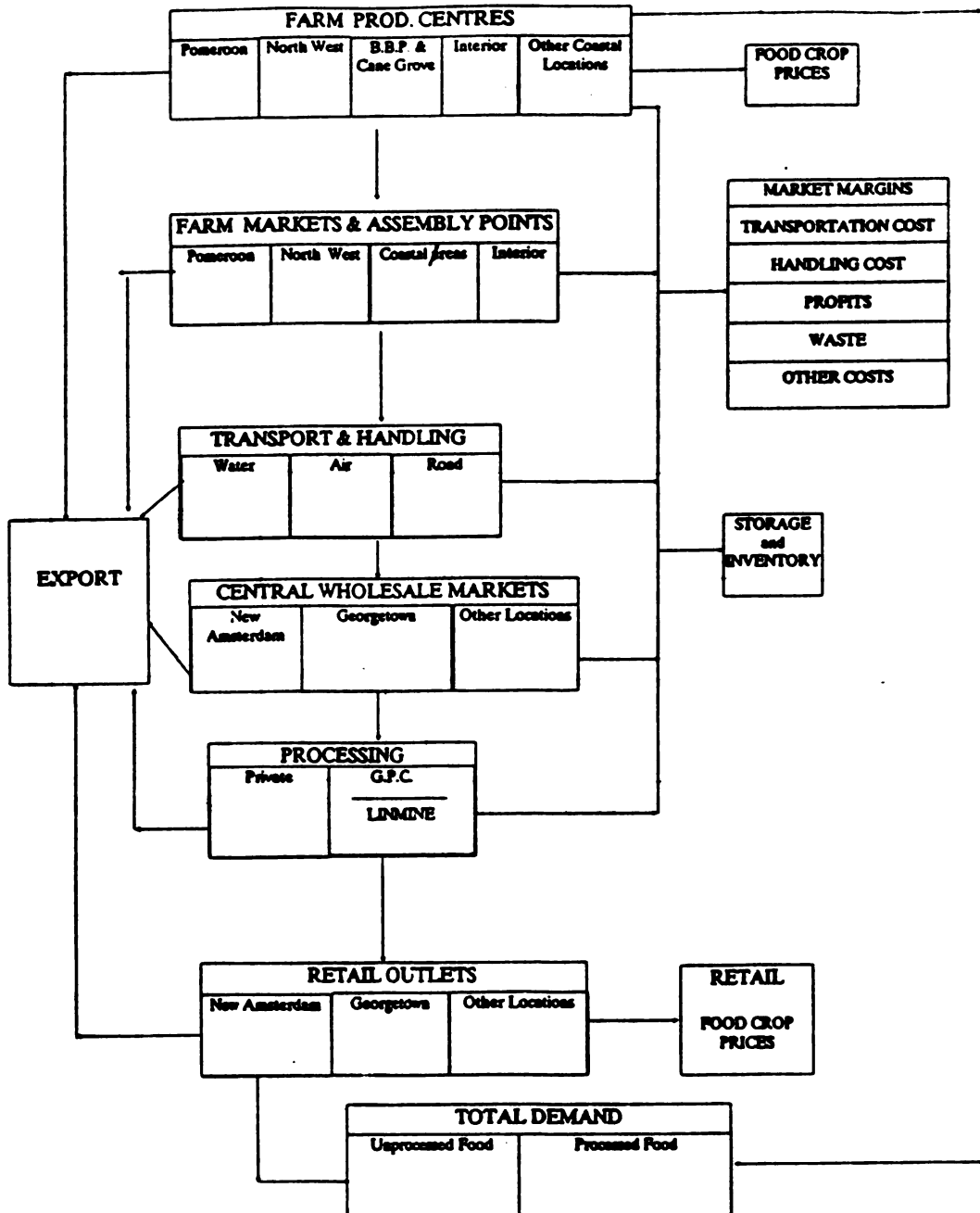
Figure 7. Pineapple



Source: NGMC.

APPENDIX 4

MARKETING CHANNELS FOR NON-TRADITIONAL CROPS



Source: Adapted by the author from Schematic of the Marketing Sub-sector Model, Nathan Associates.

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PROGRAM FOR THE ANALYSIS OF AGRICULTURAL
POLICIES VIS-A-VIS WOMEN FOOD PRODUCERS
IN THE ANDEAN REGION, THE SOUTHERN CONE
AND THE CARIBBEAN

This Program, executed by the Inter-American Institute for Cooperation on Agriculture (IICA) and financed by the Inter-American Development Bank (IDB) under Technical Cooperation Agreement ATN/SF-4064-RE, covered 18 countries in Latin America and the Caribbean. The first phase was implemented in 1992-1993 in six countries in Central America, under the auspices of the Council of Central American Agricultural Ministers in its XII Ordinary Meeting in March 1992. Results were published in the book *Mujeres de Maíz* (IICA/IDB 1995).

The second phase was carried out in the Andean Region (Bolivia, Colombia, Ecuador, Peru and Venezuela), the Southern Cone (Brazil, Paraguay and Uruguay) and the Caribbean (Barbados, Guyana, Jamaica and Suriname), by request of the First Ladies during their Summit Meeting on the Economic Advancement of Rural Women held in Geneva, Switzerland in February 1992.

Three documents were prepared for each country presenting the technical results from the four areas of research of the Program: a) assessment of the participation of women in the agricultural sector and their contribution as food producers on small-scale farms; b) analysis of agricultural policies and programs and their effects on rural women as food producers; c) evaluation of the technology used on small farms by women in food production processes; and d) analysis of the role of women in processing and marketing farm food products.

Other Program activities included the elaboration of regional comparative documents, the formulation of policy proposals and related actions, national and regional seminars for discussion of Program recommendations, and the publishing and distribution of the final results.